Appendix F

Correspondence

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

Transmitted Via Facsimile

August 12, 1996

Mr. Scott Cornelius
Project Manager
Michigan Dept. of Environmental Quality
P.O. Box 30426
Lansing, MI 48909

Re: Willow Boulevard Site
Project #: 645.82 #2

Dear Scott:

As discussed in our correspondence of August 9, 1996, we believe the best way to advance the discussion of Willow Boulevard Site remediation to a definite conclusion first involves confirmation that the prior detections of PCB in monitoring well WMW-3A were not an artifact of well construction methods. This letter proposes the construction of a double-cased well at the same location to test the hypothesis that PCB detected in samples from well WMW-3A were attributable to contamination of the well by construction methods. If PCB are not detected in a sample from the new well, the hypothesis will be accepted.

Monitoring well WMW-3A was installed as part of the RI. The statement in our August 9, 1996, letter that this was a pre-RI well was incorrect. Our concern is nevertheless the same since the top of the filter pack for WMW-3A appears to be at the same elevation and may be in direct contact with the residuals at this location.

The monitoring well drilling, installation, development, and sampling will be performed in accordance with the protocols defined in the MDNR-approved Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP), with the exception that a permanent secondary casing will be grouted in place through the base of the residual materials prior to advancing the borehole through the underlying formation materials in which the well is to be screened. The borehole will initially be advanced through the base of the residual materials, as determined by observation of continuously collected soil samples. After establishing the depth to the base of the residual materials, using a 4.25-inch diameter auger, the auger will be removed from the borehole and a 12.25-inch outside diameter hollow-stem auger will be advanced to a depth of one foot below the base of the residual materials. A 10-inch diameter steel casing will then be installed through the augers and tremie-grouted in place. After the grout has been allowed to set for a period of at least 24 hours, the borehole will be advanced through the base of the steel casing using a 4.25-inch hollow-stem auger to a depth of five feet below the base of the casing. The monitoring well will then be constructed and developed consistent with the specifications defined in the QAPP and FSP.

KB 117

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The well will be allowed to equilibrate with the surrounding formation for a period of two weeks following installation and development. During this two-week period, groundwater and river elevations will be monitored for steady-state flow conditions. The groundwater sampling activities will be performed in accordance with the FSP and the low-flow purge/sampling methods followed throughout the previous sampling event at this site. The unfiltered groundwater sample will be sent to Inchcape Laboratories, Inc. (Aquatec) and a seven-day turnaround time for analytical results requested. A detection limit of 0.2 µg/L will be targeted.

It is anticipated that drilling will begin August 16, 1996, with well installation and development occurring on August 19, 1996. Sampling of the well will take place August 30, 1996, with analytical results available September 9, 1996. The data will be reviewed for quality assurance/quality control and a letter report prepared and submitted to MDEQ by September 16, 1996.

If you have any questions or would like to discuss this further, please call me at (315) 446-9120.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Mark P. Brown, Ph.D.
Vice President

MPB/ama
Q:\2796171E

cc: Alan Howard, Michigan Dept. of Environmental Quality
George Carpenter, Michigan Dept. of Environmental Quality
J. Michael Davis, Esq., Georgia-Pacific Corporation
Dan Cummins, Georgia-Pacific Corporation
Paul Montney, Georgia-Pacific Corporation
T. Mayes Starke, Georgia-Pacific Corporation

KB 117

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

Transmitted Via Facsimile

August 13, 1996

Mr. Scott Cornelius
Project Manager
Michigan Department of Environmental Quality
P.O. Box 30426
Lansing, MI 48909

Re: Willow Boulevard Site Replacement Well
Project #: 645.82

Dear Scott:

To confirm our conversation of earlier this afternoon, please be assured that the sand pack material for the proposed replacement well at Willow Boulevard would be a Morie "0" sand, not a "00" sand.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Mark P. Brown, Ph.D.
Vice President

MPB/ama
3596171E

cc: J. Michael Davis, Esq. Georgia-Pacific Corporation
Dan Cummins, Georgia-Pacific Corporation
Paul Montney, Georgia-Pacific Corporation
T. Mayes Starke, Georgia-Pacific Corporation
Patrick N. McGuire, Blasland, Bouck & Lee, Inc.
William T. McCune, Blasland, Bouck & Lee, Inc.

KB 117

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

Transmitted Via Facsimile Followed by First Class Mail

August 13, 1997

Mr. Scott Cornelius
Project Manager
Michigan Department of Environmental Quality
P.O. Box 30426
Lansing, MI 48909

Re: Willow Boulevard Site
Project #: 645.82.500#2

Dear Scott:

This letter summarizes BBL's findings regarding the issue of the zinc detection in one groundwater sample at the Willow Boulevard Site that was greater than the 1,100 µg/L Rule 57 acute toxicity value for aquatic life that was cited in the MDEQ's June 1997 comments on the *Willow Boulevard/A-Site Operable Unit Remedial Investigation/Focused Feasibility Study*. In well WMW-2, zinc was present in a groundwater sample (and its duplicate) at a concentration of 2,200 µg/L. We believe these observations are an artifact of the use of zinc-containing materials in this pre-RI monitoring well.

We have looked at ways of using existing data to test the hypothesis that the presence of zinc in groundwater samples at levels greater than 1,100 µg/L may be an artifact of corrosion of the galvanized steel risers in the older pre-RI wells. USEPA's *RCRA Ground-Water Monitoring: Draft Technical Guidance* (USEPA, 1992) discusses the corrosion of metallic well casings and states that it can result in groundwater sample analytical bias. Zinc is a known byproduct of the corrosion of galvanized steel well materials.

Looking at all of the wells at the Willow Boulevard/A-Site, King Highway Landfill, and Allied Paper, Inc. operable units, zinc was only detected in excess of 1,100 µg/L in groundwater samples from the older wells that were constructed with galvanized steel. During the RI, zinc was measured in groundwater/leachate samples collected from 40 old wells and 51 new wells at the three Kalamazoo County OUs. The 12th Street Landfill OU, located in Allegan County, was not considered in this groundwater analysis since there were no pre-RI monitoring wells at the OU for comparison. The zinc concentrations in the samples from the pre-RI wells ranged from not detected (detection limit of 3.1 µg/L) to 3,300 µg/L and averaged 827 µg/L. On the other hand, the zinc concentrations in samples from the new wells ranged from not detected (detection limit of 3.1 µg/L) to 444 µg/L and averaged 43 µg/L. Tables 1 and 2 provide the zinc concentration data for samples from the old and new wells, respectively. Figure 1 graphically represents these data. Note that in samples with zinc concentrations below the detection limit, the detection limit was used in the analysis as a worst-case scenario.

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An alternate hypothesis that the elevated zinc levels are due to leaching of the wastes was also evaluated by reviewing the results of sampling of the leachate wells, including leachate samples from the 12th Street Landfill OU. The zinc concentrations in the nine leachate samples ranged from not detected (detection limit of 3.1 µg/L) to 63.2 µg/L and averaged 24 µg/L (Table 3). These concentrations are substantially lower on average than the zinc concentrations found in samples from the old wells at the other OUs. Note that the leachate data for the Kalamazoo County OUs are included with the new wells in Table 2 and Figure 1. So an alternate hypothesis that the elevated zinc levels are attributable to wastes can be rejected.

Tables 1 and 2 also list the well construction materials for the wells from the Kalamazoo County OUs (i.e., stainless steel, galvanized steel). All of the new wells have stainless steel risers and screens. Of the 40 pre-RI wells, complete well construction information is known for only 31 of the wells, all but two of which have galvanized steel risers. Where well construction details are known, all wells have stainless steel screens.

The corrosion hypothesis is further reinforced when the data for wells with galvanized steel risers are compared to the data for wells with stainless steel risers. Zinc concentrations in groundwater samples from wells with galvanized steel risers (all old wells, except two) ranged from not detected (detection limit of 3.1 µg/L) to 3,300 µg/L and averaged 907 µg/L. On the other hand, the concentrations in groundwater/leachate samples from the wells with stainless steel risers (all new wells, plus two old wells) ranged from not detected (detection limit of 3.1 µg/L) to 444 µg/L and averaged 43 µg/L. Tables 4 and 5 provide the zinc concentration data for samples from the galvanized and stainless steel wells, respectively. Figure 2 graphically represents these data.

At the Willow Boulevard Site, two of the groundwater samples from old wells had high levels of zinc. Samples from WMW-2 and WMW-3 (both old wells with galvanized steel risers) had zinc concentrations of 2,200 µg/L and 900 µg/L, respectively. Note that groundwater samples collected from WMW-4A and WMW-4B (both new wells with stainless steel risers), which are located between WMW-2 and WMW-3, contained 6.7 µg/L and 7.3 µg/L, respectively. Zinc concentrations in samples from the wells with galvanized steel risers are two to three orders of magnitude lower than concentrations in samples from the wells with stainless steel risers.

Given that, 1) the zinc levels in leachate samples have all been low across all four OUs (i.e., concentrations less than 63.2 µg/L), 2) the groundwater samples with zinc concentrations exceeding the toxicity value are from old wells made with galvanized steel risers, 3) none of the groundwater samples from the new wells have zinc levels even approaching the acute value, and 4) considering that corrosion of galvanized steel is known to bias groundwater sample results for zinc, we conclude that the levels of zinc in groundwater samples in excess of the level determined to be acutely toxic to aquatic life is an artifact of well corrosion.

Your recent suggestion to resample well WMW-2 probably will not resolve this issue. As stated in the USEPA's *RCRA Ground-Water Monitoring: Draft Technical Guidance* (USEPA, 1992), "according to Barcelona et al. (1983), even purging the well prior to sampling may not be sufficient to minimize this source of sample bias because the effects of the disturbance of surface coatings or accumulated corrosion products in the bottom of the well are difficult, if not impossible, to predict." This older well may be simply unable to provide a representative sampling of zinc in groundwater at the Willow Boulevard Site.

Please call me to discuss this issue after you have reviewed the information presented in this letter.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Mark P. Brown, Ph.D.
Vice President

DEP/dep
G:\MSP\32871081.WPD

cc: Bonnie Barnett, Esq., Drinker, Biddle & Reath
J. Michael Davis, Esq., Georgia-Pacific Corporation
Jon F. DeWitt, Esq., Varnum, Riddering, Schmidt & Howlett
Paul Montney, P.E., Georgia-Pacific Corporation
Joyce S. Schlesinger, P.E., Environ
Dan O. Cummins, P.G., Georgia-Pacific Corporation

TABLE 1

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

Allied Paper, Inc./King Highway Landfill/Willow Boulevard/A-Site Operable Units
Summary of 1993 Groundwater Zinc Concentrations in Old Wells

Site	Well	Groundwater Zinc Concentration (ug/L)	Riser Material	Screen Material
ALLIED	MW-1	910	G	SS
ALLIED	MW-2	430	G	SS
ALLIED	MW-3	510	G	SS
ALLIED	MW-5	110	G	SS
ALLIED	MW-7	680	G	SS
ALLIED	MW-8	360	G	SS
ALLIED	MW-11	220	G	SS
ALLIED	MW-12	1500	G	SS
ALLIED	MW-15	100	G	SS
ALLIED	MW-16B	940	G	SS
ALLIED	MW-16C	950	G	SS
ALLIED	MW-17A	2400	G	SS
ALLIED	MW-17B	1900	G	SS
ALLIED	MW-18	69	G	SS
ALLIED	MW-19C	2300	G	SS
ALLIED	MW-19D	2100	G	SS
ALLIED	MW-20	830	G	SS
ALLIED	MW-20DUP	560	G	SS
ALLIED	MW-21	59	G	?
ALLIED	MW-23	680	G	?
ALLIED	MW-24	920	G	?
ALLIED	MW-25	3300	G	?
ALLIED	MW-26	270	G	SS
ALLIED	MW-104	770	G	SS
ALLIED	MW-106	260	G	SS
ALLIED	MW-108	330	G	SS
ALLIED	MW-112	2800	G	SS
ALLIED	MW-114	220	G	?
KING HIGHWAY	MW-1	204	G	SS
KING HIGHWAY	MW-2	207	?	?
KING HIGHWAY	MW-3	182	?	?
KING HIGHWAY	MW-5	1610	?	?
KING HIGHWAY	MW-7	649	G	SS
A-SITE	AMW-1	8.4	SS	SS
A-SITE	AMW-2	8.4	SS	SS
A-SITE	AMW-3	8.5	G	SS
A-SITE	AMW-4	7.2	G	SS
A-SITE	AMW-5	3.1	G	SS
WILLOW	WMW-1	60	?	?
WILLOW	WMW-2	2200	G	SS
WILLOW	WMW-2DUP	2200	G	SS
WILLOW	WMW-3	900	G	SS
Count		42		
Arithmetic Mean		827		
Geometric Mean		327		
Median		535		
Standard Deviation		882		
Minimum		3		
Maximum		3300		

Notes:
1. DUP = Duplicate.
2. G = Galvanized steel.
3. SS = Stainless steel.
4. ? = Unknown from well construction log.
5. Non-detects reported at detection limit.

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TABLE 2

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

Allied Paper, Inc./King Highway Landfill/Willow Boulevard/A-Site Operable Units
Summary of 1993 Groundwater Zinc Concentrations in New Wells

Site	Well	Groundwater Zinc Concentration (ug/L)	Riser Material	Screen Material
ALLIED	MW-2S	3.8	SS	SS
ALLIED	MW-2SDUP	13	SS	SS
ALLIED	MW-7B	6.5	SS	SS
ALLIED	MW-12R	33	SS	SS
ALLIED	MW-19BR	29	SS	SS
ALLIED	MW-20B	18	SS	SS
ALLIED	MW-22A	170	SS	SS
ALLIED	MW-22B	19	SS	SS
ALLIED	MW-120A	40	SS	SS
ALLIED	MW-120B	3.1	SS	SS
ALLIED	MW-120BDUP	3.1	SS	SS
ALLIED	MW-121A	31	SS	SS
ALLIED	MW-121B	7.5	SS	SS
ALLIED	MW-122A	9.2	SS	SS
ALLIED	MW-122ADUP	13	SS	SS
ALLIED	MW-122B	25	SS	SS
ALLIED	MW-123A	78	SS	SS
ALLIED	MW-123B	29	SS	SS
ALLIED	MW-124A	180	SS	SS
ALLIED	MW-124B	7.7	SS	SS
ALLIED	MW-125A	3.4	SS	SS
ALLIED	MW-125B	17	SS	SS
ALLIED	MW-125P	3.1	SS	SS
ALLIED	MW-126A	110	SS	SS
ALLIED	MW-126B	3.1	SS	SS
ALLIED	MW-126BDUP	3.1	SS	SS
ALLIED	MW-127A	3.5	SS	SS
KING HIGHWAY	MW-1A	329	SS	SS
KING HIGHWAY	MW-8A	444	SS	SS
KING HIGHWAY	MW-8ADUP	349	SS	SS
KING HIGHWAY	MW-8B	3.3	SS	SS
KING HIGHWAY	MW-9A	14.1	SS	SS
KING HIGHWAY	MW-9B	11.6	SS	SS
KING HIGHWAY	MW-9R	63.2	SS	SS
KING HIGHWAY	MW-10A	3.1	SS	SS
KING HIGHWAY	MW-10B	185	SS	SS
KING HIGHWAY	MW-10R	44.7	SS	SS
A-SITE	AMW-3A	10	SS	SS
A-SITE	AMW-6A	9.6	SS	SS
A-SITE	AMW-6ADUP	8	SS	SS
A-SITE	AMW-6B	5.9	SS	SS
A-SITE	AMW-6P	19	SS	SS
A-SITE	AMW-7A	3.3	SS	SS
A-SITE	AMW-7B	13	SS	SS
A-SITE	AMW-7P	7.6	SS	SS
A-SITE	AMW-8A	3.1	SS	SS
A-SITE	AMW-8B	5.3	SS	SS
A-SITE	AMW-9A	3.1	SS	SS
A-SITE	AMW-9B	3.1	SS	SS
A-SITE	AMW-9P	3.9	SS	SS
A-SITE	AMW-10A	11	SS	SS
A-SITE	AMW-10ADUP	4.1	SS	SS
A-SITE	AMW-10B	3.1	SS	SS
A-SITE	AMW-10P	4.7	SS	SS
WILLOW	WMW-1A	45	SS	SS
WILLOW	WMW-3A	3.1	SS	SS
WILLOW	WMW-4A	6.7	SS	SS
WILLOW	WMW-4B	7.3	SS	SS
Count		58		
Arithmetic Mean		43		
Geometric Mean		13		
Median		9		
Standard Deviation		89		
Minimum		3		
Maximum		444		

Notes:
1. DUP = Duplicate.
2. SS = Stainless steel.
3. Non-detects reported at detection limit.

TABLE 3

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

Allied Paper, Inc./King Highway Landfill/Willow Boulevard/A-Site/12th Street Landfill Operable Units
Summary of 1993 Groundwater Zinc Concentrations in Leachate Wells

Site	Well	Groundwater Zinc Concentration (ug/L)	Riser Material	Screen Material
ALLIED	MW-125P	3.1	SS	SS
KING HIGHWAY	MW-9R	63.2	SS	SS
KING HIGHWAY	MW-10R	44.7	SS	SS
A-SITE	AMW-6P	19	SS	SS
A-SITE	AMW-7P	7.6	SS	SS
A-SITE	AMW-9P	3.9	SS	SS
A-SITE	AMW-10P	4.7	SS	SS
12TH STREET	LH-1	18.5	SS	SS
12TH STREET	LH-2	48.2	SS	SS
Count		9		
Arithmetic Mean		24		
Geometric Mean		14		
Median		19		
Standard Deviation		23		
Minimum		3.1		
Maximum		63.2		

Notes:
1. DUP = Duplicate.
2. SS = Stainless steel.
3. Non-detects reported at detection limit.

TABLE 4

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

Allied Paper, Inc./King Highway Landfill/Willow Boulevard/A-Site Operable Units
Summary of 1993 Groundwater Zinc Concentrations in Wells with Galvanized Risers

Site	Well	Ground-Water Zinc Concentration (ug/L)	Riser Material	Screen Material
ALLIED	MW-1	910	G	SS
ALLIED	MW-2	430	G	SS
ALLIED	MW-3	510	G	SS
ALLIED	MW-5	110	G	SS
ALLIED	MW-7	680	G	SS
ALLIED	MW-8	360	G	SS
ALLIED	MW-11	220	G	SS
ALLIED	MW-12	1500	G	SS
ALLIED	MW-15	100	G	SS
ALLIED	MW-16B	940	G	SS
ALLIED	MW-16C	950	G	SS
ALLIED	MW-17A	2400	G	SS
ALLIED	MW-17B	1900	G	SS
ALLIED	MW-18	69	G	SS
ALLIED	MW-19C	2300	G	SS
ALLIED	MW-19D	2100	G	SS
ALLIED	MW-20	830	G	SS
ALLIED	MW-20DUP	560	G	SS
ALLIED	MW-21	59	G	?
ALLIED	MW-23	680	G	?
ALLIED	MW-24	920	G	?
ALLIED	MW-25	3300	G	?
ALLIED	MW-26	270	G	SS
ALLIED	MW-104	770	G	SS
ALLIED	MW-106	260	G	SS
ALLIED	MW-108	330	G	SS
ALLIED	MW-112	2800	G	SS
ALLIED	MW-114	220	G	?
KING HIGHWAY	MW-1	204	G	SS
KING HIGHWAY	MW-7	649	G	SS
A-SITE	AMW-3	8.5	G	SS
A-SITE	AMW-4	7.2	G	SS
A-SITE	AMW-5	3.1	G	SS
WILLOW	WMW-2	2200	G	SS
WILLOW	WMW-2DUP	2200	G	SS
WILLOW	WMW-3	900	G	SS
Count		36		
Arithmetic Mean		907		
Geometric Mean		414		
Median		665		
Standard Deviation		900		
Minimum		3		
Maximum		3300		

Notes:
1. DUP = Duplicate.
2. G = Galvanized steel.
3. SS = Stainless steel.
4. ? = Unknown from well construction log.
5. Non-detects reported at detection limit.
6. King Highway MW-2, MW-3, MW-5; Willow WMW-1 well material descriptions unavailable.

TABLE 5

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

Allied Paper, Inc./King Highway Landfill/Willow Boulevard/A-Site Operable Units
Summary of 1993 Groundwater and Leachate Zinc Concentrations in Wells with Stainless Steel Risers

Site	Well	Groundwater/Leachate Zinc Concentration (ug/L)	Riser Material	Screen Material
ALLIED	MW-2S	3.8	SS	SS
ALLIED	MW-2SDUP	13	SS	SS
ALLIED	MW-7B	6.5	SS	SS
ALLIED	MW-12R	33	SS	SS
ALLIED	MW-19BR	29	SS	SS
ALLIED	MW-20B	18	SS	SS
ALLIED	MW-22A	170	SS	SS
ALLIED	MW-22B	19	SS	SS
ALLIED	MW-120A	40	SS	SS
ALLIED	MW-120B	3.1	SS	SS
ALLIED	MW-120BDUP	3.1	SS	SS
ALLIED	MW-121A	31	SS	SS
ALLIED	MW-121B	7.5	SS	SS
ALLIED	MW-122A	9.2	SS	SS
ALLIED	MW-122ADUP	13	SS	SS
ALLIED	MW-122B	25	SS	SS
ALLIED	MW-123A	78	SS	SS
ALLIED	MW-123B	29	SS	SS
ALLIED	MW-124A	180	SS	SS
ALLIED	MW-124B	7.7	SS	SS
ALLIED	MW-125A	3.4	SS	SS
ALLIED	MW-125B	17	SS	SS
ALLIED	MW-125P	3.1	SS	SS
ALLIED	MW-126A	110	SS	SS
ALLIED	MW-126B	3.1	SS	SS
ALLIED	MW-126BDUP	3.1	SS	SS
ALLIED	MW-127A	3.5	SS	SS
KING HIGHWAY	MW-1A	329	SS	SS
KING HIGHWAY	MW-8A	444	SS	SS
KING HIGHWAY	MW-8ADUP	349	SS	SS
KING HIGHWAY	MW-8B	3.3	SS	SS
KING HIGHWAY	MW-9A	14.1	SS	SS
KING HIGHWAY	MW-9B	11.6	SS	SS
KING HIGHWAY	MW-9R	63.2	SS	SS
KING HIGHWAY	MW-10A	3.1	SS	SS
KING HIGHWAY	MW-10B	185	SS	SS
KING HIGHWAY	MW-10R	44.7	SS	SS
A-SITE	AMW-3A	10	SS	SS
A-SITE	AMW-6A	9.6	SS	SS
A-SITE	AMW-6ADUP	8	SS	SS
A-SITE	AMW-1	8.4	SS	SS
A-SITE	AMW-2	8.4	SS	SS
A-SITE	AMW-6B	5.9	SS	SS
A-SITE	AMW-6P	19	SS	SS
A-SITE	AMW-7A	3.3	SS	SS
A-SITE	AMW-7B	13	SS	SS
A-SITE	AMW-7P	7.6	SS	SS
A-SITE	AMW-8A	3.1	SS	SS
A-SITE	AMW-8B	5.3	SS	SS
A-SITE	AMW-9A	3.1	SS	SS
A-SITE	AMW-9B	3.1	SS	SS
A-SITE	AMW-9P	3.9	SS	SS
A-SITE	AMW-10A	11	SS	SS
A-SITE	AMW-10ADUP	4.1	SS	SS
A-SITE	AMW-10B	3.1	SS	SS
A-SITE	AMW-10P	4.7	SS	SS
WILLOW	WMW-1A	45	SS	SS
WILLOW	WMW-3A	3.1	SS	SS
WILLOW	WMW-4A	6.7	SS	SS
WILLOW	WMW-4B	7.3	SS	SS
Count		52		
Arithmetic Mean		43		
Geometric Mean		12		
Median		8		
Standard Deviation		92		
Minimum		3		
Maximum		444		

Notes:
1. DUP = Duplicate.
2. G = Galvanized steel.
3. SS = Stainless steel.
4. Non-detects reported at detection limit.

FIGURE

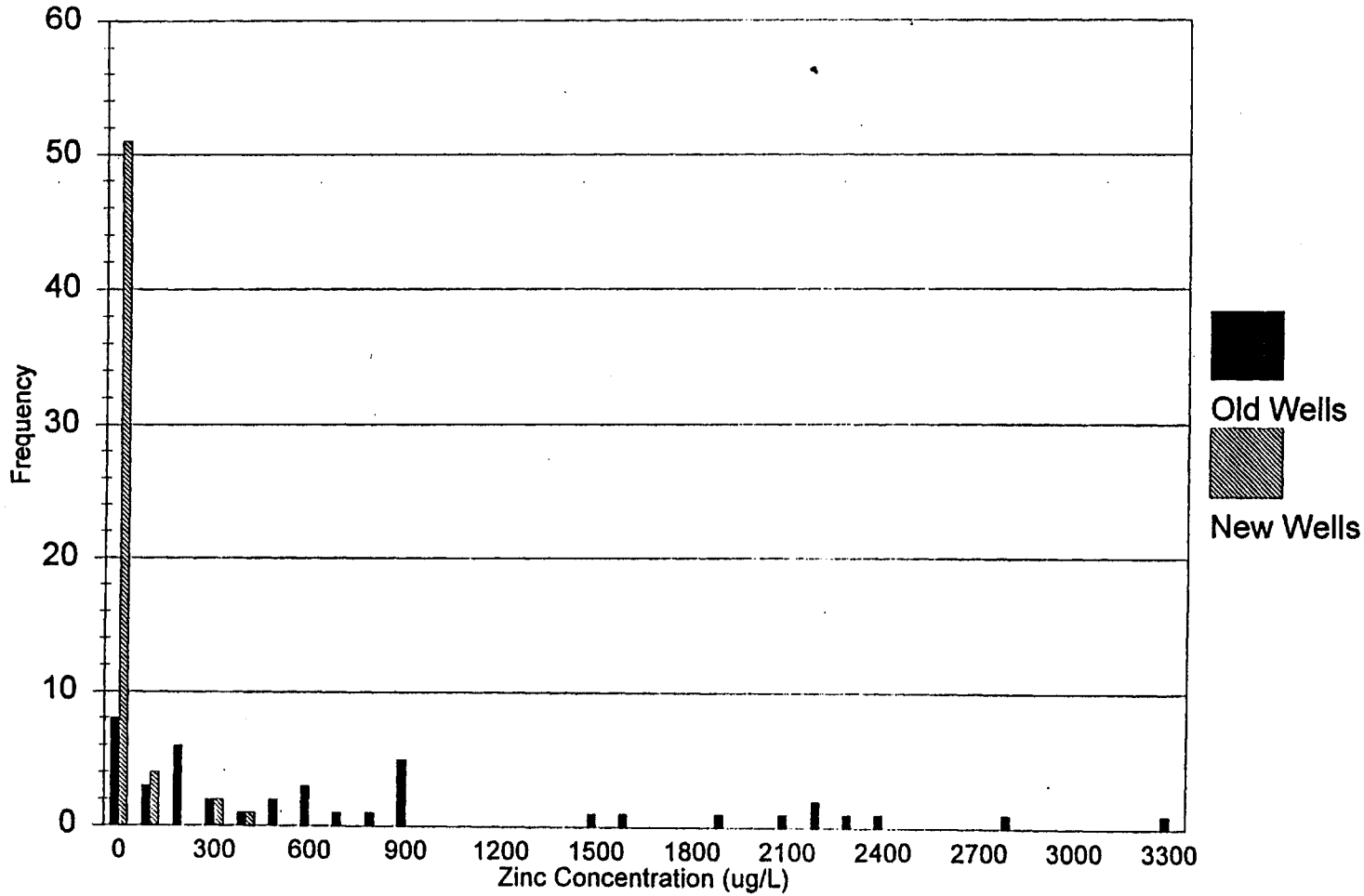

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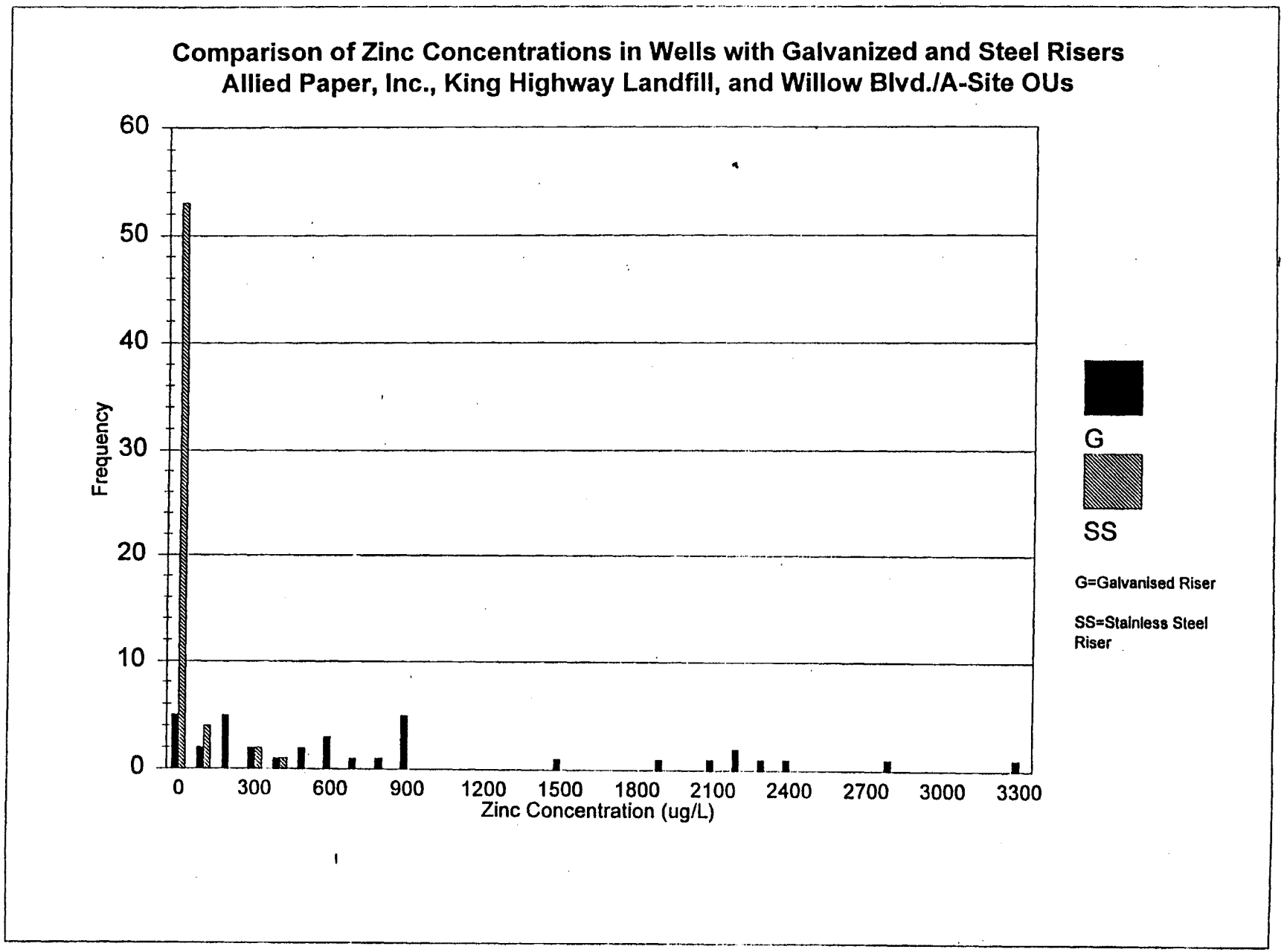
FIGURE 2



KB12000896

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

Transmitted Via Facsimile

December 18, 1997

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

Re: Willow Boulevard/A-Site Operable Unit Subsurface Investigation
Project #: 645.51.500 #2

Dear Scott:

Pursuant to our discussion at the December 16 meeting between the Michigan Department of Environmental Quality (MDEQ) and the Kalamazoo River Study Group (KRSG), this letter outlines the purpose and procedure for assessing levels of PCB, if any, in subsurface materials in the area of soil boring/monitoring well AMW-3A near the Willow Boulevard/A-Site Operable Unit.

Laboratory analysis of a soil sample collected from a depth interval of 6 to 8 feet below land surface (bls) in the soil boring advanced for the installation of off-site "background" monitoring well AMW-3A indicated the presence of PCB in soil at an estimated concentration of 62 milligrams per kilogram (mg/kg) during the Remedial Investigation. The sample's PCB result was qualified as having PCB contamination in the associated blank sample. Blasland, Bouck & Lee, Inc. (BBL) proposes to drill and sample three soil borings advanced at locations around AMW-3A at a radial distance of approximately 3 to 5 feet. These borings will be drilled and sampled continuously to a depth of approximately 12 feet bls. Soil samples collected from 6 to 8 feet bls in each boring will be analyzed in the field using Ensys-brand PCB test kits to assess the presence of PCB at concentrations greater than 1 mg/kg and 10 mg/kg. This sampling interval may be adjusted in the field based upon stratigraphy, if appropriate, to more closely correspond to the strata sampled in boring AMW-3A. A copy of the boring log for AMW-3A is attached. The 0-2 feet sample and the 4-6 feet from the first boring also will be screened. If PCB are not detected in any samples, no further investigation will be performed.

Any Ensys results testing greater than 1 mg/kg will be sent to the project's contract laboratory for analysis of PCB by the standard gas chromatography method. If PCB are detected in one or more samples collected from 6 to 8 feet bls, the samples collected from adjacent depth intervals (both above and below impacted samples) will be analyzed successively until the vertical extent of PCB-impacted soils is defined.

The drilling and soil sample collection procedure will follow protocols set forth in the approved Field Sampling Plan (Blasland & Bouck Engineers, P.C., 1993). The exact locations and quantity of soil borings

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and soil samples to be analyzed for PCB will be decided based on conditions encountered in the field. The Township of Kalamazoo, owner of the property where the borings will be collected, will be contacted by BBL regarding access.

We appreciate your timely review and response to this proposal. If you have any questions, please contact me at (315) 446-9120.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Mark P. Brown, Ph.D.
Vice President

DKC/ccm
F:\USERS\CCM\05871626.WPD

cc: Bonnie Barnett, Esq., Drinker, Biddle & Reath
J. Michael Davis, Esq., Georgia-Pacific Corporation
Jon F. DeWitt, Esq., Varnum, Riddering, Schmidt & Howlett
Daniel O. Cummins, P.G., Georgia-Pacific Corporation
Paul Montney, P.E., Georgia-Pacific Corporation
Gregory W. Peterson, LTI-Limno-Tech, Inc.
Joyce S. Schlesinger, P.E., ENVIRON
Gail A. Smith, Georgia-Pacific Corporation
Douglas K. Cowin, P.G., Blasland, Bouck & Lee, Inc.
Patrick N. McGuire, Blasland, Bouck & Lee, Inc.

Date Start/Finish: 9/7/93 – 9/7/93 Drilling Company: Mateco Drillers Driller's Name: Jim Page Drilling Method: Hollow Stem Auger Bit Size: N/A-in. Auger Size: 4.25-in. Rig Type: CME-750 Spoon Size: 2-in. Hammer Weight: 140-lb Height of Fall: 30-in.	Northing: 288509.4 Easting: 128054408.9 Well Casing Elev.: 765.27 ft. Corehole Depth: N/A ft. Borehole Depth: 12 ft. Ground Surface Elev.: 765.5 ft. Geologist: David W. Lay	Well No.: AMW-3A Operable Unit: Willow Boulevard/A-Site Site: Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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
as elevation 765.5 ft										GROUND SURFACE	Vented Casing Cap 4-in diameter steel flush mount protective casing
	765			2 3 5 5	8	1.4	0.0			Brown fine SAND, trace medium to coarse sand, gravel and gray sand layers, loose, moist.	2-in diameter well casing, stainless steel, approx 2 ft. stick-up
				2 2 2 2	4	1.7	0.0				Bentonite Pellet Seal 1.5 ft. to 3.0 ft. BGS
				1 WOH 1 1	1	1.0	0.0				
5	760	W70145		WOH WOH WOH WOH	<1	0.6	0.0			Grey SILT and CLAY, trace fine to coarse sand and organic matter, soft loose, moist. Grey fine SAND, some silt, loose, wet.	0.01 stainless steel screen from 4.0 to 9.0 ft. BGS
				WOH WOH WOH WOH	<1	NR					Sandpack from 3.0 ft. to 12.0 ft. BGS
10	755	W70146		1 WOH 1 WOH	1	0.7	0.0			Grades to light brown, with trace medium to coarse sand.	
										End of boring 12.0 ft. BGS.	

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	759.85	5.42
10/11/93	759.92	5.35
12/15/93	759.92	5.35

KR12002735

STATE OF MICHIGAN

JOHN ENGLER, Governor

DEPARTMENT OF ENVIRONMENTAL QUALITY

"Better Service for a Better Environment"

HOLLISTER BUILDING, PO BOX 30473, LANSING MI 48909-7973

INTERNET: www.deq.state.mi.us

RUSSELL J. HARDING, Director

REPLY TO:

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

December 23, 1997

Dr. Mark Brown
Blasland, Bouck & Lee
6723 Towpath Road
P.O. Box 66
Syracuse NY 13214-0066

Dear Dr. Brown:

SUBJECT: Comments on the Additional Remedial Investigation of AMW-3A at the Willow Boulevard/A-Site Operable Unit of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site, Kalamazoo and Allegan Counties, Michigan

The purpose of this letter is to transmit the Michigan Department of Environmental Quality (MDEQ) comments on the work plan for additional soil investigation at AMW-3A to the Kalamazoo River Study Group (KRSG). The KRSG's letter of December 18, 1997, regarding the investigation of AMW-3A, proposes that three borings would be taken at locations around AMW-3A and samples collected from each boring at the 6-8 foot interval. It also proposes that a sample would be collected from the 0-2 and 4-6 foot interval on one of the three borings.

Review of the previous investigation indicates that PCBs were detected at both the 6-8 and 10-12 foot interval in the AMW-3A boring. Therefore, the MDEQ requests that the work plan be modified to include the following items.

(1) One location, chosen in consultation with the MDEQ (in the field), should be sampled every two feet for the complete depth of the 12 foot boring.

(2) Any strata or change in strata of particular interest at any of the chosen locations for the complete depth of the boring should be analyzed separately.

(3) Please delete the last sentence in paragraph 2 from the work plan (i.e., "If PCB are not detected in any samples, no further investigation will be performed."). If PCB are not detected, during the proposed investigation, then the MDEQ would evaluate the significance of the PCBs contaminated soils previously detected at the AMW-3A boring.

The proposed work plan with the above requested changes represents the minimal amount of investigation work necessary to investigate the soils around AMW-3A. Please make the above changes to the work plan and submit it for approval. Thank you for your cooperation and attention to this matter. If you have any questions, please contact me.

Sincerely,

DRAFT

Scott Cornelius
Superfund Section
Environmental Response Division
517-373-7367

cc: Mr. John Bradley, MDEQ
Ms. Mary Schafer, MDEQ
file H1, Willow Boulevard/A-Site

BBL
LASLAND, BOUCK & LEE, INC.
ngineers & scientists

Transmitted Via Facsimile

December 31, 1997

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

Re: Willow Boulevard/A-Site Operable Unit Subsurface Investigation
Project #: 645.51.500 #2

Dear Scott:

Pursuant to our discussions at our December 16 meeting, and our December 30th discussion of correspondence from BBL dated December 18 and MDEQ's correspondence of December 23, 1997, this letter outlines the purpose and procedure for assessing levels of PCB, if any, in subsurface materials in the area of soil boring/monitoring well AMW-3A near the Willow Boulevard/A-Site Operable Unit.

Laboratory analysis of a soil sample collected from a depth interval of 6 to 8 feet below land surface (bls) in the soil boring advanced for the installation of off-site "background" monitoring well AMW-3A indicated the presence of PCB in soil at an estimated concentration of 62 milligrams per kilogram (mg/kg) during the Remedial Investigation. The sample's PCB result was qualified as having PCB contamination in the associated blank sample. Blasland, Bouck & Lee, Inc. (BBL) proposes to drill and sample three soil borings advanced at locations chosen in consultation with the MDEQ in the field around AMW-3A at a radial distance of approximately 3 to 5 feet. These borings will be drilled and sampled at 2-foot continuous intervals to a depth of approximately 12 feet bls. Soil samples collected from 6 to 8 feet bls in each boring will be analyzed in the field using Ensys-brand PCB test kits to assess the presence of PCB at concentrations greater than 2 mg/kg and 10 mg/kg. This sampling interval may be adjusted in the field based upon stratigraphy. Individual strata may be sampled and analyzed separately at the discretion of field personnel including MDEQ oversight. A copy of the boring log for AMW-3A is attached. The first boring location will be chosen in consultation with the MDEQ and will be sampled every 2 feet for the complete depth of the 12 foot boring. Each sample will be analyzed in the field for PCB.

If PCB are not detected in any samples, and sampling and analysis are performed to the satisfaction of the MDEQ, no additional borings will be advanced.

Any Ensys results testing greater than 2 mg/kg will be sent to the project's contract laboratory for analysis of PCB by the standard gas chromatography method. If PCB are detected in one or more samples collected from 6 to 8 feet bls, the samples collected from adjacent depth intervals (both above and below impacted samples) will be analyzed successively until the vertical extent of PCB-impacted soils is defined.

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The drilling and soil sample collection procedure will follow protocols set forth in the approved Field Sampling Plan (Blasland & Bouck Engineers, P.C., 1993). The exact locations and quantity of soil borings and soil samples to be analyzed for PCB will be decided based on conditions encountered in the field. The Township of Kalamazoo, owner of the property where the borings will be collected, will be contacted by BBL regarding access.

We appreciate your timely review and response to this proposal. If you have any questions, please contact me at (315) 446-9120.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Mark P. Brown, Ph.D.
Vice President

DKC/ccm
F:\USERS\CCM\05871626.WPD

cc: Bonnie Barnett, Esq., Drinker, Biddle & Reath
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Gail A. Smith, Georgia-Pacific Corporation
Douglas K. Cowin, P.G., Blasland, Bouck & Lee, Inc.
Patrick N. McGuire, Blasland, Bouck & Lee, Inc.

Date Start/Finish: 9/7/93 – 9/7/93 Drilling Company: Mateco Drillers [illegible]'s Name: Jim Page [illegible] Method: Hollow Stem Auger Bit Size: N/A-in. Auger Size : 4.25-in. Rig Type: CME-750 Spoon Size: 2-in. Hammer Weight: 140-lb Height of Fall: 30-in.	Northing: 288509.4 Easting: 128054408.9 Well Casing Elev.: 765.27 ft. Corehole Depth: N/A ft. Borehole Depth: 12 ft. Ground Surface Elev.: 765.5 ft. Geologist: David W. Lay	Well No. AMW-3A Operable Unit: Willow Boulevard/A-Site Site: Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 765.5 ft										GROUND SURFACE	Vented Casing Cap 4-in diameter steel flush mount protective casing
	765			2 3 5 5	8	1.4	0.0			Brown fine SAND, trace medium to coarse sand, gravel and gray sand layers, loose, moist.	2-in diameter well casing, stainless steel, approx 2 ft. stick-up
				2 2 2 2	4	1.7	0.0				Bentonite Pellet Seal 1.5 ft. to 3.0 ft. BGS
				1 WOH		1.0	0.0				
5	760			1 1	1						
		W70145		WOH WOH WOH WOH	<1	0.6	0.0			Grey SILT and CLAY, trace fine to coarse sand and organic matter, soft loose, moist. Grey fine SAND, some silt, loose, wet.	0.01 stainless steel screen from 4.0 to 9.0 ft. BGS
				WOH WOH WOH WOH		NR					Sandpack from 3.0 ft. to 12.0 ft. BGS
10	755	W70146		1 WOH		0.7	0.0			Grades to light brown, with trace medium to coarse sand.	
				1 WOH	1						
										End of boring 12.0 ft. BGS.	
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	759.85	5.42
10/11/93	759.92	5.35
12/15/93	759.92	5.35

KB12002683

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

Transmitted Via Facsimile/Fed Ex

February 6, 1998

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

Re: Willow Boulevard/A-Site OU Soil Sample Results Near AMW-3A
Project #: 645.81.500

Dear Scott:

As promised during our January 26, 1998 meeting, we are transmitting the validated data for the soil material sampled around AMW-3A near the Willow Boulevard/A-Site Operable Unit. Attachment 1 contains the data validation package for these data. We believe all samples were collected on Kalamazoo Township property.

From these data (Table 1), it is apparent that no imminent threat to human health exists, as the PCB concentrations in the surficial samples (0-2 feet below ground surface) range from 0.84 mg/kg to 3.5 mg/kg, with an average PCB concentration of 2.4 mg/kg. These concentrations are only slightly above the unrestricted residential use cleanup criteria. Nevertheless, we understand that some additional investigation will be required. The Kalamazoo River Study Group continues to collect survey and property ownership information, and once this information is available a plan will be prepared for the additional investigation work.

If you have any questions, please call me at (315) 446-9120.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Mark Brown for

Mark P. Brown, Ph.D.
Vice President

PNM/ccm
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Joyce S. Schlesinger, P.E., Environ
Gregory W. Peterson, LTI-Limno-Tech, Inc.
Patrick N. McGuire, Blasland, Bouck & Lee, Inc.

DRAFT

TABLE 1

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

WILLOW BOULEVARD/A-SITE OPERABLE UNIT
SUMMARY OF DETECTED PCB RESULTS FOR SOIL SAMPLES[1] (mg/kg)

Well ID	Depth Interval (ft.)	PCB Concentration				
		Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total
AMW3A-1	0-2	0.17	0.60	0.071J	ND(0.096U)	0.84
AMW3A-1	2-4	0.49	0.92	ND(0.092U)	0.054J	1.5
AMW3A-1	4-6	0.17J	1.1	0.11J	ND(0.19U)	1.4
AMW3A-1	7.5-8	0.85	2.5	ND(0.48U)	ND(0.48U)	3.4
AMW3A-1	8-10	2.1	1.7	ND(0.46U)	ND(0.46U)	3.8
AMW3A-2	0-2	1.2	2.3	ND(0.37U)	ND(0.37U)	3.5
AMW3A-2	2-3.5	0.18	0.64	0.056J	0.067J	0.94
AMW3A-2	3.5-4	0.015J	ND(0.024U)	ND(0.024U)	ND(0.024U)	0.015
AMW3A-2	4-5.5	0.51	0.69	ND(0.10U)	ND(0.10U)	1.2
AMW3A-2	5.5-6	17	6	ND(2.3U)	ND(2.3U)	23
AMW3A-2	10-12	1.8	1.3	ND(0.21U)	0.11J	3.2
AMW3A-2R	6-8	2.3	1.5	ND(0.47U)	ND(0.47U)	3.8
AMW3A-2R	8-10	3.6	1.3	ND(0.43U)	ND(0.43U)	4.9
AMW3A-3	0-2	0.52	2.4	ND(0.39U)	ND(0.39U)	2.9
AMW3A-3	2-3.5	0.59	1.8	ND(0.20U)	0.11J	2.5
AMW3A-3	3.5-4	ND(0.50U)	3.3	0.35J	ND(0.50U)	3.7
AMW3A-3	4-5	0.81	1.4	0.19J	ND(0.21U)	2.4
AMW3A-3	5-5.5	0.63	0.95	0.16J	ND(0.23U)	1.7
AMW3A-3	5.5-6.5	2.1	1.8	ND(0.23U)	0.13J	4.0
AMW3A-3[2]	6.5-7.5	0.75	2.1	ND(0.41U)	ND(0.41U)	2.9
AMW3A-3	8-10	0.086	0.11	ND(0.021U)	ND(0.021U)	0.20

(See Notes on Page 2)

TABLE 1

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

WILLOW BOULEVARD/A-SITE OPERABLE UNIT
SUMMARY OF DETECTED PCB RESULTS FOR SOIL SAMPLES[1] (mg/kg)

Notes:

[1]Shows only the results for compounds detected above the quantitation limit.
[2]MS/MSD of this sample was analyzed.
ND - Not detected.

Notes Explaining Data Qualifiers:

J - The compound was positively identified; however, 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.

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Attachment 1

DATA REVIEW FOR

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

SDG# KAL069

PCB ANALYSES

WILLOW/A-SITE

Analyses performed by:

ITS Environmental, Inc.
Colchester, Vermont

Review performed by:

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

Blasland, Bouck & Lee, Inc.
Syracuse, New York

KB12201365

Summary

The following is an assessment of the PCB data package for SDG# KAL069 for the analysis of soil samples from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB analyses. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Date[1]	Analysis		
				PCB	TOC	P.Size
AMW-3A-1(0-2)	350405	solid	1/7/98	x		
AMW-3A-1(2-4)	350406	solid	1/7/98	x		
AMW-3A-1(4-6)	350407	solid	1/7/98	x		
AMW-3A-1(7.5-8)	350408	solid	1/7/98	x		
AMW-3A-1(8-10)	350409	solid	1/7/98	x		
AMW-3A-2(0-2)	350410	solid	1/7/98	x		
AMW-3A-2(2-3.5)	350411	solid	1/7/98	x		
AMW-3A-2(3.5-4)	350412	solid	1/7/98	x		
AMW-3A-2(4-5.5)	350413	solid	1/7/98	x		
AMW-3A-2(5.5-6)	350414	solid	1/7/98	x		
AMW-3A-2R(6-8)	350415	solid	1/7/98	x		
AMW-3A-2R(8-10)	350416	solid	1/7/98	x		
AMW-3A-2(10-12)	350417	solid	1/7/98	x		
AMW-3A-3(0-2)	350418	solid	1/7/98	x		
AMW-3A-3(2-3.5)	350419	solid	1/7/98	x		
AMW-3A-3(3.5-4)	350420	solid	1/7/98	x		
AMW-3A-3(4-5)	350421	solid	1/7/98	x		
AMW-3A-3(5-5.5)	350422	solid	1/7/98	x		
AMW-3A-3(5.5-6.5)	350423	solid	1/7/98	x		
AMW-3A-3(6.5-7.5)[1]	350424	solid	1/7/98	x		
AMW-3A-3(8-10)	350425	solid	1/7/98	x		

1 MS/MSD analysis performed on sample

PCB ANALYSES

wkal069

KB12201367

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- 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.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- 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.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The QAPP-specified holding times for PCB analyses on soil samples are 10 days from date of sample receipt to extraction and 40 days from extraction to analysis. The technical holding times are 14 days from sample collection to extraction and 40 days to analysis.

All samples were extracted and analyzed within the specified holding times.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. No field blanks were submitted with the samples.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Surrogates were diluted beyond the range of detection in samples 1(7.5-8), 2(0-2), 2(5.5-6), 2R(6-8), 2R(8-10), 3(0-2), 3(3.5-4), 3(6.5-7.5), 3(6.5-7.5)MS, 3(6.5-7.5)MSD and 1(8-10). No data have been qualified based on diluted surrogates. All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

Due to a poor chromatographic pattern match, data for Aroclor 1242 in sample 2(3.5-4) has been qualified as estimated with presumptive evidence of identification. All other Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recovery was above control limits in the matrix spike. The relative percent difference between recoveries was also outside control limits. The variable recoveries can be attributed to interference from the relatively high concentration of Aroclor 1242 in the unspiked sample. Since the blank spike recovery was within control limits, no data have been qualified based on the matrix spike recovery.

8. Field Duplicates

No field duplicates were included in this data set.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	X		
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?		X	
If yes, were the samples reanalyzed?			X
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits? 1 out of 2			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits? 1 out of 1			
Blanks			
Is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Do any method/reagent/instrument blanks have positive results?		X	
Do any field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		X	

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	YES	NO	NA
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	X		
Aroclor 1221	X		
Aroclor 1232	X		
Aroclor 1242	X		
Aroclor 1248	X		
Aroclor 1254	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	X		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	X		
Are %D values for all compounds within limits (less than 15%)?	X		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	X		
Was the proper analytical sequence followed?	X.		
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?		X	
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	X		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	X		
Do the combined column and individual column Aroclor identifications agree?	X		
Were there any false negatives?		X	

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PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Limits			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Were field duplicates submitted with the samples?		X	

wkal069

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates	
		TCX	DCB
1 (0-2)			
1 (2-4)			
1 (4-6)			
1 (7.5-8)		D	D
1 (8-10)		D	D
2 (0-2)		D	D
2 (2-3.5)			
2 (3.5-4)			
2 (4-5.5)			
2 (5.5-6)		D	D
2R (6-8)		D	D
2R (8-10)		D	D
2 (10-12)			
3 (0-2)		D	D
3 (2-3.5)			
3 (3.5-4)		D	D
3 (4-5)			
3 (5-5.5)			
3 (5.5-6.5)			
3 (6.5-7.5)		D	D
3 (6.5-7.5) MS		D	D
3 (6.5-7.5) MSD		D	D
3 (8-10)			

Surrogate Standards
TCX Tetrachloro-m-xylene
DCB Decachlorobiphenyl

Qualifiers:
D Surrogates diluted out
! Recovery high
. Recovery low

Unless otherwise noted, all parameters are within specified limits.

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PCB Calibration Summary

Instrument: HP3327
Column: RTX-5 / RTX-35

Date:	1/15/98-1/16/98	1/17	1/17	1/17	1/17	1/17	1/18	1/18
Time:		0825	1359	1427	1905	1933	0107	0135
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D	%D
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok							
Aroclor 1242	ok			ok				
Aroclor 1248	ok		ok		ok		ok	
Aroclor 1254	ok					ok		
Aroclor 1260	ok	ok						ok
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:								

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KB12201377

CORRECTED ANALYSIS SUMMARY FORMS

wkal069

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A102

1 (0-2)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350405		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
ijection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	5.0	Date Analyzed:	01/16/98		
% Solids:	87	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	96	U
11104-28-2	Aroclor-1221	96	U
11141-16-5	Aroclor-1232	96	U
53469-21-9	Aroclor-1242	170	
12672-29-6	Aroclor-1248	600	
11097-69-1	Aroclor-1254	71	J
11096-82-5	Aroclor-1260	96	U

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A124

1 (2-4)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350406		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
ijection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	5.0	Date Analyzed:	01/16/98		
% Solids:	90	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	92	U
11104-28-2	Aroclor-1221	92	U
11141-16-5	Aroclor-1232	92	U
53469-21-9	Aroclor-1242	490	
12672-29-6	Aroclor-1248	920	
1097-69-1	Aroclor-1254	92	U
11096-82-5	Aroclor-1260	54	J

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A146

1 (4-6)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350407		
Phase Weight:	30.00 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	10.0	Date Analyzed:	01/16/98		
% Solids:	86	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	190	U
11104-28-2	Aroclor-1221	190	U
11141-16-5	Aroclor-1232	190	U
53469-21-9	Aroclor-1242	170	J
12672-29-6	Aroclor-1248	1100	
11097-69-1	Aroclor-1254	110	J
11096-82-5	Aroclor-1260	190	U

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A17.58.0

1 (7.5-8)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350408		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	20.0	Date Analyzed:	01/16/98		
% Solids:	70	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	480	U
11104-28-2	Aroclor-1221	480	U
11141-16-5	Aroclor-1232	480	U
53469-21-9	Aroclor-1242	850	
12672-29-6	Aroclor-1248	2500	
11097-69-1	Aroclor-1254	480	U
11096-82-5	Aroclor-1260	480	U

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A1810

1 (8-10)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350409		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	20.0	Date Analyzed:	01/17/98		
% Solids:	73	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	460	U
11104-28-2	Aroclor-1221	460	U
11141-16-5	Aroclor-1232	460	U
53469-21-9	Aroclor-1242	2100	
12672-29-6	Aroclor-1248	1700	
11097-69-1	Aroclor-1254	460	U
11096-82-5	Aroclor-1260	460	U

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A202

2(0-2)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350410		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	20.0	Date Analyzed:	01/16/98		
% Solids:	89	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	370	U
11104-28-2	Aroclor-1221	370	U
11141-16-5	Aroclor-1232	370	U
53469-21-9	Aroclor-1242	1200	
12672-29-6	Aroclor-1248	2300	
11097-69-1	Aroclor-1254	370	U
11096-82-5	Aroclor-1260	370	U

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A223.5

2(2-3.5)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350411		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
njection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	5.0	Date Analyzed:	01/16/98		
% Solids:	84	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	99	U
11104-28-2	Aroclor-1221	99	U
11141-16-5	Aroclor-1232	99	U
53469-21-9	Aroclor-1242	180	
12672-29-6	Aroclor-1248	640	
11097-69-1	Aroclor-1254	56	J
11096-82-5	Aroclor-1260	67	J

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A23.54.0

2(3.5-4)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350412		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	1.0	Date Analyzed:	01/16/98		
% Solids:	70	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	24	U
11104-28-2	Aroclor-1221	24	U
11141-16-5	Aroclor-1232	24	U
53469-21-9	Aroclor-1242	15	✓ J N
12672-29-6	Aroclor-1248	24	U
11097-69-1	Aroclor-1254	24	U
11096-82-5	Aroclor-1260	24	U

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A245.5
2 (4-5.5)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350413		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	5.0	Date Analyzed:	01/16/98		
% Solids:	83	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	100	U
53469-21-9	Aroclor-1242	510	
12672-29-6	Aroclor-1248	690	
11097-69-1	Aroclor-1254	100	U
11096-82-5	Aroclor-1260	100	U

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A25.56.0

2 (5.5-6)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350414		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	100.0	Date Analyzed:	01/17/98		
% Solids:	72	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	2300	U
11104-28-2	Aroclor-1221	2300	U
11141-16-5	Aroclor-1232	2300	U
53469-21-9	Aroclor-1242	17000	
12672-29-6	Aroclor-1248	6000	
11097-69-1	Aroclor-1254	2300	U
11096-82-5	Aroclor-1260	2300	U

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3421012

2(10-12)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350417		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	10.0	Date Analyzed:	01/17/98		
% Solids:	80	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	210	U
11104-28-2	Aroclor-1221	210	U
11141-16-5	Aroclor-1232	210	U
53469-21-9	Aroclor-1242	1800	
12672-29-6	Aroclor-1248	1300	
11097-69-1	Aroclor-1254	210	U
11096-82-5	Aroclor-1260	110	J

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A2R68

2R (6-10)

Lab Name:	ITS Environmental	Lab Code:	INCHVT
Contract:	91082	Case:	PCB
SDG:	KAL069		

Phase Type:	SOIL	Lab Sample ID:	350415
Phase Weight:	30.0 (g)	Date Received:	01/12/98
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98
Dilution Factor:	20.0	Date Analyzed:	01/17/98
% Solids:	71	Sulfur Clean-up:	Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	470	U
11104-28-2	Aroclor-1221	470	U
11141-16-5	Aroclor-1232	470	U
53469-21-9	Aroclor-1242	2300	
12672-29-6	Aroclor-1248	1500	
11097-69-1	Aroclor-1254	470	U
11096-82-5	Aroclor-1260	470	U

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A2R810

2R (8-10)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350416		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	20.0	Date Analyzed:	01/17/98		
% Solids:	78	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	430	U
11104-28-2	Aroclor-1221	430	U
11141-16-5	Aroclor-1232	430	U
53469-21-9	Aroclor-1242	3600	
12672-29-6	Aroclor-1248	1300	
11097-69-1	Aroclor-1254	430	U
11096-82-5	Aroclor-1260	430	U

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A302

3(C-2)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350418		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	20.0	Date Analyzed:	01/17/98		
% Solids:	85	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	390	U
11104-28-2	Aroclor-1221	390	U
11141-16-5	Aroclor-1232	390	U
53469-21-9	Aroclor-1242	520	
12672-29-6	Aroclor-1248	2400	
11097-69-1	Aroclor-1254	390	U
11096-82-5	Aroclor-1260	390	U

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A323.5
3(2-3.5)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350419		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	10.0	Date Analyzed:	01/17/98		
% Solids:	85	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	200	U
11104-28-2	Aroclor-1221	200	U
11141-16-5	Aroclor-1232	200	U
53469-21-9	Aroclor-1242	590	
12672-29-6	Aroclor-1248	1800	
11097-69-1	Aroclor-1254	200	U
11096-82-5	Aroclor-1260	110	J

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A33.54.0

3(3.5-4)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350420		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	20.0	Date Analyzed:	01/17/98		
% Solids:	67	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	U
11104-28-2	Aroclor-1221	500	U
11141-16-5	Aroclor-1232	500	U
53469-21-9	Aroclor-1242	500	U
12672-29-6	Aroclor-1248	3300	
11097-69-1	Aroclor-1254	350	J
11096-82-5	Aroclor-1260	500	U

ITS Environmental 55 South Park Drive Colchester, Vermont 05446
Telephone (802) 655-1203
Fax (802) 655-1248

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A34.05.0

3(4-5)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350421		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	10.0	Date Analyzed:	01/17/98		
% Solids:	78	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	210	U
11104-28-2	Aroclor-1221	210	U
11141-16-5	Aroclor-1232	210	U
53469-21-9	Aroclor-1242	810	
12672-29-6	Aroclor-1248	1400	
11097-69-1	Aroclor-1254	190	J
11096-82-5	Aroclor-1260	210	U

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A35.05.5

3(5-5.5)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069

Phase Type:	SOIL		Lab Sample ID:	350422	
Phase Weight:	30.0	(g)	Date Received:	01/12/98	
Injection Volume:	1.0	(uL)	Date Extracted:	01/13/98	
Dilution Factor:	10.0		Date Analyzed:	01/17/98	
% Solids:	72		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	230	U
11104-28-2	Aroclor-1221	230	U
11141-16-5	Aroclor-1232	230	U
53469-21-9	Aroclor-1242	630	
12672-29-6	Aroclor-1248	950	
11097-69-1	Aroclor-1254	160	J
11096-82-5	Aroclor-1260	230	U

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A35.56.5

3(5.5-6.5)

.o Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350423		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
ıjection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	10.0	Date Analyzed:	01/17/98		
% Solids:	72	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	230	U
11104-28-2	Aroclor-1221	230	U
11141-16-5	Aroclor-1232	230	U
53469-21-9	Aroclor-1242	2100	
12672-29-6	Aroclor-1248	1800	
11097-69-1	Aroclor-1254	230	U
1096-82-5	Aroclor-1260	130	J

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AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A36.57.5

3(6.5-7.5)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350424		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	20.0	Date Analyzed:	01/17/98		
% Solids:	81	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	410	U
11104-28-2	Aroclor-1221	410	U
11141-16-5	Aroclor-1232	410	U
53469-21-9	Aroclor-1242	750	
12672-29-6	Aroclor-1248	2100	
11097-69-1	Aroclor-1254	410	U
11096-82-5	Aroclor-1260	410	U

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FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

AMW3A3810
3(B-10)

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL069
Phase Type:	SOIL	Lab Sample ID:	350425		
Phase Weight:	30.0 (g)	Date Received:	01/12/98		
Injection Volume:	1.0 (uL)	Date Extracted:	01/13/98		
Dilution Factor:	1.0	Date Analyzed:	01/17/98		
% Solids:	81	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	21	U
11104-28-2	Aroclor-1221	21	U
11141-16-5	Aroclor-1232	21	U
53469-21-9	Aroclor-1242	86	
12672-29-6	Aroclor-1248	110	
11097-69-1	Aroclor-1254	21	U
11096-82-5	Aroclor-1260	21	U

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CHAIN OF CUSTODY

wkal069

KB12201400

ENGINEERS, P.C

CHAIN OF CUSTODY RECORD

PROJ. NO. 645.801

PROJECT NAME Willow A Site

SAMPLERS: (Signature) Peter Rein

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PCB						REMARKS
	1/7/98	9:30	X		AMW-3A-1 (0'-2')	1	X						Engine Results
		9:32			AMW-3A-1 (2'-4')	1	X						
		9:38			AMW-3A-1 (4'-6')	1	X						
		9:42			AMW-3A-1 (7.5'-8.0')	1	X						[illegible]
		9:48			AMW-3A-1 (8'-10')	1	X						
		10:15			AMW-3A-2 (0'-2')	1	X						
		10:25			AMW-3A-2 (2'-3.5')	1	X						
		10:25			AMW-3A-2 (3.5'-4.0')	1	X						
		10:35			AMW-3A-2 (4'-5.5')	1	X						
		10:35			AMW-3A-2 (5.5'-6.0')	1	X						
		12:30			AMW-3A-2R (6'-8')	1	X						
		12:35			AMW-3A-2R (8'-10')	1	X						[illegible]
		11:10			AMW-3A-2 (10'-12')	1	X						
		11:15			AMW-3A-3 (0'-2')	1	X						
		11:20			AMW-3A-3 (2'-3.5')	1	X						Field Turnaround Time

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Peter Rein	1/9/98 12:30				
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	
		[illegible] Beach	1-12-98 0930	To ITS Fed Ex #5 3495 23 771	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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KB12201401

BASLAND & ... ENGINEERS, P.C.

CHAIN OF CUS...DY RECORD

PROJ. NO. 645.81

PROJECT NAME Willow A-Site

SAMPLER(S) (Signature) Peter Rein

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PCB						REMARKS
													Expe Results
	1/7/98	11:20	X		AMW-3A-3 (3.5'-4.0')	1	X						
		12:00			AMW-3A-3 (4.0'-5.0')		X						
		12:00			AMW-3A-3 (5.0'-5.5')		X						
		12:00			AMW-3A-3 (5.5'-6.5')		X						7 10 ppm
		12:05			AMW-3A-3 (6.5'-7.5')		X						
		12:10			AMW-3A-3 (8'-10')		X						
													Fast Turnaround Time

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Peter Rein	1/9/98 12:30				
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	
		[illegible]	1-12-98 0930	To ITS Fed. Ex # 5349513171	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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KB12201402

TABLE 1

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

WILLOW BOULEVARD/A-SITE OPERABLE UNIT REMEDIAL INVESTIGATION/FOCUSED FEASIBILITY STUDY

SOIL DESCRIPTIONS FOR SAMPLES COLLECTED AT THE AMW-3A AREA

Depth (ft)	Sample ID	Soil Description	Notes
Soil Boring Location AMW-3A-1			
0-2	AMW-3A-1 (0-2')	Brown silt (0-1')	
		Light brown fine sand (1-2')	
2-4	AMW-3A-1 (2-4')	Light brown fine sand	
4-6	AMW-3A-1 (4-6')	Dark grey fine sand with brown coarse sand and gravel	
6-8	AMW-3A-1 (6-7.5')	Moist brown and grey fine sand	Sample not analyzed in laboratory
	AMW-3A-1 (7.5-8')	Moist dark grey fine sand	
8-10	AMW-3A-1 (8-10')	Moist grey fine sand	
10-12	AMW-3A-1 (10-12')	Wet grey fine sand	Sample not analyzed in laboratory
Soil Boring Location AMW-3A-2			
0-2	AMW-3A-2 (0-2')	Brown silt (0-1')	
		Light brown fine sand (1-2')	
2-4	AMW-3A-2 (2-3.5')	Light brown fine sand	
	AMW-3A-2 (3.5-4')		
4-6	AMW-3A-2 (4-5.5')	Light brown fine sand (4-5.5')	
	AMW-3A-2 (5.5-6')	Light brown fine sand with some grey-clay pieces (5.5-6')	
6-8	AMW-3A-2 (6-8')	Moist brown and fine sand with some coarse sand	Sample not analyzed in laboratory
8-10	AMW-3A-2 (8-10')	Moist grey fine sand and silt; hard obstruciton at 8.0'	Sample not analyzed in laboratory
10-12	AMW-3A-2 (10-12')	Moist grey fine sand and silt, trace of clay	
Soil Boring Location AMW-3A-2R			
6-8	AMW-3A-2R (6-8')	Grey silt, trace of clay	
8-10	AMW-3A-2R (8-10')	Grey fine sand and silt, some coarse sand	
Soil Boring Location AMW-3A-3			
0-2	AMW-3A-3 (0-2')	Brown silt (0-1')	
		Light brown fine sand (1-2')	
2-4	AMW-3A-3 (2-3.5')	Light brown fine sand	
	AMW-3A-3 (3.5-4')	Grey silt and sand, trace of clay	
4-6	AMW-3A-3 (4-5')	Light brown fine sand	
	AMW-3A-3 (5-5.5')	Light brown fine sand, with grey clay inclusions	
	AMW-3A-3 (5.5-6.5')	Grey silt with pieces of grey clay	
6-8	AMW-3A-3 (6.5-7.5')	Dark grey silt and fine sane, trace of clay	
8-10	AMW-3A-2 (8-10')	Light brown fine sand - wet	
10-12	AMW-3A-2 (10-12')	Light brown fine sand - wet	Sample not analyzed in laboratory

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

Transmitted Via Telefacsimile and Express Mail

March 3, 1998

Scott D. Cornelius
Project Manager
Michigan Department of Environmental Quality
301 S. Capital Ave
P.O. Box 30426
Lansing, MI 48909

Re: Willow Boulevard/A-Site OU AMW-3A Area Investigation
Project #: 645.81.500 #2

Dear Scott:

This letter presents a work plan to investigate the presence of polychlorinated biphenyls (PCB) detected in soils in the area of monitoring well AMW-3A located near the Willow Boulevard/A-Site Operable Unit (WB/A-OU) in Kalamazoo Township, Michigan.

Background

During the Remedial Investigation (RI) of the WB/A-OU, a soil sample collected from 6 to 8 feet below ground surface in the AMW-3A soil boring was found to contain PCB at an estimated concentration of 62 milligrams per kilogram (mg/kg). The Michigan Department of Environmental Quality (MDEQ) approved a proposal prepared by Blasland, Bouck & Lee, Inc. (BBL) on December 31, 1997 to further investigate the presence of PCB in the area. On January 6, 1998, soil borings AMW-3A-1, AMW-3A-2, AMW-3A-2R, and AMW-3A-3 were drilled at locations encircling AMW-3A and soil samples collected for field and laboratory analysis of PCB. Figure 1 shows the approximate locations of these borings. Under MDEQ oversight, BBL analyzed the soil samples for PCB using field test kits. Remaining soil sample aliquots were split, with a portion sent to ITS Laboratory in Colchester, Vermont for PCB analysis, and the remaining portion retained by the MDEQ for independent laboratory analysis. BBL reviewed the ITS Laboratory analytical results and forwarded the validated data to the MDEQ on February 6, 1998.

The investigation results indicated that surficial samples (0 to 2 feet below ground surface) contained PCB at concentrations ranging from 0.84 to 3.5 mg/kg, with a maximum concentration of 23 mg/kg detected in a sample collected from 5.5 to 6 feet below ground surface. The sampled material appears to be fill.

Investigation Approach

Seven soil borings will be completed at the approximate locations shown on Figure 1. The four soil borings to be located west of the fenceline along Davis Creek on Kalamazoo Township property will be advanced using a conventional truck-mounted drill rig. The three borings to be located east of the fenceline on privately-owned property, to which BBL has access, will be advanced either by a tripod-mounted rig or by

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hand-auger. Actual soil boring locations will be selected at the discretion of the Kalamazoo River Study Group (KRSG) field geologist based upon field conditions. The drilling and soil sample collection procedures will follow protocols set forth in the approved WB/A-OU Field Sampling Plan (Blasland & Bouck Engineers, P.C., 1993). Soil borings to be drilled by a truck-mounted or tripod-mounted drill rig will be advanced into native soils. Soil borings to be drilled by hand-auger will be advanced to native soils or to the practical limitation of this drilling technique in the field conditions encountered. Samples will be collected for observation, and the surficial samples (0 to 2 feet below grade) from each boring will be submitted to ITS Laboratory for PCB analysis by the standard gas chromatography method. If a soil boring encounters fill, one representative sample for every 2 feet of fill and a sample of the native soils beneath the fill will be collected and analyzed in the field for PCB using a field test kit with detection limits of 2 milligrams per kilogram (mg/kg) and 10 mg/kg. Those samples indicating PCB concentrations greater than 2 mg/kg as determined using the field test kits will be submitted to the project laboratory for PCB analysis.

If the validated analytical results indicate that surficial soils contain PCB at concentrations exceeding the unrestricted residential use cleanup criterion, BBL will propose additional investigation.

If you have any questions, please contact me at 315/446-9120.

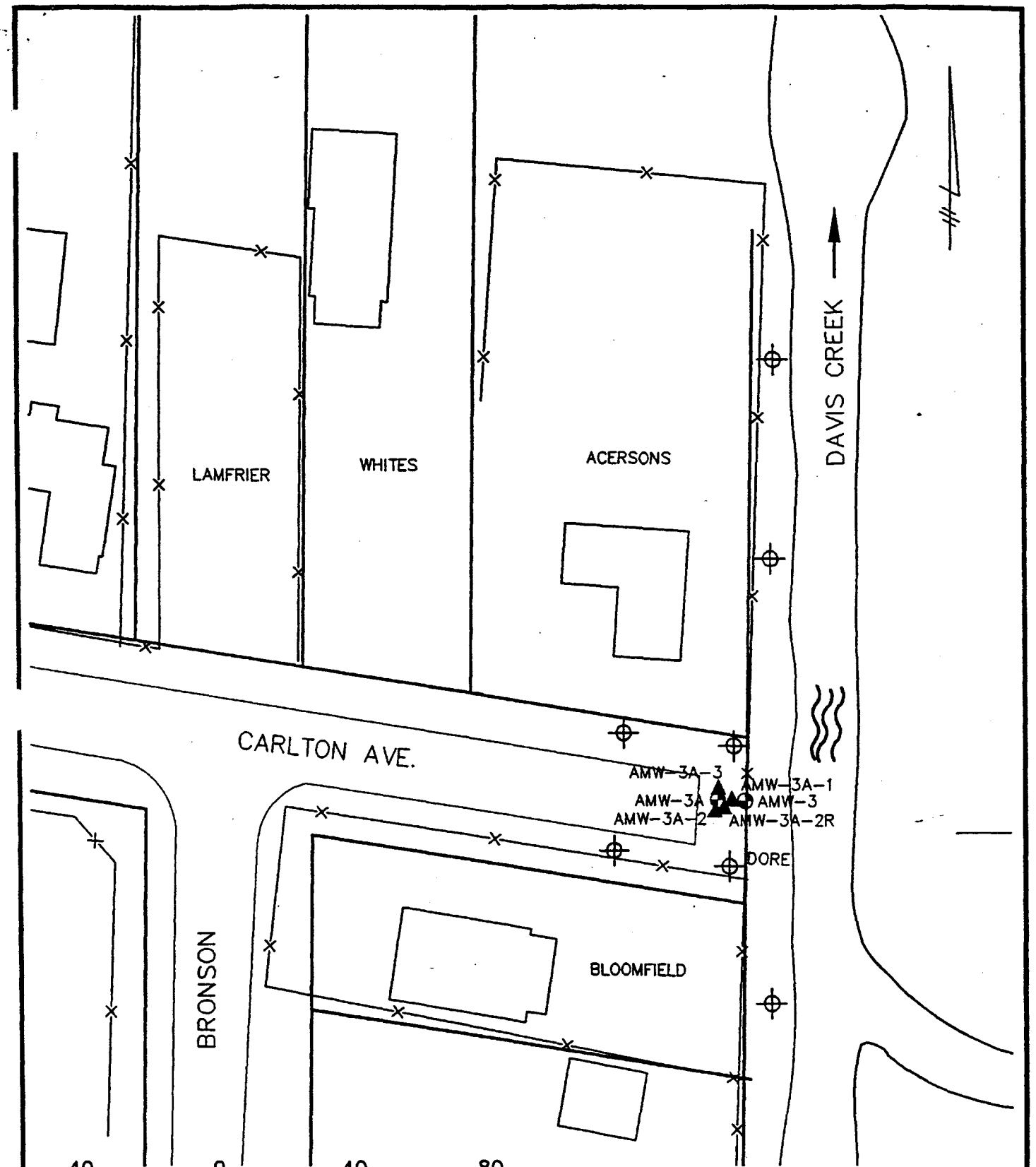
Sincerely,

BLASLAND, BOUCK & LEE, INC.

Mark P. Brown, Ph.D.
Senior Vice President

DKC/dkc
F:\USERS\CCM\CCM98\17181626.WPD

cc: Bonnie A. Barnett, Esq., Drinker, Biddle & Reath
J. Michael Davis, Esq., Georgia-Pacific Corporation
Jon F. DeWitt, Esq., Varnum, Riddering, Schmidt & Howlett
Daniel O. Cummins, P.G., Georgia-Pacific Corporation
Paul Montney, P.E., Georgia-Pacific Corporation
Gregory W. Peterson, LTI-Limno-Tech, Inc.
Joyce S. Schlesinger, P.E., Environ
Gail A. Smith, Georgia-Pacific Corporation
Douglas K. Cowin, P.G., Blasland, Bouck & Lee, Inc.
Patrick N. McGuire, Blasland, Bouck & Lee, Inc.



40 0 40 80

SCALE: 1" = 40'

LEGEND:

- EXISTING FENCELINE
- PROPOSED SOIL BORING
- EXISTING MONITORING WELL
- EXISTING SOIL BORING

2/19/98 SYR - DIVS - MAD
F:\WP\645\LOCKWOOD\WILLOW.DWG

KALAMAZOO RIVER STUDY GROUP
WILLOW BLVD. / A-SITE OPERABLE UNIT
SAMPLING PLAN

PROPOSED SOIL SAMPLING LOCATIONS IN VICINITY OF AMW-3A

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

FIGURE 1

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

Transmitted Via Fed Ex

March 6, 1998

Scott D. Cornelius
Michigan Department of Environmental Quality
Superfund Section
PO Box 30426
Lansing, MI 48909

Re: Proposed Remedial Activity at WB/A-Site Operable Unit
Project #: 645.81.670 #2

Dear Scott:

We are pleased to transmit a description of a proposed remedial activity to be completed by Georgia-Pacific Corporation (Georgia-Pacific) and Allied Paper, Inc. (Allied) at the A-site of the Willow Boulevard/A-Site Operable Unit (WB/A-Site OU). The proposed remedial activity is designed to control erosion and stabilize the dikes along the Kalamazoo River. Georgia-Pacific undertook similar activities during 1994 and 1997, stabilizing approximately 980 linear feet of the dikes at the nearby King Highway Landfill Operable Unit. The proposed work at A-Site was initially discussed during our meeting on January 26, 1998.

The proposed remedial activity has the primary objective of reducing the risks associated with potential failure of the dikes at the A-Site. As established by the draft WB/A-Site OU Remedial Investigation/ Focused Feasibility Study, this pathway is associated with the greatest risk posed by the OU. Consequently, the proposed dike stabilization work will accomplish much of the remedial goal for the OU.

The proposed work is an integral component of the containment remedy for the WB/A-Site OU. That remedy will be proposed and announced to the public in the spring of 1998. It is essential for Georgia-Pacific and Allied to have this work approved by the Michigan Department of Environmental Quality (MDEQ) as an integral portion of the final remedy for the WB/A-Site OU. Accordingly, if you have a different understanding, please let us know as soon as possible.

The proposed work is described in the format of an application for a permit which would normally be issued under the authority of Public Act 451 Parts 301 and 31. This is being done to facilitate MDEQ's determination that the substantive requirements of those authorizations will be met by the construction project. As agreed at a May 1996 meeting, the administrative requirements of permits will be waived consistent with CERCLA 121(e) provisions.

It is Georgia-Pacific's and Allied's intention to complete the proposed dike stabilization activities at the A-Site during the 1998 construction season. Given the tight time frame needed for remedial design, public notification, contractor procurement, and other necessary project activities, an expedited review of this proposal would be greatly appreciated.

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Attached to this letter, please find five copies each of a permit application with supporting information, and a hydraulic report for bank stabilization with applicable site figures and HEC-2 Water Surface Profile results. Please feel free to contact me with any questions or comments.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Pat 12am

Patrick N McGuire
Associate

WAR/ccm
Enclosure
F:\USERS\CCM\CCM98\17081626.WPD

cc: J. Michael Davis, Esq., Georgia-Pacific Corporation
Bonnie A. Barrett, Esq., Drinker, Biddle & Reath
Gregory W. Peterson, LTI-Limno-Tech, Inc.
Joyce S. Schlesinger, P.E., Environ
Daniel O. Cummins, P.G., Georgia-Pacific Corporation
Paul Montney, P.E., Georgia-Pacific Corporation
Sharon L. Bailey, P.E., RMT, Inc.
Mark P. Brown, Ph.D., Blasland, Bouck & Lee, Inc.

APPLICATION FOR PERMIT
ATTACHMENT 1

Purpose of Proposed Activity

The purpose for installing the proposed sheet pile wall system is to stabilize slopes and control erosion of the existing berms along the Kalamazoo River at the A-Site portion of the Willow Boulevard/A-Site operable unit. The location of the proposed project is shown in Figure 1.

Description of the Proposed Activity

The following is a summary of the tasks that will be performed during the construction of the sheet pile wall:

Install erosion control fence (silt fence) around the exterior of the construction area on the northern and eastern sides of the construction zone to keep soil particles from entering the Kalamazoo River

Construct access to the proposed construction area for trucks and heavy equipment which will require bridging Davis Creek west of Lake Street. The size, type, and construction methods for the creek crossing will be determined during detailed design in consultation with the County Drain Commissioner. Some imported fill will be required for the access road between Lake Street and the Creek Crossing.

Remove selected existing trees along the berm to facilitate installation of the sheet pile wall.

Install the sheet pile wall along the toe of the berm slope at the Kalamazoo River's edge and Davis Creek. Construction of the sheet pile wall will start at the eastern end of the site and progress westward to the approximate limits shown on Figure 2.

Residuals exposed due to construction activities will be removed from the berm slope inside of the sheet pile wall and stockpiled within the limits of the site for future disposition, *i.e.* to be capped during final closure. The estimated quantity of residuals and soil that will be removed during construction is 3,500 cubic yards.

Select granular fill and select aggregate fill will be placed behind the sheet pile wall to the contours shown on Figure 2. The source of the fill material will be determined by the

selected contractor. Approximately 4,300 cubic yards of clean fill will be required for the construction project.

Place riprap along the sheet pile wall at the toe of the berm slope to provide habitat for amphibian species in the river.

Following regrading of the exterior slope of the berm above the sheet pile wall, erosion control matting, topsoil, seed, and mulch will be placed along the final slope. Sediment control fence will remain in place until grass has been established.

The estimated area of the flood plain impacted by this project is 2 acres.

Project Alternatives Evaluated

A draft Feasibility Study was prepared (and is being reviewed by the Michigan Department of Environmental Quality) to assess potential remedial alternatives for the A-Site. Similar to the King Highway Landfill Operable Unit, the selected alternative for the A-Site is in-place containment with dike stabilization. Sheet pile walls were selected for dike stabilization because they would have less of an impact on the river during construction, and will be more protective of the environment.

Hydraulic Report for Bank Stabilization for Willow Boulevard/A-Site Operable Unit

Introduction

Background of Site

As the first step leading to final closure of the Willow Boulevard/A-Site Operable Unit (WB/A-Site OU), Georgia-Pacific Corporation (Georgia-Pacific) and Allied Paper, Inc. (Allied) have proposed preliminary remedial action to control erosion and stabilize the earthen dike that separates the A-Site from both the Kalamazoo River and Davis Creek.

The WB/A-Site OU is part of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Georgia-Pacific and Allied are two potentially responsible parties (PRPs) within the Kalamazoo River Study Group (KRSG) which is performing a Remedial Investigation/Focused Feasibility Study (RI/FFS) of the site under the supervision of the Michigan Department of Environmental Quality (MDEQ).

The remedial construction proposed for the summer of 1998 involves construction of a steel sheet-pile retaining wall along the dike. The sheet-pile wall would be installed adjacent to the A-Site dike along the Kalamazoo River for a length to be determined in the field based on site conditions, and along a portion of the berm next to Davis Creek.

The sheet-piling would be driven to stabilize the base of the dike. Extending the retaining wall approximately 1 foot above the 100-year flood elevation would protect the dike and WB/A-Site OU from severe flood events.

Purpose and Scope of Hydraulic Report

This hydraulic report has been prepared to evaluate the effects of the proposed installation of the sheet-pile retaining wall on the 100-year frequency flood profile and floodplain limits within and upstream of the site. For the purpose of this evaluation, it is assumed that approximately 2,000 feet of sheet-pile would be installed along the Kalamazoo River side of the A-Site. The approach of the modeling analyses and the reporting format is consistent with guidance provided to Blasland, Bouck & Lee, Inc. (BBL) by Luis Saldivia of the MDEQ.

The report provides an analysis of the hydraulics of approximately 5,100 feet of the Kalamazoo River located within the Township of Kalamazoo. Previous analysis of the flood profile and floodplain are included in *Flood Insurance Study Township of Kalamazoo, Michigan, Kalamazoo County* (December 15, 1981). The magnitude of the 100-year flow for the Kalamazoo River (6,900 cubic feet per second [cfs]) used in this report was developed for use in previous Flood Insurance Studies. It should be noted that the Federal Emergency Management Agency (FEMA) model input and preliminary results provided by the MDEQ were reviewed and appeared reasonable; therefore, the model was assumed to be correct for the purposes of this analysis.

Channel and bridge geometry data were obtained from an existing HEC-2 input data set provided by Luis Saldivia of the MDEQ. Additional cross-sections were constructed from data obtained during river probing conducted by BBL in 1993.

Water-surface profile analyses were conducted for both existing and modified (post-retaining wall installation) conditions to evaluate potential impacts on the water surface, water velocity, channel cross-section area and channel width of the Kalamazoo River.

Method of Analysis

Analyses were performed using the computer program HEC-2, Water Surface Profiles, developed by the U.S. Army Corps of Engineers' (USACE) Hydrologic Engineering Center (HEC). The release date for the PC-compatible version used is May 1991.

The computational procedure used is based on the solution to the one-dimensional energy equation with energy losses due to friction evaluated by Manning's equation. The simplifying assumptions in HEC-2 include "rigid boundary conditions", "steady, gradually varied flow", "one-dimensional flow," and "constant fluid properties". These assumptions have been found to be satisfied for most applications and appear to be fully satisfied in the analysis of the Kalamazoo River. The hydraulic analyses for this study are based only on the effects of unobstructed flow.

For additional information on HEC-2 see:

- Hydrologic Engineering Center, *HEC-2 Water Surface Profile Users Manual*, USACE, CPD-2A, Davis, California, 1990 (revised February 1991).
- Hydrologic Engineering Center, *Computing Water Surface Profiles with HEC-2 on a Personal Computer*, USACE, Training Document #26, Davis, California, 1990.
- Hoggan, D.H., *Computer Assisted Floodplain Hydrology and Hydraulics*, McGraw-Hill, 1989.

Variables and Coefficients

A Manning's value of 0.03 is used for the channel and a value of 0.10 is used for both right and left overbank in the area proposed for modification. The sole modification to roughness coefficients was for the addition of the sheet-pile retaining wall, for which the overbank Manning's "n" was changed to 0.030 to reflect conditions similar to the channel itself.

Starting Point

The starting point for the computations is just downstream of the King Highway (Route M-96) bridge. The starting elevation was determined from results of the FEMA Flood Insurance Study for areas downstream of the WB/A-Site OU, and was 764.4 feet for the 100-year flood. Figure 1 shows the Kalamazoo River in the immediate vicinity of the WB/A-Site OU and the approximate locations of cross-sections used in the HEC-2 modeling analysis. Figure 2 includes photographs of the river at the site, including bank characteristics upon which Manning's "n" was based. Table 1 provides a summary of the sources of cross-sectional information used in this analysis.

Discussion

Simulation of Sheet-Pile Effects

Modifications were made to the left bank of cross-sections 9.8 through 11. The sheet-pile retaining wall was assumed to be placed at the approximate "normal" water line (approximately 754.5 feet), rising to an elevation of 767.4 feet, approximately 2 feet above the predicted 100-year flood elevation without the sheet-pile. Cross-section geometry was modified to reflect the addition of the retaining wall and backfill to the new proposed ground surface. Figure 3 depicts a typical cross-section with and without the modifications to represent sheet-piling. HEC-2 model input and output for both scenarios are attached to this report.

Effects of the Proposed Modification

Table 2 presents the results of HEC-2 simulations for pre-and post-modification 100-year flood conditions. A summary of the results is provided below.

- Water Surface Elevation - In the reach for which the retaining wall is proposed (cross-sections 9.8 through 11) the water surface elevation is not predicted to change at all as result of the sheet-pile installation. The only increase of water surface elevation is predicted to occur 0.01 feet upstream of the proposed sheet-pile wall. Figure 4 shows the predicted pre- and post-bank stabilization water surface elevations during a 100-year flood.

- Velocity - For most modified cross-sections, a minor increase in channel velocity is predicted (ranging from 0.04 to 0.11 feet per second). Channel velocities upstream and downstream of the affected area are not predicted to change as a result of the sheetpile wall installation. The left overbank velocity is predicted to be between 0.46 and 0.94 feet per second higher after bank stabilization.

- Cross-Sectional Area - The sheet-pile retaining wall modifications are predicted to reduce the river cross-sectional area during the 100-year flood by approximately 2 to 4 percent. The slight increase in velocity would adjust for most of this loss, rather than an increase in water surface elevation.

- Channel Width - Within the reach modified, it is predicted that channel widths would be reduced due to the loss of the left overbank area. Upstream of the proposed modifications, predicted changes in the channel width are extremely small. For the two cross-sections upstream of the modifications, the maximum change in channel width is 0.26 feet.

Conclusion

The analysis shows that effects of the proposed sheet-pile retaining wall on the hydraulics of the Kalamazoo River are minor and restricted to the reach where Georgia-Pacific is the property owner. The predicted maximum off-site increase in water surface during the 100-year flood event is limited to no more than 0.01 feet.

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

Transmitted via Facsimile/First Class Mail

December 17, 1998

Mr. John N. Bradley
MDEQ-ERD
Superfund Section
P.O. Box 30426
Lansing, MI 48909

Re: Willow Boulevard/A-Site Soil Sampling near AMW-3A
Project #: 645.81.111 #2

Dear John:

This letter is a follow-up to our telephone conversation regarding the proposed soil sampling near AMW-3A. As we discussed, the equipment to be used to complete the borings is an all-terrain vehicle equipped with direct-push drilling equipment and is provided by Fibertech, Inc. (Fibertech is submitting a qualification statement to Scott Cornelius). The drilling and soil sample collection procedures will be consistent with the previous AMW-3A area investigations.

Regarding the additional borings, the borings north of Carlton Avenue will be added to the sampling program. The additional boring to the south of Carlton Avenue and on Georgia-Pacific Corporation's property will be installed. The locations requested by the Michigan Department of Environmental Quality, which are located on private property, will not be installed at this time. The need for these samples will be assessed after we review the results of the sampling program. The locations of new borings, as I understood them during our telephone conversation, are marked on the attached figure (Figure 2 from the 9/21/98 letter report) with blue asterisks.

Figure 1 from the September 21, 1998 letter report has also been corrected and is attached for your review.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Pat McGuire /BEP

Patrick N. McGuire
Associate

Enclosure

PNM/tla
F:\USERS\TLA\TLA98\44181680.WPD

KB12305601

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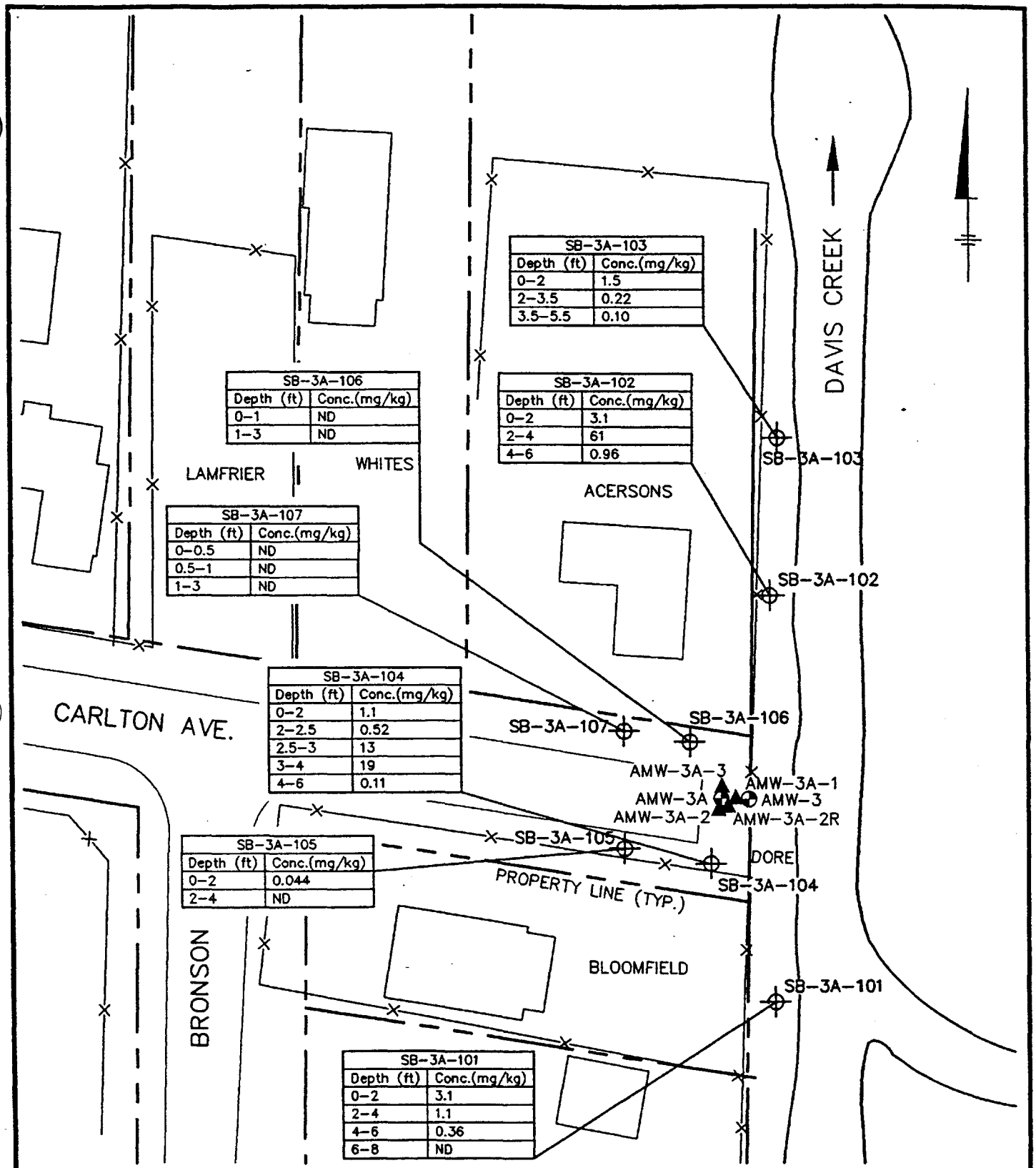
cc: Scott D. Cornelius, MDEQ
J. Michael Davis, Esq., Georgia-Pacific Corporation
Bonnie A. Barnett, Esq., Drinker Biddle & Reath LLP
Paul A. Montney, P.E., Georgia-Pacific Corporation
Joyce S. Schlesinger, P.E., ENVIRON
Gregory W. Peterson, LTI-Limno-Tech, Inc.
Daniel O. Cummins, P.G., Georgia-Pacific Corporation
Mark P. Brown, Ph.D., Blasland, Bouck & Lee, Inc.
Dawn E. Penniman, Blasland, Bouck & Lee, Inc.



SB-3A-103	
Depth (ft)	Conc.(mg/kg)
0-2	1.5
2-3.5	0.22
3.5-5.5	0.10

SB-3A-106	
Depth (ft)	Conc.(mg/kg)
0-1	ND
1-3	ND

SB-3A-102	
Depth (ft)	Conc.(mg/kg)
0-2	3.1
2-4	61
4-6	0.96

SB-3A-107	
Depth (ft)	Conc.(mg/kg)
0-0.5	ND
0.5-1	ND
1-3	ND

SB-3A-104	
Depth (ft)	Conc.(mg/kg)
0-2	1.1
2-2.5	0.52
2.5-3	13
3-4	19
4-6	0.11

SB-3A-105	
Depth (ft)	Conc.(mg/kg)
0-2	0.044
2-4	ND

SB-3A-101	
Depth (ft)	Conc.(mg/kg)
0-2	3.1
2-4	1.1
4-6	0.36
6-8	ND

LEGEND:

—x— EXISTING FENCELINE

NEW SOIL BORING (JULY 1998)

EXISTING MONITORING WELL

EXISTING SOIL BORING

0 40' 80'

GRAPHIC SCALE

12/7/98 SYR-5-MAD, 54-PGL,YCC
64581670/64583SM1.DWG

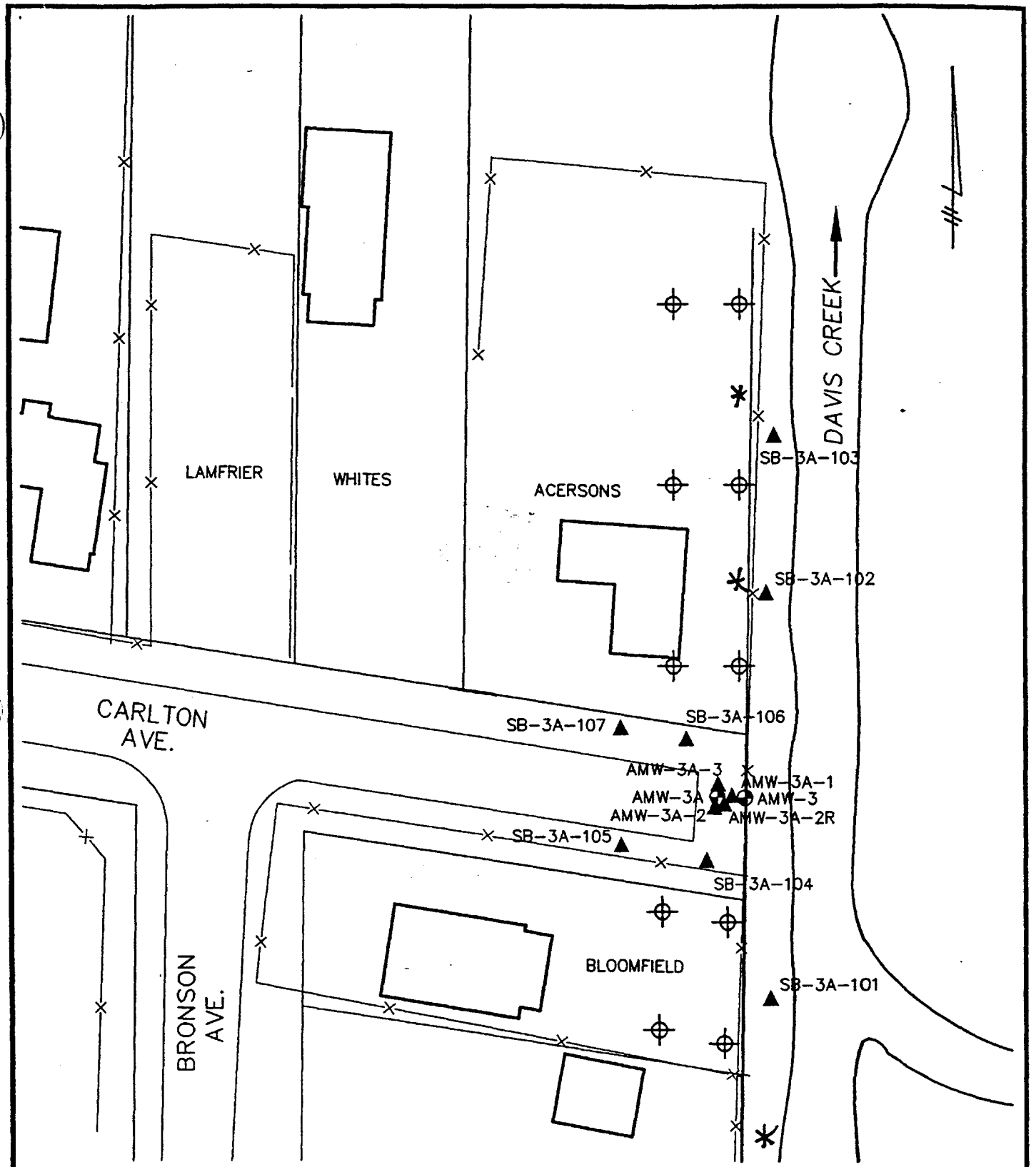
KALAMAZOO RIVER STUDY GROUP
WILLOW BLVD. / A-SITE OPERABLE UNIT

SOIL SAMPLING LOCATIONS IN VICINITY OF AMW-3A

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

FIGURE 1

KR12205603



0 40' 80'

GRAPHIC SCALE

LEGEND:

- EXISTING FENCELINE
- NEW SOIL BORING
- EXISTING MONITORING WELL
- EXISTING SOIL BORING
- ND NOT DETECTED

NOTE:

1. THE BASEMAP FOR THIS FIGURE WAS CREATED FROM PHOTOGRAMMATIC MAPPING PREPARED BY LOCKWOOD MAPPING, INC. DATED 4/91.

KALAMAZOO RIVER STUDY GROUP
WILLOW BLVD. / A-SITE OPERABLE UNIT
AMW-3A AREA

PROPOSED SOIL BORING LOCATIONS

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

FIGURE 2

L: ON=* OFF=REF*
P:: STD-PCP/AP

12/7/98 SYR-S-MAD, 54 YCC, 54 RCA
64581670/64581P01.DWG

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

Transmitted Via Federal Express

September 21, 1998

Mr. Scott D. Cornelius
MDEQ-ERD
Superfund Section
301 S. Capital Avenue
Lansing, MI 48933

Re: Willow Boulevard/A-Site OU Soil Sample Results Near AMW-3A
Project #: 645.81.500 #2

Dear Scott:

By way of this letter, we are transmitting the validated data for the soil material sampled around AMW-3A near the Willow Boulevard/A-Site Operable Unit (WB/A-OU). This sampling was conducted in accordance with the March 3, 1998 Work Plan submitted by Blasland, Bouck & Lee, Inc. (BBL). Figure 1 presents the polychlorinated biphenyl (PCB) results for each sample, and Table 1 provides Aroclor-specific data. (It should be noted that of the 15 samples in which PCB were detected, 14 samples contained Aroclors other than Aroclor 1242, suggesting potential sources other than those associated with paper-making residuals.) Attachment 1 contains the boring logs, and Attachment 2 contains the data validation packages for these data. All samples were collected on Kalamazoo Township or Georgia-Pacific Corporation property (recently purchased from Mr. Arthur Dore).

The PCB concentrations in the surficial samples (0-2 feet below ground surface) range from not detected to 3.1 mg/kg, with an average PCB concentration of 1.3 mg/kg. A maximum concentration of 61 mg/kg was detected in a sample collected 2 to 4 feet below ground surface. Although the surficial average of 1.3 mg/kg is only slightly above the unrestricted residential use cleanup criteria of 1 mg/kg for surficial soil, sample collection on private property is warranted because the sample locations are in proximity to residential property. Georgia-Pacific Corporation will work with residents (i.e., Acersons and Bloomfield) to gain access, and once access is available, the following plan will be implemented.

Ten soil borings will be completed at the approximate locations shown on Figure 2. The borings located on privately owned property, to which BBL will have access, will be advanced by hand-auger. Actual soil boring locations will be selected at the discretion of the Kalamazoo River Study Group (KRSG) field geologist based upon field conditions. The drilling and soil sample collection procedures will follow protocols set forth in the approved WB/A-OU Field Sampling Plan (Blasland & Bouck Engineers, P.C., 1993). Soil borings drilled by hand-auger will be advanced to native soils or to the practical limitation of

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this drilling technique under the field conditions encountered. Samples will be collected for observation, with one representative sample every 2 feet submitted to Severn Trent Laboratories (formerly ITS) for PCB analysis by standard gas chromatography method. A sample turnaround time of 48 hours will be requested. If the validated analytical results indicate that surficial soil contains PCB at concentrations exceeding the unrestricted residential use clean-up criterion, additional samples will be collected. Sample location will be determined in the field under consultation with the MDEQ.

If you have any questions, please call me at (315) 446-9120.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Patrick N. McGuire
Associate

PNM/tla
F:\USERS\TLA\TLA98\24681680.WPD

cc: Bonnie A. Barnett, Esq., Drinker Biddle & Reath, LLP
J. Michael Davis, Esq., Georgia-Pacific Corporation
Paul Montney, P.E., Georgia-Pacific Corporation
Daniel O. Cummins, P.G., Georgia-Pacific Corporation
Joyce S. Schlesinger, P.E., Environ
Gregory W. Peterson, LTI-Limno-Tech, Inc.
Mark P. Brown, Ph.D., Blasland, Bouck & Lee, Inc.

TABLE 1

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

WILLOW BOULEVARD/A-SITE OPERABLE UNIT
SUMMARY OF DETECTED PCB RESULTS FOR SOIL SAMPLES NEAR AMW-3A[1] (mg/kg)

Location	SB-3A-101	SB-3A-101	SB-3A-101	SB-3A-101	SB-3A-102	SB-3A-102	SB-3A-102	SB-3A-103
Depth (ft)	0-2[2]	2-4	4-6	6-8	0-2	2-4	4-6	0-2
Sample ID	W70190	W70191	W70192	W70193	W70194	W70195	W70196	W70197
Aroclor 1242	ND(0.54U)	ND(0.17U)	ND(0.068U)	ND(0.086U)	ND(0.22U)	61	0.86	0.39
Aroclor 1248	ND(0.54U)	ND(0.17U)	ND(0.068U)	ND(0.086U)	ND(0.22U)	ND(3.2U)	ND(0.18U)	1.0
Aroclor 1254	3.1	1.1	0.36	ND(0.086U)	3.1	ND(3.2U)	0.098J	0.063J
Aroclor 1260	ND(0.54U)	ND(0.17U)	ND(0.068U)	ND(0.086U)	ND(0.22U)	ND(3.2U)	ND(0.18U)	0.067J

Location	SB-3A-103	SB-3A-103	SB-3A-104	SB-3A-104	SB-3A-104	SB-3A-104	SB-3A-104	SB-3A-105
Depth (ft)	2-3.5	3.5-5.5	0-2[2]	2-2.5	2.5-3	3-4	4-6	0-2
Sample ID	W70198	W70199	W70200	W70201	W70202	W70203	W70204	W70205
Aroclor 1242	0.087	0.039J	0.28	0.14	5.3	15	0.052J	ND(0.057U)
Aroclor 1248	0.13	0.063	0.8	0.34	8	3.9	0.053J	0.044J
Aroclor 1254	ND(0.059U)	ND(0.058U)	ND(0.17U)	0.042J	ND(1.3U)	ND(1.7U)	ND(0.06U)	ND(0.057U)
Aroclor 1260	ND(0.059U)	ND(0.058U)	ND(0.17U)	ND(0.066U)	ND(1.3U)	ND(1.7U)	ND(0.06U)	ND(0.057U)

KB12303241

TABLE 1

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

WILLOW BOULEVARD/A-SITE OPERABLE UNIT
SUMMARY OF DETECTED PCB RESULTS FOR SOIL SAMPLES NEAR AMW-3A[1] (mg/kg)

Location	SB-3A-105	SB-3A-106	SB-3A-106	SB-3A-107	SB-3A-107	SB-3A-107
Depth (ft)	2-4	0-1	1-3	0-0.5	0.5-1	1-3
Sample ID	W70206	W70207	W70208	W70209	W70210	W70211
Aroclor 1242	ND(0.056U)	ND(0.054U)	ND(0.053U)	ND(0.056U)	ND(0.058U)	ND(0.053U)
Aroclor 1248	ND(0.056U)	ND(0.054U)	ND(0.053U)	ND(0.056U)	ND(0.058U)	ND(0.053U)
Aroclor 1254	ND(0.056U)	ND(0.054U)	ND(0.053U)	ND(0.056U)	ND(0.058U)	ND(0.053U)
Aroclor 1260	ND(0.056U)	ND(0.054U)	ND(0.053U)	ND(0.056U)	ND(0.058U)	ND(0.053U)

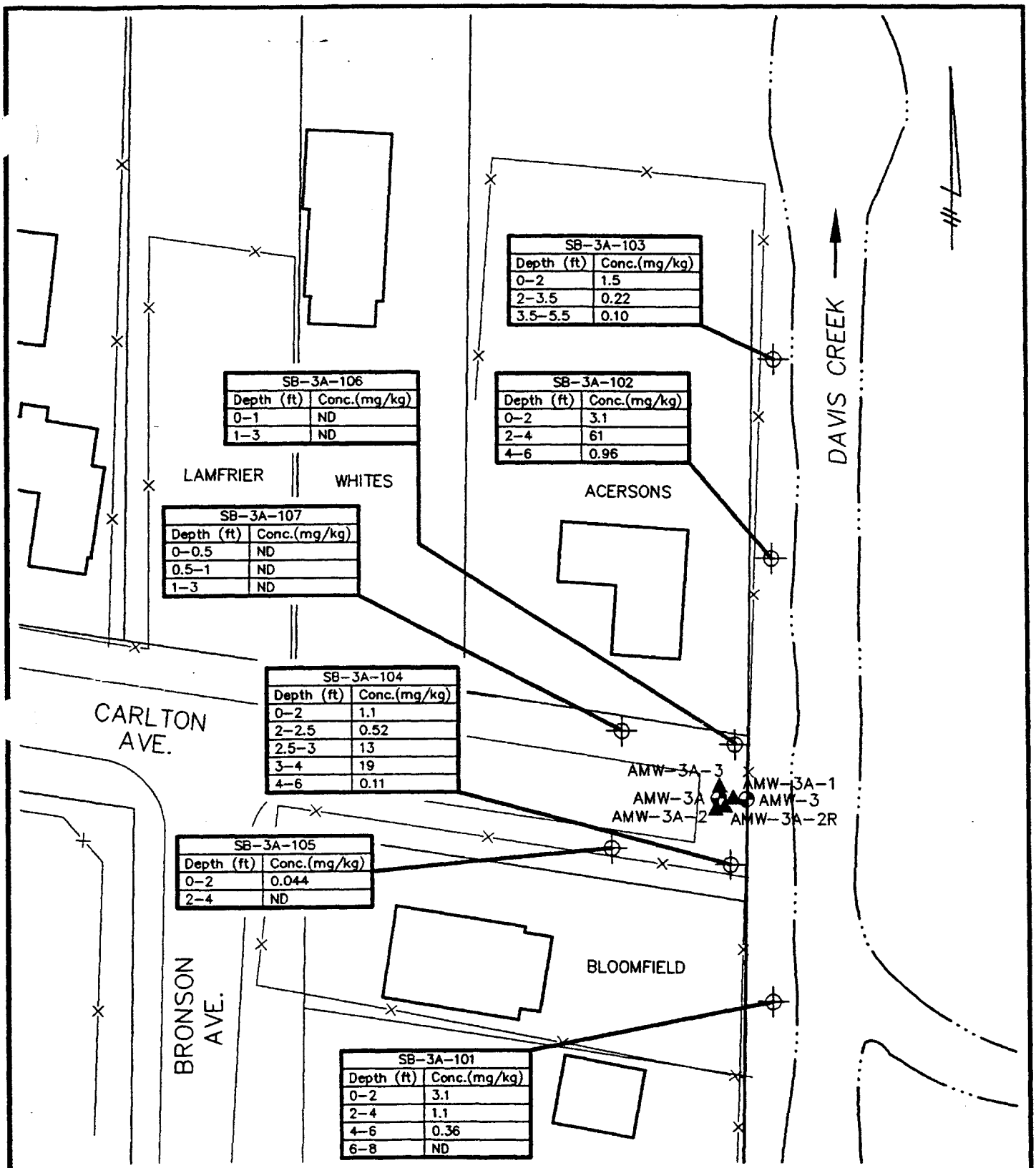
Notes:

[1]Shows only the results for compounds detected above the quantitation limit.
[2]MS/MSD of this sample was analyzed.
ND - Not detected.

Notes Explaining Data Qualifiers:

J - The compound was positively identified; however, 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.

KB12303242



KB12303243

ALAMAZOO RIVER STUDY GROUP
W BLVD. / A-SITE OPERABLE UNIT
AMW-3A AREA

LEGEND:

- EXISTING FENCELINE
- NEW SOIL BORING
- EXISTING MONITORING WELL
- EXISTING SOIL BORING
- ND NOT DETECTED

NOTE:

1. THE BASEMAP FOR THIS FIGURE WAS CREATED FROM PHOTOGRAMMATIC MAPPING PREPARED BY LOCKWOOD MAPPING, INC. DATED 4/91.
2. SAMPLE RESULTS AS REPORTED BY ITS, 1998.
3. DATA REFLECTS TOTAL PCB DERIVED FROM THE SUM OF INDIVIDUAL AROCLORS. AROCLOR-SPECIFIC RESULTS AND THEIR QUALIFIERS CAN BE FOUND IN TABLE .

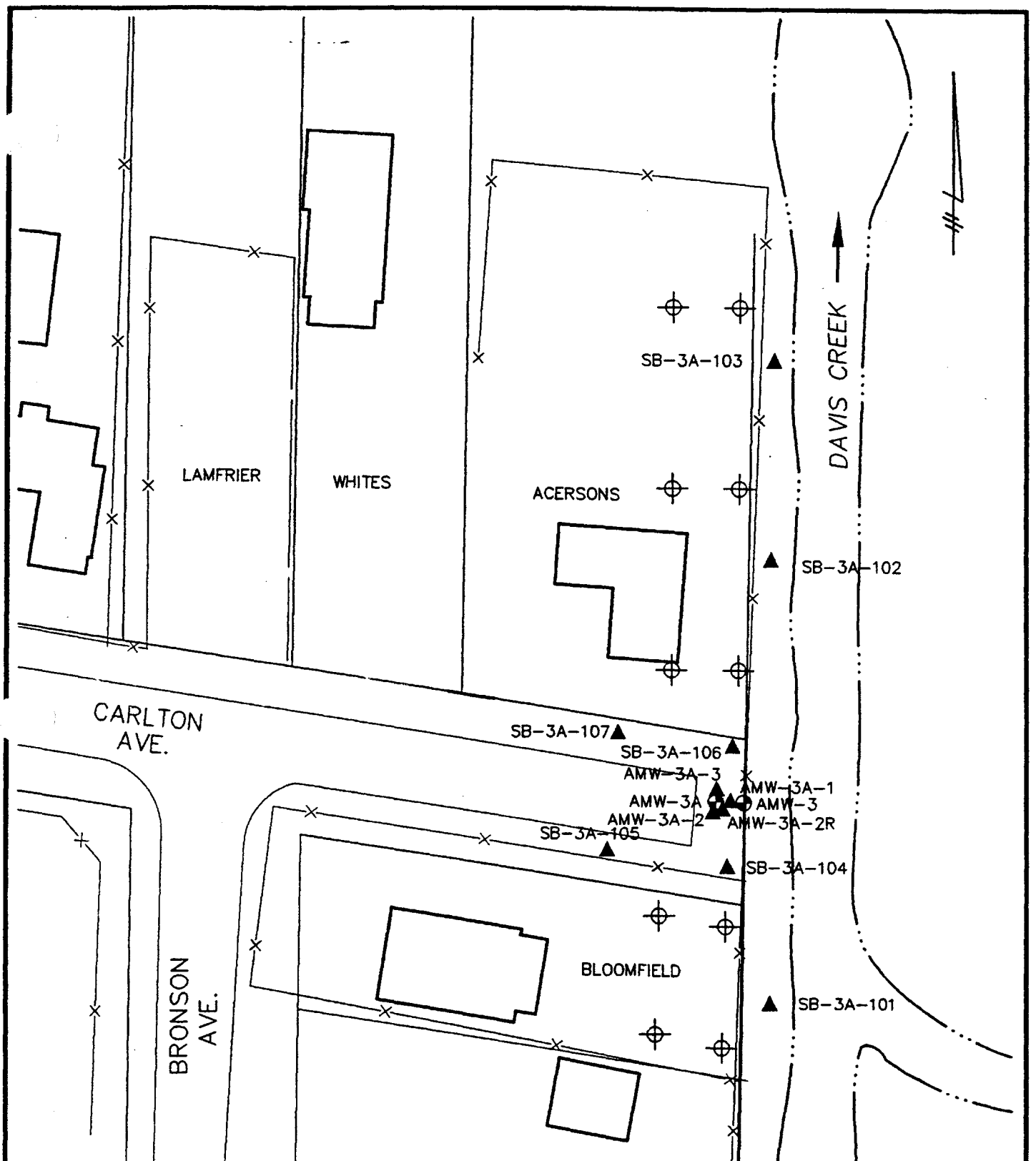
L: ON=* OFF=REF*
P:: STD-PCP/AP

9/21/98 SYR-5-MAD, 54 YCC, 54 RCA
84581500/84581G03.DWG

SOIL PCB DATA

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

FIGURE 1



KB12303244

0 40' 80'

GRAPHIC SCALE

LEGEND:

- EXISTING FENCELINE
- NEW SOIL BORING
- EXISTING MONITORING WELL
- EXISTING SOIL BORING
- ND NOT DETECTED

NOTE:
THE BASEMAP FOR THIS FIGURE WAS CREATED OM PHOTOGRAMMATIC MAPPING PREPARED BY OXWOOD MAPPING, INC. DATED 4/91.

L: ON=* OFF=REF*
P:: STD-PCP/AP

9/21/98 SYR-5-MAD, 54 YCC, 54 RCA
64581500/64581G05.DWG

ALAMAZOO RIVER STUDY GROUP
...OW BLVD. / A-SITE OPERABLE UNIT
AMW-3A AREA

PROPOSED SOIL BORING LOCATIONS

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

FIGURE 2

Attachment 1

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Date Start/Finish: 7/20/98 – 7/20/98 **Drilling Company:** **Driller's Name:** **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size :** -in. **Rig Type:** **Spoon Size:** na-in. **Hammer Weight:** -lb **Height of Fall:** -in.	**Northing:** N/A **Easting:** N/A **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 5.5 ft. **Ground Surface Elev.:** ft. **Geologist:** Brian T. Loomis	**Well No.** SB-3A-102 **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 ft.											
0										GROUND SURFACE	
		W70194								Olive gray fine-medium SAND, little silt, reworked with little white paper, damp.	
		W70195								Light gray fine-medium SAND, trace silt, trace gray clay, damp.	
		W70196								Dark gray fine-medium SAND, some silt, little coarse sand, trace fine gravel, wet.	
5	-5									End of boring 8.0 ft BGS.	
10	-10										
15	-15										

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

KB12303247

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

Date Start/Finish: 7/23/98 – 7/23/98 **Drilling Company:** Mateco **Driller's Name:** **Drilling Method:** Split Spoon **Bit Size:** N/A-in. **Auger Size :** -in. **Rig Type:** **Spoon Size:** 2-in. **Hammer Weight:** -lb **Height of Fall:** -in.	**Northing:** N/A **Easting:** N/A **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 6 ft. **Ground Surface Elev.:** ft. **Geologist:** Brian T. Loomis	**Well No.** SB-3A-104 **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 ft.										**GROUND SURFACE**	
	0	W70200								Gray fine to medium SAND, little coarse sand and silt, damp.	
		W70201								Light gray fine SAND, little fine gravel, wet.	
		W70202									
		W70203								Gray fine to medium SAND, little fine gravel, little gray to white clay, trace paper fibers, moist.	
		W70204								Gray fine to medium SAND, little fine gravel, moist.	
5	-5									Brown fine to coarse SAND, little fine gravel, wet.	
										End of boring 6.0 ft BGS.	
10	-10										
15	-15										

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

KB12303249

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

Date Start/Finish: 7/23/98 – 7/23/98 **Drilling Company:** Mateco **Driller's Name:** **Drilling Method:** Split Spoon **Bit Size:** N/A–in. **Auger Size :** –in. **Rig Type:** **Spoon Size:** 2–in. **Hammer Weight:** –lb **Height of Fall:** –in.	**Northing:** N/A **Easting:** N/A **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 3 ft. **Ground Surface Elev.:** ft. **Geologist:** Brian T. Loomis	**Well No.** SB–3A–108 **Operable Unit:** Willow Boulevard/A–Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 ft											
0										**GROUND SURFACE**	
		W70207								Dark gray fine to coarse SAND, little fine gravel and silt, moist.	
		W70208								Brown fine to medium SAND, little coarse sand, trace silt, moist.	
										End of boring 3.0 ft BGS.	
5	-5										
10	-10										
15	-15										

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

KB12303251

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

Attachment 2

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of the PCB data package for SDG# KAL074 for Willow Blvd./A-Site soil sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB analyses. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Date	Analyses				
				VOA	BNA	PCB	TAL	MISC
W70190*	361392	soil	7/20/98			x		
W70191	361393	soil	7/20/98			x		
W70192	361394	soil	7/20/98			x		
W70193	361395	soil	7/20/98			x		
W70194	361396	soil	7/20/98			x		
W70195	361397	soil	7/20/98			x		
W70196	361398	soil	7/20/98			x		
W70197	361399	soil	7/20/98			x		
W70198	361400	soil	7/20/98			x		
W70199	361401	soil	7/20/98			x		

* MS/MSD analyses performed on sample

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Surrogates were diluted beyond the range of detection in sample W70195. No data have been qualified based on diluted surrogates. All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

The reported concentration for Aroclor 1242 in sample W70195 was incorrect. The value has been corrected on the attached sample analysis summary sheets. It should be noted that although Aroclor 1242 is correctly reported as present in samples W70195 and W70196, the patterns are somewhat altered indicating the possible presence of Aroclor 1248. All other Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and relative percent differences between recoveries were within control limits. All matrix spike blank recoveries were also within control limits.

8. Field Duplicates

No field duplicates were included in this data set.

9. General Comments

The sample numbering scheme indicated on the original chain of custody was inconsistent with the project naming convention. The samples were properly renumbered after they had been submitted for analysis. The corrected sample identification numbers have been added to the attached sample analysis data sheets.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

PCB Data Review Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	X		
Were surrogate recoveries outside of specified limits for any sample or blank?		X	
If yes, were the samples reanalyzed?			X
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
0 out of 4			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
0 out of 2			
Blanks			
Is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	X		
Do any method/reagent/instrument blanks have positive results?		X	
Do any field/rinse blanks have positive results?		X	
Are there field/rinse/equipment blanks associated with every sample?	X		

wakal074

PCB Data Review Checklist - Page 3

	YES	NO	NA
Were there any false negatives?		X	
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Limits			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Were field duplicates submitted with the samples?		X	

PCB Calibration Summary

Instrument: HP2087
Column: RTX-35 / RTX-5

Date:	7/15/98	8/4/98	8/4/98	8/4/98	8/4/98	8/4/98	8/4/98
Time:		1103	1121	1514	1532	1925	1943
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	ok						
Aroclor 1221	ok						
Aroclor 1232	ok						
Aroclor 1242	ok		ok				
Aroclor 1248	ok	ok		ok		ok	
Aroclor 1254	ok				ok		
Aroclor 1260	ok						ok
Tetrachloro-m-xylene	ok						
Decachlorobiphenyl	ok						
'fected Samples:							

wakal074

KB12303265

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

L070190

~~W7018102~~

Name: ITS Environmental Lab Code: INCHVT

Contract: 91082 Case: PCB SDG: KAL074

Phase Type: SOIL Lab Sample ID: 361392

Phase Weight: 10.0 (g) Date Received: 07/23/98

jection Volume: 1.0 (uL) Date Extracted: 07/24/98

Dilution Factor: 10.0 Date Analyzed: 08/04/98

% Solids: 92 Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	540	U
11104-28-2	Aroclor-1221	540	U
11141-16-5	Aroclor-1232	540	U
53469-21-9	Aroclor-1242	540	U
12672-29-6	Aroclor-1248	540	U
97-69-1	Aroclor-1254	3100	
096-82-5	Aroclor-1260	540	U

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

W70192

~~W7018146~~

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL074
Phase Type:	SOIL			Lab Sample ID:	361394
Phase Weight:	10.0 (g)			Date Received:	07/23/98
Injection Volume:	1.0 (uL)			Date Extracted:	07/24/98
Dilution Factor:	1.0			Date Analyzed:	08/04/98
% Solids:	74			Sulfur Clean-up:	Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	68	U
11104-28-2	Aroclor-1221	68	U
11141-16-5	Aroclor-1232	68	U
53469-21-9	Aroclor-1242	68	U
12672-29-6	Aroclor-1248	68	U
11097-69-1	Aroclor-1254	360	
11096-82-5	Aroclor-1260	68	U

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

070194

~~W7018282~~

Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL074
Phase Type:	SOIL			Lab Sample ID:	361396
Phase Weight:	10.0 (g)			Date Received:	07/23/98
ection Volume:	1.0 (uL)			Date Extracted:	07/24/98
)ilution Factor:	4.0			Date Analyzed:	08/04/98
% Solids:	90			Sulfur Clean-up:	Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	220	U
11104-28-2	Aroclor-1221	220	U
11141-16-5	Aroclor-1232	220	U
53469-21-9	Aroclor-1242	220	U
12672-29-6	Aroclor-1248	220	U
97-69-1	Aroclor-1254	3100	
..96-82-5	Aroclor-1260	220	U

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

W70196
~~W7018246~~

Name: ITS Environmental Lab Code: INCHVT

Contract: 91082 Case: PCB SDG: KAL074

Phase Type: SOIL Lab Sample ID: 361398

Phase Weight: 10.0 (g) Date Received: 07/23/98

jection Volume: 1.0 (uL) Date Extracted: 07/24/98

Dilution Factor: 3.0 Date Analyzed: 08/04/98

% Solids: 83 Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	180	U
11104-28-2	Aroclor-1221	180	U
11141-16-5	Aroclor-1232	180	U
53469-21-9	Aroclor-1242	860	
12672-29-6	Aroclor-1248	180	U
1097-69-1	Aroclor-1254	98	J
1096-82-5	Aroclor-1260	180	U

FORM I

AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

W70198

~~W70183235~~

Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL074
Phase Type:	SOIL			Lab Sample ID:	361400
Phase Weight:	10.0 (g)			Date Received:	07/23/98
ction Volume:	1.0 (uL)			Date Extracted:	07/24/98
ilution Factor:	1.0			Date Analyzed:	08/04/98
% Solids:	85			Sulfur Clean-up:	Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	59	U
11104-28-2	Aroclor-1221	59	U
11141-16-5	Aroclor-1232	59	U
53469-21-9	Aroclor-1242	87	
12672-29-6	Aroclor-1248	130	
11097-69-1	Aroclor-1254	59	U
11096-82-5	Aroclor-1260	59	U

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KB12303275

DATA REVIEW FOR

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

SDG# KAL075

PCB ANALYSES

WILLOW BLVD./A-SITE

Analyses performed by:

ITS Environmental, Inc.
Colchester, Vermont

Review performed by:

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

Blasland, Bouck & Lee, Inc.
Syracuse, New York

KB12303277

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- 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.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- 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.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The QAPP-specified holding times for PCB analyses of water samples are 10 days from date of sample receipt to extraction and 40 days from extraction to analysis. The technical holding times for soils are 14 days from sample collection to extraction and 40 days to analysis.

All samples were extracted and analyzed within the specified holding times.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method or rinse blanks.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

DATA REVIEW CHECKLIST

KB12303283

PCB Data Review Checklist - Page 2

	YES	NO	NA
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	X		
Aroclor 1221	X		
Aroclor 1232	X		
Aroclor 1242	X		
Aroclor 1248	X		
Aroclor 1254	X		
Instrument Blanks		X	
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	X		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	X		
Are %D values for all compounds within limits (less than 15%)?	X		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	X		
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?			X
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	X		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	X		
Do the combined column and individual column Aroclor identifications agree?	X		

wkal075

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates	
		TCX	DCB
W70200			
W70200 MS			
W70200 MSD			
W70201			
W70202		D	D
W70203		D	D
W70204			
W70205			
W70206			
W70207			
W70208			
W70209			
W70210			
W70211			
RB1			↓

Surrogate Standards
TCX Tetrachloro-m-xylene
DCB Decachlorobiphenyl

Qualifiers:
D Surrogates diluted out
↑ Recovery high
↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

wkal075

CORRECTED ANALYSIS SUMMARY FORMS

KB12303289

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

070201
~~W7B184225~~

Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL075
Phase Type:	SOIL			Lab Sample ID:	361512
Phase Weight:	10.0 (g)			Date Received:	07/27/98
ection Volume:	1.0 (uL)			Date Extracted:	07/27/98
Dilution Factor:	1.0			Date Analyzed:	08/04/98
% Solids:	76			Sulfur Clean-up:	Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	66	U
11104-28-2	Aroclor-1221	66	U
11141-16-5	Aroclor-1232	66	U
53469-21-9	Aroclor-1242	140	
12672-29-6	Aroclor-1248	340	
97-69-1	Aroclor-1254	42	J
096-82-5	Aroclor-1260	66	U

FORM 1

AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

W70203

~~W7018434~~

Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL075
Phase Type:	SOIL			Lab Sample ID:	361514
Phase Weight:	10.1 (g)			Date Received:	07/27/98
ection Volume:	1.0 (uL)			Date Extracted:	07/27/98
ilution Factor:	25.0			Date Analyzed:	08/04/98
% Solids:	72			Sulfur Clean-up:	Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	1700	U
11104-28-2	Aroclor-1221	1700	U
11141-16-5	Aroclor-1232	1700	U
53469-21-9	Aroclor-1242	15000	
12672-29-6	Aroclor-1248	3900	
97-69-1	Aroclor-1254	1700	U
96-82-5	Aroclor-1260	1700	U

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FORM 1

AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

W70205

~~W701850Z~~

Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL075
Phase Type:	SOIL			Lab Sample ID:	361516
Phase Weight:	10.0 (g)			Date Received:	07/27/98
ection Volume:	1.0 (uL)			Date Extracted:	07/27/98
Dilution Factor:	1.0			Date Analyzed:	08/04/98
% Solids:	88			Sulfur Clean-up:	Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	57	U
11104-28-2	Aroclor-1221	57	U
11141-16-5	Aroclor-1232	57	U
53469-21-9	Aroclor-1242	57	U
12672-29-6	Aroclor-1248	44	J
97-69-1	Aroclor-1254	57	U
96-82-5	Aroclor-1260	57	U

FORM 1

AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

W70207

~~WZ018601~~

Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL075

Phase Type:	SOIL		Lab Sample ID:	361518	
Phase Weight:	10.1	(g)	Date Received:	07/27/98	
jection Volume:	1.0	(uL)	Date Extracted:	07/27/98	
Dilution Factor:	1.0		Date Analyzed:	08/04/98	
% Solids:	92		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	54	U
11104-28-2	Aroclor-1221	54	U
11141-16-5	Aroclor-1232	54	U
53469-21-9	Aroclor-1242	54	U
12672-29-6	Aroclor-1248	54	U
1097-69-1	Aroclor-1254	54	U
.096-82-5	Aroclor-1260	54	U

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

W702O9
~~WZ018705~~

Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL075
Phase Type:	SOIL	Lab Sample ID:	361520		
Phase Weight:	10.1 (g)	Date Received:	07/27/98		
ection Volume:	1.0 (uL)	Date Extracted:	07/27/98		
Dilution Factor:	1.0	Date Analyzed:	08/04/98		
% Solids:	89	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	56	U
11104-28-2	Aroclor-1221	56	U
11141-16-5	Aroclor-1232	56	U
53469-21-9	Aroclor-1242	56	U
12672-29-6	Aroclor-1248	56	U
11097-69-1	Aroclor-1254	56	U
11096-82-5	Aroclor-1260	56	U

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FORM I

AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

W70211

~~W7018751~~

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	KAL075
Phase Type:	SOIL	Lab Sample ID:	361521		
Phase Weight:	10.0 (g)	Date Received:	07/27/98		
Injection Volume:	1.0 (uL)	Date Extracted:	07/27/98		
Dilution Factor:	1.0	Date Analyzed:	08/04/98		
% Solids:	86	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION ug/Kg	QUALIFIER
12674-11-2	Aroclor-1016	58	U
11104-28-2	Aroclor-1221	58	U
11141-16-5	Aroclor-1232	58	U
53469-21-9	Aroclor-1242	58	U
12672-29-6	Aroclor-1248	58	U
11097-69-1	Aroclor-1254	58	U
11096-82-5	Aroclor-1260	58	U

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

Transmitted via Federal Express

February 17, 1999

Mr. Scott Cornelius
Michigan Department of Environmental Quality
ERD - Superfund Section
301 S. Capitol Avenue
PO Box 30426
Lansing, MI 48909

Re: Willow Boulevard/A-Site OU
Project #: 645.81/82.500 #2

Dear Scott:

As we discussed at our meeting on January 25, 1999, Georgia-Pacific Corporation (Georgia-Pacific) and Allied Paper, Inc. (Allied Paper) are proposing work efforts at two separate areas within the Willow Boulevard/A-Site Operable Unit (WB/A-OU): (1) an area south of A-Site and (2) the drainageway located between the Willow Boulevard Site and A-Site, and at a residential property south of A-Site (Figure 1). The rationale for conducting this work is based on collecting information to be used in the Remedial Design and anecdotal information obtained during recent discussions with local residents.

At a recent meeting between Georgia-Pacific and the Lakewood Homeowners Association, it was brought to Georgia-Pacific's attention that a lagoon historically existed south of A-Site. The reported historic lagoon allegedly was bounded by the A-Site's berm and another berm further south. During this meeting a local resident, Mr. J. Adkins, told of a breach in the former lagoon's southern berm (caused by an animal burrowing into the berm) occurring, approximately 30 years ago, adjacent to his property (Figure 2, shown as Lots 24 and 25). According to Mr. Adkins, paper-making residuals (residuals) were released to his property. He stated that Allied Paper was notified, and they repaired the breach and placed approximately four feet of fill over the residuals on his property.

To determine whether the historic lagoon actually existed and if so, whether it contained any residuals, the following work effort is planned. At the former lagoon south of A-Site, soil probes will be installed along north-south oriented transects that are approximately 100 feet apart (Figure 2). Along each transect, three to five soil samples will be collected and visually characterized. The actual location of the samples will be determined in the field based on field conditions. The soil borings will be advanced until either the native soils have been reached or to the practical limitations of the equipment chosen. Survey information will be collected at each boring location.

At the Adkins' property, samples will be collected at 9 locations as shown on Figure 2. Soil boring installation and sampling protocol at each of the 9 points will be consistent with the July 1993 *WB/A-OU Field Sampling Plan.* At each sampling location, samples will be collected every 2 feet, until native soil is encountered, for

visual classification with one representative sample from each 2-foot interval submitted to Severn Trent Laboratories for PCB analysis using modified United States Environmental Protection Agency (USEPA) Method 8081. If the results establish that PCB-containing residuals may extend into other residential areas, additional sampling will be proposed.

Approximately 60 days after receipt of analytical results from Severn Trent Laboratories, Georgia-Pacific will submit a letter report to the MDEQ that will include field notes, validated analytical results, and discussion of results for both parts of the sampling effort.

In an effort to respond to the MDEQ's request to evaluate erosion control measures at the Willow Boulevard Site, the extent and volume of residuals, if any, in the drainageways between Willow Boulevard Site and A-Site and south of the Willow Boulevard Site will be assessed. Soil borings will be installed along transects (as shown on Figure 1) in the drainage way area that are approximately 75 feet apart. The actual position of the samples will be determined in the field based upon field conditions. Samples from each soil boring will be collected at 2-foot intervals for visual classification until native soil is encountered or to the practical limitations of the equipment chosen.

Survey information will be collected at each boring location and at locations, determined in the field, that are important in assessing local storm water drainage patterns (e.g., invert elevations of culverts used to drain the Lakewood neighborhood).

If you have any questions, please call me at (315) 446-9120.

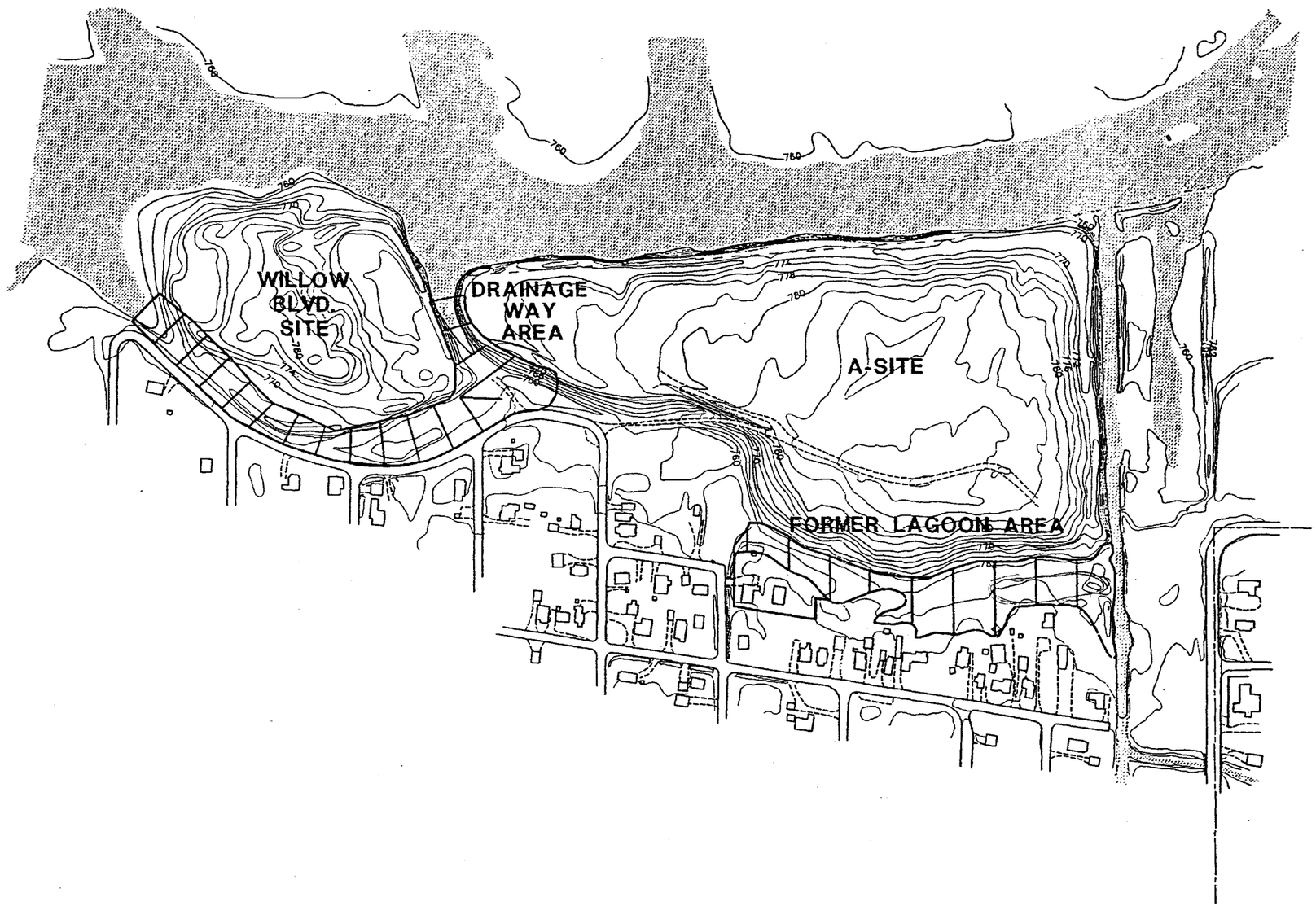
Sincerely,

BLASLAND, BOUCK & LEE, INC.

Patrick N. McGuire

PNM/tla
F:\USERS\TLA\TLA99\04691680.WPD

cc: Bonnie A. Barnett, Esq., Drinker, Biddle & Reath
J. Michael Davis, Esq., Georgia-Pacific Corporation
Daniel O. Cummins, P.G., Georgia-Pacific Corporation
Paul A. Montney, P.E., Georgia-Pacific Corporation
Joyce S. Schlesinger, P.E., Environ
Gregory W. Peterson, Limno-Tech, Inc.
Mark P. Brown, Ph.D., Blasland, Bouck & Lee, Inc.



LEGEND

- 780 — ELEVATION CONTOUR (NGVD 1929)
- UNPAVED ROAD/TRAIL
- TRANSECT LINE
- BOUNDARY OF SAMPLING AREA

150' 0 300'
SCALE

NOTES:

PHOTOGRAMMETRIC METHODS BY LOCKWOOD, INC. FROM AERIAL PHOTOGRAPHY FLOWN APRIL 1991. TOPOGRAPHIC CHANGES AFTER APRIL 1991 ARE NOT SHOWN.

2. ALL LOCATIONS ARE APPROXIMATE.

KB12307192

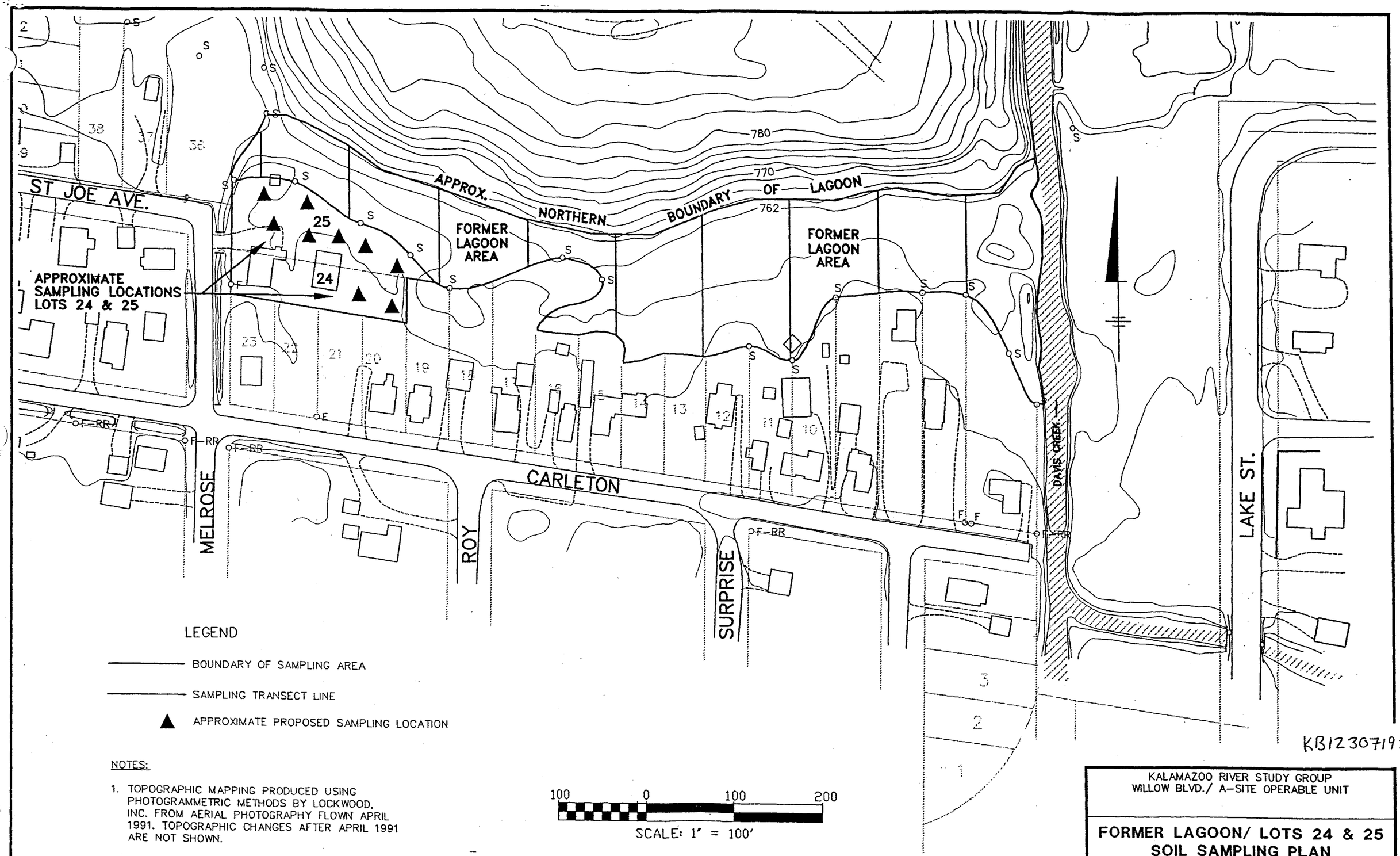
KALAMAZOO RIVER STUDY GROUP
WILLOW BLVD./ A-SITE OPERABLE UNIT

SITE MAP
FORMER LAGOON & DRAINAGE WAY

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

FIGURE 1

X: (XREF)
L: (LAYER)
P: STD-PCP/BL
1/27/99 DIV 5 - MAD
F:\WP\K45\LOCKWOOD\A-SITE2.DWG



NOTES:

1. TOPOGRAPHIC MAPPING PRODUCED USING PHOTOGRAMMETRIC METHODS BY LOCKWOOD, INC. FROM AERIAL PHOTOGRAPHY FLOWN APRIL 1991. TOPOGRAPHIC CHANGES AFTER APRIL 1991 ARE NOT SHOWN.

2. ALL LOCATIONS ARE APPROXIMATE.

X: (XREF)
L: (LAYER)
P: STD-PCP/BL
1/26/99 DIV 5 - MAD
F:\WP\645\LOCKWOOD\A-SITE3.DWG

KB12307192.C

KALAMAZOO RIVER STUDY GROUP
WILLOW BLVD./ A-SITE OPERABLE UNIT

FORMER LAGOON/ LOTS 24 & 25
SOIL SAMPLING PLAN

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

FIGURE 2

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

Transmitted via Fax/First Class Mail

February 8, 2000

Alan J. Howard, P.E.
Chief, Environmental Response Division
MDEQ-ERD
Knapps Centre
P.O. Box 30426
Lansing, MI 48909

Re: Willow Boulevard/A-Site Operable Unit
Project #: 645.82.675

Dear Al:

By way of this letter, we are confirming communication and agreements reached during the February 7, 2000 conference call regarding the remedial action Georgia-Pacific Corporation (Georgia-Pacific) is conducting at the Willow Boulevard/A-Site Operable Unit. Georgia-Pacific stated its intention to demobilize the construction project. It was agreed that any PCB-containing material remaining within the containment system will be addressed as part of the remedy for the Kalamazoo River.

Georgia-Pacific will proceed with the removal of the containment system and complete construction of the berm and temporary cover over the Willow Boulevard Site, and demobilize.

If this does not meet with your understanding of the agreement, or if you have any questions, please call me at (315) 446-2570, ext. 201.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Mark P. Brown, Ph.D.
Senior Vice President

PNM/tla

U:\TLA00\12001680.WPD

6723 Towpath Road • P.O. Box 66 • Syracuse, NY 13214-0066
Tel (315) 446-9120 • Fax (315) 449-0017 • www.bbl-inc.com • offices nationwide

BBL
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engineers & scientists

Transmitted Via Facsimile/First Class Mail

November 10, 2000

Mr. J. Brian von Gunten
MDEQ-ERD
Superfund Section
Knapps Centre
P.O. Box 30426
Lansing, MI 48909-7926

Re: Soil Sampling Results
Lot 17, at 2905 Carleton Avenue
Project #: 64581.675

Dear Brian:

This letter presents the results of the soil sampling activities conducted at Lot 17, located at 2905 Carleton Avenue in accordance with the *Work Plan for Residuals Removal - Lot 17, at 2905 Carleton Avenue* (Work Plan). Soil sampling was conducted on October 30, 2000 to assess the nature and extent of gray materials observed at the northern portion of Lot 17, south of the A-Site. Soil sampling activities were conducted by Blasland, Bouck & Lee, Inc., on behalf of the Georgia-Pacific Corporation, and under the oversight of the Michigan Department of Environmental Quality.

Test pits were dug in the northern portion of Lot 17 to determine the extent of the gray material. During test pitting activities, the gray material was inspected and observed to consist of sand; no paper fibers were observed. A total of 6 samples throughout the northern portion of Lot 17 were collected by BBL and submitted to KAR Laboratories for analysis of polychlorinated biphenyls (PCB). Sample results received on November 1, 2000 indicated that PCB were not detected in these samples at a detection limit of 330 micrograms per kilogram. The laboratory analytical results and test-pit field notes are attached.

Since PCB were not detected, site restoration activities were initiated, including moving the existing shed to the northwest corner of the house, grading the area to 6 inches below previous grade, covering with a 6-inch layer of topsoil, and seeding the area. Temporary fencing was installed along the previous fence line between Lot 17 and the A-Site. Permanent fencing will be installed on or about November 7, 2000.

Please contact me if you have any questions.

\\BBL2\VOL1\USERS\LJP\Ljp00\83701948.doc

6723 Towpath Road • P.O. Box 66 • Syracuse, NY 13214-0066
Tel (315) 446-9120 • Fax (315) 449-0017 • www.bbl-inc.com • offices nationwide

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Patrick N. McGuire
Associate

CBL/ljp

cc: John Bradley, MDEQ
J. Michael Davis, Esq., Georgia-Pacific Corporation
Paul A. Montney, P.E., Georgia-Pacific Corporation
Daniel O. Cummins, Georgia-Pacific Corporation
Bill Kotowski, RMT, Inc.

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BLASLAND, BOUCK, & LEE, INC.

engineers & scientists

Lot 17 Test Pit Field Notes

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

CONSTRUCTION ACTIVITIES REPORT

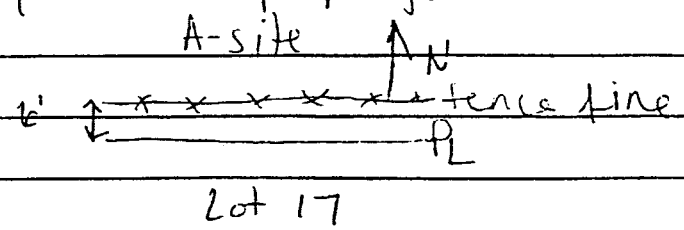
Project: Lot 17 Residual Removal	File No. 64581.675 Sheet No. 1 of 8 Sheets
Contractor: Taplin Environmental Contracting, Corp. / Contract No.: 1	Date 10/30/00 Day of Week: S (M) T W T F S
Contractor's Supervisor: Steve Taplin	
Weather: AM Sunny PM Sunny	Temperature: 34 Min. 58 Max.

Contractor's Activities, Visitors, Remarks:

8:00 On-site @ King Highway landfill trailer meet with Pat Taplin (Taplin) and Andy Kear (COM)(MDEQ oversight) to discuss activities for the day. I am to go to Georgia-Pacific (GP) and pick up property line information from Dan Cummins (GP). Will meet at A-site behind Lot 17. Pat Taplin needs to take barbed wire fence down to get PC120 onto Lot 17

8:15 At GP to pick up property line information

8:30 At A-site at fence line between A-site & Lot 17. Taplin taking fence apart in one segment. Talk to Pat Taplin regarding property line. Property line was surveyed before putting up the fence, fence was then installed (6' tall, barbed wire) on GP propert leaving a 6' buffer between the property line & GP ~~proper~~ fence line



[over]

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CONSTRUCTION ACTIVITIES REPORT

Project: Lot 17 Residual Removal	File No. 64581.675 Sheet No. 2 of 8 Sheets
Contractor: Taplin Environmental Contracting, Corp. / Contract No.: 1	Date 10/30/00 Day of Week: S M T W T F S
Contractor's Supervisor: Steve Taplin	
Weather:	Temperature: Min. Max.

Contractor's Activities, Visitors, Remarks:

845 called PNM to discuss activities for the day. PNM said to dig up to fence line (which includes Lot 17 and the 6' buffer (on GP property)) after test pitting, sketch area and fax to PNM to discuss. if small area - remove, agree with MDEQ oversight

930 Bringing PC120 onto Lot 17. Test pit just behind Lot 16 (still on GP propert, grey material in 3'x3'x3' deep test pit extend 2.5' below grand surface - with ~6" topsoil on top

945 Move to corner of Lot 17 (NE corner - fence post corner) examine area to test pit
See sketch for locations of test pits: descriptions follow

TP-1 at corner of fence (NE corner of Lot 17) 3'X3'X3' deep, grey material very distint ~2' thick, 6" topsoil on top and light brown sand (native - MDEQ oversight agree) below.

TP-2 Approx. 10' south of TP-1, 3'X3'X3' deep, grey material still distint layer ~1' thick (6" topsoil on top, same native material below)

TP-3 Approx 20' south of corner of fence, 3'x3'x3' deep

[over]

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CONSTRUCTION ACTIVITIES REPORT

ject: Lot 17 Residual Removal		File No. 64581.675 Sheet No. 3 of 8 Sheets
Contractor: Taplin Environmental Contracting, Corp.	Contract No.: 1	Date 10/30/00 Day of Week: S M T W T F S
Contractor's Supervisor: Steve Taplin		
Weather:		Temperature: Min. Max.

Contractor's Activities, Visitors, Remarks:

TP-3 (cont.) Grey material ~2" thick, topsoil on top (6") and light brown sand below, Grey material seems to pinch out going south

TP-4 Approx 17' north of garage - 30' south of corner of fence MDEQ oversight agree all mat'l appears native - no grey material in test pit (3'x3'x3' deep). light brown sand.

Note: Mr. Scott (property owner) on-site, pointing to areas of grey material, watching as dig and complaining to GP needs to clean up material before he can get a morgage from the bank to put a new roof on his house.

Mr Wadsworth (lot 15, 14, 13 property owner) also on-site. He says that there is grey mat'l on his property and its been sampled. They say its not contaminated, he's had 2 dogs die of cancer

TP-5 Approx. 10' east of TP-3 (3'x3'x3' deep) 6" topsoil, followed by native light brown sand, appears to be grey material (~2" thick) on east sidewall, no other place in test pit

[over]

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CONSTRUCTION ACTIVITIES REPORT

ect: Lot 17 Residual Removal		File No. 64581.675 Sheet No. 4 of 8 Sheets
Contractor: Taplin Environmental Contracting, Corp.	Contract No.: 1	Date 10/30/00 Day of Week: S M T W T F S
Contractor's Supervisor: Steve Taplin		
Weather:		Temperature: Min. Max.

Contractor's Activities, Visitors, Remarks:

TP-6 (3' x 3' x ~~6'~~ 5' deep) Approx 15-18' from fence (W. Lot 17), 43' North of garage. North end of tp, ~2' thick grey material, dug to sand bottom at 6', water entering. MDEQ requested us dig deeper than bottom of grey to see what is there. Appears to be native just below grey material.

TP-7 32' west from corner of fence, MDEQ oversight agrees, all material appears native, dug to sand (light brown) approx 5' deep.

TP-8 18' west of corner of fence, 19' North of corner of fence (3' x 3' x 3' deep) 6" topsoil then 1.5' grey material.

1030 Mr. Scott asked for us to look at material near his garage. Grey material, but now we notice that this grey material that we have been test pitting, that looks to be ~~a~~ clay-like from a distance, is not clay - just grey sand - no paper fibers in the material, no organic odor, no clay texture - doesn't roll in your hand. Suspect (with MDEQ oversight) that this material is not what we have previously

[over]

980842 WPO

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CONSTRUCTION ACTIVITIES REPORT

Project: Lot 17 Residual Removal		File No. 64581.675 Sheet No. 5 of 8 Sheets
Contractor: Taplin Environmental Contracting, Corp.	Contract No.: 1	Date 10/30/00 Day of Week: S M T W T F S
Contractor's Supervisor: Steve Taplin		
Weather:		Temperature: Min. Max.

Contractor's Activities, Visitors, Remarks:

seen at Willow Blvd/or King Highway. This grey material may be native sand. Left message with PNM to discuss actions - MDEQ oversight tried to call MDEQ - no answer.

1115 Talk with PNM - discuss grey sand - what to do. He suggested that we collect - maybe 3 samples, take to lab, screen samples to get quick turnaround detection level of 1 ppm. Still continue to find extent of grey material (per MDEQ oversight request & PNM)

TP-9 3' x 3' x 4' deep. 35' W of corner of fence 18' north of corner of fence. Approx. 3' grey mat'l below 6" topsoil, followed by brown fine sand

TP-10 41' W, 20' N of corner of fence. 3' x 3' x 3' deep 6" topsoil, grey/dark brown sand below. Collect sample TP-10 (6" bags) 11:30

11:45 Dan Cummins (GP) on-site. Mr Scott had called him over. Explain situation w/ Dan Cummins. He suggested we collect a sample from both above and below grey material - to make sure area is clean TP-11 35' W, 6' N. corner of fence, MDEQ agrees - native [over] mat'l

83980842.WPD

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CONSTRUCTION ACTIVITIES REPORT

Project: Lot 17 Residual Removal		File No. 64581.675 Sheet No. 6 of 8 Sheets
Contractor: Taplin Environmental Contracting, Corp.	Contract No.: 1	Date 10/30/00 Day of Week: S M T W T F S
Contractor's Supervisor: Steve Taplin		
Weather:		Temperature: Min. Max.

Contractor's Activities, Visitors, Remarks:

Received call from PNM and Paul Mathney (GP) said that even if grey mat'l comes back from the lab of clean of PCB, if Mr. Scott does not want the mat'l in his backyard, to remove it. Told Dan Cummins, he said to just landscape Mr. Scott's backyard if mat'l is clean, because all other residences behind A site will have grey mat'l in their yards too and then GP will have to dig all at, even if mat'l is clean. Left message with PNM regarding Dans comments.

1200 Collect sample from TP-1 (6" bgs) 1200 collected grey sand from top of grey layer. Dig TP-1 deeper, (4') water entering, colleted sample TP-1 (2.5' bgs) 1215 collected of grey material at bottom of grey layer. Below grey layer is dark brown fine sand / some gravel - appears to be fill mat'l (some glass), below - light brown sand (1') / some gravel - MDEQ oversight agrees - appears native.

1220 lunch

[over]

83980842.WPD

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CONSTRUCTION ACTIVITIES REPORT

Project: Lot 17 Residual Removal		File No. 64581.675 Sheet No. 7 of 8 Sheets
Contractor: Taplin Environmental Contracting, Corp.	Contract No.: 1	Date 10/30/00 Day of Week: S M T W T F S
Contractor's Supervisor: Steve Taplin		
Weather:		Temperature: Min. Max.

Contractor's Activities, Visitors, Remarks:

1330 TP-12 N.East end of lot 17 (10' from fence, 81' from ~~corner of~~ W. property line) Collect sample TP-12 (3' bgs) sample of grey (light) sand just above peat layer (Note: test pit in former Olmstead ditch line) suspect fibers in a grey/tan saturated clay material, ~~almost~~

400 TP-13 (3' X 5' X 6' deep) 57' east of W. property line. Collected sample TP-13 (~4' bgs) of mat'l 1' thick same grey/tan saturated clay material - this test pit - layer is distinct. 1420, sampled below peat.

1430 TP-14 2' topsoil/fill mat'l, 0.5' gravel/sand, 1' peat, 0.5' same light brown/grey mat'l that we dug at TP-13 (layer thinning) 30' E. of prop. line.

1500 TP-15 0-2' topsoil/fill, 2-2.5' light brown sand, 2.5-3.5' peat, 3.5'-4' (sample collected TP-15) (3.5' bgs) darker grey, suspect fibers, 4-5' sand - MDEQ oversight agrees - native mat'l

1530 Backfilled all test pits, Taplin going to set up snow fence around excavations / temp. fencing

[over]

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CONSTRUCTION ACTIVITIES REPORT

Project: Lot 17 Residual Removal		File No. 64581.675 Sheet No. 3 of 8 Sheets
Contractor: Taplin Environmental Contracting, Corp.	Contract No.: 1	Date 10/20/00 Day of Week: S M T W T F S
Contractor's Supervisor: Steve Taplin		
Weather:		Temperature: Min. Max.

Contractor's Activities, Visitors, Remarks:

1600 MDEQ oversight and I go over to Lot 16 (The Thrashers - renters) to look at grey mat'l that they reported to Dan Cummins. Dig a 4' foot hole 8" sand followed by 4" same grey sand that we found/sampled at Lot 17. Tested in center of backyard. No paper fibers, no odor, sand. Andy told him that it was same mat'l, not typical of residuals we saw at Willow Blvd or at Olmstead Creek.

1700 Take samples to KAR laboratories. Ask for an ASAP turnaround. KAR says to call Wed. morning for results.

[over]

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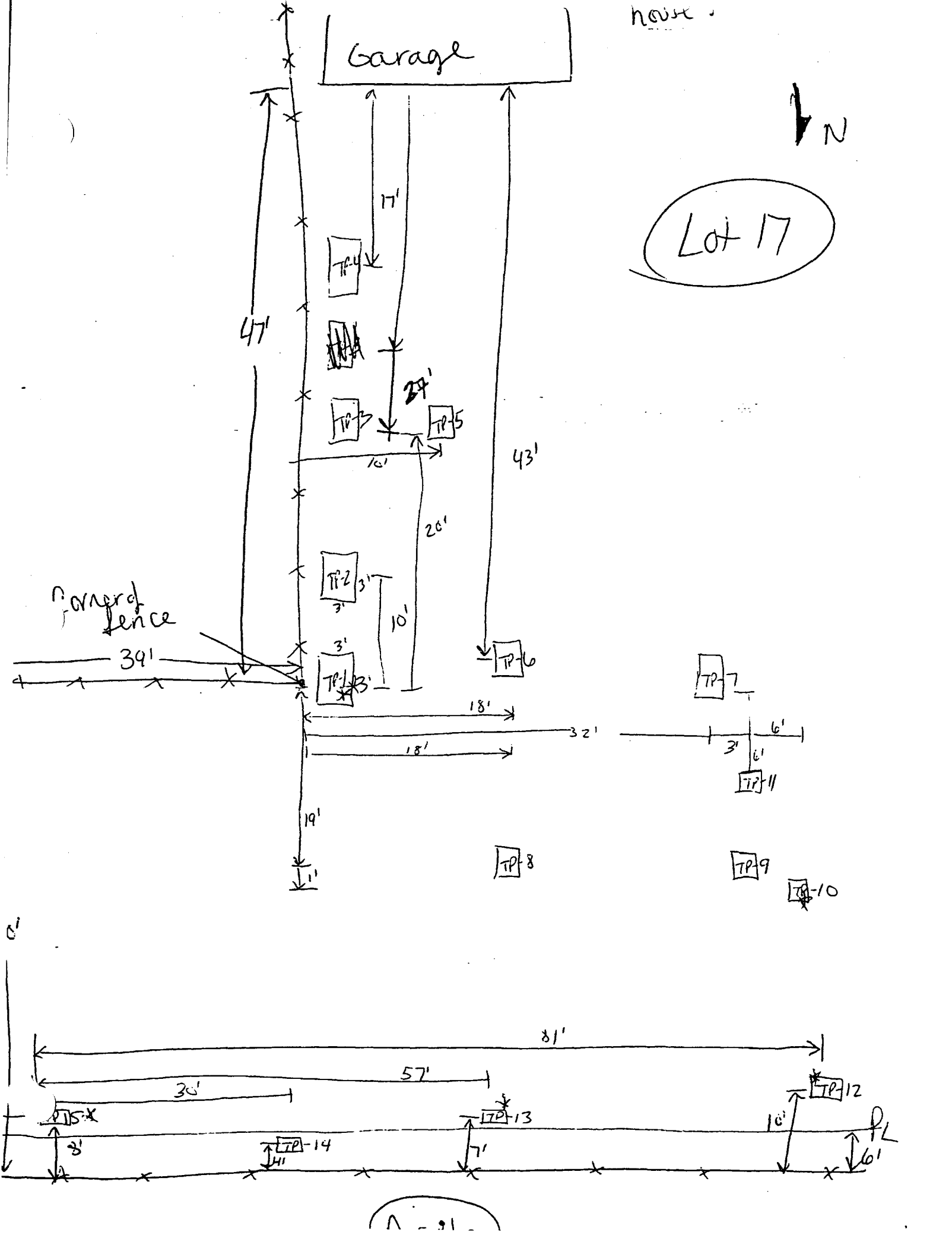
house
Garage
N
Lot 17
17'
47'
27'
43'
16'
20'
10'
TP-1
TP-2
TP-3
TP-4
TP-5
TP-6
TP-7
TP-8
TP-9
TP-10
TP-11
TP-12
TP-13
TP-14
TP-15
3'
3'
3'
3'
Garage fence
39'
18'
32'
18'
19'
1'
6'
3'
6'
81'
57'
30'
8'
4'
7'
16'
6'
PL

BLASLAND, BOUCK, & LEE, INC.

engineers & scientists

Lot 17 Analytical Report

LABORATORY DETAIL REPORT

KAR Project No. : *005609*

Client: *Blasland, Bouck & Lee, Inc.*

Date Reported : *11/01/00*

Project Description : *Analysis of six soil samples from Georgia-Pacific A-site (645.81.675).*

Sample ID : *"TP-1 (0.5' bgs)"*

Sampled By : *CBC of Blasland, Bouck, & Lee, Inc.*

Sample Date : *10/30/2000*

Sample Time : *1200*

Date Received : *10/30/2000*

Sample Type : *soil*

KAR Sample No. : *005609-01*

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	62.94	% by weight	SM(18) 2540B mod	10/30/2000	BLF	
Prep, ECD	Completed		EPA 3545	10/31/2000	SAS	
PCB	See below		EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclors, total	NA		EPA 8082	10/31/2000	MSZ	

LABORATORY DETAIL REPORT

KAR Project No. : *005609*

Client: *Blasland, Bouck & Lee, Inc.*

Date Reported : *11/01/00*

Project Description : *Analysis of six soil samples from Georgia-Pacific A-site (645.81.675).*

Sample ID : *"TP-1 (2.5' bgs)"*

Sampled By : *CBC of Blasland, Bouck, & Lee, Inc.*

Sample Date : *10/30/2000*

Sample Time : *1215*

Date Received : *10/30/2000*

Sample Type : *soil*

KAR Sample No. : *005609-02*

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	64.08	% by weight	SM(18) 2540B mod	10/30/2000	BLF	
Prep, ECD	Completed		EPA 3545	10/31/2000	SAS	
PCB	See below		EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclors, total	NA		EPA 8082	10/31/2000	MSZ	

LABORATORY DETAIL REPORT

KAR Project No. : *005609*

Client: *Blasland, Bouck & Lee, Inc.*

Date Reported : *11/01/00*

Project Description : *Analysis of six soil samples from Georgia-Pacific A-site (645.81.675).*

Sample ID : *"TP-10 (0.5' bgs)"*

Sampled By : *CBC of Blasland, Bouck, & Lee, Inc.*

Sample Date : *10/30/2000*

Sample Time : *1130*

Date Received : *10/30/2000*

Sample Type : *soil*

KAR Sample No. : *005609-03*

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Dry weight solids	74.23	% by weight	SM(18) 2540B mod	10/30/2000	BLF	
Prep, ECD	Completed		EPA 3545	10/31/2000	SAS	
PCB	See below		EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1016	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1221	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1232	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1242	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1248	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1254	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclor 1260	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
PCB Aroclors, total	NA		EPA 8082	10/31/2000	MSZ	

LABORATORY DETAIL REPORT

KAR Project No. : *005609*

: *Blasland, Bouck & Lee, Inc.*

Date Reported : *11/01/00*

ct

iption : *Analysis of six soil samples from Georgia-Pacific A-site (645.81.675).*

ID : *"TP-12 (3' bgs)"*

d By : *CBC of Blasland, Bouck, & Lee, Inc.*

Date : *10/30/2000*

Time : *1400*

Date Received : *10/30/2000*

Sample Type : *soil*

KAR Sample No. : *005609-04*

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
ht solids	33.51	% by weight	SM(18) 2540B mod	10/30/2000	BLF	
:D	Completed		EPA 3545	10/31/2000	SAS	
	See below		EPA 8082	10/31/2000	MSZ	
clor 1016	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
clor 1221	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
clor 1232	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
clor 1242	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
clor 1248	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
clor 1254	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
clor 1260	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
r tal	NA		EPA 8082	10/31/2000	MSZ	

LABORATORY DETAIL REPORT

KAR Project No. : *005609*

t: *Blasland, Bouck & Lee, Inc.*

Date Reported : *11/01/00*

ect

ription : *Analysis of six soil samples from Georgia-Pacific A-site (645.81.675).*

e ID : *"TP-13 (4' bgs)"*

ed By : *CBC of Blasland, Bouck, & Lee, Inc.*

e Date : *10/30/2000*

e Time : *1420*

Date Received : *10/30/2000*

Sample Type : *soil*

KAR Sample No. : *005609-05*

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
ght solids	43.19	% by weight	SM(18) 2540B mod	10/30/2000	BLF	
CD	Completed		EPA 3545	10/31/2000	SAS	
	See below		EPA 8082	10/31/2000	MSZ	
oclor 1016	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
oclor 1221	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
oclor 1232	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
oclor 1242	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
oclor 1248	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
oclor 1254	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
oclor 1260	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
oclors, total	NA		EPA 8082	10/31/2000	MSZ	

LABORATORY DETAIL REPORT

KAR Project No. : *005609*

nt: *Blasland, Bouck & Lee, Inc.*

Date Reported : *11/01/00*

ect
cription : *Analysis of six soil samples from Georgia-Pacific A-site (645.81.675).*

ple ID : *"TP-15 (3.5' bgs)"*

pled By : *CBC of Blasland, Bouck, & Lee, Inc.*

ple Date : *10/30/2000*

ple Time : *1500*

Date Received : *10/30/2000*

Sample Type : *soil*

KAR Sample No. : *005609-06*

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
eight solids	56.36	% by weight	SM(18) 2540B mod	10/30/2000	BLF	
ECD	Completed		EPA 3545	10/31/2000	SAS	
	See below		EPA 8082	10/31/2000	MSZ	
Aroclor 1016	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
Aroclor 1221	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
Aroclor 1232	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
Aroclor 1242	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
Aroclor 1248	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
Aroclor 1254	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
Aroclor 1260	<330	ug/kg dry sample	EPA 8082	10/31/2000	MSZ	
Aroclor total	NA		EPA 8082	10/31/2000	MSZ	

Appendix G

2000 Groundwater Sampling Field Data

SOKKIA™

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SOKKIA™

TRANSIT FIELD BOOK

No. 8152-00

10/31/00 AMW-6A WELL DEVELOPMENT NLZ

Initial Depth of well (TIC): 22.59
depth of ∇ (TIC): ~~22.59~~ ~17.00 DOFFgassing
feet of H_2O: 5.59
1 volume: ~~[illegible]~~ 2.91 gallons

Procedure & Equipment: WATERRA PUMP, footvalve, 3/8" ID X 1/2" OD HDPE TUBING, Robin 1200 watt Generator, Keck water Level Indicator, Horiba U-10 Water Quality meter.

- Surged entire 5' of screen using Waterra Pump, HDPE TUBING, surge block & footvalve. Surged Screen @ 1' intervals for approx. 10 min each.
- removed surge block & purged ~~for~~ w/ footvalve until water was free of sediment & parameters stabilized.
- water discharged to ground.

Initial Purge H_2O: v. dk grey brown, turbid, slt. odor,
Final Purge H_2O: clear, colorless, slight odor.
FINAL WELL DEPTH AFTER USING SS BAILER 22.20 (will come back & remove sadd w/ a S.S. BAILER.)
Final well depth (TIC): 22.46 →
volume H_2O surged during devel.: 14.5 gallons
Ave. Flow rate while surging: 0.25 gpm
volume H_2O Purged during devel.: 55 gallons
Ave. Flow rate while purging: 0.5 gpm
Total vol. H_2O purg./surged: 69.5 gallons

10/31/00 AMW-6A WELL DEVELOPMENT NLZ

PARAMETERS

TIME	vol. purged (GA)	TEMP °C	PH	mS/cm conduct	(NTU) Turbid.
915	Initial	13.2	6.23	1.54	517
920	2.50	13.5	6.30	1.46	84
925	5.00	13.6	6.27	1.46	26
930	7.50	13.7	6.28	1.47	27
0935	10.00	13.7	6.27	1.46	16
940	12.50	13.8	6.27	1.46	15
945	15.00	13.7	6.27	1.47	15
950	17.50	13.7	6.26	1.46	14
955	20.00	13.7	6.25	1.45	10
1000	22.50	13.7	6.26	1.46	8
1005	25.00	13.7	6.25	1.45	10
1010	27.50	13.7	6.25	1.45	10
1015	30.00	13.7	6.24	1.44	6
1020	32.50	13.8	6.23	1.43	6
1025	35.00	13.8	6.25	1.46	5
1035	40.00	13.8	6.25	1.45	3
1045	45.00	13.9	6.25	1.44	2
1055	50.00	13.9	6.25	1.45	2
1105	55.00	13.9	6.24	1.44	2
~~1115~~	~~60.00~~				
~~1125~~	~~65.00~~				

10/31/00 AMW-6B WELL DEVELOPMENT

Initial depth of well (TIC): 32.30
depth of ~~W~~ (TIC): 17.81
~~feet of~~ H_2O: 14.49
1 volume: 2.4 gallons

Procedure & Equipment: WATERRA PUMP, 3/8" ID x 1/2" OD HDPE TUBING, footvalve, Robin 1200 watt Generator, Keck water ~~level~~ level indicator, Horiba U-10 water quality meter.

- Surged entire 5' of screen @ 1' intervals for approx. 10 min. each, using Waterra pump, tubing, & footvalve w/ surgeblock.
- Removed surge block & purged until water was free of sediment & parameters stabilized. * Turbidity did not stabilize.
- water discharged to ground.

Initial Purge H_2O: v. dk. grey, brown, turbid, slight odor, v. F. SAND. (grey)
Final Purge H_2O: dk. brown, turbid, slight odor, v.f. grey SAND.
Final well depth after USWB SS Bailer 11/3/00 32.30 (50.10)
Final well depth (TIC): 29.37
volume H_2O surged during devel.: 30.5 gallons
Ave. flow rate while surging: 0.5 gpm
volume H_2O purged during devel.: 60 gallons
Ave flow rate while purged: 0.5 gpm
Total vol. H_2O purged/surged: 90.5 gallons

NLZ

10/31/00 AMW-6B WELL DEVELOPMENT.

* PARAMETERS

TIME	vol. purged (GA)	TEMP °C	PH	mS/cm conduct	NTU TURBID
0925	Initial	13.4	6.48	1.18	>999
0930	2.50	13.4	6.48	1.21	>999
0935	5.00	13.4	6.48	1.21	>999
0940	7.50	13.4	6.47	1.20	>999
0945	10.00	13.5	6.47	1.20	>999
0950	12.50	13.4	6.47	1.20	>999
0955	15.00	13.4	6.47	1.19	>999
1000	17.50	13.4	6.46	1.18	>999
1005	20.00	13.5	6.46	1.18	>999
1010	22.50	13.5	6.46	1.18	>999
1015	25.00	13.5	6.46	1.18	>999
1020	27.50	13.5	6.47	1.18	>999
1025	30.00	13.5	6.47	1.18	>999
1035	35.00	13.5	6.47	1.18	>999
1045	40.00	13.6	6.47	1.18	>999
1055	45.00	13.6	6.46	1.18	>999
1105	50.00	13.7	6.47	1.18	>999
1115	55.00	13.9	6.47	1.18	>999
1125	60.00	13.9	6.47	1.18	>999

* After 1 hr of purging, there was a 1/4 bucket full of F. SAND.

10/31/00 AMW-7A WELL DEVELOPMENT NLZ

Initial depth of ~~water~~ well (TIC): 32.02
depth of ∇ (TIC): 21.26
feet of H_2O: 10.76
1 volume: 1.8 gallons

Procedure & Equipment: waterra pump, footvalve, 3/8" ID x 1/2" OD HDPE TUBING, Robin 1200 watt Generator, Keck water level indicator, Horiba U10 water quality meter.

- Surged 5' of screen @ 1' intervals for Approx. 10 min each, using waterra pump, HDPE TUBING, & footvalve w/ surge block. - Removed surge block & purged until water was free of sediment & the parameters stabilized.
- water discharged to ground.

Initial Purge H_2O: dk grey, v. turbid, slight odor, grey fine sand.
Final Purge H_2O: Clear, colorless, slight odor.

FINAL WELL DEPTH AFTER REMOVING SILT/FINE SAND w/ STAINLESS STEEL BAILER. 32.05 (TIC) (SOLID) 11/2/00

Final well depth (TIC): 31.27 → will come back w/ SS bailer to remove sand.
vol. H_2O surged: 26.5 gallons
Ave. Flow rate while surging: 0.5 gpm
vol. H_2O purged: 72.5 gallons
Total vol. H_2O surge/purged: ~~99.0~~ 99.0
Ave. Flow rate while purging: 0.25 gpm

10/31/00 AMW-7A WELL DEVELOPMENT NLZ

*PARAMETERS

TIME	vol. Purged (GA)	TEMP °C	PH	MS/CM Conduct	(NTU) Turbid
1154	Initial (surge)	16.9	6.47	1.14	>999
1200	Initial (purge)	17.1	6.52	1.15	>999
1305	5.0	17.0	6.50	1.13	528
1310	10.0	16.9	6.47	1.12	109
1315	15.0	16.9	6.46	1.15	72
1320	20.0	16.9	6.45	1.17	48
1325	25.0	16.9	6.45	1.17	42
1330	30.0	16.9	6.46	1.17	37
1335	35.0	16.9	6.47	1.18	27
1340	40.0	16.8	6.46	1.18	25
1345	45.0	16.9	6.45	1.18	25
1350	50.0	16.9	6.46	1.18	24
1355	51.25	17.0	6.48	1.20	24
1400	52.5	17.2	6.48	1.18	38
1405	61.5 ~~53.75~~ 99.0	17.1	6.48	1.17	42
1415	60 ~~55.0~~ 27.3	17.3	6.48	1.17	39
1425	62.5 ~~56.25~~ 90	17.1	6.49	1.18	28
1435	65 ~~57.5~~ 102.5	17.1	6.49	1.18	25
1445	67.5 ~~58.75~~ 113	17.0	6.47	1.18	17
1455	70.0	17.1	6.46	1.18	18
1505	72.5	17.1	6.47	1.18	17

10/31/00 AMW-7B WELL DEVELOPMENT NLE

Initial depth of well (TIC): 39.17
depth to ~~of~~ II (TIC): 20.53
feet of H_2O: 18.64
1 volume: 3.0 gallons

Procedures
Equipment waterra pump, footvalve, 3/8" ID x 1/2" OD HDPE TUBING, Robin 1200 watt Generator, Keck water level indicator, Horiba U-10 water quality meter.

- Surged entire 5' of screen using a surge block, footvalve, & Tubing, Surged @ 1' intervals for 10 min. each.
- Removed surge block & purged until parameters stabilized. Water stayed turbid.
- Water discharged to ground.

Initial Purge H_2O: ~~clear~~ cloudy colorless, slight odor.
Final Purge H_2O: Med brown, turbid, slight odor.
Final well Depth After SS Baller 39.19 (TIC) (Solids) 11/2/00
Final well depth (TIC): 39.11
vol. H_2O surged: 62 gallons
Ave. Flow rate while surging: 1 gpm
vol. H_2O Purged: 92.5 gallons
Ave. Flow rate while purging: .75 gpm
Total vol. surged/purged: 154.5 gallons

10/31/00 AMW-7B WELL DEVELOPMENT NLE

*PARAMETERS

TIME	vol purged (GAL)	TEMP	PH	us/cm conduct	(NTU) Turbid
1152	Initial (surge)	17.4	6.71	1.01	73
1255	Initial (purge)	16.4	6.59	1.01	>999
1300	5.0	16.4	6.72	1.03	>999
1305	10.0	16.3	6.72	1.04	>999
1310	15.0	16.3	6.72	1.04	>999
1315	20.0	16.3	6.73	1.04	>999
1320	25.0	16.3	6.73	1.03	>999
1325	30.0	16.2	6.73	1.03	>999
1330	35.0	16.2	6.73	1.03	>999
1335	40.0	16.2	6.73	1.04	>999
1340	45.0	16.3	6.73	1.04	>999
1345	50.0	16.3	6.72	1.04	>999
1350	55.0	16.5	6.74	1.05	>999
1355	57.5	16.5	6.73	1.05	>999
1400	60.0	16.5	6.74	1.05	>999
1405	62.5	16.4	6.73	1.05	>999
1415	67.5	16.5	6.75	1.05	>999
1425	72.5	16.3	6.74	1.05	>999
1435	77.5	16.3	6.74	1.04	>999
1445	82.5	16.3	6.74	1.04	>999
1455	87.5	16.2	6.75	1.04	>999
1505	92.5	16.2	6.74	1.04	>999

10/31/00 AMW-10A WELL DEVELOPMENT

Initial depth of well (TIC): 35.25
depth of ▽ (TIC): } could not get
feet of H_2O: } water level due
1 volume: } to OFF-GASSING.

Procedures & Equipment: WATERRA pump, footvalve, 3/8" ID x 1/2" OD HDPE TUBING, Robin 1200 WATT generator, Keck water level indicator, Horiba U-10 water quality meter.

- Surged entire 5' of screen @ 1' intervals for approx. 10 mins each, using Waterra pump, tubing, & footvalve w/ surge block.
- Removed surge block & purged until water was free of sediment & parameters stabilized.
- water discharged to ground.

Initial Purge H_2O: dk. grey, turbid, slight odor.
Final Purge H_2O: Clear, colorless, slight odor.
Final well Depth Nice SS Bailer 35.26 (TIC) (Solid) 11/2/00
Final well depth (TIC): 35.20
vol. H_2O surged: 12.75
Ave. Flow rate surging: 0.25 gpm
vol H_2O Purged: 20 gallons
Ave Flow rate purging: 0.25 gpm
Total vol. surged/purged: 32.75 gallons

10/31/00 AMW-10B WELL DEVELOPMENT

*PARAMETERS

TIME	vol purged (GA)	TEMP °C	pH	Conduct	Turbid
1630	Initial Surge	16.1	6.02	1.12	715
1625	Initial Purge	15.5	6.17	.964	788
1630	1.25	15.1	6.44	0.96	203
1635	2.50	15.1	6.34	0.99	193
1640	3.75	15.0	6.34	0.99	131
1645	5.00	14.8	6.34	1.00	92
1650	6.25	14.9	6.34	1.01	87
1655	7.50	14.9	6.33	1.02	53
1600	8.75	14.8	6.33	0.99	41
1605	10.00	14.6	6.33	0.95	23
1610	11.25	14.7	6.33	0.99	16
1615	12.50	14.7	6.33	1.03	13
1620	13.75	14.7	6.34	1.03	11
1625	15.00	14.7	6.34	1.03	6
1630	16.25	14.5	6.35	1.02	6
1735	17.50	14.6	6.35	1.03	5
1740	18.75	14.7	6.33	1.04	4
1745	20.00	14.7	6.32	1.03	4

10/31/00 AMW-10B WELL DEVELOPMENT

Initial depth of well (TIC): 45.24
depth of ∇ (TIC): 29.41
feet of H_2O: 15.83
1 volume: 2.6 gallons

Procedure:
Equipment: Waterra pump, footvalve 3/8" ID x 1/2" OD HDPE TUBING, Robin 1200 watt generator, Keckwater ~~quality~~ level indicator, Horiba U-10 water quality meter.
- Surged entire 5' of screen @ 1' intervals for approx. 10 mins each using the waterra pump, tubing, & footvalve w/ surge block.
- Removed surge block & purged until water was free of sediment & parameters stabilized.
- Water discharged to ground.

Initial Purge H_2O: dk. grey, turbid, slight odor.
Final Purge H_2O: clear, colorless, slight odor.
Final well Depth After SS Bailer 45.25 (TIC) SOLIA 11/2/00
Final well depth (TIC): 45.12
Vol. H_2O Surged: 15.25 gallons
Ave Flow rate Surging: 0.25 gpm
vol. H_2O Purged: 45. gallons
Ave. Flow rate Purging: 0.75 gpm
Total vol. Surged / purged: 60.25 gallons

10/31/00 AMW-10B WELL DEVELOPMENT

*PARAMETERS

Time	vol. purged (GA)	Temp °C	pH	Conduct	Turbid
1528	Initial Surge	16.1	9.11	0.98	327
1530	Initial purge	15.2	7.93	1.00	407
1535	3.75	14.6	6.81	1.07	76
1540	7.50	14.5	6.83	1.08	52
1545	11.25	14.5	6.84	1.08	11
1550	15.00	14.5	6.85	1.07	2
1555	18.75	14.5	6.85	1.07	2
1600	22.50	14.4	6.86	1.08	3
1605	26.25	14.4	6.86	1.08	2
1610	30.00	14.4	6.86	1.07	3
1615	33.75	14.4	6.86	1.07	1
1620	37.50	14.4	6.85	1.06	2
1625	41.25	14.4	6.86	1.06	2
1630	45.00	14.3	6.86	1.06	2

11/1/00 AMW-9A WELL DEVELOPMENT NCZ

Initial depth of well (TIC): 31.28
depth of ∇ (TIC): 25.30
feet of H_2O: 5.98
1 volume: 0.97 gallons

Procedure:
Equipment: WATERRA Pump, footvalve, 3/8" OD x 1/2" ID HDPE TUBING, Robin 1200 WATT GENERATOR, KECK water level indicator, Horiba U-10 water quality meter.
- surged entire 5' of screen @ 1' intervals for approx. 10 mins. each using the WATERRA pump, tubing, & footvalve w/ surgeblock.
- Removed surgeblock & purged until water was free of sediment & parameters stabilized.
- water was discharged to ground.

Initial Purge H_2O: dk. grey, turbid, slight odor.
Final Purge H_2O: clear, colorless, slight odor.
~~Final well depth Address Bible~~ 31.29 (TIC) Sacio 11/2/00
Final well depth (TIC): 30.70
Vol. H_2O surged: 5 gallons (Drawdown prevented surging on top 3' of screen)
Ave. Flow rate surging: 0.25 gpm
Vol. H_2O Purged: 30 gallons
Ave. Flow rate purging: 0.25 gpm
Total Vol. purged/surged: 35 gallons

11/1/00 AMW-9A WELL DEVELOPMENT

*PARAMETERS

TIME	vol. purged (GA)	TEMPER	PH	ms/cm conduct	(NTU) Turbid
0800	Initial surge	13.8	6.37	3.09	>999
0858	Initial Purge	15.2	6.11	1.60	908
0903	1.25	15.2	6.28	1.29	95
0908	2.50	15.1	6.28	1.25	52
0913	3.75	15.2	6.29	1.22	33
0918	5.0	15.1	6.28	1.18	29
0923	6.25	15.1	6.27	1.16	22
0928	7.50	15.1	6.29	1.16	28
0933	8.75	15.1	6.31	1.16	25
0938	10.0	15.1	6.31	1.16	26
0943	11.25	15.1	6.30	1.15	24
0948	12.50	15.1	6.31	1.14	25
0953	13.75	15.2	6.31	1.14	21
0958	15.0	15.1	6.33	1.15	18
1003	16.25	15.1	6.32	1.14	19
1008	17.50	15.1	6.33	1.13	16
1018	20.0	15.1	6.30	1.12	18
1028	22.5	15.2	6.31	1.13	19
1038	25.0	15.1	6.29	1.14	18
1048	27.5	15.2	6.29	1.13	18
1058	30.0	15.1	6.28	1.13	19

11/1/00 AMW-9B WELL DEVELOPMENT NLE

Initial depth of well (TIC): 41.72
depth of ∇ (TIC): 25.62
feet of H_2O: 16.1
1 volume: 2.6 gallons

Procedure & Equipment: WATERRA pump, footvalve 3/8" OD x 1/2" ID HDPE TUBING, Robin 1200 watt Generator, KECK water level Indicator ~~quality meter~~, Horiba U-10 water quality meter.

- Surged Entire 5' of screen @ 1' intervals for Approx. 10 min Each, using the waterra pump, tubing & footvalve w/ Surge block attachment.
- Removed surge block & purged until water was free of sediment & parameters stabilized.
- water discharged to ground.

Final Well Depth After SS Bailer 41.99' (TIC) 11/2/00

Initial Purge H_2O: dk grey, turbid, slight odor

Final Purge H_2O: clear, colorless, slight odor.

Final well depth (TIC): 41.45
vol. H_2O surged: 12.5 gallons
Ave Flow rate surging: 0.25 gpm
vol. H_2O Purged: 30 gallons
Ave. Flow rate purging: 0.25 gpm
Total vol. purged/surged: 42.5 gallons

11/1/00 AMW-9B WELL DEVELOPMENT NLE

* PARAMETERS

TIME	vol. purged (GA)	TEMP °C	pH	uS/cm conduct	(NTU) Turbid
7:46	Initial surge	13.3	6.98	0.97	>999
8:50	Initial Purge	14.3	6.96	0.97	235
8:55	1.25	14.4	6.89	0.988	80
9:00	2.50	14.3	6.91	0.96	49
905	3.75	14.5	6.88	0.986	55
0910	5.0	14.5	6.89	0.96	31
0915	6.25	14.5	6.90	0.96	29
0920	7.50	14.5	6.91	0.988	25
0925	8.75	14.5	6.90	0.971	24
0930	10.0	14.5	6.91	0.973	18
0935	11.25	14.5	6.90	0.95	15
0940	12.5	14.5	6.88	0.95	16
0945	13.75	14.5	6.88	0.966	15
0950	15.0	14.6	6.89	0.967	17
0955	16.25	14.5	6.88	0.966	16
1000	17.50	14.5	6.88	0.966	16
1010	20.0	14.5	6.91	0.965	15
1020	22.50	14.6	6.90	0.968	14
1030	25.0	14.6	6.91	0.969	16
1040	27.50	14.6	6.92	0.967	14
1050	30.00	14.6	6.91	0.968	16

11/1/00 AMW-8A WELL DEVELOPMENT NLE

Initial depth of well (TIC): 35.87
depth of II (TIC): 25.88
feet of H_2O: 9.99
1 volume: 1.6 gallons

Procedure:
Equipment WATERRA Pump, footvalve, 3/8" OD, 1/2" ID HDPE TUBING, KECK water level indicator, Horiba U-10 water quality meter, Robin 1200 Generator.
- Surged Entire 5' of screen @ 1' intervals for Approx. 10 min. Each using the waterra pump, tubing, & footvalve w/ surge block.
- Removed surge block & purged w/ footvalve until water was free of Sediment MUD/OIL & parameters stabilized.
- water discharged to ground.

Initial Purge H_2O: dk. grey-brown, turbid, slight odor.
Final Purge H_2O: lt. brown/cloudy/turbid, slight odor
final well Depth After SS Bailer 35.85' (TIC) (Sam) 11/2/00
Final well depth (TIC): 35.22
vol. H_2O Surged: 12.5 gallons
Ave Flow rate Surging: 0.25 gpm
Vol. H_2O purged: 60 gallons
Ave. Flow rate purging: 0.5 gpm
Total vol. purge/surged: 72.5 gallons

11/1/00 AMW-8A WELL DEVELOPMENT NLE

* PARAMETERS

TIME	vol. purged (GA)	TEMP °C	pH	conduct MS/cm	Turbid (NTU)
12:40	Initial surge	18.7	6.68	1.08	>999
13:30	Initial Purge	16.8	6.54	1.01	>999
1335	2.5	16.5	6.56	1.07	>999
1340	5.0	16.4	6.57	1.05	821
1345	7.5	16.1	6.57	1.09	590
1350	10.0	16.1	6.55	1.08	527
1355	12.5	16.0	6.55	1.09	298
1400	15.0	16.0	6.55	1.10	296
1410	20.0	15.9	6.56	1.10	250
1420	25.0	15.9	6.56	1.10	207
1430	30.0	16.0	6.54	1.10	205
1440	35.0	15.9	6.55	1.10	196
1450	40.0	16.0	6.55	1.10	91
1500	45.0	16.0	6.54	1.10	194
1510	50.0	15.9	6.55	1.09	195
1520	55.0	15.9	6.55	1.09	188
1530	60.0	15.9	6.55	1.09	191

11/1/00 AMW-8B WELL DEVELOPMENT WLZ

Initial depth of well (TIC): 40.88
depth of ∇ (TIC): 25.48
feet of H_2O: 15.4
1 volume: 2.5 gallons

Procedure & Equipment WATERRA Pump, footvalve, 3/8" OD x 1/2" ID HDPE TUBING, Robin 1200 WATT GENERATOR, KELL water level Indicator, Horiba U-10 water quality meter.

- Surged Entire 5' of screen @ 1' intervals for Approx. 10 min. each using waterra pump, tubing, & footvalve w/ surge block.
- Removed surge block & purged w/ footvalve until water was free of sediment AND/OR & parameters stabilized.
- Water discharged to ground.

Initial Purge H_2O: dk. grey brown, turbid, slight odor. w/ brown F SAND.
Final Purge H_2O: same as above
Final well Depth After SS BAILER 40.80 (TIC) (solid) 11/2/00
Final well depth (TIC): 39.70
Vol. H_2O Surged: 25 gallons.
Ave Flow rate surging: 0.5 gpm
vol. H_2O purged: 57.5 gallons
Ave Flow rate purging: 0.5 gpm
Total Vol. purged / surged: 82.5 gallons

11/1/00 AMW-8B WELL DEVELOPMENT WLZ

* PARAMETERS

TIME	vol. purged (gal)	TEMP °C	pH	mS/cm conduct	(NTU) Turbid
1238	Initial surge	17.0	6.84	1.14	>999
1335	Initial purge	16.1	7.05	1.10	>999
1340	2.5	15.9	6.56	1.04	>999
1345	5.0	15.6	6.56	1.09	>999
1350	7.5	15.7	6.55	1.11	>999
1355	10.0	15.7	6.55	1.10	>999
1400	12.5	15.6	6.54	1.10	>999
1405	15.0	15.7	6.56	~~1.04~~ 1.11	>999
1410	17.5	15.7	6.55	1.09	>999
1415	20.0	15.6	6.55	1.09	>999
1420	22.5	15.5	6.54	1.09	>999
1430	27.5	15.6	6.54	1.10	>999
1440	32.5	15.6	6.56	1.10	>999
1450	37.5	15.6	6.55	1.11	>999
1500	42.5	15.6	6.57	1.11	>999
1510	47.5	15.5	6.58	1.10	>999
1520	52.5	15.5	6.59	1.10	>999
1530	57.5	15.5	6.58	1.10	>999

11/2/00 AMW-4 WELL DEVELOPMENT NLE

Initial depth of well (TIC): 24.47
depth of ∇ (TIC): 15.83
feet of H_2O: 8.64
1 volume: 1.4 gallons

Procedure & Equipment WATERRA pump, footvalve, 3/8" OD x 1/2" ID HDPE TUBING, Robin 1200 watt generator, Keck water level indicator, Horiba U-10 water quality meter.

- Surged entire 5' of screen w/ 1' intervals for Approx. 10 min. each using waterra pump, tubing, & footvalve w/ surge block.
- Removed surge block & purged w/ footvalve until water was free of sediment & parameters stabilized.
- water discharged to ground.

Initial purge H_2O: DK grey to black, slightly turbid, odor.
Final purge H_2O: clear, colorless, slight odor.

Final well depth (TIC): 24.50
Vol. H_2O surged: 25 gallons
Ave Flow rate surging: 0.5 gpm
Vol. H_2O purged: 57.5 gallons
Ave. Flow rate purging: 0.5 gpm
Total vol. purged/surged: 82.5 gallons

11/2/00 AMW-4 WELL DEVELOPMENT NLE

* PARAMETERS

TIME	vol. purged (GA)	TEMP °C	pH	MS/cm Conduct	(NTU) Turbid
0750	Initial surge	14.3	6.54	1.44	790
0855	Initial purge	14.9	6.43	1.31	100
0900	2.5	15.3	6.49	1.30	28
0905	5.0	15.4	6.50	1.30	24
0910	7.5	15.4	6.44	1.30	19
0915	10.0	15.5	6.44	1.29	22
0920	12.5	15.5	6.45	1.28	16
0925	15.0	15.6	6.44	1.28	15
0930	17.5	15.6	6.42	1.28	12
0940	22.5	15.7	6.43	1.29	9
0950	27.5	15.7	6.43	1.28	11
1000	32.5	15.8	6.43	1.27	10
1010	37.5	15.8	6.43	1.27	8
1020	42.5	15.8	6.44	1.26	8
1030	47.5	15.8	6.44	1.27	7
1040	52.5	15.8	6.44	1.28	6
1050	57.5	15.8	6.44	1.28	7

11/2/00 AMW-1 well development

Initial depth of well (TIC): 26.81
depth of ∇ (TIC): 16.66
feet of H_2O: 10.15
1 volume: 1.7 gallons

Procedure & Equipment: WATERRA pump, footvalve, 3/8" ODX1/2" ID HDPE TUBING, Robin 1200 WATT GENERATOR, KECK water level indicator, Horiba U-10 water quality meter.

- Surged Entire 5' of screen @ 1' intervals for Approx. 10 min Each using waterra, tubing, & footvalve w/ surge block.
- Removed surge block & purged w/ footvalve until water was free of sediment AND/OR & parameters stabilized.
- water discharged to ground.

Initial purge H_2O: dk. grey-brown, turbid, odor. w/ brown F-SAND.
Final purge H_2O: Clear, colorless, odor.

Final well depth (TIC): 25.32 (FORMIVE: SURGE BLOCK)
vol. H_2O Surged: 25 gallons
Ave. Flow rate Surging: 0.5 gpm
vol. H_2O Purged: 60 Gal
Ave. Flow rate purging: 0.5 gpm
Total vol. Surged/purged: 85 Gal

11/2/00 AMW-1 Well Development

*PARAMETERS

Time	vol purged (gal)	TEMP °C	pH	mS/cm Conduct	(NTU) Turbid
0800	Initial Surge	15.0	6.60	1.13	>999
0915	Initial Purge	15.2	6.63	1.05	895
0920	2.5	15.3	6.69	1.05	750
0925	5.0	15.4	6.68	1.07	131
0930	7.5	15.6	6.66	1.08	102
0935	10.0	15.6	6.67	1.08	61
0940	12.5	15.6	6.65	1.08	65
0945	15.0	15.5	6.66	1.08	45
0955	20.0	15.6	6.66	1.08	38
1005	25.0	15.6	6.66	1.09	35
1015	30.0	15.6	6.66	1.09	33
1025	35.0	15.6	6.66	1.09	31
1035	40.0	15.6	6.66	1.09	28
1045	45.0	15.6	6.66	1.09	24
1055	50.0	15.6	6.66	1.09	26
1105	55.0	15.6	6.66	1.09	24
1115	60.0	15.6	6.66	1.09	26

* Footvalve w/ surge block came off during surging; ~~Removed~~ Continued surging remaining screen. (pushed footvalve to bottom of well)

11/2/00 WMW-1 WELL DEVELOPMENT NZ

Initial depth of well (TIC): 14.43
depth of ∇ (TIC): 5.49
feet of H_2O: 8.94
1 volume: 1.5 gallons

Procedure & Equipment

WATERRA pump, footvalve, 3/8" OD x 1/2" ID HDPE TUBING, Robin 1200 watt Generator, Keck water level Indicator, Horiba U-10 water quality meter.

- Surged Entire 5' of Screen @ 1' intervals for approx. 10 min. Each using WATERRA pump, tubing, & footvalve w/ surgeblock.
- Removed surge block & purged w/ footvalve until parameters stabilized AND/OR water was free of sediment.
- Water discharged to ground.

Initial Purge H_2O: dk grey, turbid, slight odor.
Final Purge H_2O: v. lt. brown, slightly turbid, slight odor.

Final well depth (TIC): 14.42 (solid)
Vol H_2O surged: 1.25 gallons
Ave Flow rate surging: ~~0.125~~ 0.25 gpm
Vol. H_2O purged: 1.5 gallons
Ave ~~H_2O p~~ flow rate purging: 0.125 gpm
Total vol. surged/purged: ~3 gallons

11/2/00 WMW-1 WELL DEVELOPMENT NZ

* PARAMETERS

TIME	vol. purged (gal)	TEMP °C	pH	Conduct	(NTU) Turbid
1300	Initial surge	15.7	9.38	.650	>999
1408	Initial purge	15.7	7.37	1.12	>999
1411	0.375	15.5	7.42	1.12	>999
1414	0.75	15.6	7.45	1.12	>999
1417	1.125	15.6	7.38	1.12	>999
1420	1.5	15.7	7.41	1.12	>999
11/3/00					
0645	II (PZ) 7.92				
0655	Initial purge	10.4	7.18	1.19	422
0700		13.2	7.06	1.21	119

NOTES: WELL WENT DRY @ ~1305. Well was ALLOWED TO RECOVER & Then surged again using a footvalve w/out the ~~check valve~~ BALL.

WELL DRY AGAIN @ 1420.

11/3/00 Purged well dry again.

11/2/00 WMW-1A WELL DEVELOPMENT NLE

Initial depth of well (TIC): 10.22
depth of ∇ (TIC): 6.70
feet of H_2O: 3.52
1 volume: 0.6 gallons

Procedure & Equipment

WATERRA PUMP, footvalve, 3/8" OD x 1/2" ID HDPE TUBING, Robin 1200 WATT GENERATOR, KECK water level Indicator, Horiba U-10 water quality meter.

- Surged 4' of screen (∇ only @ 3.5') @ 1' intervals for Approx. 10 min each using waterra pump, tubing, & footvalve w/ surgeblock.
- Removed surge block & purged until water was free of sediment & parameters stabilized
- water discharged to ground.

Initial Purge H_2O: brown, med. turbid, slight odor.
Final Purge H_2O: Clear, colorless, slight odor.

Final well depth (TIC): 10.23 (solid)
Vol. H_2O surged: 25 gallons
Ave. Flow surging: 0.5 gpm
vol. H_2O Purged: 25 gallons
Ave Flow rate purging: 0.5 gpm
Total Vol. purged / surged: 50 gallons

11/2/00 NLE WMW-1A WELL DEVELOPMENT

* PARAMETERS

TIME	vol. purged (gal)	TEMP °C	pH	Conduct	(NTU) Turbidity
1305	Initial Surge	15.6	6.89	1.31	301
1405	Initial purge	15.3	6.85	1.15	>999
1410	2.5	15.0	6.87	1.16	30
1415	5.0	15.0	6.85	1.16	9
1420	7.5	15.0	6.87	1.18	6
1425	10.0	15.0	6.88	1.19	4
1430	12.5	14.9	6.83	1.19	1
1435	15.0	14.9	6.84	1.19	1
1440	17.5	14.9	6.83	1.19	1
1445	20.0	14.8	6.81	1.20	1
1450	22.5	14.8	6.83	1.19	1
1455	25.0	14.8	6.81	1.19	1

11/3/00 WMW-4B WELL DEVELOPMENT NLE

Initial depth of well (TIC): 32.27
depth of ∇ (TIC): 18.60
feet of H_2O: 13.67
1 volume: 2.2 gallons

Procedure & Equipment

WATERRA PUMP, footvalve, 3/8" OD x 1/2" ID HDPE TUBING, Robin 1200 WATT ~~WATERRA~~ generator, KECK water level indicator, Horiba U-10 water quality meter.

- Surged Entire 5' of screen @ 1' intervals using (10 min each) WATERRA pump, tubing, & footvalve w/ surge block.
- Removed surge block & purged w/ footvalve until water was free of sediment & parameters stabilized.
- water discharged to ground.

Initial Purge H_2O: dk. grey, turbid, odor.
Final Purge H_2O: clear, colorless, odor

Final well depth (TIC): 31.70
vol. H_2O surged: 25 gallons
Ave. Flow rate surging: 0.5 gpm
Vol. H_2O purged: 60.0 gallons
Ave. Flow rate purging: 0.5 gpm
Total vol. surged / purged: 85 gallons

11/3/00 WMW-4B WELL DEVELOPMENT NLE

*PARAMETERS

TIME	vol. purged (gal)	TEMP °C	pH	mS/cm Conduct	(NTU) Turbid
0745	Initial surge	12.8	6.65	1.28	>999
0840	Initial purge	13.2	6.69	1.13	699
0845	2.5	13.6	6.69	1.14	175
0850	5.0	13.7	6.69	1.14	54
0855	7.5	13.8	6.69	1.14	33
0900	10.0	13.9	6.69	1.14	29
0905	12.5	13.9	6.70	1.14	21
0910	15.0	14.0	6.67	1.14	15
0915	17.5	14.0	6.66	1.14	14
0920	20.0	14.0	6.64	1.15	16
0925	22.5	14.0	6.63	1.15	15
0930	25.0	14.0	6.64	1.13	14
0935	27.5	14.1	6.68	1.14	13
0940	30.0	14.0	6.68	1.11	11
0950	35.0	14.0	6.67	1.12	11
1000	40.0	13.9	6.62	1.11	10
1010	45.0	13.9	6.63	1.12	12
1020	50.0	13.9	6.64	1.12	9
1030	55.0	13.9	6.65	1.12	6
1040	60.0	13.9	6.64	1.12	8

11/3/00 WMW-4A WELL DEVELOPMENT

Initial depth of well (TIC): 21.36
depth of ∇ (TIC): 18.37
feet of H_2O: 2.99
1 volume: 0.49 gallons

Procedure & Equipment

WATERRA pump, footvalve, 3/8" OD x 1/2" ID HDPE TUBING, Robin 1200 WATT Generator, Keck water level Indicator, Horiba U-10 water quality meter.

- Surged 3' of 7.5' screen (water ∇ @ 3') for ~10 min each using waterra pump, tubing, & footvalve w/ surgeblock ATTACHMENT.
- Removed surgeblock & purged w/ footvalve until water was free of sediment & parameters stabilized.
- water discharged to ground.

Initial Purge H_2O: dk. grey, turbid, odor.
Final Purge H_2O: clear, colorless, odor.

Final well depth (TIC): 21.36
vol. H_2O surged: 17.5
Ave Flow rate surging: 0.5 gpm
Vol. H_2O purging: ~~0.5 gpm~~ 25.0 gallons
Ave. Flow rate purging: 0.5 gpm
Total vol. purged/surged: 42.5 gallons

11/3/00 WMW-4A WELL Development

* PARAMETERS

TIME	vol. purged (gal)	TEMP °C	pH	mS/cm Conduct	(NTU) Turbid
0800	Initial surge	12.5	6.34	2.17	>999
0843	Initial purge	14.0	6.35	2.17	489
0848	2.5	14.5	6.26	2.15	19
0853	5.0	14.7	6.26	2.20	6
0858	7.5	14.7	6.27	2.15	5
0903	10.0	14.7	6.24	2.16	3
0908	12.5	14.7	6.26	2.15	2
0913	15.0	14.7	6.25	2.15	2
0918	17.5	14.8	6.26	2.15	2
0923	20.0	14.8	6.26	2.15	1
0928	22.5	14.7	6.27	2.15	1
0933	25.0	14.8	6.26	2.11	1

11/3/00 WMW-3 WELL DEVELOPMENT

Initial depth of well (TIC): 37.86
depth of II (TIC): 13.86
feet of H_2O: 24.0
1 volume: 3.9 gallons

Procedure & Equipment

WATERRA pump, footvalve, 3/8" OD x 1/2" ID HDPE TUBING, Robin 1200 WATT GENERATOR, KECK water level Indicator, Horiba U10 water quality meter.

- Surged Entire 5' of screen @ 1' intervals for Approx 10 min. Each, using waterra pump, tubing & footvalve w/ surge block.
- Purged w/ footvalve until water was free of sediment & parameters stabilized.
- water discharged to ground.

Initial purge H_2O: ~~dk. brown~~ cloudy white/v.lt. brown, slight odor
Final purge H_2O: Clear, Colorless, slight odor.

Final well depth (TIC): 37.95 (SWD)
vol. H_2O surged: 45 gallons
Ave. Flow rate surging: 0.75 gpm
vol. H_2O purged: ~~1 gpm~~ 60 gallons
Ave. Flow rate purging: 1 gpm
Total vol. purged/surged: 105 gallons

11/3/00 WMW-3 WELL DEVELOPMENT WLE

*PARAMETERS

TIME	vol. purged (gal)	TEMP °C	pH	MS/CM Conduct	(NTU) Turbid
1100	Initial surge	13.9	6.55	1.29	466
1205	Initial purge	14.2	6.85	1.45	4
1210	5	14.0	6.74	1.46	1
1215	10	13.9	6.82	1.45	1
1220	15	13.9	6.81	1.44	1
1225	20	13.9	6.78	1.45	2
1230	25	13.9	6.77	1.45	1
1235	30	13.9	6.77	1.44	1
1245	40	14.0	6.78	1.44	1
1255	50	13.9	6.80	1.45	2
1305	60	13.9	6.80	1.43	2

11/3/00 WMW-3AR WELL DEVELOPMENT

Initial depth of well (TC): 25.17
depth of II (TC): 14.88
feet of H_2O: 10.29
1 volume: 1.7 gallons

Procedure & Equipment

WATERRA PUMP, footvalve, 3/8" OD x 1/2" ID HOPE TUBING, Robin 1200 WATT GENERATOR, KECK water level Indicator, Horiba U-10 water quality meter.

- Surged Entire 5' of Screen @ 1' intervals for Approx. 10 min. Each using waterra pump, tubing, & footvalve w/ surge block.
- Removed surge block & purged w/ foot-valve until water was free of sediment & Parameters stabilized.
- water discharged to ground.

Initial purge H_2O: dk. brown, turbid, slight odor.
Final purge H_2O: Clear, colorless, slight odor.

Final well depth (TC): 25.16 (50.10)
Vol. H_2O surged: 45 gallons
Ave. Flow rate surging: 0.75 gpm
Vol. H_2O purged: ~~1 gpm~~ 120 GAL
Ave. Flow purging: 1 gpm
Total vol. purged / surged: 165 GAL

11/3/00 WMW-3AR WELL DEVELOPMENT NCZ

* PARAMETERS

TIME	vol purged (gal)	TEMP °C	pH	µS/cm Conduct	(NTU) Turbid
1050	Initial surge	14.5	6.63	1.74	300
1205	Initial purge	15.0	6.75	1.45	202
1210	5	14.5	6.62	1.48	68
1215	10	14.5	6.62	1.47	62
1220	15	14.5	6.63	1.47	44
1225	20	14.4	6.63	1.47	27
1230	25	14.5	6.62	1.47	26
1235	30	14.5	6.62	1.47	20
1245	40	14.4	6.62	1.47	16
1255	50	14.5	6.68	1.45	13
1305	60	14.5	6.67	1.44	11
1315	70	14.5	6.63	1.44	8
1325	80	14.4	6.65	1.44	9
1335	90	14.4	6.63	1.44	7
1345	100	14.6	6.64	1.43	8
1355	110	14.6	6.66	1.42	7
1405	120	14.6	6.64	1.42	3

11/6/00 WMW-2 WELL DEVELOPMENT

Initial depth of well (TIC): 18.72
depth of ~~I~~ (TIC): 10.03
feet of H_2O: 8.69
1 volume: 1.4 gallons

Procedures & Equipment:
WATERRA Pump, footvalve, 3/8" OD x 1/2" ID HDPE TUBING, Robin 1200 WATT GENERATOR, KECK WATER LEVEL INDICATOR, HORIBA U-10 WATER QUALITY METER.

- Surged entire 5' of screen using footvalve w/ surge block @ 1' intervals for approx. 10 min each (using waterra pump & tubing)
- Removed surge block & purged using footvalve until water was free of sediment & parameters stabilized.
- water discharged to ground.

Initial Purge H_2O: dk. brown, v. turbid, slight odor.
Final Purge H_2O: clear, colorless, slight odor.

Final well depth (TIC): 18.80 (sounded)
vol. H_2O surged: 25 gallons
Ave Flow rate Surging: 0.5 gpm
Vol. H_2O purged: ~~35~~ ~~25~~ 40 gallons
Ave Flow rate purging: 0.5 gpm
total vol. surged/purged: 65 gallons

11/6/00 WMW-2 WELL DEVELOPMENT

*PARAMETERS

TIME	vol. purged (gal)	TEMP °C	pH	uS/cm conduct	(NTU) Turbid
1048	Initial Surge	13.5	7.13	1.11	>999
1045	Initial Purge	13.8	6.87	1.09	750
1150	2.5	13.7	6.86	0.99	6
1155	5.0	13.8	6.83	1.10	2
1200	7.5	13.7	6.85	1.10	2
1205	10.0	13.7	6.86	1.09	2
1210	12.5	13.8	6.85	1.10	2
1215	15.0	14.0	6.85	1.09	2
1225	20.0	13.9	6.86	1.09	1
1235	25.0	14.0	6.86	1.09	1
1245	30.0	13.9	6.87	1.09	1
1255	35.0	13.8	6.85	1.10	1
1305	40.0	13.9	6.86	1.10	1

11/6/00 AMW-2 WELL DEVELOPMENT

Initial depth of well (TIC): 26.60
depth of I (TIC): 16.47
feet of H_2O: 10.13
1 volume: 1.7 gallons

Procedure & Equipment

WATERRA PUMP, footvalve, 3/8" OD x 1/2" ID HDPE TUBING, Robin 1200 WATT GENERATOR, KECK WATER LEVEL INDICATOR, HORIBA U-10 WATER QUALITY METER.

- Surged Entire 5' of screen @ 1' intervals for Approx. 10' min Each using WATERRA Pump, tubing & footvalve w/ surge block.
- Removed surge block & purged w/ footvalve until water was free of sediment and parameters stabilized.
- water discharged to ground.

Initial Purge H_2O: Med. brown, turbid w/ F. SAND, slight odor.
Final Purge H_2O: SAA

Final well depth (TIC): 28.57
vol H_2O surged: 25 gallons
Ave Flow rate surging: 0.5 gpm
Vol. H_2O purged: 60 gallons
Ave. Flow rate purging: 0.5 gpm
Total Vol. Surged / purged: ~~60~~ 85 gallons

11/6/00 AMW-2 WELL DEVELOPMENT

*PARAMETERS

TIME	vol. purged (gal)	TEMP °C	pH	µS/cm conduct	(NTU) Turbid
1333	Initial Surge	13.8	6.42	1.91	>999
1430	Initial Purge	13.1	6.52	.699	300
1435	2.5	13.2	6.68	1.65	>999
1440	5.0	13.3	6.44	1.80	>999
1445	7.5	13.3	6.44	1.82	>999
1450	10.0	13.3	6.45	1.83	>999
1455	12.5	13.4	6.41	1.83	>999
1500	15.0	13.5	6.39	1.84	>999
1510	20.0	13.6	6.39	1.79	>999
1520	25.0	13.6	6.38	1.81	>999
1530	30.0	13.5	6.36	1.79	>999
1540	35.0	13.5	6.37	1.79	>999
1550	40.0	13.5	6.38	1.78	>999
1600	45.0	13.5	6.37	1.78	>999
1610	50.0	13.4	6.38	1.78	>999
1620	55.0	13.5	6.38	1.78	>999
1630	60.0	13.3	6.38	1.77	>999

11/7/00 AMW-3 WELL DEVELOPMENT

Initial depth of well (TIC): 20.25
depth of ▽ (TIC): 9.29
feet of H_2O: 10.96
1 volume: 1.8 gal

Procedure & Equipment

WATERRA pump, footvalve, 3/8" OD x 1/2" ID HDPE TUBING, Robin 1200 watt generator, K&K water level indicator, Horiba U10 water quality meter.

- Surged Entire 5' of screen @ 1' intervals for Approx. 10 min. Each using waterra pump, tubing & footvalve w/ surgeblock.
- Removed surgeblock & purged w/ footvalve until water was free of sediment & parameters stabilized.
- water contained & discharged inside landfill.

Initial purge H_2O: dk. grey to black, turbid, slight odor
Final purge H_2O clear, colorless, slight odor.

Final well depth (TIC): 20.34 (Solid)
Vol. H_2O surged: 25 gal
Ave. Flow rate surging: 0.5 gpm
Vol. H_2O purged: 35 gal
Ave Flow rate purging: 0.5 gpm
Total vol. surged/purged: 60 gal

11/7/00 AMW-3 WELL DEVELOPMENT

* PARAMETERS

TIME	vol. purged (gal)	TEMP °C	pH	conduct mS/cm	Turbid (NTU)
0731	Initial surge	14.6	7.55	0.704	>999
~~0830~~ 0830	Initial purge	15.1	7.09	0.774	53
~~0840~~ 0835	2.5	15.3	7.11	0.780	3
0840	5.0	15.3	7.12	0.782	1
0845	7.5	15.3	7.11	0.783	1
0850	10.0	15.2	7.11	0.784	1
0855	12.5	15.3	7.11	0.781	1
0900	15.0	15.3	7.11	0.783	1
0905	17.5	15.3	7.11	0.783	1
0910	20.0	15.3	7.12	0.784	1
0920	25.0	15.3	7.12	0.785	1
0930	30.0	15.3	7.12	0.785	1
0940	35.0	15.3	7.12	0.786	1

11/7/00 AMW-3A WELL DEVELOPMENT

Initial depth of well (TIC): 9.30 (solid)
depth of ▽ (TIC): 5.52
feet of H_2O: 3.78
1 volume: 0.6 gal

Procedure & Equipment

WATERRA Pump, footvalve, 3/8" OD x 1/2" ID HDPE TUBING, Robin 1200 WATT GENERATOR, KELK water level indicator, Horiba U-10 water quality meter.

- Surged 0-4' of screen (of 5', water ▽ @ ~4') @ 1' intervals for Approx. 10 Min. each using waterra pump, tubing, & footvalve w/ surge block.
- Removed surge block & purged w/ footvalve until water free of sediment & parameters stabilized.
- water contained & discharged inside landfill.

Initial purge H_2O: red brown, turbid, slight odor.
Final purge H_2O: clear, colorless, slight odor.

Final well depth (TIC): 9.30 (solid)
Vol H_2O surged: 10 gal.
Ave Flow rate surging: 0.25 gpm
Vol. H_2O purged: 22.5 gal
Ave Flow rate purging: 0.25 gpm
Total vol. purged/surged: 32.5 gal

11/7/00 AMW-3A WELL DEVELOPMENT (Flush Mt)

* PARAMETERS

TIME	vol. purged (gal)	TEMP °C	pH	mS/cm conduct	(NTU) Turbid
0727	Initial surge	14.5	6.86	1.25	>999
0810	Initial purge	14.8	7.19	0.821	476
0815	1.25	15.1	7.05	0.826	110
0820	2.50	15.3	7.07	0.826	26
0825	3.75	15.3	7.05	0.827	22
0830	5.0	15.3	7.04	0.828	15
0835	6.25	15.3	7.08	0.827	11
0840	7.50	15.3	7.08	0.828	8
0850	10.0	15.2	7.05	0.831	5
0900	12.5	15.3	7.05	0.830	4
0910	15.0	15.4	7.05	0.832	2
0920	17.5	15.3	7.05	0.833	3
0930	20.0	15.3	7.05	0.833	2
0940	22.5	15.3	7.05	0.832	2

11/7/00 AMW-5 WELL DEVELOPMENT

Initial well depth (TIC): 28.55
depth of ∇ (TIC): 18.24
feet of H_2O: 10.31
1 volume: 1.7 gal

Procedure & Equipment

WATERRA PUMP, footvalve, 3/8" OD x 1/2" ID HDPE TUBING, Robin 1200 watt generator, KECK water level indicator, Horiba U-10 water quality meter.

- Surged Entire 5' of screen @ 1' intervals for Approx. 10 min each using waterra pump, tubing, & footvalve w/ surgeblock.
- Removed surgeblock & purged w/ footvalve until water free of sediment & parameters stabilized.
- water discharged to ground.

Initial purge H_2O: dk grey to black, slightly turbid, slight odor.
Final purge H_2O: Clear, colorless, slight odor.

Final well depth (TIC): 28.60 (Sand)
vol. H_2O Surged: 25 gal
Ave. Flow rate surging: 0.5 gpm
vol. H_2O purged: 50 gal
Ave. Flow rate purging: 0.5 gpm
Total vol. purged/surged: 75 gal

11/7/00 AMW-5 WELL DEVELOPMENT

* PARAMETERS

TIME	vol. purged (gal)	TEMP*	pH	mS/cm Conduct	NTU Turbid
1034	Initial Surge	16.0	6.25	1.51	672
1125	5.0	16.6	6.46	1.35	10
1135	10.0	16.8	6.45	1.35	10
1145	15.0	16.9	6.43	1.35	10
1155	20.0	16.8	6.43	1.33	7
1205	25.0	16.9	6.44	1.33	7
1215	30.0	16.9	6.43	1.32	8
1225	35.0	16.9	6.43	1.33	6
1235	40.0	16.9	6.43	1.33	7
1245	45.0	16.8	6.44	1.33	3
1255	50.0	16.9	6.44	1.32	4

405	430	460	488	532
~ 7.8'	~~9'~~ 8'	~11'	~10'	9.4'

1
6' 6"
2' 8"
9 4"

1
12
8
96

105
.9
.8 30/32

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10A
40 1.8
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SOKKIA™

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TRANSIT FIELD BOOK

No. 8152-00

10/17/00 WMW-4A

- OBSTRUCTION w/in WELL @ ~15' BLS
- RDK: DAN VERHOOFT (MATECO) USE 1" PVC PIPE (NEW) TO PUSH OBSTRUCTION TO BOTTOM of WELL (~22' TIC)

10/20/00 Depth of well (TIC) 21.62
Depth to II (TIC) 18.86

10/23/00 DAILY LOG

WEATHER: OVERCAST, MID 50'S, PERIODIC RAIN

0530 RDK @ SYRACUSE AIRPORT

0940 RDK @ KALAMAZOO AIRPORT

1000 RDK ON SITE @ ALLIED O.U. MATECO CURRENTLY ON SITE, TANKING UP W/ H2O IN PREP. FOR 4" FLUSH-JOINT DRILLING @ MW-204B MATECO ON SITE @ 0930. DAN VERHOOFT, JOE BUTLER.

0930-1200 MATECO HAULS H2O TO MW-204B LOCATION. (fill poly TANK w/ water from Rig)

1200-1300 LUNCH

1300-1330 MATECO fills SUPPORT VEHICLE w/ H2O.

1330-1350 MATECO HIGH PRESSURE STEAM CLEANS 4" FLUSH JOINT CASING AND NECESSARY ASSOCIATED TOOLING.

1350-1415 MOBE: SET UP @ MW-204B

1415-1440 MATECO TRIES 3¼" ID HSA FROM MW-204B LOCATION

1440-1742 MATECO SPINS & CLEANS 4" FLUSH JOINT CASING TO 86.25' BLS. HOLE HAS ~0.8' SEDIMENT INSIDE CASING. MATECO OUT of H2O.

1800 RDK: MATECO off SITE for THE DAY. WILL INSTALL MW-204B TOMORROW A.M.

12.5 HRS

10/30/00 Daily Log

WEATHER: 60's Sunny

0530 RDK @ SJR Airport

0930 RDK @ IC-200 Airport

0930-1200 RDK gets supplies for Willow Blvd/A-Site well rehab; staff gauge installations.

1230 RDK, NLZ: Justin Woods (Con) on site @ Willow Blvd/A Site.

1245 RDK installs SG-1(R) 10' of 1" Black pipe w/ cap. Drove ~5' into sediment ~3' H2O 2.12' from top to TOC. NE side of Davis Creek

1315 RDK installs SG-2(R) west of Willow Blvd O.D. 10' of 1" Black pipe w/ cap. Drove ~5' into sediment ~1.8' H2O 2.62' from top of pipe to H2O.

1330-1430 RDK purchases 2" pipe cutter to cut down wells

1430-1730 RDK: NLZ complete round of water levels @ Willow Blvd/A-Site; complete appropriate well rehabilitation activities.

1800 RDK: NLZ off site

12.5 HRS

10/30/00 Willow Blvd/A-Site Sediment water levels

Willow Blvd

Well	TOC (ft)	Comments
WMW-1	5.55	
WMW-2	9.73	- needs new J-Plug.
WMW-3	13.80	
WMW-1A	6.57	
WMW-3A	14.92	
WMW-4A	18.22	- cut off 0.21', needs J-plug.
WMW-4B	18.50	
WMW-3 CASED	14.75	

A-Site

Well	TOC (ft)	Comments
AMW-1	18.06	need down ~~torch to cut~~ processing off/ needs J-Plug
AMW-2	16.31	needs J-PLUG
AMW-3	9.44	
AMW-4	15.57	needs J-Plug
AMW-5 well off-gassing	can't	Access ~~screw~~ can't ~~gas~~ ~~screw~~ ~~prepared~~ ~~cap on 1st.~~
AMW-6A	16.95	~~Removed.~~ Pro-casing
AMW-6B New J-Plug	17.80	needs J-plug ~~Removed Pro~~ ~~Cover (sitting on well)~~
AMW-7A	21.21	~~Pro-cover off~~ ~~cut down 1.09'~~
AMW-7B needs J-plug (lock)	~~21.51~~ 20.52	~~Pro-cover off~~ ~~cut down 1.03'~~
AMW-8A needs lock.	25.86	~~Pro-cover off~~ ~~cut off 2.15~~
AMW-8B	25.45	J-plug ~~Procover off~~ ~~cut down 2.34~~
AMW-9B	25.53	" 2.10 ~~new J-plug~~
AMW-9A	25.22	" 2.07 ~~J-plug~~
AMW-10A	~27.85	~~off-gassing~~ Hard to read acc. level.

Well	TOC (ft)	Comments
AMW-10B	~~7.48~~ 29.40	~~new processing off~~
AMW-3A	~~Cut off 1.28~~	
AMW-6P	7.64	
AMW-7P	10.44	
AMW-9P	8.87	new J-plug (L) processing off. cut off 1.28
AMW-10P	7.48	
P-1D	- DAMAGED	
P-1RS	11.50	DRY
P-2B	14.97 -	well depth 15.28. *
P-2RS	13.47	well depth 13.50 *
P-3D	11.64	total depth 11.92 *
P-3RS	11.49	needs J-plug. * total depth 11.55
P-4WT	4.40	
P-5WT	- CANNOT FIND	

* Prob just water in swamp.

10/31/00 Daily Log (RDK)

WEATHER: Sunny, 65°F

0645 RDK Arrives NLZ yd @ Hotel.

0710 RDK & NLZ on Site @ Willow Blvd/A-Site for Well Re-Development Activities.

0815-0900 RDK gets ▽ @ SG-1(R) & SG-2(R) NLZ working on Development @ AMW-6A & AMW-6B

1130 Well Development Complete @ AMW-6A & AMW-6B. RDK speaks to DWL about consistent vol/f sand in AMW-6B. As per DWL, OK to discontinue pumping (Sediment) after 2 hrs due to Assumed Stabilization.

1510 Development Complete @ AMW-7A & AMW-7B

1535-1715 RDK collects Site-wide water levels @ Allison Dr.

1800 Well Development Complete @ AMW-10A & AMW-10B

1815 RDK & NLZ off Site

(RDK)

10/11 2000 Staff Gauge SG-1(R) & SG-2(R) (RDK)

DATE	TIME	SG-1(R) ▽	SG-2(R) ▽
10/30/00	1245/1315	2.12	2.62
10/31/00	0832/0848 ~~1315~~	2.12	2.61
10/31/00	1722/1727	2.11	2.61
11/1/00	0815/0808	2.13	2.63
11/1/00	1635/1640	2.31	2.81
11/2/00	0820/0835	2.46	3.21
11/2/00	1534/1529	2.09	2.60
11/3/00	0802/0805	2.11	2.62
11/3/00	1550/1540	2.12	2.64
11/6/00	1105/1055	2.12	2.87
11/6/00	1643/1638	2.29	2.74
11/7/00	0802/0757	2.40	3.14
11/7/00	1405/1414	2.04	2.55
11/8/00	0750/0754	2.10	2.59
11/8/00	1600/1621	2.21	2.69
11/10/00	0733/0739	1.96	2.34

11/1/00 DAILY LOG (RK)

WEATHER: Sunny, 20°F

0615 RK; NLZ @ K-200 office - FAX NOTES TO DUL.

0710 RK; NLZ ON SITE @ WILLOW AMW/A-SITE FOR CONTINUATION of well Development.

0710-0800 RK; NLZ Set up; ~~Begin~~ Development @ AMW-9A; AMW-9B.

0910 Gary Swift (WESCO) on site for monitoring well repairs.

0920 CUT CAP off @ AMW-5, installed lockable J-plug.

0930 Dig 2'x2'x2' around AMW-7A, AMW-7B installed Bentonite seal. Installed lockable J-plugs @ AMW-7A; AMW-7B; AMW-7D 3 bags chips @ AMW-7B; 2 bags sand. 2 bags chips; 2 bags sand @ AMW-7A

1010 Dug down @ P-2D. Concrete pad ~6" under surface. No need for new seal.

1025 New surface seal @ P-2RS 2 bags Bentonite, 2 bags sand.

1100 Development complete @ AMW-9A; AMW-9B

1200 CUT DOWN AMW-1 1.40'

1220 Mateco finishes cutting off pro-casing @ AMW-1, New surface seal, new lockable J-plug 2 bags Bentonite 2 bags sand.

1305 New surface seal @ AMW-10A. 2 bags Bentonite, 1 bags sand. New J-plug

WILLOW BMP/A-SITE SITEWIDE WATER LEVELS

11/1/00 ~~DAILY LOG~~ (RK)

WELL	V	COMMENTS
WMW-1	5.48	
WMW-2	9.25	
WMW-3	13.83	
WMW-1A	6.63	
WMW-3A	14.97	
WMW-4A	18.26	*
WMW-4B	18.56	
WMW-CASED	14.79	
AMW-1	16.42	CUT 1.40' off RISER TODAY **
AMW-2	16.32	
AMW-3	9.47	
AMW-4	15.60	
AMW-5	18.04	DEPTH 28.49 CUT RISER TODAY **
AMW-6A	~17.20	(well off casing)
AMW-6B	17.79	
AMW-7A	21.27	*
AMW-7B	20.58	*
AMW-8A	25.88	*
AMW-8B	25.48	*
AMW-9A	25.30	*
AMW-9B	25.62	*
AMW-10A	~28.50	well off-casing
AMW-10B	29.43	
AMW-3A	5.68	
AMW-6D	7.49	

WELL	V	COMMENTS
AMW-7D	10.27	
AMW-9D	9.20	off casing *
AMW-10D	7.61	
P-1D	11.04	8AM CUT RISER 11.36 TODAY **
P-1RS	DRY @ 11.47	
P-2D	14.96	
P-2RS	13.47	
P-3D	11.65	
P-3RS	11.47	
P-4WT	4.44	
P-5WT	CANNOT FIND	

WATER LEVELS COLLECTED THROUGHOUT DAY

* CUT DOWN RISERS ON 10/30/00

** CUT DOWN RISERS ON 11/1/00

11/1/00 — Daily Log — RDK

1320 New Surface Seal @ AMW-10B. 2 Bags Bentonite, 1 Bag Sand. New J-Plug

1400 New Surface Seals @ AMW-9A & AMW-9B. 2 Bags Bentonite EACH, 1 Bag Sand EACH. New J-Plugs @ AMW 9A, AMW-9B, AMW-9P

1445 New Surface Seals @ AMW-6A & AMW-6B 2 Bags Bentonite EACH, 1 Bag Sand EACH. New J-Plugs @ AMW 6A, AMW-6B, AMW-6P

1500 Cut Down P-1D (Previously Bentonite) 2" coupler w/ additional 2" Sch. 40 AC Riser. New J-Plug. No need for New Surface Seal.

1600 New Surface Seals @ AMW-8A & AMW-8B 3 Bags Bentonite, 1 Bag Sand @ AMW-8A. 4 Bags Bentonite, 1 Bag Sand @ AMW-8B New J-Plugs @ Both Wells

1630 Mateco off Site

1700 RDK off Site

10.5 HRS

11/2/00 — Daily Log — RDK

Weather: Overcast, Mid 60's

0645 RDK; NLZ @ K-200 Office. Fax Notes to SWL.

0710 RDK; NLZ on Site @ Wisconsin Blvd/A-Site. Set up on AMW-1 & AMW-4 for Development.

1100 Development Complete @ AMW-1 & AMW-4

1430 RDK completes Removal of Silt/Clay/F Sands from Wells AMW-7A, 7B AMW-10A, 10B AMW-9A, 9B AMW-8A, 8B. Removed Silts/F Sands Down in During Development using 3' Stainless Steel Bailer. (See Development Notes for Details)

1600 Well Development Complete @ AMW-1 & AMW-4A. Have to come back to AMW-1 tomorrow for Final Pulling (well wet day)

RDK; NLZ off Site.

1600-1700 RDK; NLZ Get more Supplies for well Development.

10 HRS

11/3/00 DAILY LOG (RDK)

WEATHER: Sunny, Low 60's

0630 RDK on site @ Willow Blvd/A-Site for continuation of well development. Set up @ WMW-1 for final pumping.

0715 Development complete @ WMW-1. Mobilize & set up @ WMW-4A, 4B

1045 Development complete @ WMW-4A, 4B. Mobilize & set up @ WMW-3AR & WMW-3.

1200-1330 RDK gets Willow Blvd/A-Site sitewide water levels.

1400 NLZ to allow O-V for sitewide water levels. RDK continues w/ development Willow/A-Site.

1415 Development complete @ AMW-3AR & AMW-3. Justin (COM) off site. RDK to work on removing silt/f sand from various wells already developed. (ie silt/f sand broke into screened interval during development but not removed)

1430-1530 RDK removes gray/very f sand from bottom of AMW-6B using SS bailer.

1900 RDK departs K-200

2230 RDK @ Syr.

16 hrs

11/3/00 Willow Blvd/A-Site Sitewide Water Levels (RDK)

Willow Blvd

Well	∇ (ftc)	Comments
WMW-1	NA	not fully developed from development
WMW-2	9.85	
WMW-3	13.86	
WMW-4A	6.60	
WMW-3A	15.06	
WMW-4A	18.37	
WMW-4B	18.60	
WMW-CASED	14.88	

A-Site

Well	∇ (ftc)	Comments
AMW-1	16.48	
AMW-2	16.34	
AMW-3	9.50	
AMW-4	15.65	
AMW-5	18.09	
AMW-6A	~16.90	well offscale ∇ difficult
AMW-6B	17.82	
AMW-7A	21.33	
AMW-7B	20.59	
AMW-8A	25.95	
AMW-8B	25.57	
AMW-9A	25.36	
AMW-9B	25.67	
AMW-10A	~28.60	well offscale ∇ difficult
AMW-10B	29.51	

Well	∇ (ftc)	Comments
AMW-3A	5.71	
AMW-6P	7.60	
AMW-7P	10.31	
AMW-9P	9.59	
AMW-10P	7.74	
P-1D	11.06	DEPTH = 11.36
P-1RS	DRY @ 11.48'	
P-2D	14.96	DEPTH = 15.32
P-2RS	13.48	DEPTH = 13.90
P-3D	11.65	DEPTH = 11.82
P-3RS	11.50	DEPTH = 11.62
P-4WT	4.51	
P-5WT	CAN NOT FIND	

11/6/00 — Daily Log

WEATHER: overcast, mid 50's, windy

0530	RDK @ Syr Airport
0945	RDK @ K-200 Airport
1015	RDK: NLZ @ Willow Blvd / A-Site for continuation of well development. Set up on WMW-2A
1300	Development complete @ WMW-2. Mobilize & set up @ AMW-2.
1330 - 1500	RDK collects sitewide water levels Willow Blvd / A-Site
1630	Development complete @ AMW-2 RDK collects staff gage readings.
1715	RDK takes water levels to dual.
1730	RDK off site

12 hrs

11/6/00 — Willow Blvd / A-Site Sitewide Water Levels

Willow Blvd

Well	TOC (ft)	Comments
WMW-1	8.54	Not fully recovered ???
WMW-2	10.03	
WMW-3	~~11.96~~ 13.96	
WMW-1A	6.82	
WMW-3A	15.22	
WMW-4A	18.58	
WMW-4B	18.74	
WMW-CASD	15.03	

A-Site

Well	TOC (ft)	Comments
AMW-1	16.44	
AMW-2	16.47	
AMW-3	9.52	
AMW-4	15.72	
AMW-5	18.17	
AMW-6A	~17.25	off basin
AMW-6B	17.93	
AMW-7A	21.40	
AMW-7B	20.65	
AMW-8A	25.99	
AMW-8B	25.59	
AMW-9A	25.38	
AMW-9B	25.70	
AMW-10A	~28.30	off basin
AMW-10B	29.56	

Well	TOC (ft)	Comments
AMW-3A	5.75	
AMW-6P	7.73	
AMW-7P	10.41	
AMW-9P	~~8.25~~	off basin
AMW-10P	7.79	
P-1D	11.06	Depth 11.36
P-1RS	Dry @ 11.48	
P-2D	14.97	Depth 15.32
P-2RS	13.48	Depth 13.90
P-3P	11.62	Depth 11.92
P-3RS	11.44	Depth 11.62
P-4WT	4.58	
P-5WT	Can't find	

11/7/00 Daily Log RDK

WEATHER: overcast, mid 50's (rain last night)

0630 RDK gets up & loads supplies

0645 Setting up @ MW-3; MW-3A for development.

0915 Atwell Hicks on site for surveying of wells which have changed in elevation. Also surveying SG-1(R) & SG-2(R)

1015 Development complete @ MW-3; MW-3A mobilize to MW-5.

1330 Development complete @ MW-5.

1400 NL2 off site for Allied O.J. site-wide water levels.

1445 Atwell Hicks & RDK off site for the day.

1500-1700 RDK reviews sampling possibilities for wells w/ 25'+ @ A-Site. RDK orders solinst pump & 1/4" tubing to be by tomorrow.

1700 RDK done for day.

10.5 hrs

11/8/00 Daily Log RDK

WEATHER: Sunny, 60's

0700 RDK @ K-200 office. Preparing for today's activities i.e. (MW-2R development @ King Highway, steam water wells @ Willow Blvd/A-Site, trial of peristaltic pump @ wells where 25'+.)

0730 RDK on site @ Willow Blvd/A-Site. Staff gauge readings & steam water wells.

0930 Water wells complete @ Willow Blvd/A-Site. Mobilize to King Highway for MW-2R) development.

1330 Development complete @ King Highway

1345 RDK returns to K-200 west generator

1400 RDK @ K-200 office. Peristaltic pump; trying to decide what was supposed to happen w/ this job by Ken. RDK calls Pine Environmental, new pump & tubing to arrive tomorrow a.m. RDK working on ordering supplies for groundwater sampling next week.

1600 RDK & NL2 get staff gauge readings @ Willow Blvd/A-Site

1730 RDK drives home to Lebanon for shipment to road Newell.

1800 RDK done for the day.

11 hrs

11/8/00 Willow Blvd/A-Site Sitewide Water Levels

(Willow Blvd)

WELL	▽ (TIC)	COMMENTS
WMW-1	8.17	
WMW-2	9.86	
WMW-3	13.87	
WMW-1A	6.80	
WMW-3A	15.03	
WMW-4A	18.51	
WMW-4B	18.62	
WMW-3-CASED	14.84	

(A-Site)

WELL	▽ (TIC)	COMMENTS	WELL	▽ (TIC)	COMMENTS
AMW-1	16.47		AMW-10A	~28.65	off casing
AMW-2	16.41		AMW-10B	29.53	
AMW-3	9.47		AMW-3A	5.69	
AMW-4	15.65		AMW-6P	7.74	
AMW-5	18.10		AMW-7P	10.37	
AMW-6A	~17.35	off casing	AMW-9P	9.50	
AMW-6B	17.88		AMW-10P	7.86	
AMW-7A	21.27		P-1D	11.03	DEPTH 11.36
AMW-7B	20.53		P-1RS	DRY @ 11.48	
AMW-8A	25.96		P-2D	14.94	DEPTH 15.32
AMW-8B	25.48		P-2RS	13.38	DEPTH 13.90
AMW-9A	25.36		P-3D	11.62	DEPTH 11.92
AMW-9B	25.68		P-3RS	11.47	DEPTH 11.62
			P-4WT	4.54	
			P-5WT	NA	

Kirk Hibbard

11/9/00 MW-26D Development

Initial well depth (TIC): 36.05' (solid)
Depth of ▽ (TIC): 21.22
feet of H_2O: 14.83
1 volume: 2.4 gal

Procedure: Equipment:

- Waterra pump, footvalve, 3/8" ID x 1/2" OD HDPE tubing, Robin 1200 watt generator, Keck water level indicator, Hor. Ba V-10 water quality meter.
- Surged entire 5' of screen @ 1' intervals for approx 10 min each using Waterra pump, tubing, footvalve: surge block.
- Removed surge block & purged w/ footvalve until water was free of sediment and/or parameter stabilization was achieved.
- Water contained on site in DOT approved 55 gallon drum
- Initial purge H_2O dark gray/brown, vol/turbid, odors
- Final purge H_2O clear, colorless, odorless

Final well depth: 36.05' (solid)
Vol H_2O surged: 50 gal
Ave flow rate surging: 1.00 gpm
Vol H_2O purged: 56.70 gal
Ave flow rate purging: 0.63
Total volume purged/surged: 106.70 gal

11/8/00 King Highway MW-2R Development RDK

PARAMETERS

TIME	vol purged (gal)	TEMP (°C)	pH	mS/cm conductivity	(NTU) TURBIDITY
1008	INITIAL SURGE	13.4	7.31	1.25	>999
1105	3.15 GAL	14.2	6.98	1.28	>999
1110	6.30 GAL	14.2	6.96	1.30	773
1120	12.60 GAL	14.3	6.83	1.31	149
1130	18.90 GAL	14.4	6.77	1.31	87
1140	25.20 GAL	14.4	6.79	1.31	58
1150	31.50 GAL	14.3	6.79	1.31	41
1200	37.80 GAL	14.2	6.79	1.30	34
1210	44.10 GAL	14.2	6.79	1.31	28
1220	50.40 GAL	14.2	6.80	1.31	27
1230	56.70 GAL	14.3	6.80	1.32	27

11/9/00 DAILY LOG RDK

WEATHER: OVERCAST, OCCASIONAL RAIN, MID 50's. RAIN HEAVY @ 1500

0730 RDK @ KALAMAZOO OFFICE. SUPPLIES TO BE IN THIS AM. TO TEST PERSTALTIC PUMP @ WELLS w/ ∇ > 25' (TD).
RDK TO BRING U-HAUL TRAILER BACK THIS AM, ALSO SET TUBING IN WELLS @ WILLOW BLVD/A-SITE.

0730-1100 RDK WORKS ON GW SAMPLE LOG, CALIBRATING EQUIP - EQUIP CHECK

1100-1200 RDK PICKS UP ONE & DELIVERS TO RADISON FOR MARK BROWN

1500 INSTALL 1/4" ID x 3/8" OD TUBING @ 2.5' from BOTTOM of WELL @ MW-7A

1515 INSTALL 1/4" ID x 3/8" OD LDPE TUBING @ 2.5' from BOTTOM of WELL MW-7B.

1525 INSTALL 3/8" ID x 1/2" OD LDPE TUBING @ 2.5' from BOTTOM of WELL MW-3

1535 INSTALL 3/8" ID x 1/2" OD LDPE TUBING @ 2.5' from BOTTOM of WELL MW-3R

1545-1730 SEVERE WEATHER (RAIN, THUNDER, LIGHTNING) RDK TRIED TO WAIT IT OUT UNSUCCESSFULLY. COULD NOT GET STAFF GAGE READINGS OR COMPLETE MORE TUBING INSTALLATIONS. WILL PROCEED w/ TUBING INSTALLATIONS TOMORROW.

1730 RDK OFF SITE.

10 HRS

11/10/00 Daily Log (RD)

WEATHER: Overcast, Rain, High 40's, Windy

0700 RDK @ K-200 office. Set up for today's water levels @ Willow Blvd/A-Site! Tubing installations for Brand-Water Sampling.

0730 RDK on site @ Willow Blvd/A-Site

0745-0935 RDK collects Sitewide water levels @ Willow Blvd/A-Site

0945 Install 3/8" ID x 1/2" OD Lope tubing 1' from bottom of well @ WMW-4A

0950 Install 3/8" ID x 1/2" OD Lope tubing 2.5' from bottom of well @ WMW-4B

0955 Install 3/8" ID x 1/2" OD Lope tubing 1' from bottom of well @ WMW-1A

1000 Install 3/8" ID x 1/2" OD Lope tubing 2.5' from bottom of well @ WMW-1

1005 Install 3/8" ID x 1/2" OD Lope tubing 2.5' from bottom of well @ WMW-2

1010 Install 3/8" ID x 1/2" OD Lope tubing 2.5' from bottom of well @ AMW-2

1015 Install 3/8" ID x 1/2" OD Lope tubing 2.5' from bottom of well @ AMW-6B

1020 Install 3/8" ID x 1/2" OD Lope tubing 1.5' from bottom of well @ AMW-6A

1030 Install 3/8" ID x 1/2" OD Lope tubing 2.5' from bottom of well @ AMW-5

1100-1200 RDK: WLZ try to install Lope tubing @ MW-204B & MW-2-5B @ Allied. O.J. tubing too flexible.

11/10/00 Willow Blvd / A-Site Sitewide Water Levels (RD)

Willow Blvd

Well	▽ (TIC)	Comments
WMW-1	7.93	
WMW-2	9.60	
WMW-3	13.58	
WMW-1A	6.28	
WMW-3A	14.67	
WMW-4A	18.39	
WMW-4B	18.32	
WMW-3AR	14.49	

~1" Rain last night

A-Site

Well	▽ (TIC)	Comments
AMW-1	16.19	
AMW-2	16.12	
AMW-3	9.05	
AMW-4	15.35	
AMW-5	17.82	
AMW-6A	~16.80	off basis
AMW-6B	17.63	
AMW-7A	21.07	
AMW-7B	20.30	
AMW-8A	25.70	
AMW-8B	25.28	
AMW-9A	25.02	
AMW-9B	25.35	
AMW-10A	~20.70	off basis
AMW-10B	29.07	

Well	▽ (TIC)	Comments
AMW-3A	5.25	
AMW-6P	7.13	
AMW-7P	10.26	
AMW-9P	9.56	
AMW-10P	7.63	
P-1D	10.99	Depth 11.36
P-1RS	Dry @ 11.48'	
P-2D	14.87	Depth 15.32
P-2RS	13.39	Depth 13.90
P-3D	11.55	Depth 11.92
P-3RS	11.40	Depth 11.62
P-4WT	4.12	
P-5WT	Can not find	

11/10/00 Daily Log cont. (RJS)

1200-1500 RJC shops for hydraulic tubing for MW-205B & MW-205B. RJC gets JC & Temporary Supply for Utah & Allied O.U.

1520 RJC @ K-200 Airport

1930 RJC @ Site Airport

11/13/00 Daily Log (RJS)

Weather: 40°F, Rain, Overcast

0530 RJC @ Site Airport

1030 RJC @ K-200 Airport

1100-1215 RJC gets supplies together & loaded for Willow Bluff/A-Site G.W. Sampling Event.

1230 RJC & DEG install 3/8" ID x 1/2" OD Hope tubing 25' from bottom @ Allied O.U. well MW-205B

1250 RJC & DEG install 3/8" ID x 1/2" OD Hope tubing 25' from bottom @ Allied O.U. well MW-204B.

1515 RJC & DEG finish installing bladder pumps in wells MW-10A & MW-10B. Installed pump 25' from bottom of well MW-10B. Installed pump 1.5' from bottom of well @ MW-10A.

1530-1730 RJC shops for GW sampling supplies

12 hrs

11/14/00 Daily Log

WEATHER: OVERCAST / 30°F / SNOW / RAIN / SLEET / WIND

0630 RJK meets up, stop by K-200 office for GW sampling supplies for AMW GW sampling (MW-204B; MW-205B).

0730-0930 Problems calibrating YSI 6820 Sond for pH.

0930 Recieve Horiba U-22 water quality meter from Pace Environmental.

1200 Sample MW-204B A66222; A66222D for Total & Dissolved PCBs

1520 Sample MW-205B A66223; A66223D for Total & Dissolved PCBs

1630-1830 Pack samples for Fed-Ex shipment to STL, CLEAN; calibrate water quality meters, prepare DEL

1730 DEL Bruce samples to Fed-Ex

1740 RJK calibrates Horiba U-22 using Autocal solution
pH: 4.00/4.00 Cond: 4.54/4.49 ms/cm
Turb: 0.1/0.0 NTU @ 9.08°C

1810 ** STL not able to calibrate YSI 6820 Sond for pH. Will recover new unit tomorrow A.M.

1830 RJK; DEL off site.

12 HRS

11/15/00 Daily Log

WEATHER: OVERCAST, 30°F, WIND

0630 RJK @ K-200 office, load supplies for today's groundwater sampling @ Willow Bend/A-Site.

0910 Sampled AMW-2 (W74088) Total PCBs

1130 Sampled WMW-2 (W74089) Total PCBs

1215-1350 RJK receives new YSI, has to assemble. No flow through cell. Replace pH on 6820 from Air, still no success calibrating. Place to send flow through cell; new sonde tomorrow.

1600 Sampled AMW-10B (W74092) MS/MSD also collected here. Total PCBs

1610 Sampled AMW-10A (W74090) Total PCBs

1615 Sampled AMW-10A (W74091) Total PCBs
Duplicate of "W74090" Time is arbitrary.

1800 RJK; DEL leave Willow Bend/A-Site

1815-1900 RJK; DEL Package today's samples, calibrate water quality meters, General Cleanup; prep. for tomorrow.

Horiba U-22 calibration w/ Autocal Solution
pH: 3.99/4.00 Cond: 4.54/4.49 ms/cm
Turb: 0.0/0.0 NTU @ 9.47°C

YSI 6820 w/ 650 MDS
pH 6.99/7.00 10.01/10.00
Sp. Cond 1.413/1.413 ms/cm
Turb: 0.0/0.0 NTU
DO% w/ Sodium Sulfite Solution 0.0%

1900 RJK; DEL off site 12.5 HRS

11/16/00 Daily Log (RDK)

WEATHER: Overcast/Snow/Rain 43°F

0630 RDK on site @ K-200 office. Load supplies & prepare for todays GW sampling.

0700 RDK; DEG on site @ Willow Blvd/A-site. Install bladder pump in well AMW-9B 2.5' from bottom. Install bladder pump in well AMW-9A 2' from bottom.

1000 Sampled AMW-4A (W74093) total PCB

1000 Sampled AMW-4B (W74094) total PCB

1320 Sampled AMW-3 (W74095) total PCB

Sampled AMW-3 (W74097) total PCB

Duplicate of W74095

1320 Sampled AMW-3AR (W74096) total PCB - corrected MS/MSD @ this location.

1500 RDK; DEG off site

1500-1700 Pack samples for FedEx shipment to STL. Calibrate of YSI & HORIBA, General cleanup

HORIBA U-22 Calibration

pH = 4.00/4.00 Cond = 4.59/4.49 mS/cm

Turb = 0.2/0.0 NTU @ 9.46 °C

YSI 6820 Calibration

pH 7.01/7.00 pH 10.00/10.00

Cond = 1.418/1.413 mS/cm

DO% w/ Sodium Sulfite 50g/L = 0.5% / 0.8%

1700 RDK; DEG off site

10.5 hrs

11/17/00 Daily Log (RDK)

WEATHER: Overcast/Snow, 32°F

0630 RDK on site @ K-200 office. Prepare for todays GW sampling events.

0700 RDK; DEG on site @ Willow Blvd/A-site, set up @ AMW-9A & AMW-9B.

0920 Sampled AMW-9B (W74099) total PCB

0930 Sampled AMW-9A (W74098) total PCB

1045 RDK; DEG install 1/4" ID x 3/8" OD LDPE tubing 2.5' from the bottom of wells AMW-4 & AMW-1

1325 Sampled AMW-7A (W74100) total PCB

1330 Sampled AMW-7B (W74101) total PCB

1445 RDK; DEG install decomed bladder pumps 2.5' from ~~bottom~~ bottom of wells AMW-8A & AMW-8B

1515 RDK; DEG off site

1515-1700 RDK; DEG pack samples for FedEx shipment to STL, calibrate YSI & HORIBA, General cleanup & prep for tomorrow.

HORIBA U-22 Calibration

pH 3.97/4.00 Cond = 4.58/4.49 mS/cm Turb = -0.4/0.0 NTU @ 8.13 °C w/ autocal solution

YSI 6820 Calibration

pH 7.00/7.00 pH 10.00/10.00 Cond = 1.413/1.413

DO% w/ Sodium Sulfite 50g/L = 0.1% / 0.0%

1700 RDK; DEG off site

10.5 hrs

11/18/00 DAILY LOG (RJK)

WEATHER: OVERCAST, 28°F

0630 RJK ON SITE @ K-200 OFFICE. PREPARE FOR TODAYS GW SAMPLING ACTIVITIES.

0815-1000 PROBLEMS W/ COMPRESSORS W/ AIR DURING @ AMW-8A & AMW-8B. RJK RENTS GAS POWERED COMPRESSOR & RESUMES DURING.

1120 SAMPLED AMW-8B (WS4/103) TOTAL ABS

1132 SAMPLED AMW-8A (WS4/102) TOTAL ABS

1300 RJK; DEG DROP AIR COMPRESSOR OFF @ GOLDEN RENTALS

1330-1530 RJK; DEG COLLECT SITEWIDE WATER LEVEL

1530-1700 RJK; DEG PACK SAMPLES FOR FEDEX SHIPMENT TO STL. RJK CALIBRATES HORIBA U-22; YSI 6820. GENERAL CLEANUP.

HORIBA U-22 CALIBRATION

AUTOCAL. SOLUTION pH = 4.00/4.00 COND = 4.58/4.49 mS/cm

TURB = 0.2/0.0 NTU @ 11.06 °C

YSI 6820 CALIBRATION

pH = 7.00/7.00 pH = 10.00/10.00

TURB = 0.0/0.0 NTU

COND = 1.413/1.413 mS/cm

DO% w/ Sodium Sulfite SO_3/1L = 0.1%/0.0%

1700 RJK; DEG off SITE

10.5 HRS

11/18/00 WILLOW MUD/A-SITE WATER LEVELS (RJK)

WILLOW MUD

WELL	▽ (TOC)	COMMENTS
WMW-1	6.27	
WMW-2	8.93	
WMW-3	12.93	
WMW-1A	5.73	
WMW-3A	14.02	
WMW-4A	17.38	
WMW-4B	17.62	
WMW-3AR	13.85	

SG-1R - 1.50
SG-2R - 1.67

A-SITE

WELL	▽ (TOC)	COMMENTS
AMW-1	15.72	
AMW-2	15.66	
AMW-3	9.07	
AMW-4	14.92	
AMW-5	17.42	
AMW-6A	16.35	WELL IS OFF GASING
AMW-6B	17.06	
AMW-7A	20.60	
AMW-7B	19.87	
AMW-8A	25.25	
AMW-8B	24.85	
AMW-9A	24.53	WELL IS OFF GASING
AMW-9B	24.87	
AMW-10A	27.75	WELL IS OFF GASING
AMW-10B	28.76	

WELL	▽ (TOC)	COMMENTS
AMW-3A	5.27	
AMW-6P	6.70	
AMW-7P	8.95	
AMW-9P	9.36	
AMW-10P	7.86	
P-1D	11.00	
P-1RS	DRY	
P-2D	14.94	
P-2RS	13.40	
P-3D	11.61	
P-3RS	11.48	
P-4WT	3.84	
P-5WT	NOT FOUND	

11/19/00 Daily Log (RJK)

WEATHER: PARTLY CLOUDY 28°F

0630 RJK on site @ K-200 office, prepare for todays groundwater sampling activities.

0700 RJK: Deb on site @ Willow Blvd / A-Site

0915 Sample AMW-6B (W74105) Total PCBs

0925 Sample AMW-6A (W74104) Total PCBs

1230 Sample WMW-1A (W74110) Total PCBs

1510 Sample AMW-5 (W74108) Total PCBs

1600 RJK: Deb off site

1700 Sample Rinse Blank (W74111) Total PCBs. Pour distilled H2O through decon'd bailer pump into gas preserved container.

1615-1700 RJK: Deb pack samples, sample rinse blank, calibrate Horiba U-22, YSI, general cleanup.

Horiba U-22 calibration w/ auto cal solution

pH = 3.96/4.00 Cond = 4.63/4.49 ms/cm

Turb = -0.5/0.0 NTU @ 8.08°C

YSI 6920 calibration

pH = 7.00/7.00 pH = 10.00/10.00

Spec. Cond. = 1.413/1.413 ms/cm

Turbidity = 0.0/0.0 NTU

DO% w/ Sodium Sulfite 50g/1L -

0.0% / 0.0%

1700 RJK: Deb off site.

10.5 hrs

11/20/00 Daily Log (RJK)

WEATHER: 25°F, windy, partly cloudy, snow

0630 RJK: Deb on site @ K-200 field office, prepare for todays groundwater sampling events

0915 Sample AMW-1 (W74106) Total PCBs

0920 Sample AMW-4 (W74107) Total PCBs

1220 Sample AMW-3 (W74112) Total PCBs

1215 Sample AMW-3A (W74113) Total PCBs

1330 Sample WMW-1 (W74109) Total PCBs

1400 RJK: Deb off site.

1415-1830 RJK: Deb pack samples for Fed-x shipment to STL. RJK: Deb crew: pack all equipment for Fed-x shipment to Pine Environmental. RJK: Deb drop U-haul trailer off @ U-haul. RJK: Deb drop above items off @ Fed-x. RJK: Deb crew rental vehicle, work on timesheets etc.

1830 RJK: Deb off site.

12 hrs

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: overcast / 36°F / Wind

Well ID. AMW-10A
Date: 11/15/00
Time In: 1320 **Time Out:** 1800

WELL INFORMATION

		TIC	TOC	BGS
Depth to Water	(feet)	27.73	—	—
Total Depth	(feet)	35.26	—	—

check where appropriate

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	7.53
Volume of Water in Well:	(gal)	1.36 gal
Pumping Rate of Pump:	(mL/min)	~~100~~ 120
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	135
Total Volume Removed:	(gal)	4.3 gal

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer Peristaltic Grudfos (Other Pump) BLADDER
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer Peristaltic Grudfos (Other Pump) BLADDER

Did well go dry? Yes (No)
Water Quality Meter Type: ~~YSI 650 MDS w/~~ Horiba U-22 flow through cell

SAMPLING INFORMATION

Analyses:
(PCBs - Total)
PCBs - Dissolved

Sample ID: W74090
Sample Time: 1610 / 1645 (Arrival Time)
MS/MSD: Yes (No)
Duplicate: (Yes) No W74091
Duplicate ID: ____
Total Bottles: 4

Time / Parameter	1 Initial	2	3	4	5	6	7	8	9
	1345/1410	1420	1430	1440	1450	1500	1510	1520	1530
Volume Purged ~~(gal)~~ (ml)	Initial	1000(ml)	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	27.73	27.73	27.73	27.73	27.73	27.73	27.73	27.73	27.73
Temperature (°C)	13.63	13.29	13.45	~~14~~ 13.60	13.76	13.71	13.23	13.27	12.55
pH	7.71	7.65	7.64	7.62	7.66	7.60	7.57	7.56	7.67
Conductance (mS/cm)	0.682	0.714	0.714	0.713	0.727	0.736	0.736	0.741	0.755
Dissolved Oxygen mg/L)	8.39	1.93	NA	NA	NA	3.08	3.05	2.32	1.40
Turbidity (NTU)	14.6	1.9	1.1	0.0	0.0	1.5	1.3	1.0	0.8
ORP (mV)	59	-13	-20	-30	-37	-39	-41	-43	-45

Time / Parameter	10	11	12	13	14	15	16	17	18
	1540	1550	1600	1610					
Volume Purged (gal)	9000	10000	11000	12000					
Depth to Water (ft. TIC)	27.73	27.73	~~27.73~~ 27.73	27.73					
Temperature (°C)	12.88	12.79	13.21	13.21					
pH	7.66	7.65	7.65	7.65					
Conductance (mS/cm)	0.754	0.742	0.748	0.748					
Dissolved Oxygen mg/L)	0.93	0.68	0.49	0.40					
Turbidity (NTU)	0.5	0.5	0.1	0.1					
ORP (mV)	-46	-45	-44	-45					

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other: ____
Sample was shipped day of sampling sent on 11/16/00
Chain of Custody Signed By: [signature]

MISCELLANEOUS OBSERVATIONS/PROBLEMS

STARTED PURGING 1405
INITIAL PURGE H2O CLEAR, COLORLESS, SLIGHT ODOR
WELL OFF GAS IZ6
TUBING & BLADDER PUMP INSTALLED ON 11/13/00 1.5' FROM BOTTOM OF WELL
MDEQ SPLIT FOR TOTAL PCBS "AMW-10A"
MDEQ DUPLICATE FOR TOTAL PCBS "AMW-10A-D"
SAMPLED CLEAR, COLORLESS, SLIGHT ODOR

KRSG Willow Blvd / A-Site — **November 2000**

Site — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 / 645.82.207
Weather: OVERCAST / 36°F / WIND

Well ID. AMW-10B
Date: 11/15/00
Time In: 1320 **Time Out:** 1800

WELL INFORMATION — *check where appropriate*

		TIC	TOC	BGS
Depth to Water	(feet)	28.76	—	—
Total Depth	(feet)	45.12	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other:

WELL WATER INFORMATION

Length of Water Column:	(feet)	16.36
Volume of Water in Well:	(gal)	2.7 GAL
Pumping Rate of Pump:	(mL/min)	200 27
Pumping Rate of Pump:	(GPM)	
Minutes of Pumping:	(min)	140
Total Volume Removed:	(gal)	2.8 GAL

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer Peristaltic Grudfos (Other Pump) BLADDER
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer Peristaltic Grudfos (Other Pump) BLADDER

Did well go dry? Yes (No)
Water Quality Meter Type: YSI 650 MDS w/ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total) PCBs - Dissolved
Sample ID: W74092
Sample Time: 1600
MS/MSD: (Yes) No
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 6

Time / Parameter	1 Initial	2	3	4	5	6	7	8	9
	1345	1400	1410	1420	1430	1440	1450	1500	1510
Volume Purged (gal) (mL)	INITIAL	1500mL	2500mL	3500	4500	5500	6500	7500	8500
Depth to Water (ft. TIC)	28.76	28.76	28.76	28.76	28.76	28.76	28.76	28.76	28.76
Temperature (°C)	8.84	11.44	12.17	12.24	12.14	11.64	11.48	11.32	11.08
pH	7.11	7.08	7.03	7.06	7.08	7.09	7.08	7.09	7.09
Conductance (mS/cm)	1.146	1.184	1.201	1.178	1.170	1.165	1.167	1.165	1.164
Dissolved Oxygen mg/L)	6.96	6.02	2.76	2.07	2.05	2.26	2.17	3.27	3.82
Turbidity (NTU)	43.2	39.6	7.4	5.5	7.4	7.4	4.2	10.0	10.7
ORP (mV)	243.1	192.3	75.2	24.7	0.5	-4.5	-2.0	3.6	12.4

Time / Parameter	10	11	12	13	14	15	16	17	18
	1520	1530	1540	1550	1600				
Volume Purged (gal)	9500	10,500	11,500	12,500	13,000				
Depth to Water (ft. TIC)	28.76	28.76	28.76	28.76	28.76				
Temperature (°C)	11.23	11.19	11.33	11.37	11.38				
pH	7.09	7.09	7.09	7.09	7.09				
Conductance (mS/cm)	1.162	1.162	1.161	1.159	1.156				
Dissolved Oxygen mg/L)	4.03	4.66	4.64	5.02	4.81				
Turbidity (NTU)	11.0	11.3	11.0	11.6	11.5				
ORP (mV)	19.3	22.5	24.7	24.7	23.7				

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other:
Sample was shipped day of sampling sent on 11/16/00
Chain of Custody Signed By: RDK

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PUMP NO 6 @ 1340
- INITIAL PURGE H2O CLEAR, COLORLESS, ODORLESS
- TUB NO 6: BLADDER PUMP DEPLOYED ON 11/13/00 25' FROM BOTTOM OF WELL
- SAMPLED CLEAR, COLORLESS, ODORLESS
- MADE SPLIT FOR TOTAL PCBS "AMW-10B"
- MADE SPLIT FOR TOTAL PCBS MS/MSD "AMW-10B-MS/MSD"

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: Overcast / 28°F

Well ID. AMW-8A
Date: 11/18/00
Time In: 0850 **Time Out:** 1245

WELL INFORMATION

check where appropriate

		TIC	TOC	BGS
Depth to Water	(feet)	25.25	—	—
Total Depth	(feet)	35.85	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	10.60
Volume of Water in Well:	(gal)	1.73
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	155
Total Volume Removed:	(gal)	15500 mL / 4.01 gal

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer Peristaltic Grudfos (Other Pump) BLADDER
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer Peristaltic Grudfos (Other Pump) BLADDER
Did well go dry? Yes (No)
Water Quality Meter Type: HORIBA U-22 ~~YSI 650 MDS~~ w/ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total) PCBs - Dissolved

Sample ID: W24102
Sample Time: 1132
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	1 Initial	2	3	4	5	6	7	8	9
	0730	0740	0750	0800	0810	0820	0830	0840	1022 ~~0850~~
Volume Purged (gal)	INITIAL	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	~~25.75~~ 25.25	25.25	25.25	25.25	25.25	25.25	25.25	25.25	25.25
Temperature (°C)	15.28	13.47	13.37	13.22	13.62	12.78	12.31	10.89	9.41
pH	7.02	6.72	6.76	6.79	6.80	6.81	6.82	6.84	6.84
Conductance (mS/cm)	0.831	0.842	0.835	0.826	0.826	0.838	0.845	0.861	0.812
Dissolved Oxygen mg/L)	2.35	3.28	2.40	1.75	1.19	0.69	0.15	0.00	0.00
Turbidity (NTU)	223.0	740.0	84.0	43.2	27.4	16.5	11.3	7.8	5.8
ORP (mV)	139	32	-12	-30	-41	-45	-49	-52	-44

Time / Parameter	10 ~~7~~	11	12	13	14	15	16	17	18
	1032	1042	1052	1102	1112	1122	1132		
Volume Purged (gal)	9000	10000	11000	12000	13000	14000	15000		
Depth to Water (ft. TIC)	25.25	25.25	25.25	25.25	25.25	25.25	25.25		
Temperature (°C)	10.02	12.91	13.30	13.44	12.90	13.50	13.61		
pH	6.84	6.85	6.86	6.87	6.86	6.88	6.87		
Conductance (mS/cm)	0.826	0.823	0.829	0.830	0.829	0.830	0.830		
Dissolved Oxygen mg/L)	0.76	0.22	0.00	0.00	0.00	0.00	0.00		
Turbidity (NTU)	4.7	6.1	4.6	3.9	4.0	4.4	4.0		
ORP (mV)	-47	-51	-55	-57	-58	-59	-60		

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other: ____
Sample was (~~shipped~~ day of sampling) sent on ____
Chain of Custody Signed By: RDK

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- [illegible]
- DO INITIAL PURGE H2O LIT BRN, TURBID, SLIGHT ODOR
- INSTALLED BLADDER PUMP 2.5' FROM BOTTOM OF WELL ON 11/17/00
- OPTIS PUMP CONTROLLER ONLY REACHED 20 PSI NO MATTER WHAT THE SETTING IS. WILL SAMPLE AMW-8B; USE CONTROLLER FROM THAT WELL.
- PROBLEM WAS COMPRESSOR. PURGED ANOTHER; CONTINUED PURGING @ 100 ml/min @ 1012
- MDEQ SPLIT SAMPLE FOR TOTAL PCBS "AMW-8A"

Sampling Discharge pressure was low. Had to adjust gas powered air compressor to resume pumping.

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: 27°F Partly cloudy

Well ID. AMW-6A
Date: 11/19/00
Time In: 0700 **Time Out:** 1000

check where appropriate

WELL INFORMATION

		TIC	TOC	BGS
Depth to Water	(feet)	16.35	—	—
Total Depth	(feet)	22.70	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	6.35
Volume of Water in Well:	(gal)	1.07 GAL
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	120
Total Volume Removed:	(gal)	12000 mL / 3.176 gal

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Other Pump ____
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump ____

Did well go dry? Yes (No)
Water Quality Meter Type: YSI 650 MDS w/ flow through cell

SAMPLING INFORMATION

Analyses:
(PCBs - Total)
PCBs - Dissolved

Sample ID: W24104
Sample Time: 0925
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	1 Initial	2	3	4	5	6	7	8	9
	0730	0735	0745	0755	0805	0815	0825	0835	0845
Volume Purged (gal)	Initial	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000
Depth to Water (ft. TIC)	16.35	16.35	16.35	16.35	16.35	16.35	16.35	16.35	16.35
Temperature (°C)	12.33	11.09	9.55	9.79	9.50	9.95	9.76	10.21	10.90
pH	6.29	6.23	6.40	6.27	6.27	6.36	6.31	6.29	6.29
Conductance (mS/cm)	1.432	1.434	1.429	1.431	1.430	1.428	1.427	1.423	1.421
Dissolved Oxygen mg/L)	1.98	1.83	1.68	1.22	1.87	1.02	1.04	.92	.30
Turbidity (NTU)	2.7	102.3	0	0	19.0	0.0	0	0	0
ORP (mV)	144.0	103.4	100.4	93	3.2	-11.5	-15.1	-21.7	-25.4

Time / Parameter	10	11	12	13	14	15	16	17	18
	0855	0905	0915	0925					
Volume Purged (gal)	9,000	10,000	11,000	12,000					
Depth to Water (ft. TIC)	16.35	16.35	16.35	16.35					
Temperature (°C)	10.33	10.94	10.56	10.67					
pH	6.33	6.32	6.33	6.34					
Conductance (mS/cm)	1.423	1.422	1.419	1.421					
Dissolved Oxygen mg/L)	.78	0.77	0.78	.77					
Turbidity (NTU)	0	0	0	0					
ORP (mV)	-29.4	-31.2	-32.7	-33.9					

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other: ____
Sample was shipped day of sampling sent on 11/20/00
Chain of Custody Signed By: DC

MISCELLANEOUS OBSERVATIONS/PROBLEMS

Started pumping @ 0725
INITIAL PURGE H2O CLEAR, COLORLESS w/ ODOR
WELL OFF GASING
MDEQ SPLIT SAMPLE FOR TOTAL PCBS "AMW-6A"
INSTALLED TUBING 2' FROM BOTTOM of WELL ON 11/19/00
SAMPLED CLEAR, COLORLESS w/ ODOR

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: OVERCAST, 28°F

Well ID. AMW-8B
Date: 11/8/00
Time In: 0650 **Time Out:** 1245

WELL INFORMATION — *check where appropriate*

		TIC	TOC	BGS
Depth to Water	(feet)	24.85	—	—
Total Depth	(feet)	40.86	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	16.01
Volume of Water in Well:	(gal)	2.6 GAL
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	175
Total Volume Removed:	(gal)	17500 ml / 4.6 GAL

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer Peristaltic Grudfos (Other Pump) BLADDER
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer Peristaltic Grudfos (Other Pump) BLADDER

Did well go dry? Yes (No)

Water Quality Meter Type: YSI 650 MDS w/ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total), PCBs - Dissolved

Sample ID: AMW-8B
Sample Time: 1120
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	1 Initial	2	3	4	5	6	7	8	9
	0720	0725	0735	0745	0755	0805	0815	0825	0835
Volume Purged (gal)	Initial	1000	2000	3000	4000	5000	6000	7000	8,000
Depth to Water (ft. TIC)	24.85	24.85	24.85	24.85	24.85	24.85	24.85	24.85	24.85
Temperature (°C)	15.59	14.66	14.68	14.83	14.16	14.25	14.08	14.08	14.20
pH	6.7	6.73	6.73	6.73	6.73	6.73	6.73	6.74	6.74
Conductance (mS/cm)	1.102	1.104	1.093	1.091	1.095	1.093	1.092	1.093	1.093
Dissolved Oxygen mg/L)	.67	.50	.55	.45	.40	.36	.48	.50	.50
Turbidity (NTU)	535	432	105.1	34.8	7.1	5.4	3.4	2.8	2.7
ORP (mV)	97.1	39.3	.6	-14.6	-21.8	-33.9	-35.8	-36.5	-36.9

Time / Parameter	10	11	12	13	14	15		16	17	18
	0845	0855	1010 ~~0905~~	1020	1030	1040	1050	1100	1110	1120
Volume Purged (gal)	9,000	10,000	10000	11,000	12,000	13,000	14000	15,000	16,000	17,000
Depth to Water (ft. TIC)	24.85	24.85	24.85	24.85	24.85	24.85	24.85	24.85	24.85	24.85
Temperature (°C)	14.28		10.64	14.90	14.84	14.60	14.80	14.48	14.37	14.28
pH	6.74		6.76	6.74	6.75	6.75	6.75	6.75	6.75	6.75
Conductance (mS/cm)	1.088		1.069	1.094	1.095	1.092	1.093	1.091	1.091	1.088
Dissolved Oxygen mg/L)	.45		.50	.50	0.27	0.20	0.19	.20	0.21	0.22
Turbidity (NTU)	0.8		39.1	20.5	7.3	2.6	1.1	0.8	0.0	0.0
ORP (mV)	-37.0		10.6	-8.5	-24.5	-55.2	-44.0	-45.8	-46.8	-47.4

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other: ____
Sample was (shipped day of sampling) sent on ____
Chain of Custody Signed By: RDC

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PURGING @ 0715
- INITIAL PURGE H2O LT GRAY, TURBID, SLIGHT ODOR
- INSTALLED BLADDER PUMP 2-5' FROM BOTTOM OF WELL ON 11/17/00
- STOPPED PUMPING @ 0850 - RENTED NEW COMPRESSOR & CONTINUED PURGING @ 1000
- MDEQ SPLIT SAMPLE FOR TOTAL PCBS "AMW-8B"
- SAMPLED CLEAR, COLORLESS, ODORLESS

PRESSURE SLOWLY DISCHARGING RESULTS AIR - HAD TO RENT GAS POWERED COMPRESSOR TO RESUME PUMPING.

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: Partly Cloudy, 20°F

Well ID. AMW-6B
Date: 11/19/00
Time In: 0700 **Time Out:** 1000

check where appropriate

WELL INFORMATION

		TIC	TOC	BGS
Depth to Water	(feet)	17.12	—	—
Total Depth	(feet)	32.30	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	15.18
Volume of Water in Well:	(gal)	2.5 GAL
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	100
Total Volume Removed:	(gal)	10,000 mL / 2.6 GAL

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Other Pump ____
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump ____
Did well go dry? Yes (No)
~~Water Quality~~ Meter Type: HOR-34-V-22 ~~YSI 650 MDS w/~~ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total)
PCBs - Dissolved

Sample ID: W24105
Sample Time: 0915
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	1 Initial	2	3	4	5	6	7	8	9
	0740	0745	0755	0805	0815	0825	0835	0845	0855
Volume Purged (gal)	IW:T:41	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	17.12	17.12	17.12	17.12	17.12	17.12	17.12	17.12	17.12
Temperature (°C)	11.07	11.09	10.13	9.84	9.97	9.95	10.07	10.07	10.25
pH	6.00	6.84	7.14	7.21	7.22	7.24	7.25	7.25	7.26
Conductance (mS/cm)	0.962	0.928	0.900	0.955	0.996	1.01	1.01	1.02	1.02
Dissolved Oxygen mg/L)	0.47	2.36	1.19	0.86	0.70	0.00	0.00	0.00	0.00
Turbidity (NTU)	4.0	2.7	3.0	2.5	2.6	1.7	1.3	0.9	0.6
ORP (mV)	187	41	-35	-49	-54	-58	-56	-57	-60

Time / Parameter	10	11	12	13	14	15	16	17	18
	0905	0915							
Volume Purged (gal)	9000	10000							
Depth to Water (ft. TIC)	17.12	17.12							
Temperature (°C)	10.39	10.50							
pH	7.27	7.27							
Conductance (mS/cm)	1.02	1.03							
Dissolved Oxygen mg/L)	0.00	0.00							
Turbidity (NTU)	0.3	0.1							
ORP (mV)	-62	-62							

SAMPLE DESTINATION

Laboratory: Severn Trent (STL) Sample was shipped day of sampling
Shipped Via: (Federal Express) Other: ____ sent on 11/20/00
Chain of Custody Signed By: [signature]

MISCELLANEOUS OBSERVATIONS/PROBLEMS

STARTED PUMPING @ 0735
INITIAL PURGE H2O CLEAR, COLORLESS w/ ODOR
INSTALLED TUBING 25' FROM BOTTOM OF WELL @ 11/18/00
MCEQ SPLIT SAMPLE FOR TOTAL PCBS "AMW-6B"
SAMPLED CLEAR, COLORLESS, SLIGHT ODOR

KRSG Willow Blvd / A-Site — **November 2000**

Site — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: 24°F / Snow Winter storm warning

Well ID. AMW-1
Date: ~~11/19/00~~ 11/20/00
Time In: 0700 **Time Out:** 1000

WELL INFORMATION — *check where appropriate*

		TIC	TOC	BGS
Depth to Water	(feet)	15.80	—	—
Total Depth	(feet)	25.32	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: —

WELL WATER INFORMATION

Length of Water Column:	(feet)	9.52
Volume of Water in Well:	(gal)	1.6 Gal
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	110
Total Volume Removed:	(gal)	11000 mL / 2.9 Gal

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Other Pump ____
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump ____

Did well go dry? Yes (No)
Water Quality Meter Type: YSI 650 MDS w/ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total)
PCBs - Dissolved

Sample ID: W74106
Sample Time: 0915
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	1 Initial	2	3	4	5	6	7	8	9
	0730	0735	0745	0755	0805	0815	0825	0835	0845
Volume Purged (gal)	TURBID	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80
Temperature (°C)	13.25	12.51	12.20	11.85	11.89	12.08	12.09	12.09	12.13
pH	6.84	6.81	6.81	6.80	6.80	6.79	6.80	6.80	6.80
Conductance (mS/cm)	1.096	1.098	1.099	1.101	1.103	1.103	1.105	1.102	1.105
Dissolved Oxygen mg/L)	2.45	1.86	1.13	0.96	0.77	0.64	0.56	0.53	0.50
Turbidity (NTU)	20.8	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ORP (mV)	91.0	45.9	-18.7	-36.0	-47.0	-54.6	-58.9	-61.4	-63.6

Time / Parameter	10	11	12	13	14	15	16	17	18
	0855	0905	0915						
Volume Purged (gal)	9000	10000	11000						
Depth to Water (ft. TIC)	15.80	15.80	15.80						
Temperature (°C)	12.08	12.22	12.19						
pH	6.80	6.80	6.81						
Conductance (mS/cm)	1.103	1.105	1.103						
Dissolved Oxygen mg/L)	0.48	0.45	0.45						
Turbidity (NTU)	0.0	0.0	0.0						
ORP (mV)	-64.5	-66.0	-66.6						

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other: ____
Sample was (shipped day of sampling) sent on ~~11/19/00~~
Chain of Custody Signed By: [signature]

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PUMPING @ 0725
- INITIAL PURGE HEAVY CLAY, COLORLESS, SLIGHT ODOR
- TUBING DISTANCE 25' FROM BOTTOM OF WELL ON 11/19/00
- MDEQ SPLIT SAMPLE FOR TOTAL PCBS "AMW-1"
- SAMPLED CLEAR, COLORLESS, SLIGHT ODOR

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: 24°F / Sunny / Winter Storm Warning

Well ID. AMW-4
Date: ~~11/19/00~~ 11/20/00
Time In: 0800 **Time Out:** 1000

WELL INFORMATION

		TIC	TOC	BGS
Depth to Water	(feet)	14.98	—	—
Total Depth	(feet)	24.50	—	—

check where appropriate

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other:

WELL WATER INFORMATION

Length of Water Column:	(feet)	9.52
Volume of Water in Well:	(gal)	1.18
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	130
Total Volume Removed:	(gal)	13000 mL / 3.436 gal

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Other Pump
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump
Did well go dry? Yes (No)
Water Quality Meter Type: ~~YSI 650 MDS~~ HORIBA U22 w/ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total)
PCBs - Dissolved
Sample ID: W74107
Sample Time: 0920
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	1 Initial	2 0710	3 0720	4 0730	5 0740	6 0750	7 0800	8 0810	9 0820	0830
Volume Purged (gal)	INITIAL	1000	2,000	3,000	4,000	5,000	6000	7,000	8,000	
Depth to Water (ft. TIC)	14.95	14.98	14.98	14.98	14.98	14.98	14.98	14.98	14.98	
Temperature (°C)	13.38	12.42	11.03	10.66	11.45	11.20	11.32	11.19	11.21	
pH	6.39	6.46	6.55	6.57	6.57	6.57	6.56	6.56	6.56	
Conductance (mS/cm)	1.13	1.10	1.06	1.04	1.03	1.03	1.02	1.01	1.01	
Dissolved Oxygen mg/L)	2.79	1.22	1.81	3.90	4.02	3.64	2.75	2.09	1.63	
Turbidity (NTU)	1.0	.2	0.0	0.1	0.1	0.3	0.2	0.2	0.2	
ORP (mV)	-20	-41	-68	-75	-79	-81	-83	-84	-84	

Time / Parameter	10 0840	11 0850	12 0900	13 0910	14 0920	15	16	17	18
Volume Purged (gal)	9,000	10,000	11,000	12,000	13,000				
Depth to Water (ft. TIC)	14.98	14.98	14.98	14.98	14.98				
Temperature (°C)	11.51	11.45	11.80	12.05	12.06				
pH	6.56	6.56	6.57	6.57	6.57				
Conductance (mS/cm)	1.01	1.01	1.00	1.00	1.00				
Dissolved Oxygen mg/L)	1.17	1.04	.71	.59	.60				
Turbidity (NTU)	0.3	0.3	0.3	0.4	0.2				
ORP (mV)	-84	-84	-85	-85	-85				

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other:
Sample was (shipped day of sampling) sent on 11/20/00
Chain of Custody Signed By: RDG

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PUMPING @ 0710
- INITIAL PURGE H2O CLEAR, COLORLESS, SLIGHT ODOR
- TUBING INSTALLED 2.5' FROM BOTTOM OF WELL ON 11/18/00
- MDEQ SPLIT SAMPLE FOR TOTAL PCBS "AMW-4"
- SAMPLE CLEAR, COLORLESS, SLIGHT ODOR

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: OVERCAST, 38°F

Well ID. AMW-5
Date: 11/19/00
Time In: 1305 **Time Out:** 1545

WELL INFORMATION — *check where appropriate*

		TIC	TOC	BGS
Depth to Water	(feet)	17.33	—	—
Total Depth	(feet)	28.60	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	11.27
Volume of Water in Well:	(gal)	1.84 gal
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	120
Total Volume Removed:	(gal)	12000 mL / 3.17 gal

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Other Pump ____
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump ____

Did well go dry? Yes (No)
Water Quality Meter Type: YSI 650 MDS w/ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total) PCBs - Dissolved

Sample ID: W24108
Sample Time: 1510
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	1 Initial	2	3	4	5	6	7	8	9
	1316	1320	1330	1340	1350	1400	1410	1420	1430
Volume Purged (gal)	INIT. 41	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	17.33	17.33	17.33	17.33	17.33	17.33	17.33	17.33	17.33
Temperature (°C)	13.72	13.79	14.51	14.56	14.72	14.78	14.86	14.63	14.71
pH	6.46	6.50	6.48	6.47	6.50	6.49	6.51	6.51	6.51
Conductance (mS/cm)	1.608	1.626	1.587	1.558	1.533	1.514	1.470	1.460	1.469
Dissolved Oxygen mg/L)	1.51	1.29	0.90	0.58	0.54	0.46	0.42	0.40	0.47
Turbidity (NTU)	20.9	18.6	7.1	6.4	5.6	4.9	4.4	2.9	1.4
ORP (mV)	84.6	7.0	-61.3	-71.7	-76.5	-80.0	-81.2	-81.2	-80.3

Time / Parameter	10	11	12	13	14	15	16	17	18
	1440	1450	1500	1510					
Volume Purged (gal)	9000	10000	11000	12000					
Depth to Water (ft. TIC)	17.33	17.33	17.33	17.33					
Temperature (°C)	14.88	14.66	14.25	14.25					
pH	6.53	6.52	6.53	6.52					
Conductance (mS/cm)	1.463	1.454	1.447	1.442					
Dissolved Oxygen mg/L)	0.33	0.37	0.43	0.41					
Turbidity (NTU)	2.1	2.0	1.8	1.8					
ORP (mV)	-79.3	-78.7	-74.9	-74.0					

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other: ____
Sample was shipped day of sampling sent on 11/20/00
Chain of Custody Signed By: RDG

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PUMPING @ 1310
- INITIAL PURGE H2O CLEAR, COLORLESS, SLIGHT ODOR
- TUBING INSTALLED 2.5' FROM BOTTOM OF WELL ON 11/18/00
- MOED SPLIT SAMPLE FOR TOTAL PCBS "AMW-5"
- SAMPLED CLEAR, COLORLESS, SLIGHT ODOR

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: PARTLY CLOUDY, 35°F

Well ID. ~~AMW-1~~ WMW-1
Date: 11/19/00
Time In: 1010 **Time Out:** 1400 11/20/00

check where appropriate

WELL INFORMATION

		TIC	TOC	BGS
Depth to Water	(feet)	6.16	—	—
Total Depth	(feet)	14.42	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	8.26
Volume of Water in Well:	(gal)	1.36 gal
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	41
Total Volume Removed:	(gal)	4.00 gal / 1.0568

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (~~Peristaltic~~) Grudfos Other Pump ____
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump ____

Did well go dry? (Yes) No

Water Quality Meter Type: HORIBA U-22 ~~YSI 556 MDS~~ w/ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total) ~~PCBs - Dissolved~~

Sample ID: W74109
Sample Time: 1330 11/20/00
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	1 Initial	2 1025	3 1030	4 1040	5 1050	6 1100	7	8	9
Volume Purged (gal)	TWT:41	1000 ml	2000 ml	3000	4000				
Depth to Water (ft. TIC)	NA	NA	NA	NA	NA				
Temperature (°C)	10.10	10.52	10.82	10.75	10.70				
pH	7.26	7.99	8.08	8.07	8.05				
Conductance (mS/cm)	0.93	0.95	0.97	0.98	0.99				
Dissolved Oxygen mg/L)	7.55	4.25	2.79	2.16	2.00				
Turbidity (NTU)	4.1	3.2	2.4	3.1	3.0				
ORP (mV)	41	23	5	5	5				

Time / Parameter	10	11	12	13	14	15	16	17	18
Volume Purged (gal)									
Depth to Water (ft. TIC)									
Temperature (°C)									
pH									
Conductance (mS/cm)									
Dissolved Oxygen mg/L)									
Turbidity (NTU)									
ORP (mV)									

SAMPLE DESTINATION

Laboratory: Severn Trent (STL) Sample was (shipped day of sampling) sent on 11/20/00 ~~Chain of Custody~~ Signed By: RDK
Shipped Via: (Federal Express) Other: ____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

14 @ 1312 11/20/00

- STARTED PURGING @ 1020
- INITIAL PURGE H2O CLEAR, COLORLESS, ODORLESS
- TUBING INSTALLED 2.5' FROM BOTTOM of WELL ON 11/10/00
- MADE SPLIT SAMPLE FOR TOTAL PCBS "WMW-1"
- WELL DRY @ 1101, WILL LET RECOVER; SAMPLE 100 ml/min SLOWEST PURGE POSSIBLE
- SAMPLED CLEAR, COLORLESS, ODORLESS

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: Partly Cloudy, 35°F

Well ID. ~~AMW-1A~~ WMW-1A
Date: 11/9/00
Time In: 1010 **Time Out:** 1255

WELL INFORMATION *check where appropriate*

		TIC	TOC	BGS
Depth to Water	(feet)	5.66	—	—
Total Depth	(feet)	10.23	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other:

WELL WATER INFORMATION

Length of Water Column:	(feet)	4.57
Volume of Water in Well:	(gal)	0.74
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	130
Total Volume Removed:	(gal)	13000 mL / 3.43 gal

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

SAMPLING INFORMATION

Analyses: (PCBs - Total)
PCBs - Dissolved

Sample ID: WMW-1A
Sample Time: 1230
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Other Pump
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump

Did well go dry? Yes (No)

Water Quality Meter Type: YSI 650 MDS w/ flow through cell

Time / Parameter	1 Initial (1025)	2 (1030)	3 (1040)	4 (1050)	5 (1100)	6 (1110)	7 (1120)	8 (1130)	9 (1140)
Volume Purged (gal)	INITIAL	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	5.67	5.67	5.67	5.67	5.67	5.67	5.67	5.67	5.67
Temperature (°C)	8.77	6.51	7.25	7.85	8.66	9.62	9.61	10.23	9.90
pH	7.00	7.04	7.03	7.05	7.01	7.03	7.00	7.00	7.00
Conductance (mS/cm)	1.575	1.609	1.577	1.503	1.420	1.366	1.324	1.296	1.280
Dissolved Oxygen mg/L)	1.23	1.12	0.88	0.68	0.57	0.43	0.35	0.34	0.31
Turbidity (NTU)	124	175.2	103.4	56	38.3	33.3	13.3	7.6	4.4
ORP (mV)	161.3	165.6	163.2	155.9	147.2	137.1	127.0	113.2	104.7

Time / Parameter	10 (1150)	11 (1200)	12 (1210)	13 (1220)	14 (1230)	15	16	17	18
Volume Purged (gal)	9000	10000	11000	12000	13000				
Depth to Water (ft. TIC)	5.67	5.67	5.67	5.67	5.67				
Temperature (°C)	9.75	10.14	9.94	9.91	10.08				
pH	7.00	7.00	7.00	7.01	7.00				
Conductance (mS/cm)	1.270	1.260	1.259	1.251	1.244				
Dissolved Oxygen mg/L)	0.30	0.30	0.28	0.27	0.29				
Turbidity (NTU)	3.1	0.8	0.3	0.0	0.0				
ORP (mV)	83.9	77.7	72.5	63.2	56.4				

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other:
Sample was shipped day of sampling sent on 11/20/00
Chain of Custody Signed By: [signature]

MISCELLANEOUS OBSERVATIONS/PROBLEMS
- STARTED Purging @ 1020
- INITIAL PURGE H2O ORANGE BROWN, SLIGHTLY TURBID, ODORLESS
- TUBING INSTALLED 1' FROM BOTTOM of WELL ON 11/10/00
- MADE SPLIT SAMPLE FOR TOTAL PCB "WMW-1A"
- SAMPLED CLEAR, COLORLESS, ODORLESS

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: 32°F / SNOW / WINTER STORM WARNING

Well ID. AMW-3
Date: 11/20/00
Time In: 1005 **Time Out:** 1315

WELL INFORMATION

		TIC	TOC	BGS
Depth to Water	(feet)	9.14	—	—
Total Depth	(feet)	20.34	—	—

check where appropriate

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	11.2
Volume of Water in Well:	(gal)	1.83
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	130
Total Volume Removed:	(gal)	13000 mL / 3.43 GAL

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Other Pump ____
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump ____

Did well go dry? Yes (No) Water Quality Meter Type: YSI 650 MDS w/ flow through cell

SAMPLING INFORMATION

Analyses:
(PCBs - Total)
PCBs - Dissolved

Sample ID: W74112
Sample Time: 1220
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: N/A
Total Bottles: 2

Time / Parameter	1 Initial	2	3	4	5	6	7	8	9
	1015	1020	1030	1040	1050	1100	1110	1120	1130
Volume Purged (gal)	INITIAL	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	9.14	9.14	9.14	9.14	9.14	9.14	9.14	9.14	9.14
Temperature (°C)	11.83	9.93	9.05	8.61	8.49	8.81	9.04	9.27	9.31
pH	7.81	7.71	7.47	~~0.855~~ 7.36	7.34	7.32	7.31	7.30	7.29
Conductance (mS/cm)	0.7260	.799	0.834	0.855	0.865	0.870	0.873	0.875	0.877
Dissolved Oxygen mg/L)	1.52	.52	0.34	0.26	0.23	0.21	0.19	0.17	0.16
Turbidity (NTU)	94.5	80.6	35.7	23.0	14.6	10.2	8.6	5.6	2.2
ORP (mV)	105.0	-39.2	-85.6	-97.7	-99.4	-100.8	-101.6	-102.0	-101.9

Time / Parameter	10	11	12	13	14	15	16	17	18
	1140	1150	1200	1210	1220				
Volume Purged (gal)	9000	10000	11,000	12000	13000				
Depth to Water (ft. TIC)	9.14	9.14	9.14	9.14	9.14				
Temperature (°C)	9.56	9.50	9.63	9.73	9.63				
pH	7.29	7.28	7.27	7.26	7.26				
Conductance (mS/cm)	0.879	.880	.881	.883	0.883				
Dissolved Oxygen mg/L)	0.16	0.15	.15	0.14	0.14				
Turbidity (NTU)	1.3	2.7	1.1	2.0	1.9				
ORP (mV)	-101.2	-100.4	-99.8	-99.1	-98.7				

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other: ____
Sample was (shipped day of sampling) sent on ____
Chain of Custody Signed By: RDK

MISCELLANEOUS OBSERVATIONS/PROBLEMS – STARTED PUMP TO @ 1010
- INITIAL PURGE H2O CLEAR, COLORLESS, SLIGHT ~~COLORLESS~~ (RDK)
- TUBING INSTALLED 2.5' FROM BOTTOM OF WELL ON 11/20/00. COULD NOT INSTALL 1st DAYS IN ADVANCE BECAUSE WELLS ARE IN A RESIDENTIAL AREA.
- MDEQ SPLIT SAMPLE FOR TOTAL PCBS "AMW-3"
- SAMPLED CLEAR, COLORLESS, SLIGHT ODOR

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: 32°F Snow / Winter Storm Warning

Well ID. AMW-3A
Date: 11/20/00
Time In: 1005 **Time Out:** 1315

WELL INFORMATION (check where appropriate)

		TIC	TOC	BGS
Depth to Water	(feet)	5.34	—	—
Total Depth	(feet)	9.30	—	—

Well Type: (Flushmount) Stick-Up
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: —

WELL WATER INFORMATION

Length of Water Column:	(feet)	3.96
Volume of Water in Well:	(gal)	0.65 GAL
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	120
Total Volume Removed:	(gal)	12000 mL / 3.17 GAL

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Other Pump ____
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump ____
Did well go dry? Yes (No)
Water Quality Meter Type: HORIBA U-22 ~~YSI 650 MDS~~ w/ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total) PCBs - Dissolved
Sample ID: W024113
Sample Time: 1215
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	1 Initial 1020	2 1025	3 1035	4 1045	5 1055	6 1105	7 1115	8 1125	9 1135
Volume Purged (gal)	INITIAL	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	5.34	5.34	5.34	5.34	5.34	5.34	5.34	5.34	5.34
Temperature (°C)	13.26	13.52	13.48	13.90	13.95	13.96	13.90	14.05	14.12
pH	6.26	6.85	6.99	7.20	7.00	7.10	7.12	7.14	7.15
Conductance (mS/cm)	0.95	0.90	0.894	0.846	0.824	0.803	0.787	0.782	0.775
Dissolved Oxygen mg/L)	7.30	2.81	0.94	0.47	0.39	0.00	0.00	0.00	0.00
Turbidity (NTU)	7.8	9.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0
ORP (mV)	-12	-62	-96	-107	-111	-116	-119	-120	-122

Time / Parameter	10 1145	11 1155	12 1205	13 1215	14	15	16	17	18
Volume Purged (gal)	9000	10000	11000	12000					
Depth to Water (ft. TIC)	5.34	5.34	5.34	5.34					
Temperature (°C)	14.23	14.25	14.27	14.17					
pH	7.15	7.16	7.16	7.16					
Conductance (mS/cm)	0.770	0.768	0.766	0.765					
Dissolved Oxygen mg/L)	0.00	0.00	0.00	0.00					
Turbidity (NTU)	0.0	0.0	0.0	0.0					
ORP (mV)	-123	-124	-125	-126					

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other: ____
Sample was (shipped day of sampling) sent on ____
Chain of Custody Signed By: (RDK)

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PUMPING @ 1015
- INITIAL PURGE WAS CLEAR, COLORLESS, SLIGHT ODOR
- TUBING INSTALLED 1' FROM BOTTOM OF WELL ON 11/20/00. COULD NOT INSTALL 1" DAY IN ADVANCE BECAUSE WELLS ARE IN RESIDENTIAL AREA.
- MDEQ SPLIT SAMPLE FOR TOTAL PCBS "AMW-3A"
- SAMPLED CLEAR, COLORLESS, SLIGHT ODOR

KRSG Willow Blvd / A-Site — **November 2000**

Site — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: OVERCAST / SNOW / 32°F

Well ID: AMW-7A
Date: 11/12/00
Time In: 1120 **Time Out:** 1430

WELL INFORMATION (check where appropriate)

		TIC	TOC	BGS
Depth to Water	(feet)	20.68	—	—
Total Depth	(feet)	32.05	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	11.37
Volume of Water in Well:	(gal)	1.9
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	120
Total Volume Removed:	(gal)	12000 / 3.17 GAL

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Other Pump ____
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump ____
Did well go dry? Yes (No)
Water Quality Meter Type: Horiba U-22 ~~YSI 650 MDS~~ w/ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total) PCBs - Dissolved
Sample ID: W24100
Sample Time: 1325
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	1 Initial	2 1130	3 1135	4 1145	5 1155	6 1205	7 1215	8 1225	9 1235	1245
Volume Purged (gal)	Initial	1000	2000	3000	4000	5000	6000	7000	8000	
Depth to Water (ft. TIC)	20.68	20.68	20.68	20.68	20.68	20.68	20.68	20.68	20.68	
Temperature (°C)	14.65	14.09	13.80	13.90	13.96	14.23	14.24	14.23	13.81	
pH	6.74	6.76	6.76	6.72	6.7	6.7	6.69	6.69	6.69	
Conductance (mS/cm)	0.864	0.872	.880	.885	.888	.890	.890	.891	.890	
Dissolved Oxygen mg/L)	5.36	4.77	3.77	2.77	2.0	1.82	1.59	1.43	1.31	
Turbidity (NTU)	29.9	15.8	5.5	1.9	0	0	0	0	0	
ORP (mV)	~~7.36~~ 4	-33	-45	-47	-51	-52	-54	-55	-56	

Time / Parameter	10 1255	11 1305	12 1315	13 1325	14	15	16	17	18
Volume Purged (gal)	9,000	10,000	11,000	12,000					
Depth to Water (ft. TIC)	20.68	20.68	20.68	20.68					
Temperature (°C)	13.82	13.75	13.66	13.66					
pH	6.69	6.69	6.69	6.69					
Conductance (mS/cm)	.889	.889	.888	.890					
Dissolved Oxygen mg/L)	1.31	1.26	1.29	1.25					
Turbidity (NTU)	0	0	0	0					
ORP (mV)	-56	-56	-57	-57					

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other: ____
Sample was (shipped day of sampling) sent on ____
Chain of Custody Signed By: ____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PUMPING @ 1125
- INITIAL PURGE WAS CLEAR, COLORLESS, SLIGHT ODOR
- TUBING INSTALLED 2.5' FROM BOTTOM OF WELL ON 11/9/00
- MDEQ SPLIT FOR TOTAL PCBS "AMW-7A"
- SAMPLED CLEAR, COLORLESS, ODORLESS

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207A
Weather: OVERCAST / SNOW / 33°F

Well ID. AMW-7B
Date: 11/12/00
Time In: 1100 **Time Out:** 1430

WELL INFORMATION

		TIC	TOC	BGS
Depth to Water	(feet)	19.92	—	—
Total Depth	(feet)	39.19	—	—

check where appropriate

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	19.27
Volume of Water in Well:	(gal)	3.14
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	130 min
Total Volume Removed:	(gal)	13000 mL / 3.46 gal

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Other Pump ____
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump ____

Did well go dry? Yes (No)
Water Quality Meter Type: YSI 650 MDS w/ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total)
PCBs - Dissolved

Sample ID: W24101
Sample Time: 1330
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: ____
Total Bottles: 2

Time / Parameter	1123 1 Initial	1130 2	1141 3	1150 4	1200 5	1210 6	1220 7	1230 8	1240 9
Volume Purged (gal)	Initial	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93
Temperature (°C)	11.35	11.63	11.87	12.21	12.27	11.75	12.93	12.86	12.25
pH	6.90	6.90	6.97	6.94	6.88	7.00	7.01	6.95	6.95
Conductance (mS/cm)	1.029	1.031	1.031	1.030	1.030	1.029	1.029	1.030	1.030
Dissolved Oxygen mg/L)	0.36	0.29	0.30	0.37	0.44	0.46	0.46	0.44	0.46
Turbidity (NTU)	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ORP (mV)	-15.5	-40.1	-51.1	-57.7	-58.6	-57.1	-57.9	-59.9	-60.4

Time / Parameter	1250 10	1300 11	1310 12	1320 13	1330 14	15	16	17	18
Volume Purged (gal)	9000	10000	11000	12000	13000				
Depth to Water (ft. TIC)	19.93	19.93	19.93	19.93	19.93				
Temperature (°C)	12.38	12.28	11.50	11.60	11.43				
pH	6.93	6.96	6.95	6.95	6.94				
Conductance (mS/cm)	1.029	1.030	1.029	1.029	1.029				
Dissolved Oxygen mg/L)	0.47	0.46	0.47	0.54	0.53				
Turbidity (NTU)	0.0	0.0	0.0	0.0	0.0				
ORP (mV)	-59.4	-58.4	-56.6	-56.5	-56.6				

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other: ____
Sample was (shipped day of sampling) sent on ____
Chain of Custody Signed By: RDB

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PURGING @ 1120
- INITIAL PURGE H2O CLEAR, COLORLESS, SLIGHT ODOR
- TUBING INSTALLED 2.5' FROM BOTTOM OF WELL ON 11/9/00
- MDEQ SPLIT FOR TOTAL PCBS "AMW-7B"
- SAMPLED CLEAR, COLORLESS, ODORLESS

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: OVERCAST / RAIN / SNOW / 36°F

Well ID. WMW-4A
Date: 11/16/00
Time In: 0730 **Time Out:** 1100

WELL INFORMATION — *check where appropriate*

		TIC	TOC	BGS
Depth to Water	(feet)	17.35	—	—
Total Depth	(feet)	21.36	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	4.01
Volume of Water in Well:	(gal)	0.6656 gal
Pumping Rate of Pump:	(mL/min)	120
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	130
Total Volume Removed:	(gal)	15,600 mL 4.12 gal

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

SAMPLING INFORMATION

Analyses: (PCBs - Total) PCBs - Dissolved

Sample ID: W24093
Sample Time: 1000
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Other Pump ____
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump ____

Did well go dry? Yes (No) Water Quality Meter Type: YSI 650 MDS w/ flow through cell

Time / Parameter	1 Initial	2	3	4	5	6	7	8	9
	0753	0800	0810	0820	0830	0840	0850	0900	0910
Volume Purged (gal)	INITIAL	1200	2400	3600	4800	6000	7200	8400	9600
Depth to Water (ft. TIC)	17.36	17.36	17.36	17.36	17.36	17.36	17.36	17.36	17.36
Temperature (°C)	13.09	12.78	12.73	12.70	12.67	12.60	12.73	12.70	12.69
pH	6.43	6.44	6.45	6.46	6.47	6.47	6.47	6.47	6.49
Conductance (mS/cm)	2.377	2.375	2.373	2.377	2.372	2.377	2.363	2.362	2.361
Dissolved Oxygen mg/L)	4.04	4.51	4.60	4.43	4.34	4.51	4.27	3.71	4.10
Turbidity (NTU)	1.5	.6	0	0	0	0	0	0	0
ORP (mV)	-18.1	-56.7	-65.6	-69.7	-72.4	-73.7	-74.2	-74.4	-74.4

Time / Parameter	10	11	12	13	14	15	16	17	18
	0920	0930	0940	0950	1000				
Volume Purged (gal)	10,800	12,000	13,200	14,400	15,600				
Depth to Water (ft. TIC)	17.36	17.36	17.36	17.36	17.36				
Temperature (°C)	12.74	12.72	12.83	12.69	12.55				
pH	6.48	6.48	6.46	6.48	6.49				
Conductance (mS/cm)	2.360	2.360	2.365	2.366	2.365				
Dissolved Oxygen mg/L)	3.99	3.89	3.77	3.69	3.50				
Turbidity (NTU)	0	.6	0	0	0				
ORP (mV)	-74.3	-74.1	-74.3	-73.4	-72.1				

SAMPLE DESTINATION

Laboratory: Severn Trent (STL) Sample was (shipped day of sampling) sent on ____ Chain of Custody Signed By: RDK
Shipped Via: (Federal Express) Other: ____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PURGING @ 0750
- INITIAL PURGE H2O CLEAR, COLORLESS, SLIGHT ODOR
- SAMPLED CLEAR, COLORLESS, SLIGHT ODOR
- MDEQ SPLIT SAMPLE FOR TOTAL PCBS "WMW-4A"
- TUBING INSTALLED 1' FROM BOTTOM OF WELL ON 11/10/00

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: overcast / Rain / Snow / 36°F

Well ID. WMW-4B
Date: 11/16/00
Time In: 0730 **Time Out:** 1100

WELL INFORMATION — *check where appropriate*

		TIC	TOC	BGS
Depth to Water	(feet)	17.60	—	—
Total Depth	(feet)	32.27	—	—

Well Type: Flushmount **Stick-Up**
Well Locked: **Yes** No
Measuring Point Marked: **Yes** No
Well Diameter: 1" **2"** Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	14.67
Volume of Water in Well:	(gal)	2.4 gal
Pumping Rate of Pump:	(mL/min)	180
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	105
Total Volume Removed:	(gal)	18,900 mL (5 gal)

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer **Peristaltic** Grudfos Other Pump ____
Tubing Used: Teflon **Polyethylene (LDPE)**
Sampling Method: Bailer **Peristaltic** Grudfos Other Pump ____
Did well go dry? Yes **No**
Water Quality Meter Type: Horiba U22 ~~YSI 600 MDS~~ w/ flow through cell

SAMPLING INFORMATION

Analyses: **PCBs - Total**
PCBs - Dissolved
Sample ID: WW4094
Sample Time: 1000
MS/MSD: Yes **No**
Duplicate: Yes **No**
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	1 Initial	2 0820	3 0830	4 0840	5 0850	6 0900	7 0910	8 0920	9 0930	0940
Volume Purged (gal)	Initial	1800	3600	5400	7200	9000	10800	12600	14400	
Depth to Water (ft. TIC)	17.60	17.60	17.60	17.60	17.60	17.60	17.60	17.60	17.60	
Temperature (°C)	11.44	12.47	12.69	12.75	12.87	12.95	13.04	12.99	13.04	
pH	7.21	7.30	7.36	7.37	7.36	7.36	7.37	7.36	7.37	
Conductance (mS/cm)	0.887	0.891	0.893	0.895	0.898	0.901	0.904	0.906	0.908	
Dissolved Oxygen mg/L)	4.94	3.80	3.86	3.63	3.20	2.81	3.18	3.00	2.97	
Turbidity (NTU)	6.1	3.7	2.2	1.2	0.6	0.5	0.2	0.5	0.1	
ORP (mV)	-56	-79	-88	-90	-89	-89	-89	-88	-87	

Time / Parameter	10 0950	11 1000	12	13	14	15	16	17	18
Volume Purged (gal)	16200	18000							
Depth to Water (ft. TIC)	17.60	17.60							
Temperature (°C)	13.09	13.07							
pH	7.37	7.35							
Conductance (mS/cm)	0.909	0.907							
Dissolved Oxygen mg/L)	3.20	3.07							
Turbidity (NTU)	0.3	0.1							
ORP (mV)	-86	-86							

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: **Federal Express** Other: ____
Sample was **shipped day of sampling** sent on ____
Chain of Custody Signed By: ____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

STARTED PUMPING @ 0815
- INITIAL PURGE AND CLEAR, COLORLESS, SLIGHT ODOR
- PROBLEMS w/ RESISTAT ON PERISTALTIC PUMP (SLOWEST FLOW POSSIBLE 180 ml/min)
- SAMPLED CLEAR, COLORLESS, SLIGHT ODOR
- MOED SPLIT SAMPLE FOR TOTAL PCBS "WMW-4B"
- TUBING DISPLACED 2.5' FROM BOTTOM OF WELL ON 11/10/00

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: OVERCAST / RAIN / 45°F

Well ID. WMW-3
Date: 11/16/00
Time In: 1100 **Time Out:** 1500

WELL INFORMATION — *check where appropriate*

		TIC	TOC	BGS
Depth to Water	(feet)	12.92	—	—
Total Depth	(feet)	37.95	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	25.03
Volume of Water in Well:	(gal)	4.08
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	125
Total Volume Removed:	(gal)	12500(mL)/(3.3 gal)

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Other Pump ____
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump ____

Did well go dry? Yes (No)

Water Quality Meter Type: HORIBA U-22 ~~YSI 556 MPS~~ w/ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total)
PCBs - Dissolved
____
____
____
____

Sample ID: W74095
Sample Time: 1320
MS/MSD: Yes (No)
Duplicate: (Yes) ~~No~~ W74097 (1400)
Duplicate ID: ____
Total Bottles: 4

Time / Parameter	1 Initial	2	3	4	5	6	7	8	9
	1120	1130	1140	1150	1200	1210	1220	1230	1240
Volume Purged (gal)	Initial	1500	2500	3500	4500	5500	6500	7500	8500
Depth to Water (ft. TIC)	12.93	12.93	12.93	12.93	12.93	12.93	12.93	12.94	12.95
Temperature (°C)	11.15	12.45	13.33	13.21	13.16	13.07	13.01	12.95	12.83
pH	7.51	7.41	7.38	7.25	7.33	7.35	7.37	7.38	7.39
Conductance (mS/cm)	1.08	1.15	1.18	1.17	1.17	1.16	1.16	1.15	1.16
Dissolved Oxygen mg/L)	3.07	0.83	0.48	0.21	0.21	0.00	0.00	0.00	0.00
Turbidity (NTU)	14.2	3.6	1.8	1.5	2.0	2.7	2.3	1.6	1.2
ORP (mV)	-14	-49	-57	-63	-66	-69	-71	-72	-73

Time / Parameter	10	11	12	13	14	15	16	17	18
	1250	1300	1310	1320					
Volume Purged (gal)	9500	10500	11500	12500					
Depth to Water (ft. TIC)	12.93	12.93	12.93	12.93					
Temperature (°C)	12.67	12.55	12.52	12.45					
pH	7.39	7.39	7.39	7.39					
Conductance (mS/cm)	1.16	1.15	1.15	1.16					
Dissolved Oxygen mg/L)	0.00	0.00	0.00	0.00					
Turbidity (NTU)	0.8	0.6	0.5	0.5					
ORP (mV)	-74	-75	-75	-75					

SAMPLE DESTINATION
Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other: ____
Sample was (shipped day of sampling) sent on ____
Chain of Custody Signed By: ____

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PUMPING @ 1115
- INITIAL PURGE H2O CLEAR, COLORLESS, ODORLESS
- TUBING INSTALLED 2.5' FROM BOTTOM OF WELL ON 11/9/00
- MDEQ SPLIT FOR TOTAL PCBS "WMW-3"
- MDEQ SPLIT FOR TOTAL PCBS DUPLICATE "WMW-3D"
- SAMPLES CLEAR, COLORLESS, ODORLESS

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 / 645.82.207
Weather: OVERCAST / RAIN / 45°F

Well ID. WMW-3AR
Date: 11/16/00
Time In: 1100 **Time Out:** 1500

WELL INFORMATION — *check where appropriate*

		TIC	TOC	BGS
Depth to Water	(feet)	13.85	—	—
Total Depth	(feet)	25.16	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	11.31
Volume of Water in Well:	(gal)	1.8
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	130
Total Volume Removed:	(gal)	3.44

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Other Pump ____
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump ____
Did well go dry? Yes (No)
Water Quality Meter Type: ~~YSI 650 MDS~~ HORIBA U-22 w/ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total) PCBs - Dissolved
Sample ID: W24096
Sample Time: 1320
MS/MSD: (Yes) [redacted]
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: [redacted] 6

Time / Parameter	1 (1113) Initial	2 (1120)	3 (1130)	4 (1140)	5 (1150)	6 (1200)	7 (1210)	8 (1220)	9 (1230)
Volume Purged (gal)	Initial	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	13.95	13.90	13.86	13.86	13.86	13.86	13.86	13.86	13.86
Temperature (°C)	12.83	12.14	12.69	12.63	12.80	12.73	12.49	12.26	12.04
pH	6.68	6.69	6.70	6.67	6.63	6.68	6.68	6.71	6.73
Conductance (mS/cm)	1.529	1.562	1.562	1.571	1.572	1.572	1.571	1.570	1.572
Dissolved Oxygen mg/L)	3.07	3.26	3.40	2.12	1.57	1.34	1.03	0.90	0.77
Turbidity (NTU)	10.2	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0
ORP (mV)	40.9	43.9	-68.4	-77.4	-83.7	-86.2	-87.4	-87.0	-86.4

Time / Parameter	10 (1240)	11 (1250)	12 (1300)	13 (1310)	14 (1320)	15	16	17	18
Volume Purged (gal)	9000	10000	11000	12000	13000				
Depth to Water (ft. TIC)	13.86	13.86	13.86	13.86	13.86				
Temperature (°C)	11.45	10.19	10.78	10.36	9.78				
pH	6.69	6.71	6.71	6.71	6.71				
Conductance (mS/cm)	1.573	1.574	1.572	1.578	1.578				
Dissolved Oxygen mg/L)	0.66	0.64	0.65	0.64	0.65				
Turbidity (NTU)	0.0	0.0	0.00	0.00	0.00				
ORP (mV)	-85.6	-82.0	-81.5	-80.2	-78.7				

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other: ____
Sample was (shipped day of sampling) sent on ____
Chain of Custody Signed By: [signature]

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED pumping @ 1110
- INITIAL PURGE H2O CLEAR, COLORLESS, ODORLESS
- TUBING DISTANCED 2.5' FROM BOTTOM of WELL ON 11/9/00
- MDEQ SPLIT FOR TOTAL PCBS "WMW-3AR"
- MDEQ SPLIT FOR TOTAL PCBS MS/MSD "WMW-3AR-MS/MSD"
- SAMPLE CLEAR, COLORLESS, ODORLESS

KRSG Willow Blvd / A-Site — November 2000

Site — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: OVERCAST/SWND/ 33°F

Well ID. AMW-9A
Date: 11/17/00
Time In: 0700 **Time Out:** 1030

WELL INFORMATION

		TIC	TOC	BGS
Depth to Water	(feet)	24.72	—	—
Total Depth	(feet)	31.29	—	—

check where appropriate

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other:

WELL WATER INFORMATION

Length of Water Column:	(feet)	6.57
Volume of Water in Well:	(gal)	1.08
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	110
Total Volume Removed:	(gal)	11000ml / 2.96

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer Peristaltic Grudfos (Other Pump) BLADDER
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer Peristaltic Grudfos (Other Pump) BLADDER

Did well go dry? Yes (No)

Water Quality Meter Type: ~~YSI 650 MDS~~ HORIBA U22 w/ flow through cell YSI 650 MDS

SAMPLING INFORMATION

Analyses: (PCBs - Total) PCBs - Dissolved

Sample ID: W7408B
Sample Time: 0930
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	1	2	3	4	5	6	7	8	9
	0724	0743	0750	0800	0810	0820	0830	0840	0850
Volume Purged (gal)	Initial	INITIAL	1000	2000	3000	4000	5000	6000	7000
Depth to Water (ft. TIC)	24.72	24.72	24.72	24.72	24.72	24.72	24.72	24.72	24.72
Temperature (°C)	13.25	13.86	13.93	14.04	14.15	14.11	14.17	14.43	14.50
pH	6.85	6.26	6.32	6.33	6.34	6.35	6.36	6.36	6.38
Conductance (mS/cm)	0.810	1.719	1.630	1.602	1.579	1.534	1.485	1.456	1.404
Dissolved Oxygen (mg/L)	0.48	0.28	0.24	0.21	0.20	0.19	0.21	0.22	0.20
Turbidity (NTU)	10.0	49.5	30.2	4.9	6.1	4.2	3.3	1.8	0.8
ORP (mV)	-31.9	43.6	-8.6	-36.8	-41.7	-46.8	-48.5	-49.3	-50.9

Time / Parameter	10	11	12	13	14	15	16	17	18
	0900	0910	0920	0930					
Volume Purged (gal)	8000	9000	10000	11000					
Depth to Water (ft. TIC)	24.72	24.72	24.72	24.72					
Temperature (°C)	14.60	14.23	12.60	12.29					
pH	6.40	6.41	6.43	6.43					
Conductance (mS/cm)	1.363	1.336	1.334	1.334					
Dissolved Oxygen (mg/L)	0.20	0.19	0.22	0.24					
Turbidity (NTU)	1.4	1.1	0.8	0.2					
ORP (mV)	-53.3	-54.4	-52.5	-50.2					

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other:
Sample was (shipped day of sampling) sent on
Chain of Custody Signed By: RDK

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- BLADDER PUMP INSTALLED 2' FROM BOTTOM OF WELL ON 11/16/00
- INITIAL PURGE H2O CLEAR, COLORLESS, SLIGHT ODOR, PARTICULATE EVIDENT
- FINAL PURGE H2O CLEAR, COLORLESS, ODORLESS
- MDEQ SPLIT FOR TOTAL PCBS "AMW-9A"
- STARTED PUMPING @ ~~0720~~ 0740

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: Overcast / 32°F / Snow

Well ID. AMW-9B
Date: 11/17/00
Time In: 0700 **Time Out:** 1030

WELL INFORMATION

		TIC	TOC	BGS
Depth to Water	(feet)	25.14	—	—
Total Depth	(feet)	41.99	—	—

check where appropriate

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other:

WELL WATER INFORMATION

Length of Water Column:	(feet)	16.85
Volume of Water in Well:	(gal)	2.7
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	
Minutes of Pumping:	(min)	120
Total Volume Removed:	(gal)	12000 mL / 3.17 gal

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method:	Bailer	Peristaltic	Grudfos	(Other Pump) Bladder
Tubing Used:	Teflon	(Polyethylene (LDPE))		
Sampling Method:	Bailer	Peristaltic	Grudfos	(Other Pump) Bladder

Did well go dry? Yes (No)

Water Quality Meter Type: ~~YSI 650 MDS~~ Horiba U-22 w/ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total) PCBs - Dissolved

Sample ID:		W274099
Sample Time:		0920
MS/MSD:	Yes	(No)
Duplicate:	Yes	(No)
Duplicate ID:		NA
Total Bottles:		2

Time / Parameter	1 Initial	2 0730	3 0740	4 0750	5 0800	6 0810	7 0820	8 0830	9 0840
Volume Purged (gal) (mL)	Initial	1000	2000	3000	4000	5000	6000	7000	8,000
Depth to Water (ft. TIC)	25.14	25.14	25.14	25.14	25.14	25.14	25.14	25.14	25.14
Temperature (°C)	13.26	13.25	11.79	11.20	11.44	12.16	11.78	12.31	12.39
pH	6.72	6.85	6.91	6.93	6.98	7.00	7.01	7.00	7.00
Conductance (mS/cm)	0.823	0.810	.818	0.818	.800	0.815	0.806	.809	.809
Dissolved Oxygen mg/L)	6.45	0.48	.29	0.17	0.12	0.03	0.00	0.00	0
Turbidity (NTU)	15.2	10	10.7	5.1	3.9	3.6	3.5	3.7	3.7
ORP (mV)	14	-3.9	-64	-71	-78	-83	-86	-89	-91

Time / Parameter	10 0850	11 0900	12 0910	13 0920	14	15	16	17	18
Volume Purged (gal)	9000	10,000	11000	12000					
Depth to Water (ft. TIC)	25.14	25.14	25.14	25.14					
Temperature (°C)	12.33	12.22	12.50	12.75					
pH	7.00	7.00	7.02	7.03					
Conductance (mS/cm)	.800	.800	0.802	0.799					
Dissolved Oxygen mg/L)	0.0	0.0	0.0	0.0					
Turbidity (NTU)	0.0	0.0	0.0	0.0					
ORP (mV)	-92	-93	-94	-95					

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other:
Sample was (shipped day of sampling) sent on
Chain of Custody Signed By: RDK

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- BLADDER PUMP INSTALLED 2.5' FROM BOTTOM OF WELL ON 11/16/00
- INITIAL PURGE H2O CLEAR, COLORLESS, SLIGHT ODOR
- FINAL PURGE H2O CLEAR, COLORLESS, ODORLESS
- MDEQ SPLIT FOR TOTAL PCBS "AMW-9B"
- STARTED PUMPING @ 0720
- ~~INITIAL PUR~~

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: overcast, windy, 31°F

Well ID. AMW-2
Date: 11/15/00
Time In: 0700 **Time Out:** 0950

WELL INFORMATION

		TIC	TOC	BGS
Depth to Water	(feet)	15.25	—	—
Total Depth	(feet)	28.57	—	—

check where appropriate

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	12.82
Volume of Water in Well:	(gal)	2.09
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	110 min
Total Volume Removed:	~~(gal)~~ (mL)	11000 mL (2.9 GAL)

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Other Pump ____
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Other Pump ____
Did well go dry? Yes (No)
Water Quality Meter Type: ~~YSI 650 MDS~~ Horiba U-22 w/ flow through cell

SAMPLING INFORMATION

Analyses: (PCBs - Total)
PCBs - Dissolved

Sample ID: W240BB
Sample Time: 0910
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	0720 1 Initial	0730 2	0740 3	0750 4	0800 5	0810 6	0820 7	0830 8	0840 9
Volume Purged ~~(gal)~~ (mL)	Initial	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	15.92	15.86	15.86	15.86	15.86	15.86	15.86	15.86	15.86
Temperature (°C)	11.37	10.61	10.06	9.80	9.98	10.18	9.91	10.09	10.15
pH	7.75	7.84	7.86	7.88	7.89	7.89	7.91	7.91	7.92
Conductance (mS/cm)	1.61	1.61	1.60	1.59	1.59	1.59	1.58	1.59	1.59
Dissolved Oxygen mg/L)	6.09	3.62	NA	NA	NA	NA	NA	NA	NA
Turbidity (NTU)	23.4	6.2	3.2	3.4	2.8	1.4	2.2	1.3	1.2
ORP (mV)	-50	-71	-74	-77	-78	-78	-76	-75	-78

NOT ABLE TO FINISH CORRECTLY DUE TO AIR BUBBLES COMING IN PROBE

Time / Parameter	0850 10	0900 11	0910 12	13	14	15	16	17	18
Volume Purged (gal)	9000	10000	11000						
Depth to Water (ft. TIC)	15.36	15.36	15.36						
Temperature (°C)	10.06	10.03	10.05						
pH	7.92	7.93	7.93						
Conductance (mS/cm)	1.58	1.58	1.58						
Dissolved Oxygen mg/L)	NA	NA	NA						
Turbidity (NTU)	1.1	1.2	1.1						
ORP (mV)	-77	-77	-76						

SAMPLE DESTINATION

Laboratory: Severn Trent (STL) Sample was shipped day of sampling
Shipped Via: (Federal Express) Other: ____ sent on 11/16/00
Chain of Custody Signed By: RDK

MISCELLANEOUS OBSERVATIONS/PROBLEMS

STARTED PUMPING 0715
- INITIAL PURGE H2O OPAQUE, SLIGHTLY TURBID, ODORLESS
- SAMPLED CLEAR, COLORLESS, ODORLESS
- TUBING INSTALLED ON 11/10/00 2.5' FROM BOTTOM
MDEQ SPLIT FOR TOTAL PCBS "AMW-2"

KRSG Willow Blvd / A-Site — Site

November 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / DG
Job Number: 645.81.207 /645.82.207
Weather: OVERCAST, WINDY, 30°F

Well ID. (W)MW-2
Date: 11/15/00
Time In: 0950 **Time Out:** 1215

WELL INFORMATION

		TIC	TOC	BGS
Depth to Water	(feet)	9.12'	—	—
Total Depth	(feet)	18.80	—	—

check where appropriate

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other: ____

WELL WATER INFORMATION

Length of Water Column:	(feet)	9.68
Volume of Water in Well:	(gal)	1.6 Gal
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	90
Total Volume Removed:	(gal)	9000 ml / 2.4 gal

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L =3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos — Other Pump ____
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos — Other Pump ____
Did well go dry? Yes (No)
Water Quality Meter Type: ~~YSI 556 MDS~~ HORIBA U-22 w/ flow through cell

SAMPLING INFORMATION

Analyses:
(PCBs - Total)
PCBs - Dissolved

Sample ID: W74089
Sample Time: 1130
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	1 (1003) Initial	2 (1010)	3 (1020)	4 (1030)	5 (1040)	6 (1050)	7 (1100)	8 (1110)	9 (1120)
Volume Purged ~~(gal)~~	INITIAL	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	9.40	9.19	9.19	9.19	9.19	9.19	9.19	9.19	9.19
Temperature (°C)	12.59	12.49	12.13	12.02	12.03	12.04	12.11	12.14	12.06
pH	8.40	8.43	8.42	8.42	8.42	8.41	8.39	8.39	8.38
Conductance (mS/cm)	0.840	0.881	0.881	0.828	0.879	0.828	0.828	0.877	0.877
Dissolved Oxygen mg/L)	8.81	7.20	3.47	1.93	1.08	0.55	0.15	0.02	0.00
Turbidity (NTU)	1.6	1.2	0.8	0.4	0.6	0.3	0.1	0.7	0.3
ORP (mV)	-34	-68	-78	-84	-87	-90	-92	-93	-94

Time / Parameter	10 (1130)	11	12	13	14	15	16	17	18
Volume Purged (gal)	9000								
Depth to Water (ft. TIC)	9.19								
Temperature (°C)	12.02								
pH	8.40								
Conductance (mS/cm)	0.877								
Dissolved Oxygen mg/L)	0.00								
Turbidity (NTU)	0.4								
ORP (mV)	-95								

SAMPLE DESTINATION

Laboratory: Severn Trent (STL) — Sample was shipped day of sampling
Shipped Via: (Federal Express) Other: ____ — sent on 11/16/00 — Chain of Custody Signed By: RDD

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- TUBING INSTALLED 11/14/00 2.5' from BOTTOM
- STARTED PUMPING @ 1000
- INITIAL PURGE H2O CLEAR, COLORLESS, ODORLESS
- SAMPLED CLEAR, COLORLESS, ODORLESS

MS/MSD SPLIT FOR TOTAL PCBs "WMW-2"

BL
BARLAND BOCHNER LEE, INC.
engineers & scientists
6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROJ. NO. (645-81-20) (645-82-20)
PROJECT NAME: KRSG Tonawanda / A-Site Groundwater Pumping
SAMPLERS: (Signature)

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	Number of Containers	PAH (TOTAL)						REMARKS
AMW-6B	11/17/00	0915		X	W74105	2	X						- All samples preserved @ 4°C
AMW-6A	11/17/00	0925		X	W74104	2	X						- Please analyze as per KRSG QAPP
WMW-1A	11/17/00	1230		X	W74110	2	X						- Please send analytical results to
AMW-5	11/17/00	1510		X	W74108	2	X						Bill McCue / Dave Cay c/o BBL
Rinse Blank	11/17/00	1700		X	W74111 (Rinse Blank)	2	X						6723 Towpath Road
AMW-1	11/20/00	0915		X	W74106	2	X						Syracuse NY 13214
AMW-4	11/20/00	0920		X	W74107	2	X						- Standard turnaround
AMW-3	11/20/00	1220		X	W74112	2	X						
AMW-3A	11/20/00	1215		X	W74113	2	X						
WMW-1	11/20/00	1350		X	W74109	2	X						

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	Relinquished by: (Signature)	DATE	TIME	Relinquished by: (Signature)
	11/20/00	1500					
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:
						FED-X AIRBILL #: 823750545900

10/23/95
5951188L.CDR

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

BL
BASLAND, BOUCK & LEE, INC.
engineers & scientists
6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROJ. NO. 045-81-207 045-82-207
PROJECT NAME: KRSG [illegible] BLDG / A-[illegible] GROUNDWATER SAMPLING
SAMPLERS: (Signature) [illegible] (Thomas A. King)

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	Number of Containers	PCB (TOTAL)	MC/MED					REMARKS
AMW-2	11/15/00	0710		X	W74088	2	2						- All samples preserved @ 4°C
WMW-2	11/15/00	1130		X	W74089	2	2						- Place analytical [illegible]
AMW-10B	11/15/00	1600		X	W74092	6	2	4					- Place [illegible] analytical [illegible]
AMW-10A	11/15/00	1610		X	W74090	2	2						Bill McCune / Dan Lang c/o IAL
—	11/15/00	1645		X	W74091	2	2						Blind Duplicate of W74090 "AMW-10A"
WMW-4A	11/16/00	1000		X	W74093	2	2						6723 Towpath Rd
WMW-4B	11/16/00	1000		X	W74094	2	2						Syracuse N.Y. 13214
WMW-3	11/16/00	1320		X	W74015	2	2						- Standard T.A.T. Around
WMW-3A	11/16/00	1520		X	W74016	6	2	4					
—	11/16/00	1400		X	W74017	2	2						Blind Duplicate of W74095 "WMW-3"

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	Relinquished by: (Signature)	DATE	TIME	Relinquished by: (Signature)
[signature]	11/16/00	1700					
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: FED-X AIRBILL #: 823750545944	

10/23/95
5951188L.CDR

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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BASLAND, BOLLER & ASSOCIATES, INC.
engineers & scientists
6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROJ. NO.: 645-81(30) 645-82(30)
PROJECT NAME: KRS Williams Avenue / A-Site Groundwater Sampling
SAMPLERS: (Signature) (Randy D. Kraus)

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	Number of Containers	PBS (TAT)						REMARKS
AMW-7B	11/7/00	0820		X	W074099	2	2						- All samples preserved @ 4°C
AMW-9A	11/7/00	0730		X	W074098	2	2						- Please analyze as per KRS QAPP
AMW-7A	11/7/00	1325		X	W074100	2	2						- Please send analytical results to
AMW-7B	11/7/00	1330		X	W074101	2	2						Bill McLaw / Dave Cay c/o BBL
													6723 Towpath Road
													Syracuse NY 13214
													- Standard Turnaround

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	Relinquished by: (Signature)	DATE	TIME	Relinquished by: (Signature)
[signature]	11/7/00	1700					
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: FedEx Airbill #: 823750545922	

10/23/95
5951188L.CDR

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

BASLAND, BOUCK & LEE, INC.
engineers & scientists
6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROJ. NO. 645-81-202 645-8-202
PROJECT NAME: KRS6 WYLDWOOD PLUS / A-SITE GROUNDWATER SAMPLING
SAMPLERS: (Signature)

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	Number of Containers	KBS (TOTAL)						REMARKS
AMW-8B	11/8/00	1130		X	W74103	2	2						- ALL SAMPLES PRESERVED @ 4°C
AMW-8A	11/8/00	1132		X	W74102	2	2						- PLEASE ANALYZE AS PER KRS6 QAPP
													- PLEASE FAX ANALYTICAL RESULTS TO
													BILL McCLURE / DAN CLAY C/O BBL
													6723 TOWPATH ROAD
													SYRACUSE NY 13214
													- STANDARD TURNAROUND

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	Relinquished by: (Signature)	DATE	TIME	Relinquished by: (Signature)
	11/8/00	1100					
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: FED-X AIRBILL #: 823750545911	

10/23/95
5951188L.CDR

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

6/22/00 WILLOW BLVD / A-SITE MW EVALUATION (RK)

WILLOW BLVD

WELL	▽ TIC	DEPTH (TIC)	COMMENTS
WMW-1	5.19	14.43	- NEED NEW LOCK - BOTTOM SOLID
WMW-2	9.05	18.67	- NEED NEW LOCK - BOTTOM SOLID - NEED REISSUE EXTENSION / NEW PRO-COVER
WMW-3	12.82	37.89	- NEED NEW LOCK - BOTTOM SOLID
WMW-1A	6.11	10.22	- NEED NEW LOCK - BOTTOM SOLID - NO J-PLUG
WMW-3A	14.22	28.20	- PROCESSING SCHEMA ON TOP OF WELL - WELL OBSTRUCTION @ 14.25 (TIC)
WMW-4A	DRY??	NA	- NEED NEW LOCK - NO J-PLUG
WMW-4B	17.67	32.33	- NEED NEW LOCK - BOTTOM SOFT
WMW-3 (ARD)	14.00	25.20'	- NEED NEW LOCK - BOTTOM SOLID - GOOD SHAPE

A-SITE

WELL	▽ (TIC)	DEPTH (TIC)	COMMENTS
AMW-1	17.44	28.54	- NEED NEW LOCK - BOTTOM MOD. SOFT
AMW-2	15.63	26.57	- NEED NEW LOCK - BOTTOM MOD. SOFT
AMW-3	9.33	20.20	- NEED NEW LOCK - BOTTOM SOLID
AMW-4	14.95	24.47	- NEED NEW LOCK - BOTTOM MOD. SOFT
AMW-5	CAN NOT OPEN WELL, HAS		- NEED NEW LOCK GALVANIZED SCHEMA ON TOP, NEED CLOSE REMARKS - COULD NOT GET ACCURATE ▽, HIGHLY CONTAMINATED??
AMW-6A	NA	22.65	- BOTTOM SOFT - NEED NEW LOCK
AMW-6B	17.09	32.31	- NEED NEW LOCK - BOTTOM SOFT - PRO-CASING SETTLED ON WELL
AMW-7A	21.89	33.12	- NEED NEW LOCK - PRO CASING SETTLED ON WELL - BOTTOM MOD SOFT
AMW-7B	20.90	40.24	- NEED NEW LOCK - BOTTOM SOLID
AMW-8A	27.48	38.01	- NEED NEW LOCK - BOTTOM MOD. SOFT - STICKUP CURRENTLY ~5' AGS. (OK HAD TO REMOVE PRO-COVER. (IE LAND SETTLED ~2')
AMW-8B	27.25	43.24	- NEED NEW LOCK - STICKUP CURRENTLY ~5' AGS. NEED TO CUT DOWN WELL, DESTROY NEW PRO-CASING, RE-SURVEY SAME
AMW-9B	27.31	43.85	- NEED NEW LOCK - NEED TO CUT DOWN WELL, NEW PRO-CASING; AND - STICKUP ~5' AGS BOTTOM MOD SOFT
~~AMW-9B~~ AMW-9A	26.98	33.35	- NEED NEW LOCK - BOTTOM MOD SOFT - GROUND SETTLED ~2'

6/22/00 WILLOW BLVD / A-SITE MW EVALUATION (RK)

A-SITE CONT.

WELL	▽ (TIC)	DEPTH (TIC)	COMMENTS
AMW-10A	NA	35.25	- NEED NEW LOCK - VENTING GAS BLAW - BOTTOM MOD SOFT
AMW-10B	29.01	45.24	- NEED NEW LOCK - BOTTOM SOFT - BOTTOM SOLID FLUSHMOUNT
AMW-3A	5.53'	9.25'	- GOOD CONDITION - BOTTOM SOLID
AMW-6P	7.09	12.33	- NEED NEW LOCK - NEED NEW LOCK - BOTTOM SOLID
AMW-7P	9.68	15.23	- NEED NEW LOCK - WELL VENTING GAS - GROUND SETTLED ~2' - ▽ NA DUE TO GAS VENTING
AMW-9P	NA	19.00	- NEED NEW LOCK - BOTTOM SOLID
AMW-10P	7.27	19.33	
P-1P	- WELL DAMAGED (EXCAVATED AROUND WELL, WELL BENT OVER IN MAT VERY TO ~ 2-3' BGS. *EASILY REPAIRABLE)		
P-1RS	- DRY @ 11.48' (TIC)		NEEDS NEW LOCK
P-2D	14.95	15.27	- NEED NEW LOCK - BOTTOM SOLID
P-2RS	13.45	13.85	- NEED NEW LOCK - PRO-CASING SETTLED ON WELL - BOTTOM SOFT
P-3D	11.63	11.92	- NEED NEW LOCK - BOTTOM SOLID
P-3RS	11.48	11.56	- NEED NEW LOCK - BOTTOM SOLID
P-4WT	4.09	13.95	- NEED NEW LOCK - BOTTOM SOLID
P-5WT	- COULD NOT FIND		

6/20/00 DAILY LOG (RJK)

WEATHER: SUNNY, ~75°F

0630 RJK ON SITE @ K-200 OFFICE. ADK PREPARES FOR TODAY'S MONITORING WELL EVALUATIONS @ WILLOW BLVD / A-SITE. ADDITIONALLY, RJK COPIES & FAXES WATER MAPS, GWE-4, MW-30R & OW-5PR LOGS TO JEN SMADOFF.

1300 RJK COMPLETES MONITORING WELL EVALUATIONS @ A-SITE / WILLOW BLVD.

1300-1700 RJK PACKS EQUIPMENT FROM PUMP TESTS & SHIPS OFF VIA FED EX.

1700 RJK OFF SITE

10 SHRS

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

SUBJECT	PROJ. NO.	BY	DATE	SHEET
Willow Blvd/A Site Sitewide water levels				

CALCS. BY RDK, NCZ; DATE 10/30/00 CHECKED BY _____; DATE _____

WILLOW BLVD

WELL	∇ (TIC)	COMMENTS
WMW-1	5.55	
WMW-2	9.73	— needs new J-plug.
WMW-3	13.80	
WMW-1A	6.57	
WMW-3A	14.92	
WMW-4A	18.22	— cut 0.21' off of riser. — New Elevation needed. Needs a new J-plug.
WMW-4B	18.50	
WMW-3-CASED	14.75	

A-SITE

WELL	∇ (TIC)	COMMENTS
AMW-1	18.06	- need torch to cut pro-casing off. will do on Nov. 1, needs J-plug.
AMW-2	16.31	— needs new J-plug.
3	9.44	
AMW-4	15.57	— needs new J-plug.
AMW-5	—	Can't access - Can't unscrew cap. Will be repaired on Nov. 1.
AMW-6A	~16.95	Hard to get accurate level due to off-gassing. Removed Pro-Casing
AMW-6B	17.80	- Removed Pro-cover (sitting on well), needs new J-plug.
AMW-7A	21.21	- Removed Pro-Cover & cut down riser 1.09'. Needs new J-plug.
AMW-7B	20.52	- Removed Pro-cover & cut down riser 1.03'.
AMW-8A	25.86	- removed Pro-cover & cut down riser 2.15'. Needs new locking J-plug.
AMW-8B	25.45	- Removed Pro-cover & cut down riser 2.34'. Needs new locking J-plug.
AMW-9B	25.53	- Removed Pro-cover & cut down riser 2.10'. Needs new J-plug.
AMW-9A	25.22	- Removed Pro-cover & cut down riser 2.07'. Needs new J-plug.
AMW-10A	~27.85	- OFF-GASSING - Hard to get accurate reading/water level.
AMW-10B	29.40	
AMW-3A	NA	NO FISHING TOOLS
AMW-6P	7.64	
AMW-7P	10.44	
AMW-9P	8.87	- Removed Pro-casing & cut down riser 1.28'. Needs new J-plug.
AMW-10P	7.48	

WELL	∇ (TIC)	COMMENTS
P-1D	-	DAMAGED
P-1RS	11.50	- DRY
P-2D	14.97	Total depth - 15.28. Probably just water in sump
P-2RS	13.47	Total depth - 13.50. Prob. just water in sump.
P-3D	11.64	Total depth - 11.92. Prob. just water in sump.
P-3RS	11.49	Total depth: 11.55. Prob. just water in sump, needs J-plug
P-4WT	4.40	
P-5WT	CANNOT FIND	

* NEED NEW REFERENCE ELEVATION

MONITORING WELLS

PROJECT: WILLOW BOULEVARD
JOB NO.: 645.81.675
DATE: 12/20/2000

Note: Elevations based on National Geodetic Vertical Datum of 1929.

DESCRIPTION	ELEVATION			REMARKS
	TOP OF PROTECTIVE CASING	TOP OF WELL	GROUND	
AMW-3A	765.78'	765.54'	765.8'	
AMW-6A		774.13'	771.1'	
AMW-8A		783.36'	780.0'	
AMW-10A		787.57'	784.8'	
AMW-10B		787.99'	785.1'	

12/21/00 NCZ, SCK

TUBING ONLY
- AMW-3A → Need shove 19 pols.
- AMW-4 ✓ → GO BACK OK
- AMW-6A ✓ → GO BACK OK

PUMP
- AMW-8A ✓
- AMW-9A → need more tubing
- AMW-10A ✓
- AMW-10B → NEED MORE TUBING

TO DAVE LAY:

DAVE - I'M GOING BACK TOMORROW + GET SG-1R, AMW-4, SG-2R, WMW-3AR WATER LEVELS. I still need to put the pumps into AMW-9A & 10B & Tubing into 3A. Let me know if you need anything else while I'm out there (I'm going out there btw 8 & 9AM)

NICOLE

12/21/00 WILLOW BLVD/A-SITE SITEWIDE WATER LEVELS

WILLOW BLVD

WELL	∇ (TIC)	COMMENTS
WMW-1	7.80	
WMW-2	CANT FIND	
WMW-3	13.21	
WMW-1A	6.21	
WMW-3A	14.45	
WMW-4A	17.70	
WMW-4B	18.00	
WMW-3AR	— LOCK FROZEN	

A-SITE

WELL	∇ (TIC)	COM.	WELL	∇ (TIC)	COMMENTS
AMW-1	16.03		AMW-3A	→ GO BACK w/ Tool & Shovel	
AMW-2	15.95		AMW-8P	7.37	
AMW-3	9.32		AMW-7P	8.81	
AMW-4	15.19		AMW-9P	9.49	OFF GAS & BUBBLING
AMW-5	17.71		AMW-10P	8.10	
AMW-6A	~16	bubbling off gas	P-1D	[illegible]	
AMW-6B	17.38		P-1RS	DRY @ 11.50	
AMW-7A	20.92		P-2D	14.61	
AMW-7B	20.15		P-2RS	13.61	
AMW-8A	25.51		P-3D	11.66	
AMW-8B	25.12		P-3RS	Dry @ 11.40	
AMW-9A	CANT REMOVE CAP		P-4WT	4.10	
AMW-9B	25.31		P-5WT	CANNOT FIND	
AMW-10A	~17	bubbling off gas	RG-X2	1.55 top of ice	
AMW-10B	29.28		RG-X1	NEED LADDER 2/1/01 (CBL)	

ASG A-Site O.U. — Site

December 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / NLZ
Job Number: 645.81.207
Weather: OVERCAST, 20°F, SNOW

Well ID: MMW-8A
Date: 12/21/00
Time In: 0800 Time Out: 1300

WELL INFORMATION

		TIC	TOC	BGS
Depth to Water	(feet)	25.54	—	—
Total Depth	(feet)	35.85	—	—

check where appropriate

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other:

WELL WATER INFORMATION

Length of Water Column:	(feet)	10.31
Volume of Water in Well:	(gal)	1.76 gal
Pumping Rate of Pump:	(mL/min)	100 mL/min
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	190
Total Volume Removed:	(gal)	4.8

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer Peristaltic Grudfos (Bladder) Other Pump
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer Peristaltic Grudfos (Bladder) Other Pump

Did well go dry? Yes (No) Water Quality Meter Type: YSI w/ flow through cell

SAMPLING INFORMATION

Analyses: PCBs - Total

Sample ID: W74121
Sample Time: 1200
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	0900	0910	0920	0930	0940	0950	1000	1010	1020
	1 Initial	2	3	4	5	6	7	8	9
Volume Purged (gal)	1000	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	25.54	25.54	25.54	25.54	25.54	25.54	25.54	25.54	25.54
Temperature (°C)	15.30	14.21	12.52	11.46	10.85	10.24	12.40	14.14	14.89
pH	6.89	7.02	7.04	7.11	7.13	7.18	7.18	7.14	7.15
Conductance (mS/cm)	1.272	1.256	1.249	1.248	1.233	1.246	1.228	1.252	1.252
Dissolved Oxygen mg/L)	2.02	4.58	5.08	5.90	6.14	6.53	6.55	5.96	6.13
Turbidity (NTU)	970.0	148.6	105.3	84.1	69.9	56.6	49.2	32.7	26.2
ORP (mV)	217.1	196.9	185.2	125.1	169.4	165.0	162.5	152.9	150.3

Time / Parameter	1030	1040	1050	1100	1110	1120	1130	1140	1150	1200
	10	11	12	13	14	15	16	17	18	
Volume Purged (gal)	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000
Depth to Water (ft. TIC)	25.54	25.54	25.54	25.54	25.54	25.54	25.54	25.54	25.54	25.54
Temperature (°C)	14.83	15.11	14.82	15.04	15.04	14.92	14.76	14.88	14.94	15.04
pH	7.15	7.12	7.14	7.14	7.13	7.14	7.14	7.14	7.14	7.14
Conductance (mS/cm)	1.251	1.254	1.254	1.252	1.253	1.253	1.253	1.252	1.253	1.253
Dissolved Oxygen mg/L)	6.09	5.95	5.79	5.97	5.91	5.83	6.02	5.92	5.99	5.98
Turbidity (NTU)	18.8	18.7	17.8	15.6	13.6	9.3	3.2	2.9	0.8	0.8
ORP (mV)	141.6	136.3	132.8	128.6	125.6	123.5	122.5	120.9	119.7	119.2

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other: FED-EX AIRBILL # 8005 4284 4902

Sample was (shipped day of sampling) sent on ____

Chain of Custody Signed By: NLZ

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PUMPING @ 0850
- INITIAL PURGE H2O GRAY/BROWN, TURBID, ODORLESS
- BLADDER PUMP INSTALLED 2.5' FROM BOTTOM OF WELL ON 12/21/00
- MS/MSD SPLIT FOR TOTAL PCBS "OU2-MMW-8A"
- SAMPLES CLEAR, COLORLESS, ODORLESS
- RINSE BLANK W74122 COLLECTED USING BLADDER PUMP & DISTILLED H2O (1400)

L KLS

SG-1R 1.96
SG-2R 1.55 (KE)
MMW-4 15.29
MMW-3AR 14.31

RSG A-Site O.U. — Site

December 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / NLZ
Job Number: 645.81.207
Weather: SUNNY, CLEAR SKIES, -2°F

Well ID: AMW-9A
Date: 12/28/00
Time In: 0730 Time Out:

WELL INFORMATION (check where appropriate)

		TIC	TOC	BGS
Depth to Water	(feet)	25.07	—	—
Total Depth	(feet)	31.69	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other:

WELL WATER INFORMATION

Length of Water Column:	(feet)	6.22'
Volume of Water in Well:	(gal)	1 GAL
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	220 min
Total Volume Removed:	(gal)	5.5 GAL

Conversion Factors

gallons per foot of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer Peristaltic Grudfos (Bladder) Other Pump
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer Peristaltic Grudfos (Bladder) Other Pump
Did well go dry? Yes (No)
Water Quality Meter Type: YSI w/ flow through cell

SAMPLING INFORMATION

Analyses: PCBs - Total

Sample ID: W24119
Sample Time: 1720
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: 24
Total Bottles: 2

Time	1350	1400	1410	1420	1430	1452	1500	1510	1520
Parameter	1 Initial	2	3	4	5	6	7	8	9
Volume Purged (gal/ml)	DURING	1000	2000	3000	4000	6000	7000	8000	9000
Depth to Water (ft. TIC)	25.07	25.07	25.07	25.07	25.07	25.07	25.07	25.07	25.07
Temperature (°C)	14.98	14.21	8.76	13.16	9.38	14.11	12.78	11.13	11.28
pH	6.59	6.60	6.66	6.68	6.72	6.62	6.63	6.65	6.68
Conductance (mS/cm)	1.922	1.812	1.796	1.791	1.766	1.765	1.663	1.627	1.616
Dissolved Oxygen (mg/L)	2.19	2.10	3.67	2.80	2.77	2.73	1.75	1.82	2.09
Turbidity (NTU)	50.2	34.6	47.4	65.7	59.6	29.7	33.1	31.7	38.2
ORP (mV)	130.4	157.4	130.6	132.1	109.0	74.9	65.4	60.1	57.8

Time	1530	1540	1550	1600	1610	1620	1630	1640	1650	1700
Parameter	10	11	12	13	14	15	16	17	18	
Volume Purged (gal/ml)	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000
Depth to Water (ft. TIC)	25.07	25.07	25.07	25.07	25.07	25.07	25.07	25.07	25.07	25.07
Temperature (°C)	14.21	14.17	14.52	14.40	14.79	14.50	14.30	14.45	14.48	14.41
pH	6.66	6.68	6.72	6.68	6.70	6.66	6.67	6.68	6.69	6.69
Conductance (mS/cm)	1.609	1.579	1.546	1.568	1.520	1.501	1.473	1.470	1.462	1.459
Dissolved Oxygen (mg/L)	2.61	2.22	2.42	1.80	1.79	1.77	1.69	1.41	1.28	1.27
Turbidity (NTU)	42.2	22.3	22.7	17.0	21.3	18.9	14.4	13.8	12.7	12.5
ORP (mV)	67.6	65.7	50.2	32.7	28.2	19.6	10.9	5.3	-1.1	-4.8

CONTINUED ON BACK.....

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other: FEDEX AIRBILL # 8225 4284 4902
Sample was (shipped day of sampling) sent on 12/29/00
Chain of Custody Signed By: [signature]

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- CONDENSATION IN AIR LINE FROZE NOT ALLOWING AIR TO FLOW TO PUMP. TRIED USING TORCH TO THAW FROZEN H2O IN LINE, BEFORE TOO QUICKLY. ALSO, TOO COLD FOR PUMP CONTROLLER, NOT EXPELLING AIR.
- STARTED PUMPING @ 1340, USING PORTABLE KEROSENE HEATER TO KEEP EQUIPMENT WARM; AIRLINE OPERABLE
- INITIAL PURGE H2O BLACK, VERY TURBID, DROP w/ WHITE PARTICULATE (PROBABLY RESIN)
- GENERATOR COULD NOT HANDLE BOTH HEATER & COMPRESSOR, RAN TO GET BY WITH GAS. 1430
- SAMPLES GIVEN COLORS, SHIPPED.
- MDEQ SPLIT FOR TOTAL PCBS "OU2-AMW-9A"

e pump installed 2.5' from top of well on 12/22/00
Turbidity as low as reasonable after ~4 hr time frame

Continuation of AMW-9A

TIME PARAMETER	1710	1720						
VOL PURGED (gal)	20000	21000						
DEPTH TO ∇ (FTC)	25.07	25.07						
TEMP. (°C)	14.10	14.50						
pH	6.70	6.70						
COND (mS/cm)	1.450	1.452						
DO (mg/L)	1.34	1.33						
TURBIDITY (NTU)	12.5	12.6						
ORP (mV)	-7.0	-8.0						

SG A-Site O.U. — Site

December 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / NLZ
Job Number: 645.81.207
Weather: OVERCAST, SNOW, 15°F

Well ID: AMW-6A
Date: 12/21/00
Time In: 1530 Time Out: 1800

WELL INFORMATION

		TIC	TOC	BGS
Depth to Water	(feet)	16.70	—	—
Total Depth	(feet)	22.70	—	—

check where appropriate

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other:

WELL WATER INFORMATION

Length of Water Column:	(feet)	6.0'
Volume of Water in Well:	(gal)	1 GAL
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	120
Total Volume Removed:	(gal)	29 GAL

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

SAMPLING INFORMATION

Analyses: PCBs - Total

Sample ID: W24118
Sample Time: 1730
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Bladder Other Pump
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Bladder Other Pump

Did well go dry? Yes (No) Water Quality Meter Type: YSI w/ flow through cell

Time / Parameter	1 Initial	2	3	4	5	6	7	8	9
	1540	1550	1600	1610	1620	1630	1640	1650	1700
Volume Purged (gal)	INITIAL	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	~16.70	~16.70	~16.70	~16.70	~16.70	~16.70	~16.70	~16.70	~16.70
Temperature (°C)	10.54	12.84	13.06	13.01	13.01	13.01	12.80	13.05	13.07
pH	6.21	6.21	6.24	6.24	6.23	6.23	6.24	6.23	6.23
Conductance (mS/cm)	1.6480	1.6470	1.6464	1.6453	1.6447	1.6447	1.6444	1.6437	1.6435
Dissolved Oxygen mg/L)	0.36	0.22	0.22	0.20	0.20	0.20	0.21	0.20	0.27
Turbidity (NTU)	24.5	3.3	7.3	2.4	1.4	1.4	1.4	1.0	1.3
ORP (mV)	187.2	146.3	78.9	39.2	22.0	22.0	0.1	-7.9	-12.8

Time / Parameter	10	11	12	13	14	15	16	17	18
	1210	1220	1230						
Volume Purged (gal)	9000	10000	11000						
Depth to Water (ft. TIC)	~16.70	~16.70	~16.70						
Temperature (°C)	13.13	12.95	12.92						
pH	6.22	6.23	6.22						
Conductance (mS/cm)	1.6430	1.6430	1.6428						
Dissolved Oxygen mg/L)	0.30	0.34	0.32						
Turbidity (NTU)	0.9	0.6	0.5						
ORP (mV)	-16.1	-20.3	-23.2						

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other:
Fedex #: 8225 4284 4913

Sample was shipped day of sampling (sent on) 12/28/00

Chain of Custody Signed By: [signature]

MISCELLANEOUS OBSERVATIONS/PROBLEMS

WATER LEVELS
[illegible] 1.70
S6-2R 1.55 (ICE)
WMW-3AR 14.35
AMW-4 15.26

- WELL OFF GAS 26
- STARTED PUMPING @ 1530
- INITIAL PURGE H2O CLEAR, COLORLESS, ODOR, AIR BUBBLES
- MADE SPLIT SAMPLE FOR TOTAL PCBS "OU2-AMW-6A"
- SAMPLED CLEAR, COLORLESS, SLIGHT ODOR
- TUBING INSTALLED 2.5' FROM BOTTOM OF WELL ON 12/21/00

SG A-Site O.U. — Site

December 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / NLZ
Job Number: 645.81.207
Weather: Sunny, Cold Occs, -3°F

Well ID: AMW-4
Date: 12/28/00
Time In: 0905 Time Out: 1300

WELL INFORMATION (check where appropriate)

		TIC	TOC	BGS
Depth to Water	(feet)	15.31	—	—
Total Depth	(feet)	24.50	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other:

WELL WATER INFORMATION

Length of Water Column:	(feet)	9.19
Volume of Water in Well:	(gal)	1.5 GAL
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	
Minutes of Pumping:	(min)	115
Total Volume Removed:	(gal)	4.2 GAL

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer (Peristaltic) Grudfos Bladder Other Pump
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer (Peristaltic) Grudfos Bladder Other Pump

Did well go dry? Yes (No) Water Quality Meter Type: YSI w/ flow through cell

SAMPLING INFORMATION

Analyses: PCBs - Total

Sample ID: W74120
Sample Time: 1225
MS/MSD: Yes (No)
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 2

Time / Parameter	1 Initial	2 0955	3 1005	4 1015	5 1025	6 1035	7 1045	8 1055	9 1105
Volume Purged (gal)	Initial	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	15.31	15.31	15.31	15.31	15.31	15.31	15.31	15.31	15.31
Temperature (°C)	8.63 4.44	8.91	7.48	8.02	9.27	8.88	7.73	6.57	8.105
pH	6.63	6.68	6.68	6.62	6.69	6.65	6.66	6.69	6.68
Conductance (mS/cm)	1.634	1.605	1.643	1.639	1.632	1.616	1.605	1.604	1.603
Dissolved Oxygen mg/L)	3.86	0.70	0.88	0.88	0.97	0.83	0.66	0.67	0.64
Turbidity (NTU)	9.5	2.6	2.4	1.1	0.8	0.7	0.8	0.8	0.7
ORP (mV)	222.3	186.8	208.2	204.8	194.5	187.9	181.1	170.7	150.5

Time / Parameter	10 1115	11 1125	12 1135	13 1145	14 1155	15 1205	16 1215	17 1225	18
Volume Purged (gal)	9000	10000	11000	12000	13000	14000	15000	16000	
Depth to Water (ft. TIC)	15.31	15.31	15.31	15.31	15.31	15.31	15.31	15.31	
Temperature (°C)	9.64	9.31	9.53	9.28	9.97	9.48	10.10	10.82	
pH	6.67	6.68	6.60	6.66	6.66	6.69	6.69	6.77	
Conductance (mS/cm)	1.599	1.597	1.585	1.581	1.574	1.573	1.558	1.572	
Dissolved Oxygen mg/L)	0.56	0.55	0.54	0.52	0.52	0.54	0.54	0.48	
Turbidity (NTU)	0.8	0.5	0.4	0.6	0.4	0.5	0.5	0.5	
ORP (mV)	115.7	72.4	47.6	22.8	12.7	2.3	-4.5	-2.3	

SAMPLE DESTINATION

Laboratory: ~~Severn Trent (STL)~~
Shipped Via: (Federal Express) Other:
Sample was (shipped day of sampling) sent on
Chain of Custody Signed By:
Fed Ex # 8125 4281 4913

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PUMPING @ 0915, PROBLEMS W/ FT, SWITCHED TO NEW ONE
- STARTED PUMPING @ 0940
- TUBING INSTALLED 2.5' FROM BOTTOM OF WELL ON 12/21/00
- INITIAL PURGE 1120 CLEAR, COLORLESS, ODORLESS
- MDEQ SPLIT SAMPLE FOR TOTAL PCBS "OU2-AMW-4"
- SAMPLED CLEAR, COLORLESS, ODORLESS

u RLS
5-1K 1.70
5-2R 1.55(cm)
MW-4 15.31
MW-3AR 14.40

RSG A-Site O.U. — Site

December 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / NLZ
Job Number: 645.81.207
Weather: OVERCAST, LIGHT SNOW, 50F

Well ID: AMW-10B
Date: 12/22/00
Time In: 1140 Time Out: 1515

WELL INFORMATION

		TIC	TOC	BGS
Depth to Water	(feet)	29.27	—	—
Total Depth	(feet)	45.12	—	—

check where appropriate

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other:

WELL WATER INFORMATION

Length of Water Column:	(feet)	15.85
Volume of Water in Well:	(gal)	2.6 GAL
Pumping Rate of Pump:	(mL/min)	100
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	130
Total Volume Removed:	(gal)	3.17

Conversion Factors

gallons per foot of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer Peristaltic Grudfos (Bladder) Other Pump
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer Peristaltic Grudfos (Bladder) Other Pump
Did well go dry? Yes (No)
Water Quality Meter Type: YSI w/ flow through cell

SAMPLING INFORMATION

Analyses: PCBs - Total
Sample ID: W241117
Sample Time: 1400
MS/MSD: (Yes) No
Duplicate: Yes (No)
Duplicate ID: NA
Total Bottles: 6

Time	1200	1210	1220	1230	1240	1250	1300	1310	1320
Parameter	1 Initial	2	3	4	5	6	7	8	9
Volume Purged (gal)	INITIAL	1000	2000	3000	4000	5000	6000	7000	8000
Depth to Water (ft. TIC)	29.27	29.27	29.27	29.27	29.27	29.27	29.27	29.27	29.27
Temperature (°C)	8.35	10.25	9.90	9.29	8.88	9.08	8.56	8.25	10.17
pH	7.13	7.15	7.14	7.14	7.14	7.13	7.13	7.12	7.12
Conductance (mS/cm)	1.278	1.314	1.315	1.314	1.309	1.298	1.301	1.287	1.294
Dissolved Oxygen mg/L)	0.64	0.38	0.28	0.27	0.27	0.27	0.26	0.26	0.22
Turbidity (NTU)	35.9	7.6	13.25	1.6	1.3	0.9	0.8	0.5	0.7
ORP (mV)	134.2	61.2	13.7	-20.8	-35.8	-47.6	-54.8	-59.5	-66.3

Time	1330	1340	1350	1400					
Parameter	10	11	12	13	14	15	16	17	18
Volume Purged (gal)	9000	10000	11000	12000					
Depth to Water (ft. TIC)	29.27	29.27	29.27	29.27					
Temperature (°C)	10.21	10.23	9.08	8.51					
pH	7.13	7.13	7.13	7.13					
Conductance (mS/cm)	1.298	1.299	1.293	1.295					
Dissolved Oxygen mg/L)	0.19	0.19	0.21	0.23					
Turbidity (NTU)	1.0	1.0	0.8	0.8					
ORP (mV)	-74.5	-80.4	-82.8	-84.3					

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other:
Sample was (shipped day of sampling) sent on
Chain of Custody Signed By: RDK
AIRBILL # 8236 0387 2503

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PUMPING @ 1150
- INITIAL PURGE H2O SLIGHTY TURBID, COLORLESS, VERY SLIGHT ODOR
- BLADDER PUMP DISTANCE 2.5' FROM BOTTOM OF WELL ON 12/22/00
- MADE SPLIT SAMPLE FOR TOTAL PCBS "002-AMW-10B"
- SAMPLED CLEAR, COLORLESS, SLIGHT ODOR

RSG A-Site O.U. — Site

December 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / NLZ
Job Number: 645.81.207
Weather: Overcast, light snow, 15°F

Well ID: MW-10A
Date: 12/22/00
Time In: 0930 Time Out: 1190

WELL INFORMATION (check where appropriate)

		TIC	TOC	BGS
Depth to Water	(feet)	28.27	—	—
Total Depth	(feet)	35.26	—	—

Well Type: Flushmount (Stick-Up)
Well Locked: (Yes) No
Measuring Point Marked: (Yes) No
Well Diameter: 1" (2") Other:

WELL WATER INFORMATION

Length of Water Column:	(feet)	6.99
Volume of Water in Well:	(gal)	1.14
Pumping Rate of Pump:	(mL/min)	80
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	1165
Total Volume Removed:	(gal)	3.17

Conversion Factors

gallons per feet of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer Peristaltic Grudfos (Bladder) Other Pump
Tubing Used: Teflon (Polyethylene (LDPE))
Sampling Method: Bailer Peristaltic Grudfos (Bladder) Other Pump

Did well go dry? Yes (No)
Water Quality Meter Type: YSI w/ flow through cell

SAMPLING INFORMATION

Analyses: PCBs - Total

Sample ID: W24115
Sample Time: 1035
MS/MSD: Yes (No)
Duplicate: (Yes) No
Duplicate ID: W24116
Total Bottles: 4

Time	0805	0815	0825	0835	0845	0855	0905	0915	0925
Parameter	1 Initial	2	3	4	5	6	7	8	9
Volume Purged ~~(gal)~~ ml	Initial	800	1600	2400	3200	4000	4800	5600	6400
Depth to Water (ft. TIC)	28.27	28.27	28.27	28.27	28.27	28.27	28.27	28.27	28.27
Temperature (°C)	8.17	4.38	6.26	7.18	7.11	7.02	7.31	6.25	4.86
pH	6.23	6.216	6.40	6.47	6.51	6.57	6.61	6.64	6.666
Conductance (mS/cm)	1.005	1.016	0.965	0.991	0.989	0.991	0.999	1.005	1.006
Dissolved Oxygen mg/L)	1.19	0.53	0.48	0.59	0.48	0.45	0.47	0.57	0.42
Turbidity (NTU)	236.2	24.8	52.3	7.3	4.1	3.1	2.3	1.0	1.5
ORP (mV)	245.8	244.7	236.1	225.3	222.1	219.1	215.5	213.2	212.5

Time	0935	0945	0955	1005	1015	1025	1035		
Parameter	10	11	12	13	14	15	16	17	18
Volume Purged ~~(gal)~~ ml	7200	8000	8800	9600	10400	11200	12000		
Depth to Water (ft. TIC)	28.27	28.27	28.27	28.27	28.27	28.27	28.27		
Temperature (°C)	5.96	6.45	4.83	4.16	4.91	4.44	4.68		
pH	6.67	6.69	6.70	6.72	6.72	6.74	6.76		
Conductance (mS/cm)	1.016	1.002	1.018	1.021	1.010	1.013	1.018		
Dissolved Oxygen mg/L)	0.45	0.45	0.47	0.50	0.39	0.42	0.37		
Turbidity (NTU)	1.5	1.0	1.4	1.7	1.0	0.7	0.8		
ORP (mV)	209.4	206.4	203.8	201.5	197.1	194.6	191.8		

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: (Federal Express) Other:
Airbill #: 8236 0382 2503

Sample was (shipped day of sampling) sent on

Chain of Custody Signed By: (DK)

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PUMPING @ 0930
- INITIAL PURGE HAD CLEAR, COLORLESS, ODOR w/ BLACK PARTICULATES IN WATER
- BLADDER PUMP INSTALLED 2.5' FROM BOTTOM ON 12/21/00
- HAD PROBLEMS w/ FLOW RATE STEADILY DECREASING OVER TIME. COMPENSATED FOR LOSS IN FLOW BY INCREASING PSI ON BLADDER PUMP CONTROLLER. POSSIBLE SEDIMENT/SILT BUILDUP @ PUMP DISCHARGE.
- SAMPLED CLEAR, COLORLESS w/ODOR
- INSTALL AFF-GASING

NDEQ SPLIT SAMPLE FOR TOTAL PCBS "OU2-MW-10A"

SG A-Site O.U. — Site

December 2000 — Event

GROUND-WATER SAMPLING LOG

Sampling Personnel: RDK / NLZ
Job Number: 645.81.207
Weather: OVERCAST, ~15°F

Well ID: AMW-3A
Date: 12/26/00
Time In: 1435 Time Out: 1735

WELL INFORMATION (check where appropriate)

		TIC	TOC	BGS
Depth to Water	(feet)	5.56	—	—
Total Depth	(feet)	9.30	—	—

Well Type: Flushmount Stick-Up
Well Locked: Yes No
Measuring Point Marked: Yes No
Well Diameter: 1" 2" Other:

WELL WATER INFORMATION

Length of Water Column:	(feet)	3.74
Volume of Water in Well:	(gal)	0.6 GAL
Pumping Rate of Pump:	(mL/min)	120
Pumping Rate of Pump:	(GPM)	—
Minutes of Pumping:	(min)	135
Total Volume Removed:	(gal)	4.12 GAL

Conversion Factors

gallons per foot of water column:	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 mL = 0.1337 cubic ft.

Unit Stability

pH	DO	Cond	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

EVACUATION INFORMATION

Evacuation Method: Bailer Peristaltic Grudfos Bladder Other Pump
Tubing Used: Teflon Polyethylene (LDPE)
Sampling Method: Bailer Peristaltic Grudfos Bladder Other Pump

Did well go dry? Yes No

Water Quality Meter Type: YSI w/ flow through cell

SAMPLING INFORMATION

Analyses: PCBs - Total

Sample ID: (A)24114
Sample Time: 1200
MS/MSD: Yes No
Duplicate: Yes No
Duplicate ID:
Total Bottles: 2

Time / Parameter	1452 Initial	1500	1510	1520	1530	1540	1550	1600	1610
	1	2	3	4	5	6	7	8	9
Volume Purged (gal)	INITIAL	1200	2400	3600	4800	6000	7200	8400	9600
Depth to Water (ft. TIC)	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56
Temperature (°C)	8.40	8.67	8.60	8.61	8.86	8.82	8.60	8.65	8.65
pH	6.89	6.98	7.02	7.10	7.10	7.15	7.20	7.19	7.19
Conductance (mS/cm)	1.434	1.177	1.047	0.987	0.951	0.925	0.906	0.892	0.892
Dissolved Oxygen (mg/L)	1.20	0.96	0.77	0.60	0.55	0.57	0.56	0.53	0.53
Turbidity (NTU)	26.5	13.0	4.9	2.5	1.0	1.0	0.9	0.6	0.6
ORP (mV)	221.5	242.5	207.5	196.0	189.7	182.1	173.3	165.1	169.9

Time / Parameter	1620	1630	1640	1650	1700				
	10	11	12	13	14	15	16	17	18
Volume Purged (gal)	10800	12000	13200	14400	15600				
Depth to Water (ft. TIC)	5.56	5.56	5.56	5.56	5.56				
Temperature (°C)	8.60	8.66	8.57	8.58	8.55				
pH	7.18	7.21	7.22	7.21	7.21				
Conductance (mS/cm)	0.873	0.867	0.862	0.859	0.856				
Dissolved Oxygen (mg/L)	0.49	0.48	0.48	0.50	0.49				
Turbidity (NTU)	0.5	0.6	0.5	0.9	0.4				
ORP (mV)	149.0	140.9	129.5	116.1	101.4				

SAMPLE DESTINATION

Laboratory: Severn Trent (STL)
Shipped Via: Federal Express Other:
Sample was shipped day of sampling sent on 12/27/00
Chain of Custody Signed By: RDK
AIRBILL #: 8236 0357 2303

MISCELLANEOUS OBSERVATIONS/PROBLEMS

- STARTED PUMPING @ 1445
- TUBING INSTALLED 1' FROM BOTTOM of WELL ON 12/22/00
- INITIAL PURGE H2O CLEAR, COLORLESS, SLIGHT ODOR
- SAMPLED CLEAR, COLORLESS, SLIGHT ODOR
- MADE SPLIT SAMPLE FOR TOTAL PCBS "OU2-AMW-3A"

WL LEVELS 12/26/00

	1.64 (BL)
1R	1.64
2R	1.55 (BL)
W-3AR	14.24
W-4	15.13

BP
BLASLAND, BOUCK & LEE, INC.
engineers & scientists
6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

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CHAIN OF CUSTODY RECORD

PROJ. NO.: (645.B1.20)
PROJECT NAME: KRSG A-Site Groundwater Sampling
SAMPLERS: (Signature)

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	Number of Containers	PCBs (TOTAL)							REMARKS
AMW-9A	12/28/00	1720		X	W74119	2	X							- All Samples Preserved @ 4°C
AMW-8A	12/29/00	1200		X	W74121	2	X							- Please Analyze as per KRSG QAPP
Rinse Blank	12/29/00	1400		X	W74122	2	X							- Please Send Analytical Results to
														Bill McGuire c/o BBL
														6723 Towpath Road
														Syracuse, N.Y. 13214

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	Relinquished by: (Signature)	DATE	TIME	Relinquished by: (Signature)
	12/29/00	1700					
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: FED-X AIRBILL # 8225 4284 4902	

10/23/95
5951188L.CDR

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

BBL
BARTON & BLOOD, LTD. engineers
BBL INC. scientists
6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

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CHAIN OF CUSTODY RECORD

PROJ. NO.: 5951-202
PROJECT NAME: KRSG A-Site Groundwater Sampling
SAMPLERS: (Signature)

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	PCBs (TOTAL)	REMARKS
AMW-6A	12/7/00	0930		X	W74118	X	- All Samples Preserved @ 4°C
AMW-4	12/7/00	0925		X	W74120	X	- Please Analyze As Per KRSG QAPP
							- Please Send Analytical Results To
							Bill McCue c/o BBL
							6723 Towpath Road
							Syracuse, N.Y. 13214

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	Relinquished by: (Signature)	DATE	TIME	Relinquished by: (Signature)
	12/7/00	1800					
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: Fed-X Air Bill #: 822542844913	

10/23/95
5951188L.CDR

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

BL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists
6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROJ. NO.: 64581-207
PROJECT NAME: KRSG A-Site Groundwater Sampling
SAMPLERS: (Signature)

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	PCBs-TOTAL	MS/MSD					REMARKS
MW-3A	12/26/00	1700		X	W74114	X						- All samples preserved 4°C
MW-10A	12/27/00	1035		X	W74115	X						- Please analyze as per KRSG QAPP
DUP	12/27/00	—		X	W74116 Blind Duplicate of W74115	X						- Please send analytical results to
MW-10B	12/27/00	1400		X	W74117	X	X					Bill McCune c/o BBL
												6723 Towpath Road
												Syracuse NY 13214

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	Relinquished by: (Signature)	DATE	TIME	Relinquished by: (Signature)
	12/27/00	1700					
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: FEDEX AIRBILL # 8236 0387 2503	

10/23/95
5951188L.CDR

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

FEB 16 '01 12:29 VS 14:40 TO:BLASLAND BOUCK LEE INC FAX:16103600828 PAGE 4

Appendix H

Boring Logs

A-SITE

KB53701230

5/13/92
292711.B

SWANSON ENVIRONMENTAL, INC.

SOIL BORING LOG

WELL INSTALLATION AND COMPLETION DATA

Client : GEORGIA-PACIFIC
Well No. : SB-1
Total Depth : 32 FEET
Casing Size & Type : NA

Site : "A" SITE
Location : NORTHEAST
Screen Length : NA
Field Geo./Eng. : DLR

Job No. : MH 6179
Driller : STEARNS
Ground Elev. : NA
Org. Vap. Instr. : NONE

Date Drilled : 07/20/90
Method : HOLLOW STEM AUGERS
Top of Casing Elev. : NA
09/07/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
0	GP 1-1	0,1,2,2		100 %		White to blue-gray fiberous residuals with a pink tint near the surface. Moist		Strong Odor
2		2,2,1,1		100 %				
4		1,0,0,0		40 %				
6		0,0,0,0		0 %				
8		1,0,0,0		90 %		Blue-gray and gray-white clayey residuals with fine fibers. Wet		
10		0,0,0,0		85 %				
12		0,1,1,2		60 %		Light blue-gray fiberous residuals, clayier near bottom of interval. Moist		
14		0,1,1,0		100 %				
16		0,0,0,1		100 %				
18		0,0,0,0		100 %				
20		0,0,0,1		100 %		White, light blue-gray and dark blue-gray clayey fiberous residuals. Moist		
22		1,0,1,2		100 %				
24	GP 1-13	1,1,1,3		100 %				
26		1,1,2,6		100 %		Fine to coarse sand and fine grained fill material. Wet		
28								

CONTINUED ON NEXT PAGE

SWANSON ENVIRONMENTAL, INC.

Well No. : SB-1 Site : "A" SITE Job No. : MH 6179 Date Drilled : 07/20/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
28		NA		100 %		Poorly sorted fine to coarse sand and gravel. Wet		
30		NA		100 %				
32								

BOTTOM OF BORE HOLE

KB53701232

SWANSON ENVIRONMENTAL, INC.

SOIL BORING LOG

WELL INSTALLATION AND COMPLETION DATA

Client : GEORGIA-PACIFIC
Well No. : SB-2
Total Depth : 30 FEET
Casing Size & Type : NA

Site : "A" SITE
Location : EAST CENTRAL
Screen Length : NA
Field Geo./Eng. : DLR

Job No. : NH 6179
Driller : STEARNS
Ground Elev. : NA
Org. Vap. Instr. : NONE

Date Drilled : 07/20/90
Method : HOLLOW STEM AUGERS
Top of Casing Elev. : NA
07/18/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
0		0,0,0,0		20 %		Gray, gray-white and blue-gray fiberous residuals. Moist		
2		0,1,1,0		60 %				
4		0,0,0,0		0 %				
6	GP 2-4	0,1,0,0		35 %		Blue-gray fiberous residuals. Moist		
8		0,1,1,0		35 %				
10		0,1,0,0		55 %				
12		0,1,0,0		67 %				
14		0,1,0,0		100 %				
16		0,1,0,0		85 %		Layered blue-gray and white-brown clayey residuals with fine fibers. Moist		
18		0,0,0,0		85 %		Blue-gray clayey residuals with fine fibers. Wet		
20		0,1,1,1		90 %				
22	GP 2-12	0,1,1,1		100 %				
24		1,1,1,0		100 %				
26		NA		100 %		Dark brown organic topsoil. Moist		
28								

CONTINUED ON NEXT PAGE

SWANSON ENVIRONMENTAL, INC.

Well No. : SB-2 Site : 'A' SITE Job No. : MW 6179 Date Drilled : 07/20/93

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
28		NA		100 %		Fine to coarse sand and gravel. Wet		
30								

BOTTOM OF BORE HOLE

KB53701234

SWANSON ENVIRONMENTAL, INC.

SOIL BORING LOG

WELL INSTALLATION AND COMPLETION DATA

Client : GEORGIA-PACIFIC
Well No. : SB-3
Total Depth : 35 FEET
Casing Size & Type : NA

Site : "A" SITE
Location : SOUTHEAST
Screen Length : NA
Field Geo./Eng. : DLR

Job No. : MH 6179
Driller : GREAT LAKES
Ground Elev. : NA
Org. Vap. Instr. : NONE

Date Drilled : 07/11/90
Method : HOLLOW STEM AUGERS
Top of Casing Elev. : NA
09/07/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
0								
	GP 3-1							
2		1,2,1,1		40 %				
4		2,1,3,3		15 %		Blue-gray fiberous residuals. Moist		
6								
8								Poor Recovery Pushed Sampler
10		1,2,2,3		5 %				
12								
14	GP 3-4	2,1,2,1		90 %		Interlayered black sandy gravel (flyash) and white fiberous residuals. Wet		
16		1,0,1,2		5 %				
18		1,1,2,1		95 %				
20		1,0,0,1		100 %				
22		1,2,2,4		100 %		Gray-white to blue-gray fiberous residuals. Moist		
24		1,3,3,5		100 %				
26	GP 3-9	3,4,5,5		100 %				
28								

CONTINUED ON NEXT PAGE

KB53701236

SWANSON ENVIRONMENTAL, INC.

Well No. : SB-3 Site : "A" SITE Job No. : MH 6179 Date Drilled : 07/11/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
28		2,7,10,11		100 %				
30						Dark brown sand and gravel. Wet		
32		9,12,15,16		100 %				
35								

BOTTOM OF BORE HOLE

KB53701237

SWANSON ENVIRONMENTAL, INC.

SOIL BORING LOG

WELL INSTALLATION AND COMPLETION DATA

Client : GEORGIA-PACIFIC
Well No. : SB-4
Total Depth : 34 FEET
Casing Size & Type : NA

Site : "A" SITE
Location : CENTRAL
Screen Length : NA
Field Geo./Eng. : DLR

Job No. : MH 6179
Driller : STEARNS
Ground Elev. : NA
Org. Vap. Instr. : NONE

Date Drilled : 07/20/90
Method : HOLLOW STEM AUGERS
Top of Casing Elev. : NA
09/07/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
0		0,0,0,0		50 %		Blue-gray fiberous residuals. Moist		
2		0,0,0,0		33 %				
4	GP 4-3	0,0,0,1		55 %				
6		0,0,0,1		55 %				
8		0,6,2,2		80 %				
10		0,1,6,2		90 %		White residuals with 2-3" layers of brown coarse sand. Moist		
12		0,0,0,1		80 %				
14		0,0,0,0		100 %		Milky white and blue-gray clayey residuals with fine fibers. Moist		
16		0,0,0,0		100 %		Gray-white to blue-gray clayey residuals with fine fibers. Wet		
18		0,0,0,0		100 %				
20		0,1,0,0		100 %				
22		1,1,1,1		100 %		Blue-gray fiberous residuals. Moist		
24	GP 4-13	0,1,0,1		100 %				
26		1,2,2,4		100 %		Dark brown organic topsoil. Moist		
28								

CONTINUED ON NEXT PAGE

KB53701238

SWANSON ENVIRONMENTAL, INC.

Well No. : SB-4 Site : 'A' SITE Job No. : MH 6179 Date Drilled : 07/20/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
28						Dark brown organic topsoil. Moist		
		1,4,6,4		100 %				
30						Coarse sand grading to poorly sorted fine to coarse sand. Wet		
32								
		5,7,11,16		60 %				
34								

BOTTOM OF BORE HOLE

KB53701239

SWANSON ENVIRONMENTAL, INC.

SOIL BORING LOG

WELL INSTALLATION AND COMPLETION DATA

Client : GEORGIA-PACIFIC
Well No. : SB-6
Total Depth : 30 FEET
Casing Size & Type : NA

Site : "A" SITE
Location : CENTRAL
Screen Length : NA
Field Geo./Eng. : DLR

Job No. : MH 6179
Driller : GREAT LAKES
Ground Elev. : NA
Org. Vap. Instr. : NONE

Date Drilled : 07/18/90
Method : HOLLOW STEM AUGERS
Top of Casing Elev. : NA
09/18/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
0								
2	GP 6-1					Gray-white fiberous residuals. Dry to moist		
4								
6						Gray-white fiberous residuals and dark gray sand and gravel. Wet		Poor Recovery Pushed Sampler
8								
10		2,2,1,2		50 %		White clayey residuals with fine fibers. Wet		
12		1,2,1,1		100 %				
14		1,0,1,1		100 %				
16		1,1,0,2		25 %		Gray fiberous residuals. Moist Intermixed with brown silt from 19-20 feet.		
18		2,2,1,3		100 %				
20	GP 6-8	1,2,3,3		100 %				
22		2,2,3,4		100 %		Gray and tan-gray fiberous residuals. Moist		
24	GP 6-10	3,2,3,5		100 %				
26						Dark brown medium sand. Wet		
28								

CONTINUED ON NEXT PAGE

SWANSON ENVIRONMENTAL, INC.

Well No. : SB-6 Site : "A" SITE Job No. : MW 6179 Date Drilled : 07/10/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
28		11,13,13,14		100 %		Dark brown medium sand. Wet		
30								

BOTTOM OF BORE HOLE

KB53701240

SWANSON ENVIRONMENTAL, INC.

SOIL BORING LOG

WELL INSTALLATION AND COMPLETION DATA

Client : GEORGIA-PACIFIC
Well No. : SB-7
Total Depth : 34 FEET
Casing Size & Type : NA

Site : "A" SITE
Location : SOUTH CENTRAL
Screen Length : NA
Field Geo./Eng. : DLR

Job No. : MH 6179
Driller : GREAT LAKES
Ground Elev. : NA
Org. Vap. Instr. : NONE

Date Drilled : 07/10/90
Method : HOLLOW STEM AUGERS
Top of Casing Elev. : NA
09/07/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
0								
	GP 7-1			5 %				
2		1,1,0,2		5 %				
4		1,0,0,1		100 %		White sandy fiberous residuals. Wet		
6	GP 7-3	1,0,0,1		75 %				
8								
10		1,2,2,2		65 %		Sand and gravel. Moist		
12		1,2,2,2		15 %		Gray, gray-white and blue-gray fiberous residuals. Moist		
14		1,1,1,1		100 %		Gray-white zones, wet.		
16		3,3,4,5		100 %				
18		2,2,2,3		100 %		Blue-gray fiberous residuals with occasional sandy zones. Moist		
20		2,2,3,4		100 %				
22		2,3,3,4		100 %				
24	GP 7-11	3,4,4,6		100 %		Blue-gray fiberous residuals with intermixed black organic topsoil. Moist		
26								
28								

CONTINUED ON NEXT PAGE

KB53701242

SWANSON ENVIRONMENTAL, INC.

Well No. : SB-7 Site : 'A' SITE Job No. : MH 6179 Date Drilled : 07/10/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
28		8,9,17,17		100 %				
30						Dark gray medium sand. Wet		
32		12,18,19,22		100 %				
34								

BOTTOM OF BORE HOLE

KB53701243

SWANSON ENVIRONMENTAL, INC.

SOIL BORING LOG

WELL INSTALLATION AND COMPLETION DATA

Client : GEORGIA-PACIFIC
Well No. : SB-6
Total Depth : 31 FEET
Casing Size & Type : NA

Site : "A" SITE
Location : NORTH CENTRAL
Screen Length : NA
Field Geo./Eng. : DLR

Job No. : MH 6179
Driller : GREAT LAKES
Ground Elev. : NA
Org. Vap. Instr. : NONE

Date Drilled : 07/11/90
Method : HOLLOW STEM AUGERS
Top of Casing Elev. : NA
09/07/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
0								
2	GP 6-1	2,2,1,3		5 %				Strong Odor
4		2,3,3,2		90 %		Blue-gray fiberous, crumbly residuals. Dry		
6		2,3,3,3		55 %				
8		1,1,1,3		100 %				
10		2,2,3,3		45 %		Gray-white clayey residuals with fine fibers. Moist		
12								
14		2,1,1,1		50 %		Gray-white clayey residuals with fine fibers. Wet		
16		1,2,3,3		100 %		Gray-black fine fiberous residuals. Moist		
18		3,2,2,3		100 %				
20		2,2,2,3		95 %		Blue-gray fiberous residuals. Moist		
22	GP 6-10	2,2,3,5		95 %				
24		12,19,20,19		100 %				
26						Dark gray sand. Wet		
28								

CONTINUED ON NEXT PAGE

KB53701244

SWANSON ENVIRONMENTAL, INC.

Well No. : SB-8 Site : "A" SITE Job No. : MH 6179 Date Drilled : 07/11/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
28								
						Dark gray sand. Wet		
30		15,15,16,17		100 %				
31								

BOTTOM OF BORE HOLE

KB53701245

SWANSON ENVIRONMENTAL, INC.

SOIL BORING LOG

WELL INSTALLATION AND COMPLETION DATA

Client : GEORGIA-PACIFIC
Well No. : SB-9
Total Depth : 22 FEET
Casing Size & Type : NA

Site : "A" SITE
Location : NORTHWEST
Screen Length : NA
Field Geo./Eng. : DLR

Job No. : MH 6179
Driller : STEARNS
Ground Elev. : NA
Org. Vap. Instr. : NONE

Date Drilled : 07/18/90
Method : HOLLOW STEM AUGERS
Top of Casing Elev. : NA
09/07/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
0		0,1,1,1		95 %		White and pink residuals. Moist		Strong Odor
2	GP 9-2	0,0,0,1		75 %		White-brown, gray-white, and blue-gray fiberous residuals. Moist		
4		0,0,0,1		100 %		Blue-gray fiberous residuals. Moist		
6		0,1,0,0		65 %				
8		0,1,1,1		55 %				
10		0,1,1,1		100 %		White and gray-brown sandy fiberous residuals. Moist		
12		1,1,1,1		100 %		Blue-gray fiberous residuals. Wet		
14	GP 9-8	1,1,1,2		95 %		White-gray clayey residuals. Wet		
16		0,1,1,3		25 %		Blue-gray fiberous residuals. Moist		
18		3,5,8,8		95 %		Dark gray well sorted fine sand. Wet		
20		4,9,9,12		95 %		Gray fine sand and small pebbles. Wet		
22								

BOTTOM OF BORE HOLE

KB53701246

SWANSON ENVIRONMENTAL, INC.

SOIL BORING LOG

WELL INSTALLATION AND COMPLETION DATA

Client : GEORGIA-PACIFIC
Well No. : SB-1C
Total Depth : 18 FEET
Casing Size & Type : NA

Site : "A" SITE
Location : FAR NORTHWEST
Screen Length : NA
Field Geo./Eng. : DLR

Job No. : MH 6179
Driller : STEARNS
Ground Elev. : NA
Org. Vap. Instr. : NONE

Date Drilled : 07/18/90
Method : HOLLOW STEM AUGERS
Top of Casing Elev. : NA
09/07/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
0		0,0,0,0		10 %		Gray to blue-gray fiberous residuals with pink and black mottles. Dry to moist		Strong Odor
2	GP 10-2	0,0,1,2		75 %				
4		0,0,1,2		10 %				
6		0,0,0,1		90 %		Blue-gray clayey fiberous residuals. Moist		
8		0,1,1,1		25 %				
10	GP 10-6	0,1,1,1		90 %				
12		0,0,1,3		100 %				
14		5,6,7,8		100 %		Dark gray medium sand and gravel. Wet		
16		0,4,5,4		100 %				
18								

BOTTOM OF BORE HOLE

PROJECT Georgia-Pacific MW-1

JOB NO

LOCATION "A" Landfill

SURFACE ELEV 773.43' DATE 2/22/88

Kalamazoo, MI

Sample Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. Wt. P.C.F.	Unc. Comp. Strength PSI Qu	Qe	SU %
	1	Blue grey clay, Fill						
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	10							
	11							
	12							
	13							
	14							
	15							
	16							
	17							
	18	Fine silty black sand						
	19							
	20							
	21							
	22							
	23							
	24							
	25							

TYPE OF SAMPLE
D - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
TW - THIN WALL TUBE
RC - ROCK CORE
WS - WASHED SAMPLE

REMARKS:

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT 17 FT 6 INS
G.W. ENCOUNTERED AT FT INS
G.W. AFTER COMPLETION FT. INS
G.W. AFTER HRS FT INS
G.W. VOLUMES MEDIUM

0023565

KB53701247

Monitor Well Information

PROJECT Georgia-Pacific

MW-1

JOB NO

LOCATION "A" Landfill

SURFACE ELEV 773.43' DATE 2/22/88

Kalamazoo, MI

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WT P.C.F	Unc. Comp. Strength PSF Qp	Qu	Sat. %
	26							
	27							
	28							
	29	End of Boring						
	30							
	31							
	32							
	33							
	34							
	35							
	36							
	37							
	38							
	39							
	40							
	41							
	42							
	43							
	44							
	45							
	46							
	47							
	48							
	49							
	50							

TYPE OF SAMPLE
D - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
TW - THIN WALL TUBE
RC - ROCK CORE
WS - WASHED SAMPLE

REMARKS:
Natural sand filter pack well set with 2" stainless steel, 10' screen

0023569

PLUGGING PROCEDURE
MINERAL WELL ACT PERMIT NO
HOLE SEALED WITH BETWEEN
DEPTHS OF AND

KB53701248

Monitor Well Information

GROUND SURFACE ELEVATION 773.43'

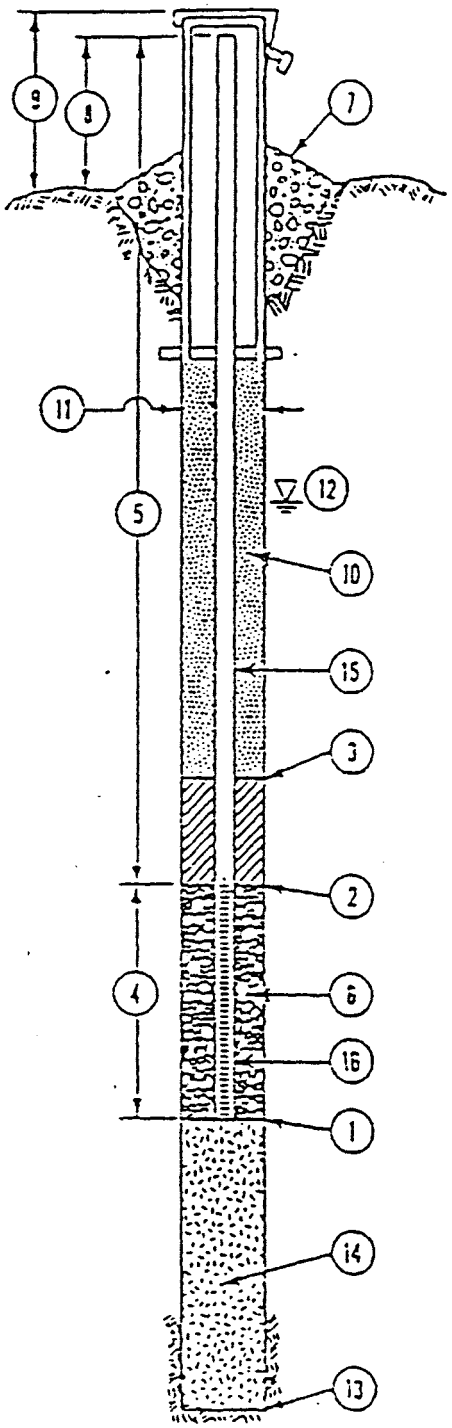
TOP OF WELL CASING ELEVATION 775.18'

JOB NUMBER ME4447

BORING NUMBER MW-1

DATE 2/23/88

LOCATION "A" Landfill



1. DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 28.25 FEET.*
2. DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 18.25 FEET.*
3. DEPTH TO TOP OF SEAL (IF INSTALLED) 16.25 FEET.*
4. LENGTH OF WELL SCREEN 10 FEET. SLOT SIZE 0.010".
5. TOTAL LENGTH OF PIPE 20 FEET AT 2 INCH DIAMETER.
6. TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Native Fine Sand.
7. CONCRETE CAP. YES NO (CIRCLE ONE)
8. HEIGHT OF WELL CASING ABOVE GROUND 1.75 FEET.
9. PROTECTIVE CASING? YES NO (CIRCLE ONE) HEIGHT ABOVE GROUND ____ FEET. LOCKING CAP? YES NO (CIRCLE ONE)
10. TYPE OF UPPER BACKFILL Cement Grout.
11. BOREHOLE DIAMETER 3.5 INCHES.
12. DEPTH TO GROUND WATER 16.23 FEET.*
13. TOTAL DEPTH OF BOREHOLE 28.25 FEET.*
14. TYPE OF LOWER BACKFILL none.
15. PIPE MATERIAL stainless steel
16. SCREEN MATERIAL stainless steel

*(DEPTH FROM GROUND SURFACE)

0023567

KB53701249

PROJECT: Georgia-Pacific

JOB NO

LOCATION: "A" Landfill

MW-2

SURFACE ELEV: 770.59' DATE: 2/22/88

Kalamazoo, MI

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. Wt. P.C.F.	Unc. Comp. Strength PSF Qu	Qu	Str. %
		Sandy Topsoil						
	1							
	2							
	3	Fine silty black-grey sand						
	4							
	5							
	6							
	7							
	8							
	9							
	10							
	11							
	12							
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							

TYPE OF SAMPLE
D - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
TW - THIN WALL TUBE
RC - ROCK CORE
WS - WASHED SAMPLE

REMARKS:

0023571

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT 16 FT 0 INS
G W ENCOUNTERED AT FT INS
G W AFTER COMPLETION FT INS
G W AFTER HRS FT INS
G W VOLUMES MEDIUM

KB53701250

PROJECT Georgia-Pacific MW-2

JOB NO

LOCATION "A" Landfill
Kalamazoo, MI

SURFACE ELEV 770.59' DATE 2/22/88

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. Wt. P.C.F.	Unc. Comp. Strength PSF Qp	Qu	Sat. %
	26							
	27							
	28							
	29	End of Boring						
	30							
	31							
	32							
	33							
	34							
	35							
	36							
	37							
	38							
	39							
	40							
	41							
	42							
	43							
	44							
	45							
	46							
	47							
	48							
	49							
	50							

TYPE OF SAMPLE
D - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
TW - THIN WALL TUBE
RC - ROCK CORE
WS - WASHED SAMPLE

REMARKS: Natural sand filler pack well set with 2" stainless steel, 10" screen

0023572

PLUGGING PROCEDURE
MINERAL WELL ACT PERMIT NO
HOLE SEALED WITH BETWEEN
DEPTHS OF AND

KB53701251

Monitor Well Information

GROUND SURFACE ELEVATION 770.59'

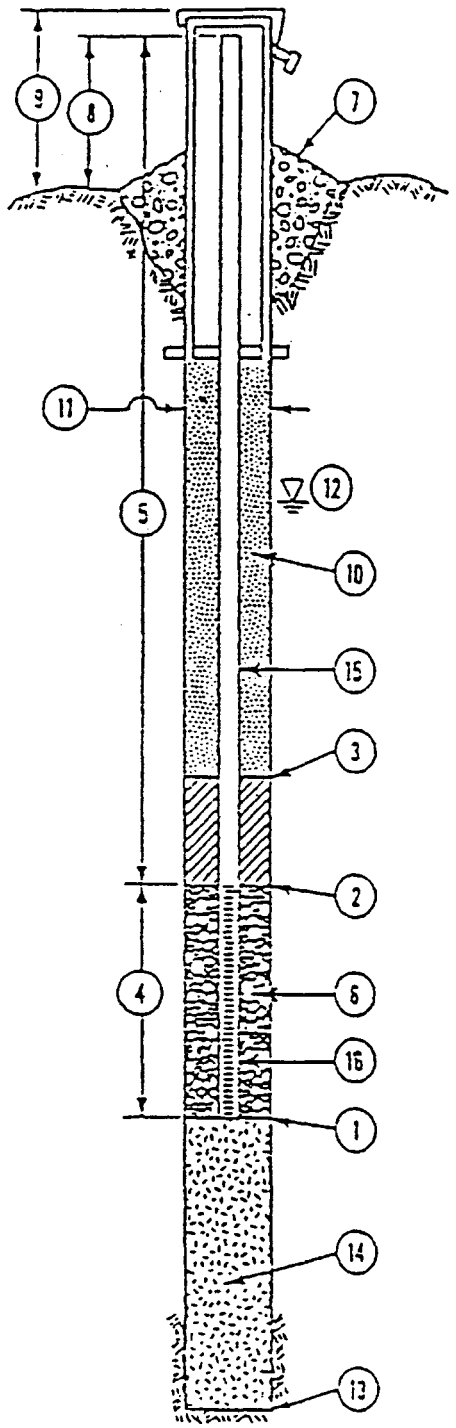
TOP OF WELL CASING ELEVATION 772.39'

JOB NUMBER ME3447

BORING NUMBER MW-2

DATE 2/23/88

LOCATION "A" Landfill



(1) DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 28.2 FEET.*

(2) DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 18.2 FEET.*

(3) DEPTH TO TOP OF SEAL (IF INSTALLED) 16.2 FEET.*

(4) LENGTH OF WELL SCREEN 10 FEET. SLOT SIZE 0.010".

(5) TOTAL LENGTH OF PIPE 20 FEET AT 2 INCH DIAMETER.

(6) TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Native Fine Sand

(7) CONCRETE CAP. (YES) NO (CIRCLE ONE)

(8) HEIGHT OF WELL CASING ABOVE GROUND 1.8 FEET.

(9) PROTECTIVE CASING? (YES) NO (CIRCLE ONE)
HEIGHT ABOVE GROUND ____ FEET.
LOCKING CAP? (YES) NO (CIRCLE ONE)

(10) TYPE OF UPPER BACKFILL Cement Grout

(11) BOREHOLE DIAMETER 3.5 INCHES.

(12) DEPTH TO GROUND WATER 14.33 FEET.*

(13) TOTAL DEPTH OF BOREHOLE 28.2 FEET.*

(14) TYPE OF LOWER BACKFILL None.

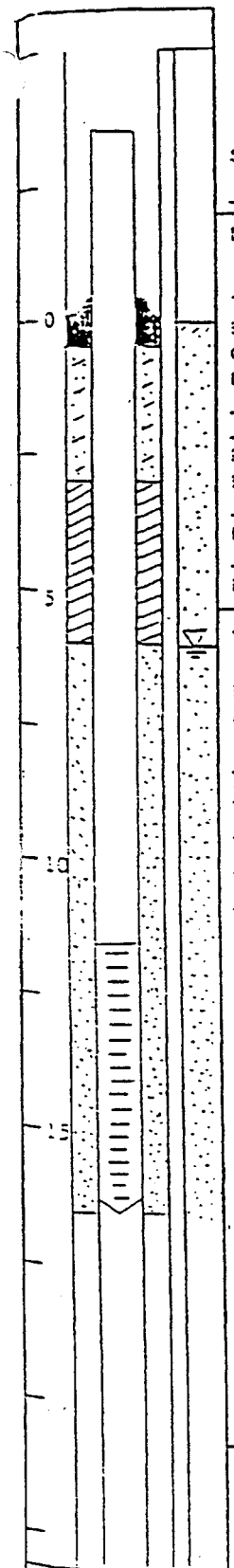
(15) PIPE MATERIAL stainless steel

(16) SCREEN MATERIAL stainless steel

*(DEPTH FROM GROUND SURFACE)

0023570 SUBSTANTIATION

KB53701252



Well No. MW-3

Boring No. X-Ref:

MONITOR WELL CONSTRUCTION SUMMARY

Survey Coords:

Elevation Ground Level 765.72

Top of Casing 769.20

Drilling Summary:

Total Depth 16.5'

Borehole Diameter 4"

Casing Stick-up Height: 3.5'

Driller Stearns Drilling
Dan Dennis - Driller

Rig CME 550

Bit(s) HSA

Drilling Fluid None

Protective Casing 4" x 4" x 5'

Construction Time Log:

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling	9/8	11:30	9/8	12:00
Geophys.Logging:				
Casing:	9/8	12:30	9/8	12:43
Filter Placement:	9/8	12:30	9/8	12:43
Cementing:	9/8	12:45	9/8	1:00
Development:	9/8	1:00	9/8	1:15

Well Design & Specifications

Basis: Geologic Log ___ Geophysical Log ___

Casing String(s): C = Casing S = Screen.

Depth	String(s)	Elevation
+3.5 - 11.5	C_1	-
11.5 - 16.5	S.	-

Casing: C1 2" Ø Galvanized casing

C2

Screen: S1 2" 7 slot stainless steel screen -5 ft long

S2

Filter Pack: In-situ sand

Grout Seal: Redi-mix gravel mix 0.5' - 0.0'

Bentonite Seal: Holeplug Wyoming Bentonite, 6 -3'
Bentonite/Soil 3'-0.5'

Well Development:

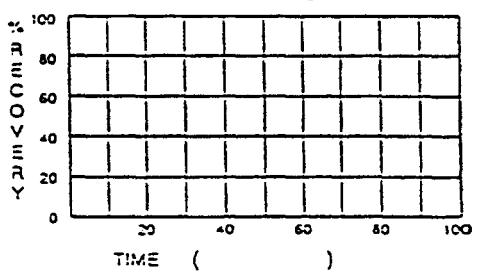
Water pumped from well using 3.5 hr pump (~4 gpm) for 15 min. water was clear after 5 min.

Stabilization Test Data:

Time	pH	Spec. Cond.	Temp (C)

Recovery Data:

C= S_o=



Comments:

SITE NAME Georgia-Pacific Ashlie Carleton St., Kalamazoo, MI

SUPERVISED BY Dan Drlesanga

Printed on recycled paper.

0023573

KB53701253

SOIL BOREHOLE LOG

PROJECT NAME AND LOCATION Georgia-Pacific "A" Landfill Site Kalamazoo, Michigan	DRILLING METHOD: Hollow stem auger SAMPLING METHOD: Split spoon 5' intervals	BORING NO. MW-3 SHEET 1 OF 1
DATUM	ELEVATION 765.72	WATER LEVEL / TIME / DATE / CASING DEPTH
DRILLING	START	FINISH
TIME	11:30	1:15
DATE	9/8/88	9/8/88
DRILL RIG	CME 550	SURFACE CONDITIONS
ANGLE 90	BEARING	
SAMPLE HAMMER TORQUE	FT.-LBS	

DEPTH (ELEVATION)	BLOWS/6" OR SAMPLE (RECOVERY)	SYMBOL	SAMPLE NUMBER AND DESCRIPTION OF MATERIAL	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING	TEST RESULTS: WATER CONTENT %	LIQUID LIMIT %	PLASTIC LIMIT %	SPECIFIC GRAVITY	OTHER TESTS
			topsoil								
2											
4			brown fine to medium sand								
6											
8											
10											
12											
14											
16			EOB at 16.5' in same								

DRILLING CONTR. Stearns' Drilling Co.
Dutton, Michigan

SL 06438

LOGGED BY Dell Engineering, Inc.
DATE 9/8/88 CHK'D BY THB

0023574

KB53701254

SWANSON ENVIRONMENTAL, INC.

SOIL BORING LOG — WELL INSTALLATION AND COMPLETION DATA

Client : GEORGIA-PACIFIC
Well No. : MW-4
Total Depth : 22 FEET
Casing Size & Type : 2" GALV.

Site : "A" SITE
Location : NORTHEAST
Screen Length : 10 FEET
Field Geo./Eng. : RJC

Job No. : MH 6179
Driller : STEARNS
Ground Elev. : 770.6
Org. Vap. Instr. : NONE

Date Drilled : 07/19/90
Method : HOLLOW STEM AUGERS
Top of Casing Elev. : 772.52
09/07/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks
0		2,5,6,6		75 %		Topsoil, thin layer of residuals, sand and gravel and ash fill. Dry		
2	MW 4-1	2,2,4,5		80 %		Black silty fine to medium sand with gray nodules (residuals?). Moist		
4		4,4,5,4		75 %				
6		1,1,2,2		75 %		Dark brown to black silt, sandy silt and clayey silt fill. Moist		
8		1,1,2,2		67 %				
10		1,1,2,3		67 %				
12		2,1,2,3		95 %		Brown sandy silt. Moist		Water Table at 13 ft
14		1,6,5,4		67 %		Dark gray medium to fine sand. Wet		
16								
18						Gray poorly sorted sand and gravel, primarily coarse sand. Wet		
20	MW 4-2	4,7,8,11		100 %		Gray fine to very fine sand. Wet		
22								

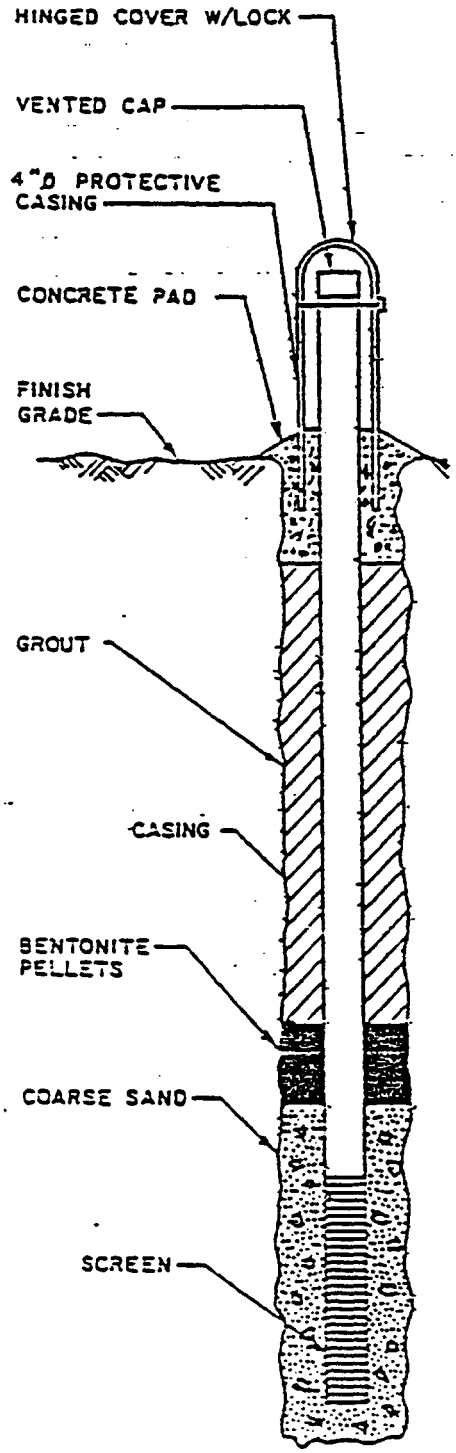
BOTTOM OF BORE HOLE

KB53701255

SWANSON ENVIRONMENTAL, INC.

WELL INSTALLATION LOG 09/07/90

WELL NO.: MW-4 LOCATION : NORTHEAST OWNER : GEORGIA-PACIFIC PROJECT : MH 6179



DRILLING SUMMARY

DRILLERS : STEARNS DRILLING METHOD : HOLLOW STEM AUGER
RIG TYPE : CME 850, ROTARY HEAD BIT : 4.25" ID AUGER
DRILLING FLUID : NONE QUANTITY : N/A
BOREHOLE DIAMETER : 7" TOTAL DEPTH : 23 FEET
SUPERVISING GEOLOGIST : RJC
LOG BOOK : NUMBER : 2 PAGES : 82-88

WELL CONSTRUCTION

CASING :	MAT.: GALV. STEEL	DIA. : 2"		LENGTH :	15.0 FT
SCREEN :	MAT.: ST. STEEL	DIA. : 2"		LENGTH :	10.0 FT
		SLOT :	0.007 INCH	SETTING :	12.0'-22.0'
FILTER :	MAT.: #3 SAND	AMT. :	320 LBS	SETTING :	9.8'-23.0'
SEAL :	MAT.: BENT. PELLETS	AMT. :	50 LBS	SETTING :	7.3'-9.8'
GROUT :	MAT.: CEMENT-BENT	AMT. :	3 BGS CEMENT	SETTING :	0'-7.3'

ELEVATIONS

GROUND SURFACE : 770.6 WATER LEVEL (08/01/90) : 756.22
TOP OF WELL : 772.52 BOTTOM OF SCREEN : 747.6

TIME LOG

DRILLING :	DATE STARTED :	07/19/90	DATE COMPLETED :	07/19/90
DATE INSTALLED :		07/19/90	DATE GROUTED :	07/19/90
DEVELOPMENT :	DATE :	07/20/90	TIME :	20 MIN
	DATE :	N/A	TIME :	N/A

WELL DEVELOPMENT

METHOD : PUMPING
EQUIPMENT : BRAINARD-KILMAN HAND PUMP
PUMPING RATE : 3-5 GPM
VOLUME REMOVED : APPROX. 75 GALLONS
REMARKS : FINAL DISCHARGE - CLEAR, COLORLESS

KB53701256

SWANSON ENVIRONMENTAL, INC.

BORING LOG

WELL INSTALLATION AND COMPLETION DATA

09/07/90

Client : GEORGIA-PACIFIC
Well No. : MW-5
Total Depth : 26 FEET
Casing Size & Type : 2" GALV.

Site : "A" SITE
Location : NORTH CENTRAL
Screen Length : 10 FEET
Field Geo./Eng. : DLR

Job No. : MH 6179
Driller : STEARNS
Ground Elev. : 773.2
Org. Vap. Instr. : NONE

Date Drilled : 07/19/90
Method : HOLLOW STEM AUGERS
Top of Casing Elev. : 775.10
09/07/90

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata Change	Remarks	STEM AUGER
0		5,6,2,2		80 %		Sandy fill, thin layer of residuals. Dry			
2	MW 5-1	2,10,13,11		95 %					
4		5,4,4,5		100 %					
6		1,2,2,3		95 %		Thin (4-12") layers of coarse sand, sandy clay, clayey silt and fine to medium sand. Moist			.0 FT .0 FT .0'-26.0' .7'-26.0' .9'-13.7' -11.9'
8		1,1,2,1		85 %					
10		1,1,4,5		100 %					
12		2,2,2,2		100 %					55.48
14		2,3,3,4		100 %					
16		1,1,1,3		67 %		Brown-gray to gray fine to medium sand. Moist		Water Table at 17 ft	
18		4,6,8,7		67 %		Black to gray coarse sand. Wet			07/19/90 07/19/90 20 MIN N/A
20									
22									
24	MW 5-2	5,7,9,16		100 %		Gray fine to medium sand. Wet			
26									

BOTTOM OF BORE HOLE

KB53701257

Date Start/Finish: 9/28/93 - 9/28/93 **Drilling Company:** Blasland Bouck & Lee **Driller's Name:** William Schaefer **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size** : 3-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287061.9 **Easting:** 12804490.3 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 2.0 ft. **Ground Surface Elev.:** 762.6 ft. **Geologist:** David W. Lay	**Well No. ARS-1** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 762.6 ft.										**GROUND SURFACE**	
		W70172				0.5				Dark Brown fine SAND and SILT, trace clay and medium to coarse sand, loose, moist (TOPSOIL).	
		W70173 (D)				0.5					
						0.5					
		W70174				0.5				Brown fine to medium SAND, some silt, little coarse sand and fine gravel, loose, moist.	
	760									End of boring at 2.0 ft. BGS.	
5											
	755										
10											
	750										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite pellets upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

Date Start/Finish: 9/28/93 - 9/28/93 **Drilling Company:** Blasland Bouck & Lee **Driller's Name:** William Schaefer **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size** : 3-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 286791.9 **Easting:** 12804836.5 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 2.0 ft. **Ground Surface Elev.:** 761.9 ft. **Geologist:** David W. Lay	**Well No. ARS-2** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 761.9 ft.										**GROUND SURFACE**	
		W70175				0.5				Dark Brown fine SAND and SILT, trace clay and organic matter, loose, moist (TOPSOIL).	
						0.5					
						0.5					
		W70176				0.5				Brown fine to medium SAND, some silt, little coarse sand and fine gravel, loose, moist.	
	760										
										Brown/Grey mottled SILT, little fine sand, trace clay and organic matter, loose, moist.	
										End of boring at 2.0 ft. BGS.	
5											
	755										
10											
	750										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite pellets upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

Date Start/Finish: 9/28/93 - 9/28/93 **Drilling Company:** Blasland Bouck & Lee **Driller's Name:** William Schaefer **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size** : 3-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 286795.5 **Easting:** 12805320.7 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 2.0 ft. **Ground Surface Elev.:** 761.9 ft. **Geologist:** David W. Lay	**Well No. ARS-3** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 761.9 ft.											
										GROUND SURFACE	
		W70177				0.5				Dark Brown fine SAND and SILT, some medium to coarse sand, trace gravel, loose, moist (TOPSOIL).	
						0.5					
						0.5					
		W70179				0.5				Light Brown fine SAND, trace silt, loose, moist.	
	760									Brown medium SAND, little fine sand, loose, moist.	
										End of boring at 2 ft. BGS.	
5											
	755										
10											
	750										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite pellets upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

Date Start/Finish: 8/16/93 - 8/16/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25 ID-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287383.9 **Easting:** 12804201.4 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 22 ft. **Ground Surface Elev.:** 774.0 ft. **Geologist:** David W. Lay	**Well No. AS-1** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 774.0 ft.										**GROUND SURFACE**	
		W70085		WOH		0.1				Light Grey to Pink CLAY and SILT, trace of roots, very soft, moist.	
		W70092		WOH							
				1	1		7.1				
				1							
				1		1.6				Grey/Black PAPER FIBERS, some clay, very soft, moist odor.	
				WOH							
				1	1		7.1				
				1							
	770	W70086		1		2.0					
				WOH							
5				1	1		7.1			Grades with cinder layers.	
				1							
				1		1.5				Light Grey to White CLAY, little silt, soft, moist.	
				1							
				1	2		1.0				
				2						Grades with Grey paper fibers.	
				1		0.9					
				1							
	765			1	2		3.0			1" layer of leaves and wood.	
				1							
10		W70087		WOH		1.1				Light Grey to Grey PAPER FIBERS, little clay, silt and fine sand, soft, wet.	
				WOH							
				WOH	<1		11.3				
				1						Grey/Green PAPER FIBERS, trace of clay, very loose, moist.	
				WOH		1.8					
				1							
				1	2		5.1				
				1							
	760	W70088		1		1.9					
15				1							

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

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

Operable Unit:
Willow Boulevard/A-Site

Well No. AS-1

Total Depth = 22 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
				2	3		17.4			Grey/Green PAPER FIBERS, trace of clay, medium dense, moist.	
				2							
		W70089		2		1.7					
				2							
				2	4		11.3				
				3							
		W70090		2		1.8					
				2							
	755			2	4		13.3				
				2							
20		W70091		12		1.1				Brown fine to coarse SAND, little silt and gravel, rounded, loose, wet.	
				12							
				11	23		0.3				
				11							
										End of boring at 22 ft. BGS.	
	750										
25											
	745										
30											
	740										
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring filled with bentonite/cement grout upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

Project: 645.81

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 8/13/93 – 8/13/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25 ID-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287295.7 **Easting:** 12805128.5 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 30 ft. **Ground Surface Elev.:** 783.9 ft. **Geologist:** David W. Lay	**Well No. AS-2** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 783.9 ft.										**GROUND SURFACE**	
		W70075 W70083 W70084		WOH WOH WOH WOH	<1	0.2	0.0 0.0			Light Grey SILT, some clay, trace of paper fibers, very soft, moist.	
				WOH WOH 1 WOH	1	1.1	0.0			Grey PAPER FIBERS, little clay, soft, moist.	
	780			WOH 1		1.4				Grades with trace silt.	
5				1 2	2		3.9				
		W70076		1 2		1.6					
				1 1	3		5.4				
				1 1		1.6					
	775			1 1	2		3.9				
10						1.0					
				1 0.5 0.5 2	1	2.0	3.9				
	770			1 1		1.6					
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

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

Operable Unit:
Willow Boulevard/A-Site

Well No. AS-2

Total Depth = 30 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
				1	2		2.3			Grey PAPER FIBERS, some clay, soft, moist.	
				1							
				WOH		1.8					
				WOH							
				8	8		2.3				
				1							
		W70077		2		2.0					
				1							
	765			1	2		5.4				
				1							
20				1		2.0					
				1							
				2	3		2.3				
				2							
		W70078		2		1.0					
				2							
				1	3		5.4				
				2							
	760	W70079		2		1.0					
				3							
25				3	6		3.9				
				4							
		W70080		3		2.0	11.3				
				5							
		W70081		6	13		2.3				
				8							
				WOR		1.0				Brown SILT, little clay, moist (PEAT).	
				WOR							
	755			WOR	<1					Grey fine SAND, very loose, wet.	
				WOR							
30										End of boring at 30.0 ft. BGS.	
	750										
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring filled with bentonite/cement grout upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

Date Start/Finish: 8/16/93 – 8/16/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A–in. **Auger Size** : 4.25 ID–in. **Rig Type:** CME–750 **Spoon Size:** 2–in. **Hammer Weight:** 140–lb **Height of Fall:** 30–in.	**Northing:** 286974.0 **Easting:** 12805104.2 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 22 ft. **Ground Surface Elev.:** 778.0 ft. **Geologist:** David W. Lay	**Well No. AS–3** **Operable Unit:** Willow Boulevard/A–Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 778.0 ft.										**GROUND SURFACE**	
		W70093 W70100		WOH 1 1 1	2	1.7	3.0			Grey SILT and CLAY, trace of paper fibers, soft, dry to moist.	
				WOH WOH WOH WOH	<1	NR					
	775										
		W70094		WOH WOH WOH 1	<1	0.6	3.0			Grey PAPER FIBERS, some clay, soft, moist.	
5											
				WOH WOH WOH 1	<1	0.2	0.2			Grades with silt.	
	770										
				WOH WOH WOH 1	<1	1.4	8.2				
10		W70095		1 1 1 2	2	1.0	14.3			Light Grey CLAY and SILT, grading with white to dark green paper fibers, soft, moist hydrogen sulfide odor.	
				WOH WOH WOH WOH	<1	1.4	2.0				
	765										
		W70096		WOH WOH		1.7	4.1			4" layer of brown/grey paper fibers.	
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

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

Operable Unit:
Willow Boulevard/A-Site

Well No. AS-3

Total Depth = 22 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
				1	1					Light Grey CLAY, trace paper fibers, soft, wet.	
				2							
		W70097		1		1.5	6.1				
				1							
				2	3						
				2						Grades with fine to medium sand.	
	760	W70098		1		2.0	16.4				
				2							
				3	5						
				3							
20		W70099		3		1.0	0.0				
				3						Layer of brown PEAT.	
				5	8					Brown fine SAND, little silt, loose, moist to wet.	
				9							
										End of boring at 22.0 ft. BGS.	
	755										
25											
	750										
30											
	745										
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring filled with bentonite/cement grout upon completion.

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

Project: 645.81

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 9/27/93 - 9/27/93 **Drilling Company:** Blasland Bouck & Lee **Driller's Name:** William Schaefer **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size** : 3-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287548.2 **Easting:** 12805502.8 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 1.0 ft. **Ground Surface Elev.:** 760.4 ft. **Geologist:** David W. Lay	**Well No.** EDC-1 **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 760.4 ft.											
										GROUND SURFACE	
	760	W70167				0.5				Grey SILT some clay, trace fine sand, rootlets and paper fibers, loose, moist.	
		W70168				0.5				Brown fine SAND, trace silt, loose, moist to wet.	
										End of boring at 1.0 ft. BGS.	
5	755										
10	750										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite pellets upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

Date Start/Finish: 9/27/93 - 9/27/93 **Drilling Company:** Blasland Bouck & Lee **Driller's Name:** William Schaefer **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size** : 3-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287548.2 **Easting:** 12805502.8 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 1.0 ft. **Ground Surface Elev.:** 759.8 ft. **Geologist:** David W. Lay	**Well No.** EDC-2 **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 759.8 ft.											
										GROUND SURFACE	
		W70165				0.5				Brown fine to medium SAND, some silt, trace clay and rootlets, loose, moist.	
		W70166				0.5					
										Thin layer of peat.	
										End of boring at 1.0 ft. BGS.	
5	755										
10	750										
15	745										

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite pellets upon completion.

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

Date Start/Finish: 9/27/93 – 9/27/93 **Drilling Company:** Blasland Bouck & Lee **Driller's Name:** William Schaefer **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size :** 3-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287597.9 **Easting:** 12805621.3 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 1.0 ft. **Ground Surface Elev.:** 758.7 ft. **Geologist:** David W. Lay	**Well No.** EDC-3 **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 758.7 ft.											
										GROUND SURFACE	
		W70163				0.5				Brown/Grey fine SAND, little silt, trace clay and coarse sand, loose, moist.	
		W70164				0.5				Grades to wet.	
										End of boring at 1.0 ft. BGS.	
	755										
5											
	750										
10											
	745										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite pellets upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

Date Start/Finish: 9/27/93 - 9/27/93 **Drilling Company:** Blasland Bouck & Lee **Driller's Name:** William Schaefer **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size** : 3-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287704.8 **Easting:** 12805636.9 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 1.0 ft. **Ground Surface Elev.:** 758.2 ft. **Geologist:** David W. Lay	**Well No.** EDC-4 **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 758.2 ft.											
										GROUND SURFACE	
		W70161				0.5				Grey CLAY, some silt and file sand, trace rootlets, soft, moist.	
		W70162				0.5				Brown/Grey fine SAND, little silt, loose, wet.	
										End of boring at 1.0 ft. BGS.	
	755										
5											
	750										
10											
	745										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite pellets upon completion.

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

Date Start/Finish: 9/27/93 – 9/27/93 **Drilling Company:** Blasland Bouck & Lee **Driller's Name:** William Schaefer **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size** : 3-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287706.2 **Easting:** 12805494.7 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 1.0 ft. **Ground Surface Elev.:** 758.1 ft. **Geologist:** David W. Lay	**Well No.** EDC-5 **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 758.1 ft.											
										GROUND SURFACE	
		W70159				0.5				Grey CLAY, little silt, fine sand and rootlets, soft, moist.	
		W70160				0.5				Light Brown fine SAND, little silt, iron staining, loose, wet.	
										End of boring at 1.0 ft. BGS.	
	755										
5											
	750										
10											
	745										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite pellets upon completion.

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

Date Start/Finish: 9/27/93 – 9/27/93 **Drilling Company:** Blasland Bouck & Lee **Driller's Name:** William Schaefer **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size** : 3-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287449.8 **Easting:** 12805497.4 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 1.0 ft. **Ground Surface Elev.:** 759.5 ft. **Geologist:** David W. Lay	**Well No. EDC-6** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 759.5 ft.											
										GROUND SURFACE	
		W70157				0.5				Grey CLAY and SILT, little fine sand and rootlets, soft, moist.	
		W70158				0.5				Brown fine SAND, little silt, laminated, loose, moist.	
										End of boring at 1.0 ft. BGS.	
	755										
5											
	750										
10											
	745										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite pellets upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

Date Start/Finish: 9/27/93 - 9/27/93 **Drilling Company:** Blasland Bouck & Lee **Driller's Name:** William Schaefer **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size** : 3-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287122.6 **Easting:** 12805477.7 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 1.0 ft. **Ground Surface Elev.:** 759.3 ft. **Geologist:** David W. Lay	**Well No.** EDC-7 **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 759.3 ft.											
										GROUND SURFACE	
		W70153				0.5				Grey CLAY and SILT, little fine sand and rootlets, soft, moist.	
		W70154 (D)				0.5					
		W70155								Dark Brown SILT, little clay and fine sand, trace rootlets, loose, moist (PEAT).	
		W70156 (D)									
										End of boring at 1.0 ft. BGS.	
	755										
5											
	750										
10											
	745										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite pellets upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

Date Start/Finish: 9/27/93 - 9/27/93 **Drilling Company:** Blasland Bouck & Lee **Driller's Name:** William Schaefer **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size :** 3-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287001.3 **Easting:** 12805486.7 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 2.0 ft. **Ground Surface Elev.:** 759.3 ft. **Geologist:** David W. Lay	**Well No.** EDC-8 **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 759.3 ft.										**GROUND SURFACE**	
		W70147				0.5				Grey fine SAND and SILT, little clay, trace coarse sand, loose, moist.	
						0.5					
						0.5				Brown/Grey fine SAND, some silt, loose, moist.	
		W70150				0.5					
										Dark Brown SILT, little clay and fine sand, trace rootlets, loose, moist.	
										End of boring at 2.0 ft. BGS.	
	755										
5											
	750										
10											
	745										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite pellets upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

Date Start/Finish: 8/23/93 - 8/23/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25 ID-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287605.7 **Easting:** 12804142.0 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 32 ft. **Ground Surface Elev.:** 770.3 ft. **Geologist:** David W. Lay	**Well No.** G20-1 **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 770.3 ft.										**GROUND SURFACE**	
	770			2		1.7					
				3						Brown fine SAND, little medium to coarse sand, rounded, loose, damp (DIKE FILL).	
				3	6						
				4							
				2		1.2				2" layer of residuals.	
				3							
				3	6					4" layer of residuals.	
				5							
				2		0.7					
				2							
5	765			2	4						
				2						3" layer of residuals.	
				2		1.3				Grades with little gravel.	
				2							
				2	4					Black CLAY and SILT, little organic matter, soft, moist (PEAT).	
				2							
				2		1.1				Grey/Black fine SAND, trace of coarse sand, loose, moist.	
				2							
				2	4						
				2							
10	760			2		1.3					
				1							
				2	3					Brown SILT, some fine sand, little clay and organic matter, medium dense, moist, (PEAT).	
				3							
				2		1.4					
				3							
				6	9						
				12							
				7		1.4				Brown/Black fine SAND, loose, wet.	
				11						Grey fine to medium SAND, medium loose, wet.	
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

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

Operable Unit:
Willow Boulevard/A-Site

Well No. G20-1

Total Depth = 32 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
	755			20 26	31					Grades to fine to coarse sand.	
				12 14 12 13	26	1.3				Grey fine to coarse SAND, rounded, trace of gravel and silt, medium dense, wet.	
				4 6 8 11	14	1.0					
20	750									Grey coarse SAND, some medium sand, trace of fine sand, rounded, medium dense, wet.	
25	745			8 13 21 25	34	2.0				Light Brown fine to medium SAND, trace of coarse sand, rounded, medium dense, wet.	
										Light Brown fine SAND, medium dense, wet.	
30	740			6 9 12 15	21	1.0					
										End of boring at 32.0 ft. BGS.	
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring filled with bentonite/cement grout upon completion.

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

Project: 645.81
Script: Kalaold
Date: 12/15/00

Date Start/Finish: 8/19/93 - 8/19/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25 ID-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287651.1 **Easting:** 12804900.5 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 72 ft. **Ground Surface Elev.:** 771.6 ft. **Geologist:** David W. Lay	**Well No.** GEO-1 **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 771.6 ft.										**GROUND SURFACE**	
				2		1.3				Light Brown to Brown fine SAND and SILT, little medium to coarse sand and gravel, loose, moist (DIKE FILL).	
				5							
				6	11						
	770			8							
				5		1.6				Thin layer of hard grey clay.	
				6							
				6	12						
				6							
				3		1.1				Grades grey/green in color.	
				2							
5				3	5						
				2							
				6		0.7				Grey fine SAND, some silt, trace of clay, trace of gravel, loose, moist (DIKE FILL).	
	765			3							
				4	7						
				4							
				1		2.0				Grades with silt seams.	
				1							
				2	3						
				2							
10				1		1.5				Grey/Black fine SAND and SILT, loose, moist (DIKE FILL).	
				1							
				2	3						
	760			2						Grades grey/green in color.	
				1		1.9				Grades grey to black, 2" piece of wood observed.	
				2							
				1	3						
				2						Grades brown with trace of clay.	
				WOH		2.0					
15				1							

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

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

Operable Unit:
Willow Boulevard/A-Site

Well No. GEO-1

Total Depth = 72 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
				1	2					Grey SILT with black clay laminations, moist to wet (FILL).	
				2							
				2		2.0					
	755			1						Grey fine SAND, trace of coarse sand, loose, wet.	
				2	3						
				2							
				WOH		1.4				Grades with dark silt seams.	
				1							
				2	3						
				2							
20				1		2.0				Grey fine to medium SAND, trace of shells, loose, wet.	
				1						Layer of fine sand and silt, wet.	
				2	3						
	750			2							
				3		2.0					
				5							
				4	9						
				4							
25				3		1.1					
				4							
				6	10						
	745			9						Light Brown fine SAND, loose, wet.	
30				6		1.0					
				15							
				13	28						
	740			14						Brown medium to coarse SAND and rounded GRAVEL, medium dense, wet.	
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

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

Operable Unit:
Willow Boulevard/A-Site

Well No. GEO-1

Total Depth = 72 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
				10		0.5				Brown medium to coarse SAND and GRAVEL, little fine sand subrounded, medium dense, wet.	
				9							
				7	16						
	735			9							
40				7		NR					
				5							
				8	13						
	730			8							
45				7		0.5					
				5							
				3	8						
	725			3							
50				12		0.5				Grey SILT, trace of fine to coarse rounded sand, very dense, moist.	
				14							
				43	57						
	720			21							
55											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

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

Operable Unit:
Willow Boulevard/A-Site

Well No. GEO-1

Total Depth = 72 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
				38 18 16 41	34	0.1				Grey GRAVEL, subangular, medium dense, wet.	
	715										
60				7 13 28 31	41	NR					
	710										
65				17 25 32 50/.3	57	1.6				Grey SILT, trace shale fragments, very dense, dry, (TILL).	
	705										
70				PC PC 17 29	>17	0.2					
	700									End of boring at 72.0 ft. BGS.	
75											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
boring filled with bentonite/cement grount upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

Project: 645.81

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 8/17/93 – 8/18/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25 ID-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287231.9 **Easting:** 12805381.0 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 73 ft. **Ground Surface Elev.:** 770.9 ft. **Geologist:** David W. Lay	**Well No. GEO-2** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 770.9 ft.										**GROUND SURFACE**	
	770			3 5 6 11	11	1.0				Brown fine to medium SAND, some coarse sand, little silt, trace of gravel, medium dense, moist (DIKE FILL).	
				7 10 5 5	15	2.0					
				2 3		1.8				Color grades from light brown to black, trace of slag.	
5	765			3 3 6 5	6	0.1				Brown and Grey/Green fine SAND and SILT, thin layers of grey clay and brown peat, loose, moist (DIKE FILL).	
				6 6	11					Brown fine to coarse SAND, little silt, loose, moist (DIKE FILL).	
				3 3 4 5	7	1.8				Dark Brown SILT, little clay and organic matter, trace of fine sand, soft, moist (PEAT).	
10	760			1 3 2 2	5	1.5				Brown/Grey fine SAND, loose, moist.	
						2.0				Dark Brown SILT, little fine sand and organic matter, trace of clay, soft, moist, (PEAT).	
15				1 1		2.0				Brown/Grey fine to coarse sand, trace wood, loose, wet.	

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ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

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

Operable Unit:
Willow Boulevard/A-Site

Well No. GEO-2

Total Depth = 73 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
				2, 3	3					Brown/Grey fine to coarse sand, trace wood, loose, wet.	
	755			4		2.0				Grades to fine SAND.	
				5, 7, 9	12					Grades to fine to coarse SAND, medium dense.	
				3, 4		1.7					
				6, 9	10						
20				6, 7		0.4				Grades with some gravel.	
	750			9, 15	16						
25				8, 14						Grades with trace of shells.	
	745			17, 19	31					Light Brown fine SAND, dense, wet.	
30				7, 12							
	740			21, 33	33					Brown fine to medium SAND, little coarse sand, rounded, dense, wet.	
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

Project: 645.81

Script: Kalaold
Date: 12/15/00

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

Operable Unit:
Willow Boulevard/A-Site

Well No. GEO-2

Total Depth = 73 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		2.0				Brown fine SAND, loose, wet.	
	735			6						Brown fine SAND and SILT, medium dense, wet.	
				5	11						
				7							
40				27		1.7				Light Brown fine SAND loose, wet.	
	730			12							
				14	26						
				20						Brown coarse SAND and GRAVEL, rounded, medium dense, wet.	
45				9		0.7				Grades with little fine to medium sand.	
	725			7							
				4	11						
				5							
50				13		0.4					
	720			12							
				10	22						
				7							
55											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

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

Operable Unit:
Willow Boulevard/A-Site

Well No. GEO-2

Total Depth = 73 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
				4 2 4 5	6	0.5				Brown coarse SAND and GRAVEL, little fine to medium sand, rounded, loose, wet.	
60	715			9 4 5 8	9	0.5					
65	710			18 32 43 50/.5	75	1.7				Light Brown SILT, some fine sand, very dense, wet.	
	705			18 22 28 50/.4	50	1.6				Brown fine to medium SAND, trace of coarse sand, little silt, very dense, moist.	
70				50/.4	>50	0.1				Grey laminated SILT, trace of fine to coarse sand, rounded, very dense, moist (TILL).	
	700			67/.6	>67	0.6				SHALE fragments some silt, trace gravel, angular, weak, wet (WEATHERED BEDROCK).	
75										End of boring at 73.0 ft. BGS.	

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring filled with bentonite/cement grout upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

Project: 645.81

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 9/7/93 - 9/7/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 286509.4 **Easting:** 128054406.9 **Well Casing Elev.:** 765.27 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 12 ft. **Ground Surface Elev.:** 765.5 ft. **Geologist:** David W. Lay	**Well No. AMW-3A** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 765.5 ft.										**GROUND SURFACE**	Vented Casing Cap 4-in diameter steel flush mount protective casing
	765			2 3 5 5	8	1.4	0.0			Brown fine SAND, trace medium to coarse sand, gravel and gray sand layers, loose, moist.	2-in diameter well casing, stainless steel, approx 2 ft. stick-up
				2 2 2 2	4	1.7	0.0				Bentonite Pellet Seal 1.5 ft. to 3.0 ft. BGS
				1 WOH		1.0	0.0				
5	760			1 1	1						
		W70145		WOH WOH WOH WOH	<1	0.6	0.0			Grey SILT and CLAY, trace fine to coarse sand and organic matter, soft loose, moist. Grey fine SAND, some silt, loose, wet.	0.01 stainless steel screen from 4.0 to 9.0 ft. BGS
				WOH WOH WOH WOH	<1	NR					Sandpack from 3.0 ft. to 12.0 ft. BGS
10	755	W70146		1 WOH 1 WOH	1	0.7	0.0			Grades to light brown, with trace medium to coarse sand.	
15										End of boring 12.0 ft. BGS.	

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	759.85	5.42
10/11/93	759.92	5.35
12/15/93	759.92	5.35

Project: 645.81

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 8/12/93 - 8/14/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287541.9 **Easting:** 12804094.5 **Well Casing Elev.:** 773.85 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 20 ft. **Ground Surface Elev.:** 771.5 ft. **Geologist:** David W. Lay	**Well No. AMW-6A** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 771.5 ft.											Vented Casing Cap 4-in diameter steel protective casing stick-up 2.0 ft above ground surface (not including cap)
										GROUND SURFACE	
				WOH		1.4	3.9			Light Brown CLAY, some paper fibers, trace silt, soft, moist.	
				WOH							
				WOH	<1						Cement pad 0.5 ft. AGS to 1.5 ft. BGS
	770			1							
										Grades to light grey paper fibers, trace clay.	
5				1		0.8	3.9				2-in diameter well casing, stainless steel, approx. 2 ft. stick-up
				1							
				1	2						
	765			2							
											Cement grout 1.5 to 11 ft. BGS
10				1		2.0	2.3				
				2							
				2	4					Grades to medium dense grey paper fibers, moist.	
	760			3							
				1		2.0	0.7				Bentonite Slurry Seal 11 to 14 ft. BGS
				1							
				1	2						
				2							
				4		0.8	0.7			Dark Brown ORGANIC MATTER, fine SAND and SILT, medium dense, moist (PEAT).	
15				5							

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring log augmented from adjacent borehole AMW-6B.

Water Levels

Date / Time	Elevation	TOC
10/08/93	756.59	17.26
10/11/93	756.61	17.24
12/15/93	757.63	16.22

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

Operable Unit:
Willow Boulevard/A-Site

Well No. AMW-6A

Total Depth = 20 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 10	12					Light Brown fine to medium SAND, loose, moist.	0.01 stainless steel screen from 15 ft. to 20 ft. BGS
	755										
				2 3 4 4	7	1.0	0.7			Grades with coarse sand, some fine gravel.	Sandpack from 14 ft. to 20 ft. BGS
20										End of boring at 20.0 ft. BGS.	
	750										
25											
	745										
30											
	740										
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring log augmented from adjacent borehole AMW-6B.

Water Levels

Date / Time	Elevation	TOC
10/08/93	756.59	17.26
10/11/93	756.61	17.24
12/15/93	757.63	16.22

Project: 645.81

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 8/9/93 – 8/12/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287539.2 **Easting:** 12804081.6 **Well Casing Elev.:** 773.99 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 30 ft. **Ground Surface Elev.:** 771.5 ft. **Geologist:** David W. Lay	**Well No. AMW-8B** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 771.5 ft.											Vented Casing Cap 4-in diameter steel protective casing stick-up 2.0 ft above ground surface (not including cap)
										GROUND SURFACE	
		W70069		1 WOH		0.6	0.8 5.5			Light Brown CLAY, some paper fibers, trace silt, soft, moist.	
	770			1 WOH	1						Cement pad 0.5 ft. AGS to 1.5 ft. BGS
		W70070		1 2 2 2	4	0.4	14.6			Grades to light grey paper fibers, trace clay.	
				2 1 2 1	3	1.1	6.9				
5											2-in diameter well casing, stainless steel, approx. 2 ft. stick-up
	765			WOH WOH		1.0	0.4			Grades to paper fibers and clay.	
				1 2	1					Grey/Brown fine SAND and SILT, little clay, loose, moist.	
		W70071		WOH WOH		1.4	9.4				
				WOH WOH	<1					Green/Grey CLAY, some silt, trace organic matter and rootlets, soft, moist.	
10		W70072		WOH WOH		2.0	3.0			Light Green PAPER FIBERS, trace silt and clay, loose wet.	Cement grout 1.5 to 19.0 ft. BGS
	760			1 1	1						
		W70073		1 1 2 2	3	2.0	3.8				
		W70074		1 2		2.0	1.2			Dark Brown ORGANIC MATTER, Fine SAND and SILT, loose, moist (PEAT).	
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	756.30 ▼	17.69
10/11/93	756.33 ▽	17.66
12/15/93	756.24 ▽	17.75

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

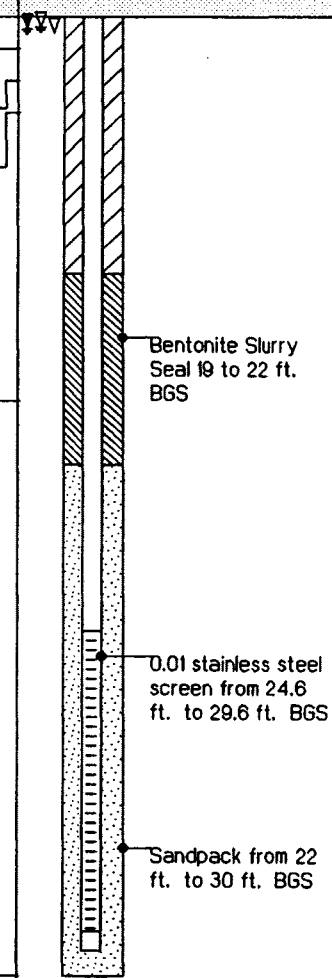
Operable Unit:
Willow Boulevard/A-Site

Well No. AMW-6B

Total Depth = 30 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
				8	10					
				10						
				4		1.6	0.0			Light Brown fine to medium SAND, loose, moist.
	755			8						
				12	20					Brown fine SAND and SILT, some clay, loose, moist.
				18						Brown fine to medium SAND, loose, wet.
				2		1.0	0.0			
				3						Grades with coarse sand, some fine gravel.
				5	8					
				7						
20				4		1.0	0.0			
				5						
				6	11					
	750			6						Light Brown fine SAND, medium dense, wet.
				5		1.0	0.4			
				7						
				8	15					
				8						
				6		1.5	0.0			
				9						
25				10	19					
				12						
				4		1.1	0.0			
	745			7						
				7	14					
				8						
				4		1.6	0.0			
				6						
				6	12					
				8						
30										End of boring at 30.0 ft. BGS.
	740									
35										

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	756.30	17.69
10/11/93	756.33	17.66
12/15/93	756.24	17.75

Project: 645.81

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 8/12/93 - 8/14/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287544.7 **Easting:** 12804107.3 **Well Casing Elev.:** 774.16 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 10 ft. **Ground Surface Elev.:** 771.5 ft. **Geologist:** David W. Lay	**Well No. AMW-6P** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 771.5 ft.										**GROUND SURFACE**	Vented Casing Cap 4-in diameter steel protective casing stick-up 2.0 ft above ground surface (not including cap)
				WOH WOH		1.0	3.9			Light Brown CLAY, some paper fibers, trace silt, very soft, moist.	
	770			1 1	1					Grades to light grey paper fibers, trace clay.	Cement pad 0.5 ft. AGS to 2 ft. BGS Bentonite Pellet Seal 2 to 4 ft. BGS 2-in diameter well casing, stainless steel, approx. 2 ft. stick-up
5											
	765			4 1 1 4	2	0.8	17.9			Grades to clay, trace paper fibers.	0.01 stainless steel screen from 5 ft. to 10 ft. BGS
				1 1		1.4	8.5			Grades to paper fibers, little clay, wet.	
				1 1	2					Green/Grey CLAY, some silt, trace organic matter and rootlets, soft, moist.	Sandpack from 4 ft. to 10 ft. BGS
10						2.0	2.3			End of boring at 10.0 ft. BGS.	
	760										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring log augmented from adjacent borehole AMW-6B.

Water Levels

Date / Time	Elevation	TOC
10/08/93	767.14	7.02
10/11/93	767.16	7.00
12/15/93	766.84	7.32

Date Start/Finish: 8/10/93 - 8/12/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287569.3 **Easting:** 12804590.4 **Well Casing Elev.:** 779.69 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 31 ft. **Ground Surface Elev.:** 777.2 ft. **Geologist:** David W. Lay	**Well No. AMW-7A** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 777.2 ft										**GROUND SURFACE**	Vented Casing Cap 4-in diameter steel protective casing, approx. stick-up 2 ft. above ground surface (not including cap)
				WOH WOH 1 WOH	1	0.1	1.1			Grey fine SAND and SILT, trace fine to coarse sand, very soft, damp (FILL).	Cement pad 0.5 ft. AGS to 1.5 ft. BGS
	775										
5				2 2 2 4	4	0.8	2.4			Light Brown fine to medium SAND, trace silt, clay, coarse sand and fine gravel, loose, moist (FILL).	2-in diameter well casing, stainless steel, approx. 2 ft. stick-up
	770									Light Grey PAPER FIBERS, some clay, soft, moist.	
										Light Brown fine to medium SAND, little silt, trace clay, coarse sand and gravel, loose, moist (FILL).	
10				WOH WOH WOH WOH	<1	0.9	1.5				Cement Grout 1.5 to 23 ft. BGS
	765									Light Grey PAPER FIBERS, some clay, soft, moist.	
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring log augmented from adjacent borehole AMW-7B. Augered from 30 to 31 ft. BGS in order to set well.

Water Levels

Date / Time	Elevation	TOC
10/08/93	756.83	22.86
10/11/93	756.86	22.83
12/15/93	756.70	22.99

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

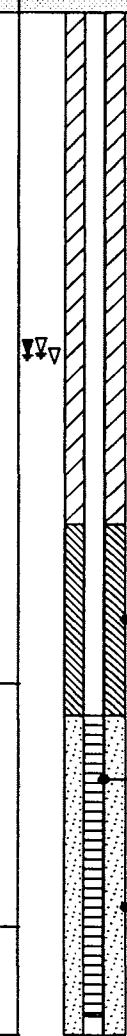
Operable Unit:
Willow Boulevard/A-Site

Well No. AMW-7A

Total Depth = 31 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
				1		2.0	35.2			Brown/Grey PAPER FIBERS, little clay, soft, moist.
				1						
				1	2					
				1						
	760									
20				2		2.0	45.9			
				2						
				4	6					
				4						
	755			2		2.0	19.7			
				3						
				4	7					
				4						
				2		1.6	8.9			
				8						
25				12	20					
				14						
				6		1.1	14.4			Brown fine to coarse SAND, little fine gravel, medium dense, wet.
				8						
	750			9	17					
				14						
				6		1.8	1.5			
				8						
				14	22					
				21						Light Brown fine SAND, medium dense, wet.
30										
										End of boring at 31.0 ft. BGS.
	745									
35										

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring log augmented from adjacent borehole AMW-7B. Augered from 30 to 31 ft. BGS in order to set well.

Water Levels

Date / Time	Elevation	TOC
10/08/93	756.83	22.86
10/11/93	756.86	22.83
12/15/93	756.70	22.99

Date Start/Finish: 8/5/93 - 8/5/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287556.7 **Easting:** 12804590.3 **Well Casing Elev.:** 778.33 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 38 ft. **Ground Surface Elev.:** 775.9 ft. **Geologist:** David W. Lay	**Well No. AMW-7B** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 775.9 ft.										**GROUND SURFACE**	Vented Casing Cap 4-in diameter steel protective casing, approx. stick-up 2 ft. above ground surface (not including cap)
	775	W70058		WOH WOH WOH 1	<1	0.0	0.0			Grey fine SAND and SILT, trace fine to coarse sand, loose, damp (FILL).	Cement pad 0.5 ft. AGS to 1.5 ft. BGS
		W70059		WOH WOH 1 1	1	0.8	3.3			Light Grey PAPER FIBERS, some clay, very soft, moist.	
5	770			2 2 2 2	4	1.6	0.1			Light Brown fine to medium SAND, trace silt, clay, coarse sand and fine gravel, very loose, moist (FILL).	2-in diameter well casing, stainless steel, approx. 2 ft. stick-up
				WOH WOH WOH WOH	<1	0.7	1.3			Light Grey PAPER FIBERS, some clay, very soft, moist. Light Brown fine to medium SAND, little silt, trace clay, coarse sand and gravel, very loose, moist (FILL).	
10	765			WOH WOH WOH WOH	<1	0.0					
				WOH WOH WOH 1	<1	1.1	16.7				Cement Grout 1.5 to 27.5 ft. BGS
		W70060 W70061 (D)		WOH 1 1 1	2	1.5	18.0			Light Grey PAPER FIBERS, some clay, very soft, moist.	
15				WOH 1		1.8	2.0			1" layer of brown fine to medium sand.	

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	755.98	22.35
10/11/93	757.02	21.31
12/15/93	758.93	21.40

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

Operable Unit:
Willow Boulevard/A-Site

Well No. AMW-7B

Total Depth = 38 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
				1 2	2					Brown/Grey PAPER FIBERS, little clay, soft, moist.	
	760	W70062		1 1		2.0	12.8				
				1 2	2						
		W70063		1 2		1.6	1.3			Layer of black silt and clay.	
				3 5	5						
20		W70064		2 2		2.0	2.9				
	755	W70065 (D)		2 5	4						
		W70066		1 6		1.1	0.0			Dark Brown fine SAND and SILT, medium dense, moist.	
		W70067 (D)		8 8	14					Grey fine to coarse SAND, trace silt and shells, medium dense, wet.	
				2 6		1.5	0.1			Grades with little fine gravel.	
25				9 10	15						
	750			7 10		2.0	0.0				
				12 14	22					Light Brown fine SAND, medium dense, wet.	
				4 6		0.7	0.0				Bentonite Slurry Seal 27.5 ft. 30.5 ft. BGS
				9 11	15						
30				4 6		1.3	0.0				
	745			6 6	12						
				4 4		1.2	0.0				
				5 7	9						0.01 stainless steel screen from 32.5 ft. to 37.5 ft. BGS
				2 3		1.4	0.0			Grades with clay laminations.	
35											

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Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	755.98	22.35
10/11/93	757.02	21.31
12/15/93	756.93	21.40

Project: 645.81

Script: Kalaold
Date: 12/15/00

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

Operable Unit:
Willow Boulevard/A-Site

Well No. AMW-7B

Total Depth = 38 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
				2	5					Light Brown fine SAND, loose, wet.	
				5							
	740			9		1.3	0.0				Sandpack from 30.5 ft. to 38 ft. BGS
				14							
				13	27					Light Brown fine to coarse SAND, some fine angular gravel, little silt, medium dense, wet.	
				14							
										End of boring at 38.0 ft. BGS.	
40											
	735										
45											
	730										
50											
	725										
55											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

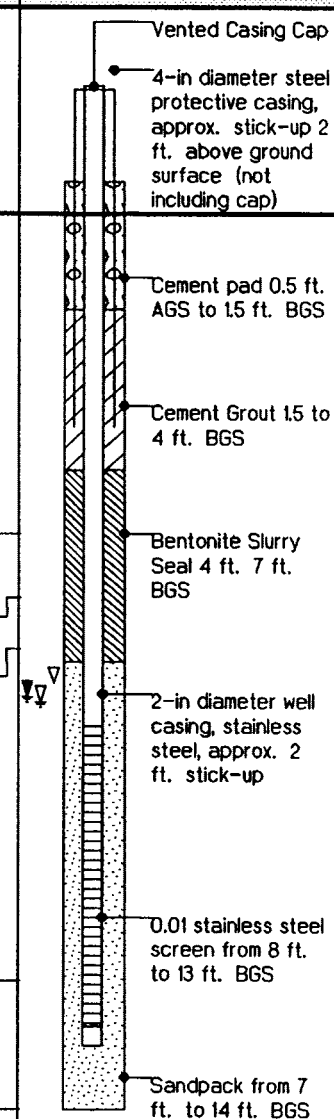
Date / Time	Elevation	TOC
10/08/93	755.98	22.35
10/11/93	757.02	21.31
12/15/93	758.93	21.40

Project: 645.81

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 8/11/93 - 8/12/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287547.9 **Easting:** 12804591.5 **Well Casing Elev.:** 779.51 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 14 ft. **Ground Surface Elev.:** 777.7 ft. **Geologist:** David W. Lay	**Well No. AMW-7P** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
gs elevation 777.7 ft										**GROUND SURFACE**
				WOH WOH 1 1	1	1.3	3.6			Grey fine SAND and SILT, trace fine to coarse sand, very loose, damp (FILL).
	775									
5				2 3 5 5	8	1.9	4.1			Light Brown fine to medium SAND, trace silt, clay, coarse sand and fine gravel, loose, moist (FILL).
										Light Grey PAPER FIBERS, some clay, soft, moist.
	770									Light Brown fine to medium SAND, little silt, trace clay, coarse sand and gravel, loose, moist (FILL).
10				WOH WOH WOH 1	<1	0.3	0.0			
	765			WOH WOH WOH 1	<1	1.0	5.0			Light Grey PAPER FIBERS, some clay, very soft, moist.
15										End of boring at 14.0 ft. BGS.



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Remarks:

Boring log augmented from adjacent borehole AMW-7B.

Water Levels

Date / Time	Elevation	TOC
10/08/93	770.15 ▼	9.36
10/11/93	770.07 ▼	9.44
12/15/93	770.36 ▽	9.15

Date Start/Finish: 7/27/93 – 7/30/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287523.3 **Easting:** 12805015.9 **Well Casing Elev.:** 785.19 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 35 ft. **Ground Surface Elev.:** 782.4 ft. **Geologist:** David W. Lay	**Well No. AMW-8A** **Operable Unit:** Willow Boulevard/A Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 782.4 ft.										**GROUND SURFACE**	Vented Casing Cap 4-in diameter steel protective casing stick-up 2.72 ft. above ground surface (not including cap)
				1 1 1 1	2	0.2	0.7			Light Grey fine SAND and SILT, trace paper fibers, rootlets, very loose, damp (FILL).	Cement pad 0.5 ft. AGS to 1.5 ft. BGS
	780										
5				2 1 1 1	2	0.2	5.3			Grades to brown, no paper fibers, trace rounded gravel.	2-in diameter well casing, stainless steel, approx. 2 ft. stick-up
	775										
										Light Grey CLAY, some paper fibers, medium plastic, soft, moist.	
10				1 1 1 2	2	0.2	11.4				Cement Grout 1.5 to 27 ft. BGS
	770									Grades with little fine to coarse sand and fine gravel.	
15											

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Remarks:

Boring log augmented from adjacent borehole AMW-8B.

Water Levels

Date / Time	Elevation	TOC
10/08/93	757.32	27.87
10/11/93	757.35	27.84
12/15/93	757.29	27.90

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

Operable Unit:
Willow Boulevard/A Site

Well No. AMW-8A

Total Depth = 35 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
				1 1 1 1	2	2.0	20.6			Light Grey CLAY, some paper fibers, medium plastic, soft, moist. 1.5" layer of wet silt.	
	765										
20				2 2 2 3	4	2.0	55.8				
	760										
25						2.0	52.8				
	755									Brown fine to medium SAND, trace coarse sand, fine gravel, and organic matter, loose, moist.	
				5 8 16 18	24	0.7	5.4				Bentonite Slurry Seal 27 to 30 ft. BGS
30				6 6 10 15	16	0.5	13.2				0.01 stainless steel screen from 30 to 35 ft. BGS
	750										
				3 7 13 16	20	0.9	0.0				Sandpack from 30 to 35 ft. BGS
35										End of boring at 35.0 ft. BGS.	

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Remarks:
Boring log augmented from adjacent borehole AMW-8B.

Water Levels

Date / Time	Elevation	TOC
10/08/93	757.32	27.87
10/11/93	757.35	27.84
12/15/93	757.29	27.90

Project: 645.81

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 7/26/93 – 7/30/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287522.3 **Easting:** 12805002.6 **Well Casing Elev.:** 784.94 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 40 ft. **Ground Surface Elev.:** 782.0 ft. **Geologist:** David W. Lay	**Well No. AMW-8B** **Operable Unit:** Willow Boulevard/A Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 782.0 ft.										**GROUND SURFACE**	Vented Casing Cap 4-in diameter steel protective casing stick-up 2.72 ft. above ground surface (not including cap)
		W70036		1 1 1 1	2	0.4	0.0 0.0			Light Grey fine SAND and SILT, trace paper fibers, rootlets, very loose, damp.	Cement pad 0.5 ft. AGS to 1.5 ft. BGS
	780			2 1 2 1	3	1.2	21.4			Light Grey PAPER FIBERS, some clay, soft, moist, odor.	
5				1 1 1 1	2	0.1	0.0			Light Brown SILT and fine SAND, trace fine rounded gravel, very loose, moist (FILL).	2-in diameter well casing, stainless steel, approx. 2 ft. stick-up
	775			WOH WOH WOH 1	<1	0.2	2.8				
		W70037		WOH WOH WOH WOH	<1	0.9	45.7			Light Grey CLAY, some paper fibers, medium plastic, soft, moist.	
10				WOH 1 1 1	2	0.2	11.4				Cement Grout 1.5 to 29 ft. BGS
	770			WOH 1 1 1	2	1.7	37.1			Grades with little fine to coarse sand and fine gravel.	
15				WOH 1		1.7	35.7				

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	757.31	27.63
10/11/93	757.37	27.57
12/15/93	757.27	27.67

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

Operable Unit:
Willow Boulevard/A Site

Well No. AMW-8B

Total Depth = 40 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
				1 1	2						
				WOH 1		1.6	44.2			1.5" layer of wet silt.	
	765			1 1	2						
		W70038		WOH 1		1.8	45.7			0.25" layer of black cinders. 3" layer of wet silt.	
				1 2	2					Grey/Brown PAPER FIBERS, trace clay, loose, moist.	
20		W70039		2 2		2.0	31.4			Grades with some clay, and trace fine to coarse sand and fine rounded gravel, medium stiff, odor.	
				4 6	6						
	760	W70040		4 5		2.0	31.4			Grades to medium dense paper fibers, trace clay.	
				7 8	12						
		W70041		3		2.0	39.9				
		W70042		3			5.7			Brown fine to medium SAND, trace coarse sand fine gravel, and organic matter, medium dense, moist.	
25				6 9	9						
				9 12		1.2	2.2				
	755			12 11	24						
				6 8		1.2	2.2				
				16 15	24						
30				6 8		0.6	2.2				Bentonite Slurry Seal 29 to 33 ft. BGS
				9 15	17						
	750			5 7		1.1	2.2				
				12 15	19						
				5 9		1.0	0.7				
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	757.31	27.63
10/11/93	757.37	27.57
12/15/93	757.27	27.67

Project: 645.81

Script: Kalaold
Date: 12/15/00

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

Operable Unit:
Willow Boulevard/A Site

Well No. AMW-8B

Total Depth = 40 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
				15	24					Brown fine to medium SAND, trace coarse sand fine gravel and organic matter, loose, moist.	0.01 stainless steel screen from 35 to 40 ft. BGS
				17							
				10		1.8	2.2				
				8							
	745			10	18						
				11							
				8		1.3	2.2				Sandpack from 33 to 40 ft. BGS
				8							
				11	19						
				12							
40										End of boring at 40.0 ft. BGS.	
	740										
45											
	735										
50											
	730										
55											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	757.31	27.63
10/11/93	757.37	27.57
12/15/93	757.27	27.67

Date Start/Finish: 7/27/93 - 7/30/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287529.7 **Easting:** 12805009.2 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 21 ft. **Ground Surface Elev.:** 782.1 ft. **Geologist:** David W. Lay	**Well No. B-8P (AMW-8P)** **Operable Unit:** Willow Boulevard/A Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 782.1 ft.											
										GROUND SURFACE	
				1 2 2 2	4	1.2	0.7			Light Grey fine SAND and SILT, trace paper fibers, rootlets, very loose, damp.	
	780									Light Grey PAPER FIBERS, some clay, very soft, moist, hydrogen sulfide odor.	
5				WOH WOH 1 1	1	0.6	21.0				
	775										
10				WOH 1 WOH 1	1	1.0	36.7				
	770										
15											

BLASLAND, BOUCK & LEE, INC.
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Remarks:

Boring log augmented from adjacent borehole AMW-8B. Boring filled with bentonite/cement grout upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

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

Operable Unit:
Willow Boulevard/A Site

Well No. B-8P (AMW-8P)

Total Depth = 21 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
				WOH 1 1 1	2	2.0	21.0			Light Grey PAPER FIBERS, some clay, very soft, moist, hydrogen sulfide odor.	
	765			WOH WOH 1 1	1	2.0	24.2				
				1 2 2 5	4	2.0	41.4			2-in. layer of black cinders.	
20										End of boring at 21.0 ft. BGS.	
	760										
25											
	755										
30											
	750										
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring log augmented from adjacent borehole AMW-8B. Boring filled with bentonite/cement grout upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

Project: 645.81
Script: Kalaold
Date: 12/15/00

Date Start/Finish: 7/29/93 - 8/2/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** N/A **Easting:** N/A **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 42 ft. **Ground Surface Elev.:** 785.20 ft. **Geologist:** David W. Lay	**Well No. B-10B (AMW-10B)** **Operable Unit:** Willow Boulevard/A Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 785.20 ft.										**GROUND SURFACE**	
	785	W70043		1 2 2 2	4	1.5	3.9			White, fine SAND and SILT, some paper fibers , rootlets, very loose, damp.	
				2 1 2 2	3	2.0	2.5				
				2 1 1 2	2	1.2	5.4			Grey PAPER FIBERS, little clay, trace rounded gravel, very soft, moist, hydrogen sulfide odor.	
5	780	W70044		2 1 1 1 2	2	2.0	7.4			2-in layer of black cinders. 2-in layer of dark grey fine sand and silt. Grades to soft consistency.	
				1 1 1 1	2	1.6	5.4			Grades with fine to coarse sand. Grades to no sand.	
10	775			1 1 1 2	2	1.4	3.9			Grades with trace fine to coarse sand.	
				1 1 1 2	2	1.2	5.4			Grey/Brown fine SAND and SILT, some black clay laminations, loose, moist. Lens of wet silt.	
		W70045		1 1		2.0	7.9			Grey PAPER FIBERS, some clay, soft, moist. Grades with silt, wet, odors.	
15											

BLASLAND, BOUCK & LEE , INC.
ENGINEERS & SCIENTISTS

Remarks:

Original well overdrilled, removed, and borehole filled with bentonite /cement grout.

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

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

Operable Unit:
Willow Boulevard/A Site

Well No. B-10B (AMW-10B)

Total Depth = 42 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
	770			1	2						
				1						Green/grey SILT and fine SAND, medium dense, moist.	
				1		1.6	3.9				
				WOH						Mottled PAPER FIBERS, some clay, trace fine to coarse sand, very soft, moist.	
				1	1						
				WOH							
				1		2.0	2.3			Grades with silt, wet.	
				WOH							
				1	1					Grades to no silt, moist.	
				1							
20	765			1		2.0	7.0				
				WOH							
				1	1						
				1							
		W70046		1		1.5	5.4				
				WOH							
				1	1						
				1							
		W70047		1		1.8	8.6				
				1							
25	760			1	2		5.4				
				2							
		W70048		1		2.0	2.3			Grades to wet.	
				3							
		W70049		5	8					Brown ORGANIC MATTER, soft, moist (PEAT).	
				8							
				4		0.9	0.0			Brown fine to coarse SAND, trace silt and fine gravel, rounded, medium dense, moist.	
				7							
				8	15						
				8							
30	755			7			0.0			Grades to wet.	
				10							
				12	22					Brown coarse SAND and fine GRAVEL, trace fine to medium sand, rounded, loose, wet.	
				13							
				4		2.0	2.3			Brown fine to coarse SAND, little silt, trace fine gravel and shells, medium dense, wet.	
				6							
				8	14						
				9							
				5		1.3	0.7				
35				6							

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Original well overdrilled, removed, and borehole filled with bentonite /cement grout.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

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

Operable Unit:
Willow Boulevard/A Site

Well No. B-10B (AMW-10B)

Total Depth = 42 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
	750			8	14					Brown fine to coarse SAND, little silt, trace fine gravel and shells, medium dense, wet.	
				9							
				8		0.8	2.3				
				7							
				8	15						
				11							
				6		0.7	0.7				
				9							
				12	21						
				12							
40	745			3		1.6	0.0			Grades with fine gravel.	
				6							
				12	18					Brown fine SAND, some medium sand, medium dense, wet.	
				12							
										End of boring at 42 ft. BGS.	
45	740										
50	735										
55											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Original well overdrilled, removed, and borehole filled with bentonite /cement grout.

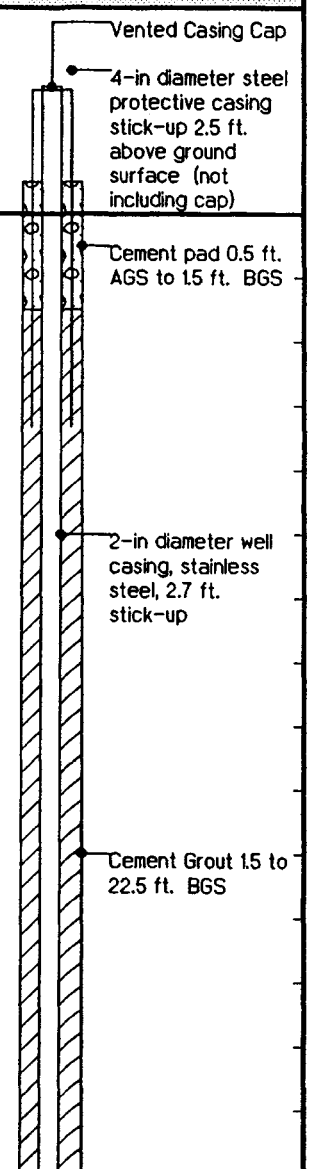
Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

Date Start/Finish: 8/3/93 - 8/5/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287215.7 **Easting:** 12804782.1 **Well Casing Elev.:** 785.52 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 32.5 ft. **Ground Surface Elev.:** 783.2 ft. **Geologist:** David W. Lay	**Well No. AMW-9A** **Operable Unit:** Willow Boulevard/A Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
gs elevation 783.2 ft.										**GROUND SURFACE**
				WOH WOH WOH 1	<1	0.8	4.0			Light Grey fine SAND and SILT, loose, damp.
	780									Light Grey PAPER FIBERS and CLAY, some silt, soft, moist, odor.
5				1 1 1 1	2	2.0	14.2			Grades to some clay, wet.
	775									
10				1 WOH 1 1	1	1.4	29.6			Grades to paper fibers and clay, moist to wet.
	770									
15										

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring log augmented from adjacent borehole AMW-9B.

Water Levels

Date / Time	Elevation	TOC
10/08/93	758.46	27.06
10/11/93	758.49	27.03
12/15/93	758.42	27.10

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

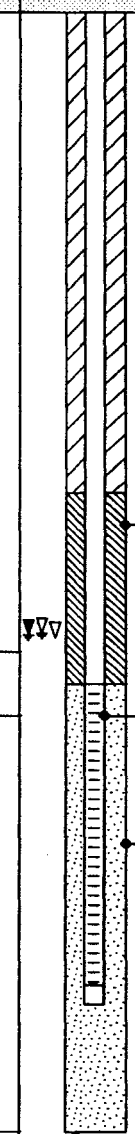
Operable Unit:
Willow Boulevard/A Site

Well No. AMW-9A

Total Depth = 32.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
										Light Grey PAPER FIBERS and CLAY, some silt, soft, moist.
	765									
20				1		1.6	29.5			
				1						
				2	3					
				2						
				1		1.4	7.7			
				1						
	760			2	3					
				2						
				2		2.0	1.1			
				4						
25				5	9					Brown ORGANIC MATTER, trace wood particles, loose, moist (PEAT).
				9						
				5		1.0	0.0			Grey fine to medium SAND, medium dense, wet.
				10						
				5	15					
				7						
	755			4		1.9	0.0			
				7						
				13	20					
				17						
30										
				3		1.1	0.0			Grades with some coarse sand and fine gravel.
				15						
				18	33					
				20						
	750									End of boring at 32.5 ft. BGS.
35										

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring log augmented from adjacent borehole AMW-9B.

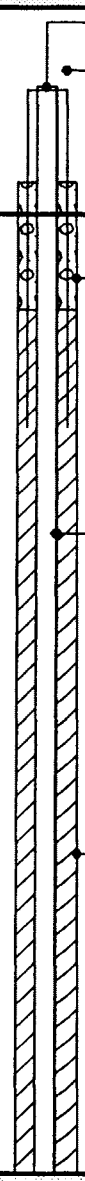
Water Levels

Date / Time	Elevation	TOC
10/08/93	758.46 ▼	27.06
10/11/93	758.49 ▼	27.03
12/15/93	758.42 ▽	27.10

Date Start/Finish: 8/2/93 - 8/5/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287220.6 **Easting:** 12804770.8 **Well Casing Elev.:** 785.79 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 42 ft. **Ground Surface Elev.:** 783.3 ft. **Geologist:** David W. Lay	**Well No. AMW-9B** **Operable Unit:** Willow Boulevard/A Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
gs elevation 783.3 ft.										**GROUND SURFACE**
		W70051		WOH		0.2	0.0			Light Grey fine SAND and SILT, loose, damp.
				WOH			1.8			
				WOH	<1					
				1						
				WOH		0.5	60			Light Grey PAPER FIBERS and CLAY, some silt, very soft, moist, odor.
				WOH						
	780			WOH	<1					
				2						
		W70052		WOH		1.2	61.1			
				WOH						
5				WOH	<1					
				1						Grades to some clay, wet.
				WOH		0.6	49.1			
				WOH						
				WOH	<1					
				1						
	775			WOH		1.4	52.7			
				WOH						
				WOH	<1					Grades to clay, some paper fibers, moist.
				WOH						
10		W70053		WOH		2.0	77.2			Grades to paper fibers and clay, moist to wet.
				WOH						
				WOH	<1					
				WOH						
				WOH		1.6	11.3			
				WOH						
	770			WOH	<1					
				1						
				WOH		1.6	7.6			
15				1						

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	758.41	27.38
10/11/93	758.48	27.31
12/15/93	758.38	27.41

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

Operable Unit:
Willow Boulevard/A Site

Well No. AMW-9B

Total Depth = 42 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
				1 1 WOH 1 1 2 2 WOH 1 1 1 1 1 1 WOH WOH 1 2 1 2 3 5 6 4 3 6 8 9 9 6 8 11 11 7 16 18 19 7 13	2 2 2 2 1 2 3 10 17 19 34	2.0 2.0 2.0 2.0 2.0 0.5 1.6 0.8 1.1 1.0	11.7 46.2 7.6 12.8 41.0 7.3 5.4 15.0 11.7 1.0			Light Grey PAPER FIBER and CLAY, some silt, very soft, moist, odor.	
765											
20		W70054									
		W70055									
760											
		W70056									
25											
		W70057								Brown ORGANIC MATTER, trace wood particles, loose, moist (PEAT). 3" layer of grey fine to medium sand, wet. 3" layer of wood particles.	
755											
										Grey fine to medium SAND, medium dense, wet. Grades with some coarse sand and fine gravel.	
30											
750											
										Brown fine SAND, medium dense, wet.	
35											

Well Construction: Bentonite Slurry Seal 31.5 to 34.5 ft. BGS

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	758.41	27.38
10/11/93	758.48	27.31
12/15/93	758.38	27.41

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

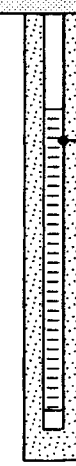
Operable Unit:
Willow Boulevard/A Site

Well No. AMW-9B

Total Depth = 42 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
				14	27					Brown fine SAND, dense, wet.
				14						
				8		1.0	1.4			
				14						
				22	36					
				25						
	745			9		1.0	0.3			
				15						
				22	37					
				20						
40				10		1.6	0.0			
				22						
				30	52					
				28						Lens of fine rounded gravel.
										End of boring at 42.0 ft. BGS.
	740									
45										
	735									
50										
	730									
55										

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	758.41	27.38
10/11/93	758.48	27.31
12/15/93	758.38	27.41

Project: 645.81

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 8/4/93 - 8/5/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287212.2 **Easting:** 12804787.5 **Well Casing Elev.:** 784.88 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 16.5 ft. **Ground Surface Elev.:** 782.6 ft. **Geologist:** David W. Lay	**Well No. AMW-9P** **Operable Unit:** Willow Boulevard/A Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 782.6 ft.										**GROUND SURFACE**	Vented Casing Cap 4-in diameter steel protective casing stick-up 2.5 ft. above ground surface (not including cap)
				WOH WOH WOH WOH	<1	0.3	0.0			Light Grey fine SAND and SILT, very loose, damp.	Cement pad 0.5ft. AGS to 1.5 ft. BGS
	780									Light Grey PAPER FIBERS and CLAY, some silt, very soft, moist, odor.	2-in diameter well casing, stainless steel, 2.65 ft. stick-up
5				WOH WOH WOH 1	<1	0.5	29.9				Cement Grout 1.5 to 6.5 ft. BGS
	775										Bentonite Slurry Seal 6.5 to 9.5 ft. BGS
10				WOH 1 1 WOH	2	2.0	61.0			2" layer of wood particles and rootlets.	
	770			WOH WOH WOH 1	<1	1.2	21.9			1" layer of wood particles and rootlets.	0.01 stainless steel screen from 11.5 to 16.5 ft. BGS
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring log augmented from adjacent borehole AMW-9B.

Water Levels

Date / Time	Elevation	TOC
10/08/93	776.23 ▼	8.65
10/11/93	776.24 ▼	8.64
12/15/93	775.85 ▽	9.03

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

Operable Unit:
Willow Boulevard/A Site

Well No. AMW-9P

Total Depth = 16.5 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
				WOH 1 1 1	2	1.5	19.5			Light Grey PAPER FIBERS and CLAY, some silt, very soft, moist, hydrogen sulfide odor. 1" layer of wood particles and rootlets at 15'.	Sandpack from 9.5 to 17.0 ft. BGS
										End of boring at 17.0 ft. BGS.	
	765										
20											
	760										
25											
	755										
30											
	750										
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring log augmented from adjacent borehole AMW-9B.

Water Levels

Date / Time	Elevation	TOC
10/08/93	776.23	8.65
10/11/93	776.24	8.64
12/15/93	775.85	9.03

Project: 645.81

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 7/30/93 - 8/2/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287146.7 **Easting:** 12805115.0 **Well Casing Elev.:** 787.41 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 33 ft. **Ground Surface Elev.:** 785.40 ft. **Geologist:** David W. Lay	**Well No. AMW-10A** **Operable Unit:** Willow Boulevard/A Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 785.40 ft.										**GROUND SURFACE**	Vented Casing Cap 4-in diameter steel protective casing stick-up 1.97 ft. above ground surface (not including cap)
	785			8 15 5 4	20	1.8	7.6			White fine SAND and SILT, some paper fibers, rootlets, medium dense, damp.	Cement pad 0.5 ft. AGS to 1.5 ft. BGS
5	780			1 WOH 1 WOH	1	0.8	15.3			Grey PAPER FIBERS, little clay, trace rounded gravel, soft, moist, hydrogen sulfide odor.	2-in diameter well casing, stainless steel, approx. 2 ft. stick-up
10	775			1 1 1 1	2	0.9	18.0			Grey/Brown fine SAND and SILT, some black clay laminations, loose, moist. Grey PAPER FIBERS, some clay, soft, moist.	Cement grout 1.5 to 24.5 ft. BGS
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring log augmented from the adjacent borehole B-10B (AMW-10B).

Water Levels

Date / Time	Elevation	TOC
10/08/93	759.46	27.95
10/11/93	759.62	27.79
12/15/93	759.51	27.90

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

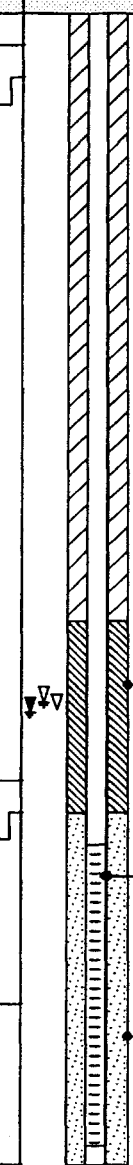
Operable Unit:
Willow Boulevard/A Site

Well No. AMW-10A

Total Depth = 33 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
	770			1 WOH WOH WOH	<1	1.2	10.6			Green/grey SILT and fine SAND, very loose, moist. Mottled PAPER FIBERS, some clay, trace fine to coarse sand, very soft, moist.
20	765			1 1 1 2	2	2.0	22.7			
25	760			1 1 2 3	3	2.0	5.0			Grades to wet.
										Brown ORGANIC MATTER, soft, moist (PEAT). Brown fine to coarse SAND, trace silt and fine gravel, rounded, loose, moist.
30	755			3 5 11 10	16	1.4	0.0			Brown coarse SAND and fine GRAVEL, trace fine to medium SAND, rounded, medium dense, wet.
35										End of boring at 33 ft. BGS.

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring log augmented from the adjacent borehole B-10B (AMW-10B).

Water Levels

Date / Time	Elevation	TOC
10/08/93	759.46 ▼	27.95
10/11/93	759.62 ▼	27.79
12/15/93	759.51 ▽	27.90

Project: 645.81
Script: Kalaold
Date: 12/15/00

Date Start/Finish: 9/4/93 - 9/5/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287150.4 **Easting:** 12805131.8 **Well Casing Elev.:** 787.67 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 45 ft. **Ground Surface Elev.:** 785.20 ft. **Geologist:** David W. Lay	**Well No. AMW-10B** **Operable Unit:** Willow Boulevard/A Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 785.20 ft.										**GROUND SURFACE**	Vented Casing Cap 4-in diameter steel protective casing stick-up 1.95 ft. above ground surface (not including cap)
	785									White fine SAND and SILT, some paper fibers, rootlets, very loose, damp.	Cement pad 0.5 ft. AGS to 1.5 ft. BGS
5	780									Grey PAPER FIBERS, little clay, trace rounded gravel, very soft, moist, hydrogen sulfide odor.	2-in diameter well casing, stainless steel, approx. 2 ft. stick-up
10	775										Cement Grout 1.5 ft. to 32.0 ft. BGS
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring log augmented from adjacent borehole B-10B (AMW-10B).

Water Levels

Date / Time	Elevation	TOC
10/08/93	758.72	28.95
10/11/93	759.45	28.22
12/15/93	758.78	28.89

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

Operable Unit:
Willow Boulevard/A Site

Well No. AMW-10B

Total Depth = 45 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
	770									Grey PAPER FIBERS, little clay, trace rounded gravel, very soft, moist.	
20	765										
25	760										
				2 2 5 7	7	2.0				Grades to wet. Brown ORGANIC MATTER, soft, moist (PEAT). Brown fine to coarse SAND, trace silt and fine gravel, rounded, medium dense, moist.	
30	755										Bentonite Slurry Seal 32.0 ft. to 35.0 ft. BGS
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring log augmented from adjacent borehole B-10B (AMW-10B).

Water Levels

Date / Time	Elevation	TOC
10/08/93	758.72	28.95
10/11/93	759.45	28.22
12/15/93	758.78	28.89

Project: 645.81

Script: Kalaold
Date: 12/15/00

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

Operable Unit:
Willow Boulevard/A Site

Well No. AMW-10B

Total Depth = 45 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
	750									Brown fine to coarse SAND, trace silt and fine gravel, rounded, medium dense, moist.	
40	745										0.01 stainless steel screen from 38.0 to 43.0 ft. BGS Sandpack from 35.0 ft. to 45 ft. BGS
45	740									End of boring at 45 ft. BGS.	
50	735										
55											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring log augmented from adjacent borehole B-10B (AMW-10B).

Water Levels

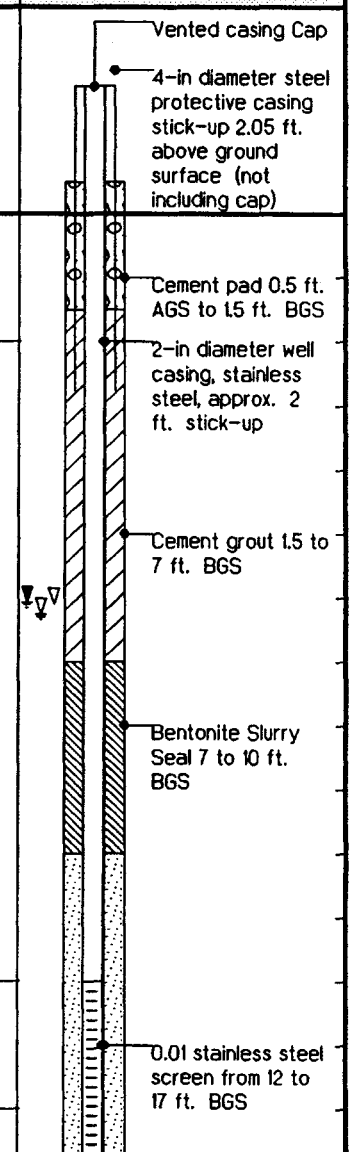
Date / Time	Elevation	TOC
10/08/93	758.72 ▼	28.95
10/11/93	759.45 ▼	28.22
12/15/93	758.78 ▽	28.89

Project: 645.81
Script: Kalaold
Date: 12/15/00

Date Start/Finish: 7/30/93 - 8/2/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size :** 4.25 ID-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287148.2 **Easting:** 12805123.2 **Well Casing Elev.:** 787.68 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 20 ft. **Ground Surface Elev.:** 785.5 ft. **Geologist:** David W. Lay	**Well No.** AMW-10P **Operable Unit:** Willow Boulevard/A Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
gs elevation 785.5 ft.										**GROUND SURFACE**
	785			10 17 6 5	23	1.2	3.6			Brown to dark brown fine to coarse SAND, some silt, trace fine gravel, loose, moist (FILL).
										Light Grey, PAPER FIBERS, some clay, soft, moist.
5	780			1 2 1 1	3	0.2	22.0			
10	775			1 1 1 1	2	1.0	39.4			Grades with trace medium to coarse sand and gravel.
				1 WOH 1 1	1	0.1	31.7			Grey PAPER FIBERS and SILT, some clay, soft, wet.
15				1 WOH		0.8	54.7			Light Grey PAPER FIBERS, some clay, very soft, moist.

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring log augmented from adjacent borehole B-10B (AMW-10B).

Water Levels

Date / Time	Elevation	TOC
10/08/93	779.42 ↧	8.26
10/11/93	779.24 ↧	8.44
12/15/93	779.40 ∇	8.28

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

Operable Unit:
Willow Boulevard/A Site

Well No. AMW-10P

Total Depth = 20 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
	770			1	1						
				2							
				1		0.8	55.4			Layer of brown SILT and fine to medium SAND, trace fine gravel.	Sandpack from 10 to 20 ft. BGS
				WOH							
				WOH	<1						
				WOH							
				1		2.0	2.3				
				WOH							
				WOH	<1					Grades to Dark Grey with some to little silt.	
				WOH							
20	765									End of boring at 20.0 ft. BGS.	
25	760										
30	755										
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring log augmented from adjacent borehole B-10B (AMW-10B).

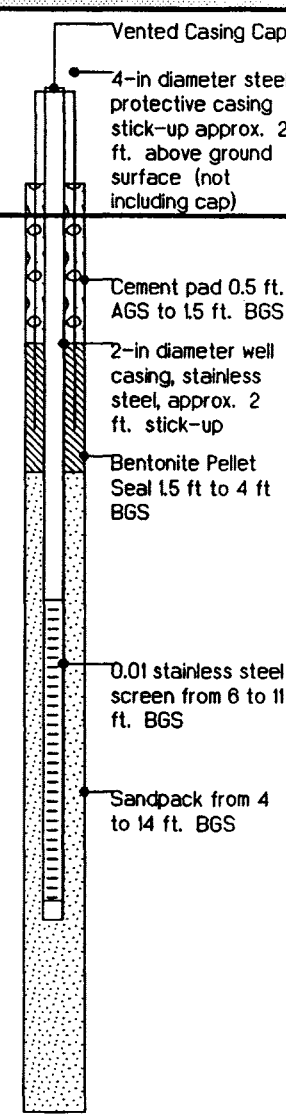
Water Levels

Date / Time	Elevation	TOC
10/08/93	779.42	8.26
10/11/93	779.24	8.44
12/15/93	779.40	8.28

Date Start/Finish: 8/24/93 - 8/24/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287579.9 **Easting:** 12803889.2 **Well Casing Elev.:** 772.35 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 14 ft. **Ground Surface Elev.:** 769.9 ft. **Geologist:** David W. Lay	**Well No. P-1D** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
gs elevation 769.9 ft.										**GROUND SURFACE**
				2		1.8				Brown SILT, some fine sand, trace medium to coarse sand and gravel, loose, damp (DIKE FILL).
				3						
				4	7					
				4						
				5		1.9				
				3						Grades with little grey paper fibers.
				5	8					
				8						Grades to some silt.
				3		2.0				Interbedded layers of brown fine SAND, some silt, and green/grey SILT and fine SAND, roots, loose, moist (DIKE FILL).
				4						
5	765			4	8					
				6						
				2		2.0				Light Grey PAPER FIBERS, some fine sand and silt, loose.
				1						
				2	3					Dark Brown SILT, some clay, loose, moist (PEAT).
				2						
		W70102		1		1.6				Grey fine SAND, little silt, loose, moist.
				1						
				1	2					Black fine SAND and ORGANIC MATTER, trace coarse sand, rounded, loose, moist, (PEAT).
				1						
10	760			1		1.0				
				2						
				2	4					
				3						
				2		1.6				Grey fine SAND, trace coarse sand and gravel, rounded, loose, moist.
				2						
				2	4					
				3						
										End of boring at 14.0 ft. BGS.
15	755									

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

Date Start/Finish: 8/26/93 - 8/26/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hand Driven Well Point **Bit Size:** N/A-in. **Auger Size** : N/A-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287588.5 **Easting:** 12803880.4 **Well Casing Elev.:** 769.93 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 9 ft. **Ground Surface Elev.:** 767.5 ft. **Geologist:** David W. Lay	**Well No. P-IRS** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 767.5 ft.										**GROUND SURFACE**	Vented Casing Cap 4-in diameter steel protective casing stick-up approx. 2 ft. above ground surface (not including cap)
										Brown fine SAND, some silt, trace medium to coarse sand and gravel, loose, damp (DIKE FILL).	Cement pad 0.5 ft. AGS to 1.5 ft. BGS
	765									Interbedded layers of brown fine SAND, some silt, and green/grey SILT and fine SAND, roots, loose, moist (DIKE FILL).	2-in diameter well casing, steel, approx. 2 ft. stick-up
										Light Grey PAPER FIBERS, some fine sand and silt, loose.	
										Dark Brown SILT, some clay, loose, moist (PEAT).	
5										Grey fine SAND, little silt, loose, moist.	0.01 stainless steel screen from 4 to 9 ft. BGS.
	760									Black fine SAND and ORGANIC MATTER, trace coarse sand, rounded, loose, moist (PEAT).	
										End of boring at 9.0 ft. BGS.	
10											
	755										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring log augmented from adjacent borehole P-1D.

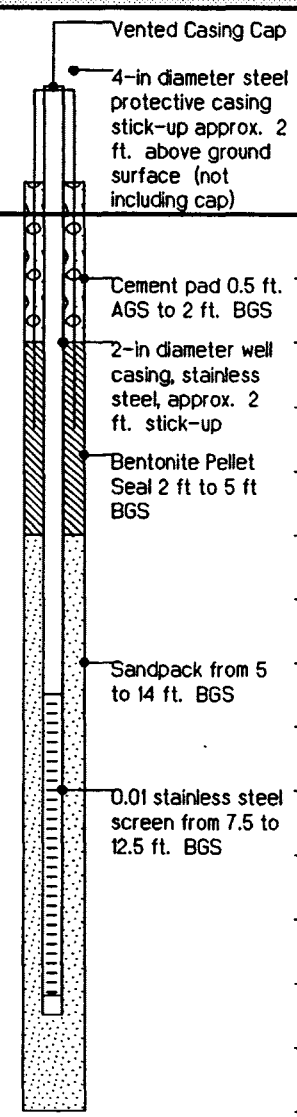
Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

Date Start/Finish: 8/24/93 - 8/24/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287634.5 **Easting:** 12804601.1 **Well Casing Elev.:** 775.43 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 14 ft. **Ground Surface Elev.:** 772.9 ft. **Geologist:** David W. Lay	**Well No.** P-2D **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
gs elevation 772.9 ft.										**GROUND SURFACE**
				5, 9, 9, 18	18	1.3				Brown fine SAND and SILT, trace medium to coarse sand, rootlets and slag, medium dense, moist (DIKE FILL).
	770			4, 7, 11, 17	18	1.4				
5				5, 5, 8, 8	13	1.7				Dark Brown SILT, little fine sand, trace medium to coarse sand, medium dense, moist (DIKE FILL).
	765			3, 3, 3, 3	6	1.2				Dark Brown fine SAND, little medium to coarse sand, trace gravel, loose, moist (DIKE FILL). Grades to light grey with peat mottles.
				2, 2, 2, 2	4	0.9				
10		W70105		2, 2, 3, 2	5	1.4				Dark Brown SILT, little fine sand, trace clay and organics, moist, (PEAT/FILL).
	760			WOH, 4, 5, 5	9	1.7				Dark Brown SILT, little fine sand, clay and organic matter, loose, moist, (PEAT/NATURAL).
15										End of boring at 14.0 ft. BGS.

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

Date Start/Finish: 8/26/93 - 8/26/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hand Driven Well Point **Bit Size:** N/A-in. **Auger Size** : N/A-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287653.6 **Easting:** 12804586.6 **Well Casing Elev.:** 773.14 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 10 ft. **Ground Surface Elev.:** 771.1 ft. **Geologist:** David W. Lay	**Well No. P-2RS** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 771.1 ft.										**GROUND SURFACE**	Vented Casing Cap 4-in diameter steel protective casing stick-up approx. 2 ft. above ground surface (not including cap)
	770									Brown fine SAND and SILT, trace medium to coarse sand, rootlets and slag, medium dense, moist (DIKE FILL).	Cement pad 0.5 ft. AGS to 2 ft. BGS
										Dark Brown SILT, little fine sand, trace medium to coarse sand, medium dense, moist (DIKE FILL).	
										Dark brown fine sand, little medium to coarse sand, trace gravel, loose, moist (DIKE FILL).	2-in diameter well casing, steel, approx. 2 ft. stick-up
5	765										
										Dark Brown SILT, little fine sand, trace clay and organics, loose, moist, (PEAT).	0.007 stainless steel screen from 6 to 11 ft. BGS.
10	760									End of boring at 11.0 ft. BGS.	
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring log augmented from adjacent borehole P-1D.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

Date Start/Finish: 8/26/93 - 8/26/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hand Driven Well Point **Bit Size:** N/A-in. **Auger Size** : N/A-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287403.4 **Easting:** 12805384.6 **Well Casing Elev.:** 771.24 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 7.5 ft. **Ground Surface Elev.:** 768.2 ft. **Geologist:** David W. Lay	**Well No.** P-3RS **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 768.2 ft.										**GROUND SURFACE**	Vented Casing Cap 4-in diameter steel protective casing stick-up approx. 2 ft. above ground surface (not including cap)
										Brown SILT, some fine sand, trace medium to coarse sand and gravel, loose, moist (DIKE FILL). Grades with fine sand.	Cement pad 0.5 ft. AGS to 2 ft. BGS
	765										
5											2-in diameter well casing, galvanized steel, approx. 2 ft. stick-up
										Dark Brown SILT, trace clay and organic matter, loose, moist (PEAT).	0.01 stainless steel screen from 2.5 to 7.5 ft. BGS
	760									End of boring at 7.5 ft. BGS.	
10											
	755										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring log augmented from adjacent borehole P-1D.

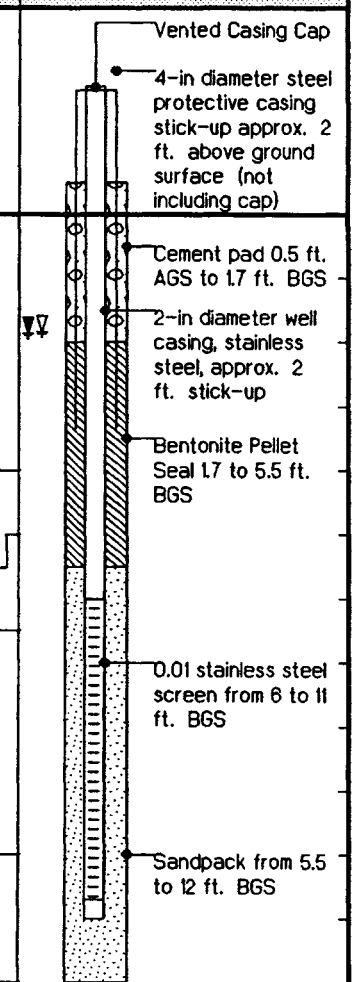
Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

Date Start/Finish: 8/26/93 - 8/26/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287271.1 **Easting:** 12804329.4 **Well Casing Elev.:** 762.19 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 12 ft. **Ground Surface Elev.:** 759.8 ft. **Geologist:** David W. Lay	**Well No.** P-4WT **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
gs elevation 759.8 ft.										**GROUND SURFACE**
				1		1.5				Light Brown fine SAND and SILT, trace medium to coarse sand and gravel, loose, moist.
				1						
				1	2					
				2						
				2		0.9				
				3						
				8	11					
				4						Layer of ashes.
		W70107		1		1.5				Light Grey CLAY, some paper fibers, soft, moist.
	755			3						
5				4	7					Grades to wet.
				6						Grey/Brown fine SAND, loose, wet.
				WOH		1.9				
				3						Brown medium to coarse SAND, some fine sand, trace of rounded gravel, loose, wet.
				4	7					
				6						
				3		0.7				
				6						
				7	13					
	750			7						
10				4		1.0				Light Brown fine SAND, loose, wet.
				4						
				6	10					
				7						
										End of boring at 12.0 ft. BGS.
15	745									

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	757.94	4.25
12/15/93	757.97	4.22
		NA

Date Start/Finish: 8/25/93 - 8/25/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287019.0 **Easting:** 12804688.8 **Well Casing Elev.:** 780.87 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 26 ft. **Ground Surface Elev.:** 778.3 ft. **Geologist:** David W. Lay	**Well No. P-5WT** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 778.3 ft.										**GROUND SURFACE**	Vented Casing Cap 4-in diameter steel protective casing stick-up approx. 2 ft. above ground surface (not including cap)
				1		1.1					
				1							
				1	2					Light Grey SILT, trace fine sand and rootlets, loose, damp.	Cement pad 0.5 ft. AGS to 1.5 ft. BGS
				1		0.6					
				2							
				1							
	775			1	2						
				2		1.2					
				1							
				1							
5				1	2					Grey PAPER FIBERS, some clay, very soft, sight hydrogen sulfide odor, moist.	2-in diameter well casing, stainless steel, approx. 2 ft. stick-up
				2		NR					
				WOH						Grades with silt.	
				WOH							
				1	1						
				WOH		0.6					
	770			WOH							
				1							
				WOH	1						
				1		2.0					
10				WOH							Cement Grout 1.5 to 17 ft BGS
				WOH							
				1	1						
				WOH		1.5					
				WOH							
				WOH							
	765			WOH	<1						
				1		1.2				Grades to little paper fibers.	
				WOH							
15				WOH							

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	759.22 ▼	21.65
10/11/93	759.32 ▼	21.55
12/15/93	759.25 ▼	21.62

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

Operable Unit:
Willow Boulevard/A-Site

Well No. P-5WT

Total Depth = 26 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
				1	1					Grades to clay, some silt, with hydrogen sulfide odors.
				2		2.0				
				WOH						
				WOH						
				2	2					Layer of organic material, leaves.
				2		1.9				Grades to green/grey paper fibers.
	760			1						
				1						
				2	3					
				3		1.9				
20		W70106		1						Brown/Grey SILT, little fine sand, trace clay and organic matter, loose, wet (PEAT).
				1						
				2	3					
				3		1.4				Brown/Grey fine SAND, trace organic matter, loose, wet.
				1						
				1						
	755			2	3					
				3		1.5				
				2						Grey fine to coarse SAND, little gravel, loose, wet.
				3						
25				8	11					Grey fine SAND, trace organics and medium to coarse sand, loose, wet.
				9						
										Brown/Grey fine to coarse SAND, little gravel, loose, wet.
										End of boring at 26.0 ft. BGS.
	750									
30										
	745									
35										

Well Construction

- Bentonite Slurry Seal 17 to 20 ft BGS
- 0.01 stainless steel screen from 20.5' to 25.5' BGS
- Sandpack from 20 to 26 ft. BGS

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	759.22	21.65
10/11/93	759.32	21.55
12/15/93	759.25	21.62

Project: 645.81

Script: Kalaold
Date: 12/15/00

WILLOW BOULEVARD SITE

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 2

PROJECT Georgia Pacific

LOCATION Kalamazoo, Michigan

JOB NO. 406-75086

SURFACE ELEV. N/A

DATE 7-9-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc. Comp. Strength PSF Qp	Qu
	1	30" FILL					
	2						
	3	Silty Clay, gray with trace of organics, moist, layers of FILL					
	4						
	5						
	6	Fine to medium SAND, black to dark gray, wet					
	7						
	8						
	9	END OF BORING					
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24						
	25						

TYPE OF SAMPLE
- DISTURBED
- SPLIT SPOON
- UNDIST LINER
- THIN WALL TUBE
- ROCK CORE

REMARKS:
Samples taken continuously every 24" from ground surface to end of boring

0003864

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT		5 FT.	6 IN
G W ENCOUNTERED AT		FT.	IN
G W AFTER COMPLETION		FT.	IN
G W AFTER	HRS	FT.	IN

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 3

PROJECT Georgia Pacific

LOCATION Kalamazoo, Michigan

JOB NO. 406-75086

SURFACE ELEV. N/A DATE 7-9-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc. Comp. Strength PSF Qp	Qu
		6" FILL, some sand					
	1	FILL					
	2						
	3						
	4	Silty CLAY, gray with trace of organics					
	5						
	6						
	7						
	8	Fine to medium SAND, black to dark gray, wet					
	9						
	10						
	11						
	12						
	13	END OF BORING					
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24						
	25						

TYPE OF SAMPLE
DISTURBED
SPLIT SPOON
UNDIST LINER
THIN WALL TUBE
ROCK CORE

REMARKS:
Samples taken continuously every 24" from ground surface to end of boring

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT		7 FT.	0 IN
G W ENCOUNTERED AT		FT.	IN
G W AFTER COMPLETION		FT.	IN
G W AFTER	HRS	FT.	IN

0003865

Kb-701200

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 4

PROJECT Georgia Pacific

LOCATION Kalamazoo, Michigan

JOB NO. 406-75086

SURFACE ELEV. N/A DATE 7-10-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WT. P.C.F.	Unc. Comp. Strength PSF Qp	Qu
		30" FILL					
	1						
	2						
	3	Fine to medium SAND, brown with trace of gravel, moist					
	4						
	5	Fine to medium SAND, gray, wet					
	6						
	7						
	8	FILL					
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18	Fine to medium SAND, black to gray, wet (possible topsoil)					
	19						
	20						
	21	END OF BORING					
	22						
	23						
	24						
	25						

TYPE OF SAMPLE
D DISTURBED
S SPLIT SPOON
U UNDIST LINER
T THIN WALL TUBE
R ROCK CORE

REMARKS:
-Samples taken continuously every 24" from ground surface to end of boring

0003866

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT	4	FT.	6	INS
G W ENCOUNTERED AT	17	FT.	6	INS
G W AFTER COMPLETION	NONE	FT.		INS
G W AFTER	HRS	FT		INS

KB53701202

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 5

PROJECT Georgia Pacific

LOCATION Kalamazoo, Michigan

JOB NO. 406-75086

SURFACE ELEV. N/A DATE 7-9 & 7-10-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc Comp Strength PSI Qp	Qu	%
		12" FILL						
	1							
		Silty CLAY, gray with trace of organics						
	2							
	3							
	4							
	5							
	6							
	7	FILL						
	8							
	9							
	10							
	11							
	12							
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24	Fine to medium SAND, dark gray, wet						
	25	END OF BORING						

TYPE OF SAMPLE
- DISTURBED
- SPLIT SPOON
- UNDIST LINER
- THIN WALL TUBE
- ROCK CORE

REMARKS:
Samples taken continuously every 24" from ground surface to end of boring

0003867

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT	23 FT.	0 INS	
G W ENCOUNTERED AT	FT.	INS	
G W AFTER COMPLETION	NONE	FT.	INS
G W AFTER HRS	FT	INS	

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 6

PROJECT Georgia Pacific

JOB NO. 406-75086

LOCATION Kalamazoo, Michigan

SURFACE ELEV. N/A DATE 7-8-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Unit Wt. P.C.F.	Unc. Comp. Strength P.S.F. Qp	Qw	S. %
	1	108" FILL, occasional sand and silt layers						
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	10	Fine to medium SAND, gray, wet						
	11	END OF BORING						
	12							
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							

KB53701203

TYPE OF SAMPLE
- DISTURBED
- SPLIT SPOON
- UNDIST LINER
- THIN WALL TUBE
- ROCK CORE

REMARKS:
* Cave-in at 7'0"
Samples taken continuously every 24" from ground surface to end of boring

0003868

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT		9	FT.	0 INS
G W ENCOUNTERED AT			FT.	INS
G W AFTER COMPLETION		*	FT	INS
G W AFTER	HRS.		FT.	INS

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 7

PROJECT Georgia Pacific

LOCATION Kalamazoo, Michigan

JOB NO 406-75086

SURFACE ELEV. N/A DATE 7-7-87

Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. Wt. P.C.F.	Unc. Comp. Strength PSI Q_p	Q_u
1	19' FILL					
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20	Fine to medium SAND, gray with trace of gravel, wet					
21						
22						
23	END OF BORING					
24						
25	KB53701204					

TYPE OF SAMPLE
- DISTURBED
- SPLIT SPOON
- UNDIST LINER
- THIN WALL TUBE
- ROCK CORE

REMARKS:
* Cave-in at 18'2"
Samples taken continuously every 24" from ground surface to end of boring

0003869

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT	19	FT.	0 IN
G W ENCOUNTERED AT		FT.	IN
G W AFTER COMPLETION	*	FT.	IN
G W AFTER HRS		FT.	IN

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 8

PROJECT Georgia Pacific

LOCATION Kalamazoo, Michigan

JOB NO. 406-75086

SURFACE ELEV. N/A DATE 7-8-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. Wt. P.C.F.	Unc. Comp. Strength PSF Q_p	Q_v
		26'6" FILL					
	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24						
	25						

KB53701205

TYPE OF SAMPLE
- DISTURBED
- SPLIT SPOON
- UNDIST LINER
- THIN WALL TUBE

REMARKS:
* Cave-in at
Samples taken continuously every 24"

0003870

GROUND WATER OBSERVATIONS
G W ENCOUNTERED AT 20 FT. 6 IN.
G W ENCOUNTERED AT * FT. IN.
G W AFTER COMPLETION FT. IN.

Professional Service Industries, Inc.
Michigan Testing Engineers Division

CONTINUATION OF SOIL BORING NO. 8

PROJECT Georgia Pacific

JOB NO. 406-75086

LOCATION Kalamazoo, Michigan

SURFACE ELEV. N/A DATE 7-8-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc. Comp. Strength PSF Qp	Qu	Str.
		26'6" FILL						
	26							
	27	Fine to medium SAND, dark gray, wet						
	28							
	29	END OF BORING						
	30							
	31							
	32							
	33							
	34							
	35							
	36							
	37							
	38							
	39							
	40							
	41							
	42							
	43							
	44							
	45							
	46							
	47							
	48							
	49							
	50							

KB53701206

TYPE OF SAMPLE
- DISTURBED
- SPLIT SPOON
- UNDIST LINER
- THIN WALL TUBE

REMARKS:

0003871

PLUGGING PROCEDURE

MINERAL WELL ACT PERMIT NO. _____

HOLE SEALED WITH _____ BETWEEN

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 9

PROJECT Georgia Pacific

LOCATION Kalamazoo, Michigan

JOB NO. 406-75086

SURFACE ELEV. N/A DATE 7-9-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. Wt. P.C.F.	Unc. Comp. Strength PSF Qp	Qv
	1	11' FILL, occasional sand lenses					
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12	SAND and GRAVEL, gray with trace of clay, wet					
	13						
	14						
	15	END OF BORING					
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24						
	25	KB53701207					

TYPE OF SAMPLE
- DISTURBED
- SPLIT SPOON
- UNDIST LINER
- THIN WALL TUBE
- ROCK CORE

REMARKS: 0003872

Samples taken continuously every 24" from ground surface to end of boring

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT 11 FT. 6 IN.

G W ENCOUNTERED AT FT. IN.

G W AFTER COMPLETION NONE FT. IN.

G W AFTER HRS FT. IN.

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 10

PROJECT Georgia Pacific

LOCATION Kalamazoo, Michigan

JOB NO. 406-75086

SURFACE ELEV N/A DATE 7-8-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc. Comp. Strength PSF Qp	Qu	Ex %
	1	84" FILL, occasional sand and silty clay lenses						
	2							
	3							
	4							
	5							
	6							
	7							
	8	Fine to medium SAND, gray, wet						
	9	END OF BORING						
	10							
	11							
	12							
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							

KB53701208

TYPE OF SAMPLE
- DISTURBED
- SPLIT SPOON
- UNDIST LINER
- THIN WALL TUBE

REMARKS:
Samples taken continuously every 24" from ground surface to end of boring

0003873

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT	FT.	INS
G W ENCOUNTERED AT	FT.	INS
G W AFTER COMPLETION	FT.	INS

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 11

PROJECT Georgia Pacific

LOCATION Kalamazoo, Michigan

JOB NO. 406-75086

SURFACE ELEV. N/A DATE 7-7-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc. Comp. Strength PSF Qp	Qu
	1	13'6" FILL, occasional sand and gravel layers					
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14	TOPSOIL, black, moist					
	15	Fine to medium SAND, gray with trace of gravel, wet					
	16						
		END OF BORING					
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24						
	25						

KB53701209

0003874

TYPE OF SAMPLE
- D - DISTURBED
- SS - SPLIT SPOON
- UL - UNDIST LINER
- TW - THIN WALL TUBE
- RC - ROCK CORE

REMARKS:
Samples taken continuously every 24" from ground surface to end of boring

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT	14	FT.	6	IN
G W ENCOUNTERED AT		FT.		IN
G W AFTER COMPLETION		FT.		IN

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 12

PROJECT Georgia Pacific

JOB NO. 406-75086

LOCATION Kalamazoo, Michigan

SURFACE ELEV. N/A DATE 7-7-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. Wt P.C.F.	Unc. Comp. Strength PSF Qp	Qu
	1	23' FILL					
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21	120 +9.29					
	22	KB53701210					
	23						
	24	Fine SAND, black, wet (possible topsoil)					
	25						

0003877

TYPE OF SAMPLE
D - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
TW - THIN WALL TUBE
RC - ROCK CORE

REMARKS: * Cave-in at
Samples taken continuously every 24" from ground surface to end of boring

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT	23	FT. 0	INS
G W ENCOUNTERED AT		FT.	INS
G W AFTER COMPLETION	8	FT	INS
G W AFTER HRS		FT	IN

Professional Service Industries, Inc.
Michigan Testing Engineers Division

CONTINUATION OF SOIL BORING NO. 12

PROJECT Georgia Pacific

JOB NO. 406-75086

LOCATION Kalamazoo, Michigan

SURFACE ELEV. N/A DATE 7-7-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. Wt. P.C.F.	Unc. Comp. Strength PSF Qp	Qu
		Fine SAND, black, wet (possible topsoil)					
	26	Fine to medium SAND, gray with trace of gravel, wet					
	27						
		END OF BORING					
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						
	36						
	37						
	38						
	39						
	40						
	41						
	42						
	43						
	44						
	45						
	46						
	47						
	48						
	49						
	50						

KB53701211

TYPE OF SAMPLE
D - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
TW - THIN WALL TUBE
RC - ROCK CORE

REMARKS:

0003876

PLUGGING PROCEDURE
MINERAL WELL ACT PERMIT NO.
HOLE SEALED WITH BETWEE

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 13
PROJECT Georgia Pacific
LOCATION Kalamazoo, Michigan

JOB NO. 406-75086
SURFACE ELEV. N/A DATE 7-8-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. Wt. P.C.F.	Unc. Comp. Strength PSF Qp	Qw	% RQD
	1	60" FILL						
	2							
	3							
	4							
	5							
	6	SLAG, SAND and GRAVEL, dark brown, wet						
	7							
	8							
	9	FILL, occasional sand layers						
	10							
	11	Silty CLAY, gray with trace of organics, occasional sand lenses						
	12							
	13							
	14							
	15							
	16							
	17	FILL, occasional sand lenses						
	18							
	19	Fine to medium SAND, gray, wet, trace of gravel						
	20							
	21							
	22							
	23	END OF BORING						
	24	KB53701212						
	25	0003875						

TYPE OF SAMPLE
- D - DISTURBED
- SS - SPLIT SPOON
- U - UNDIST LINER
- TW - THIN WALL TUBE

REMARKS:
Samples taken continuously every 24" from ground surface to end of boring

GROUND WATER OBSERVATIONS
G W ENCOUNTERED AT 5 FT. 0 IN.
G W ENCOUNTERED AT FT. IN.
G W AFTER COMPLETION FT. IN.

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 14

PROJECT Georgia Pacific

JOB NO. 406-75086

LOCATION Kalamazoo, Michigan

SURFACE ELEV. N/A DATE 7-8-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. Wt. P.C.F.	Unc. Comp. Strength Psf Q_p	Q_u
	1	10'6" FILL, occasional clay layers					
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11	Fine to medium SAND, gray with trace of gravel, wet					
	12						
	13	END OF BORING					
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24						
	25						

KB53701213

TYPE OF SAMPLE
- DISTURBED
- SPLIT SPOON
- UNDIST LINER
- THIN WALL TUBE
- ROCK CORE

REMARKS: * Cave-in at 9'0"
Samples taken continuously every 24" from ground surface to end of boring

0003879

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT	10	FT.	6	INS.
G W ENCOUNTERED AT		FT.		INS
G W AFTER COMPLETION	*	FT.		INS
G W AFTER HRS.		FT		INS

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 15

PROJECT Georgia Pacific

LOCATION Kalamazoo, Michigan

JOB NO. 406-75086

SURFACE ELEV. N/A DATE 7-10-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc. Comp. Strength PSF Q_p	Q_v
	1	13'6" FILL					
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14	Very sandy TOPSOIL, black, wet					
	15	Fine to medium SAND, gray, wet					
	16						
	17	END OF BORING					
	18						
	19						
	20						
	21						
	22						
	23	KB53701214					
	24						
	25	0003880					

TYPE OF SAMPLE
D - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
TW - THIN WALL TUBE

REMARKS:
Samples taken continuously every 24" from ground surface to end of boring

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT	13	FT.	6	IN.
G W ENCOUNTERED AT		FT.		IN.
G W AFTER COMPLETION	13	FT	0	IN.

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 16

PROJECT Georgia Pacific

JOB NO. 406-75086

LOCATION Kalamazoo, Michigan

SURFACE ELEV. N/A DATE 7-10-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc. Comp. Strength PSI Qp	Qu	SL %
	1	23'6" FILL						
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	10							
	11							
	12							
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22	KB53701215						
	23							
	24	Fine to medium SAND, gray, wet						
	25							

0003881

TYPE OF SAMPLE
- DISTURBED
- SPLIT SPOON
- UNDIST LINER
- THIN WALL TUBE
- ROCK CORE

REMARKS:
Samples taken continuously every 24" from ground surface to end of boring

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT	23	FT.	6	INS
G W ENCOUNTERED AT		FT.		INS
G W AFTER COMPLETION		FT.		INS

Professional Service Industries, Inc.
Michigan Testing Engineers Division

CONTINUATION OF SOIL BORING NO. 16

PROJECT Georgia Pacific

JOB NO. 406-75086

LOCATION Kalamazoo, Michigan

SURFACE ELEV. N/A DATE 7-10-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc Comp Strength PSF Qp	Qu	Sat. %
		Fine to medium SAND, gray, wet						
	26							
	27	END OF BORING						
	28							
	29							
	30							
	31							
	32							
	33							
	34							
	35							
	36							
	37							
	38							
	39							
	40							
	41							
	42							
	43							
	44							
	45							
	46							
	47							
	48							
	49							
	50							

KB53701216

TYPE OF SAMPLE
B - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
TW - THIN WALL TUBE
RC - ROCK CORE

REMARKS:

0003882

PLUGGING PROCEDURE

MINERAL WELL ACT PERMIT NO. _____

HOLE SEALED WITH _____ BETWEE

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 17

PROJECT Georgia Pacific

JOB NO. 406-75086

LOCATION Kalamazoo, Michigan

SURFACE ELEV. N/A DATE 7-8-87

Sample Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc. Comp. Strength PSF Qp	Qu
	1	66" FILL					
	2						
	3						
	4						
	5						
	6	SLAG, SAND and GRAVEL, dark brown, wet					
	7						
	8						
	9	Mixed TOPSOIL, SAND with trace of clay					
	10	Fine SAND, dark gray with trace of organics, very moist					
	11	Fine to medium SAND, gray, wet					
	12						
	13	END OF BORING					
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24	KB53701217					
	25						

TYPE OF SAMPLE
D - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
T - THIN

REMARKS:
Samples taken continuously every 24" from ground surface to end of boring

0003883

GROUND WATER OBSERVATIONS
G W ENCOUNTERED AT 5 FT. 6 INS
G W ENCOUNTERED AT 10 FT. 6 INS

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 18

PROJECT Georgia Pacific

LOCATION Kalamazoo, Michigan

JOB NO. 406-75086

SURFACE ELEV. N/A DATE 7-9-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc. Comp. Strength PSF Qp	Qu
	1	8'6" FILL					
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9	Silty CLAY, gray with trace of organics, moist					
	10						
	11						
		TOPSOIL and PEAT, black, moist					
	12	Fine to medium SAND, gray, wet					
	13						
	14						
	15	END OF BORING					
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24						
	25						

KB53701218

0003884

TYPE OF SAMPLE
B - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
Tw - THIN WALL TUBE

REMARKS:
Samples taken continuously every 24" from ground surface to end of boring

GROUND WATER OBSERVATIONS
G W ENCOUNTERED AT 11 FT. 6 IN.
G W ENCOUNTERED AT FT. IN.
G W AFTER COMPLETION FT. IN.

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 19

PROJECT Georgia Pacific

JOB NO 406-75086

LOCATION Kalamazoo, Michigan

SURFACE ELEV. N/A DATE 7-9-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc. Comp. Strength PSF Qp	Qu	Sens. %
		4" crushed LIMESTONE						
	1	Fine to medium SAND, brown, moist						
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9	Fine to medium SAND, gray, wet						
	10							
	11							
	12							
	13	END OF BORING						
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23	KB53701219						
	24							
	25	0003885						

TYPE OF SAMPLE
D - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
TW - THIN WALL TUBE

REMARKS:
Samples taken continuously every 24" from ground surface to end of boring

GROUND WATER OBSERVATIONS
G W ENCOUNTERED AT 9 FT. 0
G W ENCOUNTERED AT FT.
G W AFTER COMPLETION FT.

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 20

PROJECT Georgia Pacific

JOB NO. 406-75086

LOCATION Kalamazoo, Michigan

SURFACE ELEV. N/A DATE 7-9-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc. Comp. Strength TSF Qp	Qw	Str. %
		18" FILL						
	1							
	2	Fine to medium SAND, brown with trace of gravel, moist						
	3							
	4	Fine to medium SAND, dark gray to black, wet						
	5							
	6							
		FILL						
	7							
	8							
	9							
	10							
	11							
	12							
	13							
	14							
	15	Fine to medium SAND, dark gray, wet						
	16							
	17							
	18	Fine to medium SAND, gray with trace of gravel, wet						
	19	END OF BORING						
	20							
	21							
	22							
	23							
	24							
	25							

KB53701220

0003886

TYPE OF SAMPLE
- DISTURBED
- SPLIT SPOON
- UNDIST LINER
- THIN WALL TUBE
- ROCK CORE

REMARKS:
Samples taken continuously every 24" from ground surface to end of boring

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT	4	FT.	0	INS
G W ENCOUNTERED AT	14	FT.	6	INS
G W AFTER COMPLETION	15	FT.	0	INS
G W AFTER HRS		FT		INS

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 21

PROJECT Georgia Pacific

LOCATION Kalamazoo, Michigan

JOB NO. 406-75086

SURFACE ELEV. N/A DATE 7-10-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc. Comp. Strength Psf Qp	Qu
	1	66" fine to medium SAND, brown with some gravel and occasional cobbles, moist					
	2						
	3						
	4						
	5						
	6	SAND and GRAVEL, gray with trace of clay, moist					
	7						
	8						
	9						
	10	FILL					
	11						
	12						
	13						
	14						
	15						
	16	Fine to medium SAND, gray, wet					
	17						
	18						
	19	END OF BORING					
	20						
	21						
	22						
	23						
	24						
	25						

KB53701221

0003887

TYPE OF SAMPLE
B - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
TW - THIN WALL TUBE
RC - ROCK CORE

REMARKS:
Samples taken continuously every 24" from ground surface to end of boring

GROUND WATER OBSERVATIONS
G W ENCOUNTERED AT 15 FT. 6
G W ENCOUNTERED AT FT.
G W AFTER COMPLETION FT.

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 22

PROJECT Georgia Pacific

JOB NO. 406-75086

LOCATION Kalamazoo, Michigan

SURFACE ELEV. N/A DATE 7-8-87

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc Comp Strength PSF Qp	Qu
		2" crushed LIMESTONE					
	1	Fine to medium SAND, brown, moist					
	2	Silty CLAY, gray, some silty clay, trace of organics, moist					
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16	Fine to medium SAND, gray, wet, trace of gravel					
	17	END OF BORING					
	18						
	19						
	20						
	21						
	22						
	23	KB53701222					
	24						
	25	0003888					

TYPE OF SAMPLE
B - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
TW - THIN WALL TUBE

REMARKS:
Samples taken continuously every 24" from ground surface to end of boring

GROUND WATER OBSERVATIONS
G W ENCOUNTERED AT 15 FT. 0 IN
G W ENCOUNTERED AT FT. IN
G W AFTER COMPLETION 14 FT. 0 IN
G W AFTER HRS FT.

:ustrial Park Drive
:rton, Michigan 49316
5. 698-7770

- No. 87-1763-12

) TEST BORING NO. B -1-

heet 1 of 2

oject Willow Blvd. Landfill

ocation Kalamazoo, MI

ate Completed 12-2-87

:rew Chief Mike Hefferan
Drill Rig Acker ADII
Boring Method HSA & Rotary

Hole Plugged With Cement Grout

GROUNDWATER:
Encountered @ 14.5 ft.
After completion 14.5 ft.
After ____ hrs. NA ft.
Seepage 1.5 ft.
Caved at NA ft.

MONITOR WELL DATA:
Pipe/Type
Length
Above Ground
Cap
Screen/Type
Size
Slot
Set @
Backfilled
Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned
Development

REMARKS:

LEGEND:
SS - Count/Blows per 6"
w/140# hammer x 30" drop
- 2" Split Spoon Sampler
- Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

				Gray Sludge
SS	6	8 7 6		Brown Bricks and Gravel - Wet
SS	18	1 1 1	5	Gray Sludge (Moist to Wet)
ST	20			*3" Shelby Tube Sample
SS	18	1 1 1	10	
SS	16	4 3 4	15	Gray Coarse to Fine Sand - Wet
SS	16	4 5 5	20	Gray Very Fine Silty Sand - Wet * Auger to 19' then Rotary Bore w/3 1/8" Bit
SS	18	9 11 10	25	
SS	18	8 9 9	30	Gray Very Fine Sand - Wet (Mud Loss)

KB53701223

STEARNS DRILLING COMPANY
Industrial Park Drive
Dutton, Michigan 49316
616/698-7770

Job No. 87-1763-12

LOG OF TEST BORING NO. B -1

Sheet 2 of 2

Project Willow Blvd. Landfill

Location Kalamazoo, MI

Date Completed 12-2-87

Crew Chief Mike Hefferan
Drill Rig Acker ADII
Boring Method HSA & Rotary

Hole Plugged With Cement Grout

GROUNDWATER:
Encountered @ 14.5 ft.
After completion 14.5 ft.
After ____ hrs. NA ft.
Seepage 1.5 ft.
ng Caved at NA ft.

MONITOR WELL DATA:
Pipe/Type
Length
Above Ground
Cap
Screen/Type
Size
Slot
Set @
Backfilled
Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned
Development

REMARKS:

ID:
Count/Blows per 6"
140# hammer x 30" drop
2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Type	REC	Blow Count	Depth in Feet	Soil Description
				Gray Coarse to Fine Sand and Fine Gravel - Wet (Mud Loss)
SS	13	9 12 12	35	
SS	16	10 27 27	40	Gray Coarse to Fine Sand and Gravel, Occasional Cobble - Wet (Mud Loss)
SS	0	4 4 2	45	
			50	End of Boring at 48.5' * Total Mud Loss ± 250 Gallons
			55	
			60	

KB53701224

STEARNS DRILLING COMPANY
Industrial Park Drive
Dutton, Michigan 49316
616/698-7770

Job No. 87-1763-12

LOG OF TEST BORING NO. B -1 A

Sheet 1 of 1

Project Willow Blvd. Landfill

Location Kalamazoo, MI

Date Completed 12-2-87

Crew Chief Mike Hefferan
Drill Rig Acker ADII
Boring Method HSA 3½" ID

Hole Plugged With Cement Grout

GROUNDWATER:
Encountered @ 13.0 ft.
After completion 1.5 ft.
After ____ hrs. ____ ft.
Seepage ____ ft.
Boring Caved at NA ft.

MONITOR WELL DATA:
Pipe/Type ____
Length ____
Above Ground ____
Cap ____
Screen/Type ____
Size ____
Slot ____
Set @ ____
Backfilled ____
Bentonite Seal ____
Grout/Type ____
Depth ____
Protective Casing ____
Materials Cleaned ____
Development ____

REMARKS: Approx. 5' South of #4

LEGEND:
Blows/Blows per 6"
140# hammer x 30" drop
2" Split Spoon Sampler
BL - Brass Liner Sample
ST - Shelby Tube Sample
N.R. - Sample not recovered

Type	Rec	Count	Depth in Feet		Soil Description
					Crushed Limestone
					Brown Bricks and Sludge (Fill)
			5		
					Gray Sludge (Fill)
			10		
ST	24				Gray Coarse to Fine Sand w/Shells & Wood
			15		End of Boring at 14.0'
			20		
			25		
			30		

KB53701225

FIELD BORING RECORD

PROJECT Georgia-Pacific
LOCATION Willow Blvd. Landfill
BORING NUMBER MW-1
TYPE Hand Auger
SURFACE ELEVATION 758.75'

DRILLER KCK
ASSISTANT CLO
OBSERVER None
DATE February 9, 1988

DEPTH (ft)	DESCRIPTION
1	Light to dark brown sand with clay binder, occasional clay lenses and gravel, roots, topsoil, no odor, loose.
Post Hole	
2	
Hand Auger	
3 ▽ W.T.	Dark brown fine sand, trace gravel, roots, piece of china plate, little to no clay binder, firm, no odor
4	Cave in. Dark brown fine sand and coarse water sand. Encountered water at 4.0 feet but rose to 3.0 feet.
5	
	E.O.B.
6 Driven	
7	Drove well to approximately 12.0'

KB53701226

0003897

SCALE

DELL ENGINEERING
Environmental Consultants

February, 19

EARNS DRILLING COMPANY
ustrial Park Drive
on, Michigan 49316
695-7770

ob No. 88-1820-2

OG OF TEST BORING NO. MW-2

heet 1 of 1

roject Willow Blvd Landfill

ocation Kalamazoo, MI

ate Completed 2-8-88

rew Chief Jim Gryska
rill Rig CME 550
oring Method HSA

ole Plugged With
Grout, Holeplug

GROUNDWATER:
ountered @ 9.8 ft.
ter completion 8.0 ft.
ter ____ hrs. ____ ft.
eepage ____ ft.
oring Caved at 10.0 ft.

ONITOR WELL DATA:
ipe Type 2" Galvanized
Length 18
Above Ground 4'
Cap HD Locking
creen Type Stainless
Size 3'
Slot 7
Set @ 14' - 17'
Backfilled Natural Soil - 10'
entonite Seal Holeplug 10' - 8'
out Type Neat Cement
Depth 8' - Surface
rotective Casing
aterials Cleaned Steam
evelopment Suction Pumped
5 GPM for 20 Minutes

EMARKS:

EGEND:
Count/Blows per 6"
140# hammer x 30" drop
2" Split Spoon Sampler
Brass Liner Sample
Shelby Tube Sample
Sample not recovered

Type	No.	Count	Depth	Soil Description
3 ST	15			Paper Residual, Fill
3 ST	0			
3 ST	24		5	
3 ST	10			Sand & Gravel, Black, Medium, Fill and Gray Clay
SS	15	7 7 11	10	Sand & Gravel, Black, Medium to Coarse Wet
SS	7	7 9 11	15	
SS	6	2 4 6	20	Sand, Brown, Medium, Wet
				End of Boring at 20.0'
			25	
			30	

KB53701227

0003891

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strial Park Drive
on, Michigan 49316
688-7770

e No. 88-1820-2

G OF TEST BORING NO. MW-3

et 1 of 2

ect Willow Blvd Landfill

ation Kalamazoo, MI

e Completed 2-10-88

w Chief Jim Gryska
Rig CME 550
ing Method HSA

e Plugged With Holeplug, Grout

OUNDWATER:
ountered @ 23.0 ft.
r completion 17.0 ft.
r hrs. ft.
ssage ft.
ing Caved at 23.0 ft.

NITOR WELL DATA:
eType 2" Galvanized
ength 36
Above Ground 3
ap HD Locking

een/Type Stainless
Size 3'
Slot 7
Set @ 33' - 36'
Backfilled Natural Soil - 23'

ntonite Seal Holeplug 23' - 20'
ut/Type Neat Cement
epth 20' - Surface
emove Casing
ntials Cleaned Steam

elopment Suction pumped
GPM for ½ hour

MARKS:

EGEND:
Blows per 6"
hammer x 30" drop
Split Spoon Sampler
Liner Sample
Shelby Tube Sample
Sample not recovered

Type	REC	Blow Count	Depth	Soil Description
3 ST	14			Paper Residual, Fill
3 ST	22			
3 ST	15		5	
3 ST	20			
3 ST			10	
3 ST	24			
3 ST	24			
3 ST	16		15	
3 ST	18			
3 ST	18			Peat, Black, Sandy
3 ST	24		20	
SS	18	9 12 16		Sand, Brown to Gray, Medium, Wet
			25	
SS	10	8 16 19		Sand, Gray, Fine, Silty, Wet
			30	

KB53701228

0003892

STEARNS DRILLING COMPANY
Industrial Park Drive
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616-683-7770

Job No. 88-1820-2

LOG OF TEST BORING NO. MW-3

Sheet 2 of 2

Project Willow Blvd Landfill

Location Kalamazoo, MI

Date Completed 2-9-88

Crew Chief Jim Gryska
Drill Rig CME 550
Boring Method HSA

Hole Plugged With
Grout, Holeplug

GROUNDWATER:
Encountered @ 23.0 ft.
After completion 17.0 ft.
After hrs. ft.
Seepage ft.
Boring Caved at 23.0 ft.

MONITOR WELL DATA:
Pipe/Type 2" galvanized
Length 36
Above Ground 3
Cap HD Locking

Screen/Type Stainless
Size 3'
Slot 7
Set @ 33' - 36'
Backfilled Natural Soils - 23'

Bentonite Seal Holeplug 23' - 20'
Grout/Type Neat Cement
Depth 20' - Surface
Protective Casing
Materials Cleaned Steam

Development Suction Pumped
25 GPM for ½ hour

REMARKS:

KEY:
Count: Blows per 6"
140# hammer x 30" drop
2" Split Spoon Sampler
Brass Liner Sample
Shelby Tube Sample
Sample not recovered

Sample Type	Rec	Blows Count	Depth in Feet	Soil Description
			31	Sand & Gravel, Gray, Coarse to Fine Wet
SS	12	9 10 11	35	
				End of Boring at 35'
			40	
			45	
			50	
			55	
			60	

KB53701229

0003893

Date Start/Finish: 9/1/93 - 9/1/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size :** 4.25 ID-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287326.6 **Easting:** 12803537.4 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 24 ft. **Ground Surface Elev.:** 776.1 ft. **Geologist:** David W. Lay	**Well No. WB-1** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 776.1 ft.										**GROUND SURFACE**	
		W70135		2		1.3	0.0			Grey CLAY and SILT, little fine sand, trace of medium to coarse sand, soft, damp.	
		W70142		2							
	775	W70143 (D)		2	4						
				2							
				1		1.2	0.0			Light Grey CLAY and SILT, soft, moist.	
				2						Grades with trace coarse sand and gravel.	
				2	4						
				2							
				1		1.5	5.2			Grades with some brown silt layers.	
				2							
5				2	4						
				3							
	770	W70136		WOH		1.4	13.8			Light Grey CLAY, some paper fibers, little fine to coarse sand, trace of gravel, very soft, wet.	
				WOH							
				WOH	<1						
				WOH							
				1		NR					
				WOH							
				1	1						
				WOH							
10		W70137		1		0.7	8.3				
				1							
	765			2	3						
				2							
				WOH		2.0	5.2				
				WOH							
				WOH	<1						
				WOH							
				WOH		2.0	5.2				
15				WOH							

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

Project: 645.82 Script: Kalaold
Date: 12/15/00

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

Operable Unit:
Willow Boulevard/A-Site

Well No. WB-1

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
				WOH	<1					Grades with lenses of sand.	
				2							
	760	W70138		2		2.0	3.8			Light Grey PAPER FIBERS, little clay, trace of fine to coarse sand, medium stiff, moist.	
				3							
				4	7						
				5							
		W70139		2		1.5	13.8				
				3							
				5	8						
				5							
20		W70140		2		1.8	5.2			Grades with brown silt lenses.	
				4							
	755			12	16						
				10							
		W70141		4		1.0	0.0			Grey/Brown fine SAND, medium dense, wet.	
				7							
				12	19						
				12						Grey/Brown fine to coarse SAND, medium dense, wet.	
25										End of boring at 24.0 ft. BGS.	
	750										
30											
	745										
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring filled with bentonite/cement grout upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

Date Start/Finish: 8/30/93 - 8/30/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25 ID-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287424.0 **Easting:** 12803811.8 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 20 ft. **Ground Surface Elev.:** 767.3 ft. **Geologist:** David W. Lay	**Well No. WB-2** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 767.3 ft										**GROUND SURFACE**	
		W70109		1		1.4	0.0			2" layer of dark brown fine SAND and SILT, trace rootlets, loose, moist (TOPSOIL).	
		W70115		1							
				3	4						
				4						Light Brown fine SAND, little medium to coarse sand, trace of gravel, loose, moist (DIKE FILL).	
	765			1		1.2	0.0				
				2							
				3	5						
				3						Grades with layer of light grey clay and silt.	
				2		1.4	0.0				
				1							
5				2	3					Grades with layer of light grey clay and silt.	
				3							
				3		1.3	0.2				
				5							
	760			8	13						
				11							
		W70110		3		1.5	1.3.			Several lenses of grey clay.	
				4							
				4	8					Grades to brown.	
				6							
10		W70111		2		1.5	2.3			Grey CLAY, some paper fibers.	
				2						Grey/Brown fine SAND, some medium sand, trace of coarse sand, loose, wet.	
				2	4						
				2						Grey CLAY, little paper fibers, soft, moist.	
	755	W70112		2		1.9	0.7				
				2						Light Brown SAND, loose, moist.	
				3	5						
				2						Grey PAPER FIBERS, loose moist.	
		W70113		2		1.1	2.3			Black CLAY and SILT, some fine sand and organic matter, medium stiff, moist, (PEAT).	
15				3							

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▼	NA

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

Operable Unit:
Willow Boulevard/A-Site

Well No. WB-2

Total Depth = 20 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	6					Black CLAY and SILT, some fine sand and organic matter, medium stiff, moist, (PEAT).	
		W70114		4							
				3		1.0	0.2				
				4						Grey fine to medium SAND, little coarse sand, medium dense, wet.	
	750			8	12						
				7							
				3		1.3				Light Brown fine SAND, medium dense, wet.	
				5							
				7	12						
				9							
20										End of boring at 20.0 ft. BGS.	
	745										
25											
	740										
30											
	735										
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring filled with bentonite/cement grout upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

Project: 645.82

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 9/1/93 - 9/1/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25 ID-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287192.3 **Easting:** 12803668.5 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 8 ft. **Ground Surface Elev.:** 758.9 ft. **Geologist:** David W. Lay	**Well No.** WB-3 **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 758.9 ft.										**GROUND SURFACE**	
		W70127		2		1.5	0.0			Light Grey CLAY and SILT, trace of fine to coarse sand, trace of garbage, paper, rootlets, medium stiff, moist.	
		W70128		2							
		W70134		3	5						
				4							
		W70129		3		1.2	0.0				
				3						Grades with little peat.	
				3	6						
				3						Grades with little paper fibers.	
	755	W70130		WOH		1.4	0.0				
		W70131 (D)		1							
5				2	3						
				2							
		W70132		1		1.2	0.0			Dark Brown SILT and ORGANIC MATTER, loose, moist (PEAT).	
		W70133 (D)		2							
				2	4						
				2							
										Grey fine SAND, loose, wet.	
	750									End of boring at 8.0 ft. BGS.	
10											
	745										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite/cement grout upon completion.

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

Project: 645.82

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 8/31/93 - 8/31/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25 ID-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287481.5 **Easting:** 12803141.8 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 10 ft. **Ground Surface Elev.:** 761.0 ft. **Geologist:** David W. Lay	**Well No. WB-4** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 761.0 ft.											
										GROUND SURFACE	
		W70122		2 2 2 2	4	1.4	0.0			Dark Brown fine SAND and SILT, trace rootlets, loose, moist (TOPSOIL).	
	760									Light Grey CLAY, some silt, little fine to coarse sand, trace of gravel, rounded, soft, loose, moist.	
		W70123		1 2 2 2	4	1.3	0.0				
		W70124		2 2 2 3	4	0.2	0.0				
5	755	W70125		1 2 2 4	4	1.5	0.0				
		W70126		1 2 4 5	6	1.1	0.0			Grey/Brown PAPER FIBERS and fine SAND, loose, moist.	
										Dark Grey fine SAND, little silt, loose, wet.	
10	750									Grey medium to coarse SAND and GRAVEL, little fine sand, loose, wet.	
										End of boring at 10.0 ft. BGS.	
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite/cemant grout upon completion.

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

Date Start/Finish: 8/31/93 – 8/31/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** –in. **Auger Size** : 4.25 ID–in. **Rig Type:** CME–750 **Spoon Size:** 2–in. **Hammer Weight:** 140–lb **Height of Fall:** 30–in.	**Northing:** 287736.0 **Easting:** 12803079.5 **Well Casing Elev.:** ft. **Corehole Depth:** ft. **Borehole Depth:** 8 ft. **Ground Surface Elev.:** 757.9 ft. **Geologist:** David Lay	**Well No. WB–5** **Operable Unit:** Willow Boulevard/A–Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 757.9 ft.										**GROUND SURFACE**	
		W70116 W70117 (D) W70118		1 1 1 1	2	1.0	0.0			Light Gray CLAY, some silt, little paper fibers, trace fine to medium sand, loose, moist.	
		W70119		WOH WOH WOH	<1	1.2	0.0				
	755			1						Grades with paper fibers, wet.	
		W70120		2 2 2	3	0.9	0.0				
5				1						Dark Brown ORGANIC MATTER, loose, moist, (PEAT).	
		W70121		1 1 1 1	2	1.8	0.0			Gray fine to medium SAND, little coarse rounded sand, loose, wet.	
	750									End of boring at 8.0 ft. BGS.	
10											
	745										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite/cemant grout upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

Date Start/Finish: 9/27/93 – 9/27/93 **Drilling Company:** Blasland Bouck & Lee **Driller's Name:** William Schaefer **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size** : 3-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287396.6 **Easting:** 12803052.6 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 0.5 ft. **Ground Surface Elev.:** 762.4 ft. **Geologist:** David W. Lay	**Well No. WBAS-1** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 762.4 ft.										
										GROUND SURFACE	
		W70171				0.5				Dark Brown fine SAND and SILT, trace clay and rootlets, loose, moist (TOPSOIL).	
										End of boring at 0.5 ft. BGS.	
	760										
5											
	755										
10											
	750										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite pellets upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

Date Start/Finish: 9/27/93 - 9/27/93 **Drilling Company:** Blasland Bouck & Lee **Driller's Name:** William Shaefer **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size** : 3-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287190.9 **Easting:** 12803270.1 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 0.5 ft. **Ground Surface Elev.:** 762.1 ft. **Geologist:** David W. Lay	**Well No. WBAS-2** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 762.1 ft.											
										GROUND SURFACE	
		W70170				0.5				Dark SILT, some fine sand, trace clay and rootlets, loose, moist (TOPSOIL).	
										End of boring at 0.5 ft. BGS.	
	760										
5											
	755										
10											
	750										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite pellets upon completion.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

Date Start/Finish: 9/27/93 - 9/27/93 **Drilling Company:** Blasland Bouck & Lee **Driller's Name:** William Schaefer **Drilling Method:** Hand Auger **Bit Size:** N/A-in. **Auger Size** : 3-in. **Rig Type:** N/A **Spoon Size:** N/A-in. **Hammer Weight:** N/A-lb **Height of Fall:** N/A-in.	**Northing:** 287396.6 **Easting:** 12803052.6 **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 0.5 ft. **Ground Surface Elev.:** 760.7 ft. **Geologist:** David W. Lay	**Well No. WBAS-3** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 760.7 ft.										**GROUND SURFACE**	
	760	W70169				0.5				Dark Brown fine SAND and SILT, trace clay and medium to coarse sand, loose, moist (TOPSOIL).	
										End of boring at 0.5 ft. BGS.	
5	755										
10	750										
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring filled with bentonite pellets upon completion.

Water Levels

Date / Time	Elevation	TOC
		NA
		NA
		NA

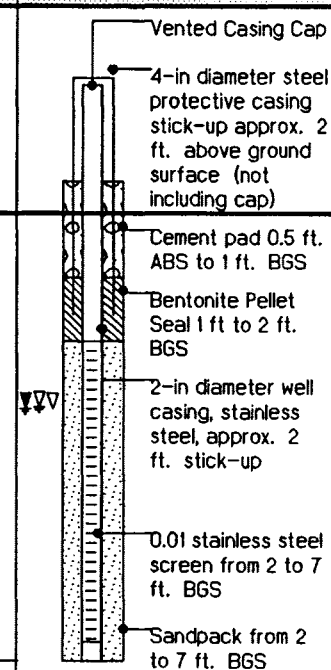
Project: 645.82

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 7/26/93 - 7/27/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287251.9 **Easting:** 12803319.0 **Well Casing Elev.:** 764.41 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 7 ft. **Ground Surface Elev.:** 761.1 ft. **Geologist:** David W. Lay	**Well No. WMW-1A** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
gs elevation 761.1 ft.										**GROUND SURFACE**
	760			1 1 2 3	3	1.2	0.0			Brown fine to coarse SAND, little silt and fine gravel, trace rootlets, loose, moist.
		W70034		4 3		1.1	0.0			
		W70035		2 2 2 1	5	0.8	0.0			Grades to wet.
5	755			2 4	3					
										End of boring at 7.0 ft. BGS.
10	750									
15										

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Augered from 6 to 7 ft. BGS in order to set well.

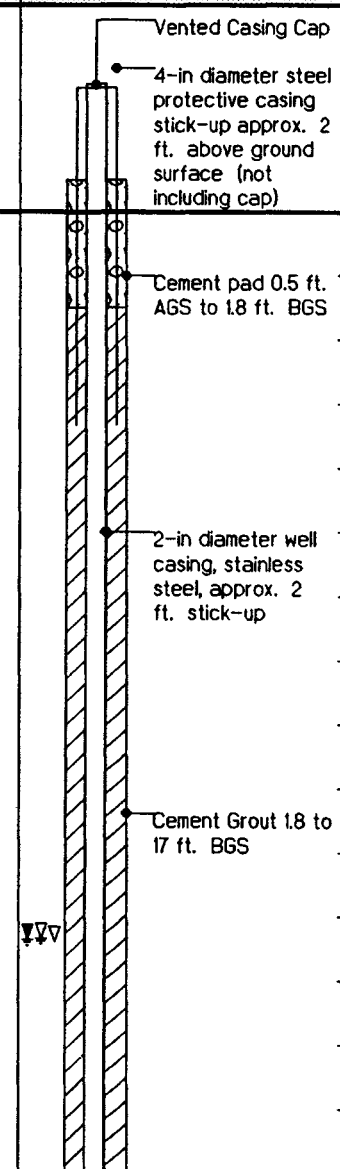
Water Levels

Date / Time	Elevation	TOC
10/08/93	758.06 ▼	6.37
10/11/93	758.06 ▼	6.35
12/15/93	758.04 ▽	6.37

Date Start/Finish: 7/22/93 - 7/23/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287580.3 **Easting:** 12803196.9 **Well Casing Elev.:** 771.19 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 25.5 ft. **Ground Surface Elev.:** 767.9 ft. **Geologist:** David W. Lay	**Well No. WMW-3A** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
gs elevation 767.9 ft.										**GROUND SURFACE**
		W70023		2		1.5	1.9			Light Grey CLAY and SILT, little fine to coarse sand, trace rounded gravel, loose, damp.
				2			0.0			
		W70024		4	6					
				4						
		W70025		2		1.5	0.0			
				3						
	765			3	6					
				3						1" layer of brown fine to medium sand and silt.
				1		1.4	25.2			
				1						
5				1	2					
				1						Grades with some paper fibers, moist.
						2.0	47.5			
	760	W70026		2		0.8	53.6			
				2						
				2	4					
				2						
10				WOH		1.4	48.4			Grades with little fine to coarse sand.
				WOH						
				2	2					
				3						
				1		1.3	39.4			
				2						
	755			2	4					
				2						
		W70027		2		1.8	43.4			
15				2						

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	756.51	14.68
10/11/93	756.54	14.65
12/15/93	756.49	14.70

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

Operable Unit:
Willow Boulevard/A-Site

Well No. WMW-3A

Total Depth = 25.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
				3	5					Grey CLAY and PAPER FIBERS, little fine to coarse sand, trace gravel, medium plastic, moist.
				3						
		W70028		2		1.8	38.1			
				3						
				3	6					
				5						
	750	W70029		2		2.0	42.0			
		W70030 (D)		3						
				3	6					
				5						
20				2		1.6	5.8			Black ORGANIC MATTER, loose, moist (PEAT).
		W70031		2						
		W70032 (D)		3	5					Gray fine to medium SAND, some peat mottles, trace shells, loose, moist.
				3						
				1		1.0	9.6			
				2						Grades to wet.
	745			3	5					
				4						
25										
										End of boring at 25.5 ft. BGS.
	740									
30										
	735									
35										

Well Construction

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Augered from 24 to 25.5 ft. BGS in order to set well.

Water Levels

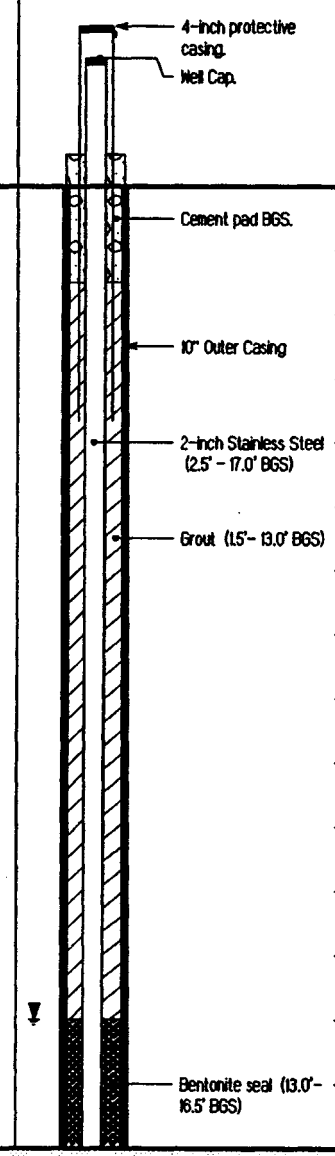
Date / Time	Elevation	TOC
10/08/93	756.51	14.68
10/11/93	756.54	14.65
12/15/93	756.49	14.70

Project: 645.82
Script: Kalaold
Date: 12/15/00

Date Start/Finish: 08-16-96 / 08-16-96 **Drilling Company:** Mateco **Driller's Name:** **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A in. **Rig Type:** CME 45 ATV **Sampling Method:** Split Spoon **Hammer Weight:** 140 lbs.	**Well Casing:** 770.60 feet **Borehole Depth:** 22.5 feet **Ground Surface:** 767.60 feet **Geologist:** James I. Saxton	**Well No: WMW-3AR** **Client:** Willow Boulevard / A-Site OU **Location:** Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
gs elevation 767.60 ft.										**GROUND SURFACE**
		1		2 2 3 3	5	1.16				0.0'-2.5' Light Grey Paper Fibers, dry, crumbly
	765	2		2 3 4 3	7	0.67				Same As Above to 5.0', then brown fine sand, trace of silt, dry, loose, moist. 4.0'-6.0' Light Grey Paper Fibers, dry crumbly to 4.25', then greyish brown fine sand, trace of silt, loose, dry.
5		3		3 4 5 5	9	0.75				
		4		3 3 1 1	4	1.00				6.0'-8.0' Light Grey Paper Fibers, dry, crumbly to 6.5', then wet, grey Paper Fibers.
	760	5		1 1 2 1	3	0.33				8.0'-10.0' Same as above, alternating wet and dry layers.
10		6		1 1 1 1	2	2.00				10.0'-12.0' Grey Paper Fibers, visible paper fibers, moist soft
	755	7		WOH WOH WOH 1	WOH					12.0'-14.0' Same as above.
15		8		WOH WOH	2	2.00				14.0'-16.5' Same as above.

Well Construction



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

Remarks:
This well cased through the residuals. Surface Elevation is approximate.

Water Levels

Date / Time	Elevation	Depth
08-14-96		13.0 ▼

Client:
Willow Boulevard / A-Site OU

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

Well No: WMW-3AR

Total Depth = 22.5 ft.

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Well Construction
		8		2 2	2	2.00					
	750	9		2 2 1 1	3	1.75				16.5'-18.0' Black, peaty, fine SAND with layers of decomposed peat at 17.5' and 17.7'.	Sand Pack (16.5' - 22.5' BGS)
		10		1 1 2 3	3	2.00					Well Screen (17.0' to 22.0' BGS)
20		11		1 1 6 10	7	1.50				Grayish brown fine SAND.	
	745									Bottom of boring at 22.5'.	
25											
	740										
30											
	735										
35											

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

Remarks:

Water Levels

Date / Time	Elevation	Depth
08-14-96		13.0 ▼

Project: 645.81
File: WMW-3AC.LOG
Script: 99nbbl
Date: 12/15/00

Date Start/Finish: 7/20/93 - 7/21/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** N/A **Easting:** N/A **Well Casing Elev.:** N/A ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 20 ft. **Ground Surface Elev.:** 772.2 ft. **Geologist:** David W. Lay	**Well No. B-4A (WMW-4A)** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 772.2 ft.										**GROUND SURFACE**	
				2 3 3 3	6	0.9	0.6			Light Grey CLAY, some fine sand and paper fibers, trace gravel, soft, damp.	
	770										
5				1 WOH WOH WOH	<1	1.7	18.0				
	765										
10				1 2 2 5	4	1.3	13.2				
	760			10 11 13 10	24	1.3	0.6			Brown fine to coarse SAND, trace silt and fine gravel, medium dense, wet.	
15				3 11		1.2	4.4				

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring log augmented from the adjacent borehole WMW-4B. Original well overdrilled, removed, and borehole filled with bentonite/cement grout.

Water Levels

Date / Time	Elevation	TOC
	▼	NA
	▼	NA
	▽	NA

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

Operable Unit:
Willow Boulevard/A-Site

Well No. B-4A (WMW-4A)

Total Depth = 20 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
				15 12 7 2 2 3	26 4	1.3	0.0			Brown fine to coarse SAND, trace silt and fine gravel, medium dense, wet. Grades to dark grey.	
20	755									End of boring at 20.0 ft. BGS.	
25	750										
30	745										
35	740										

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring log augmented from the adjacent borehole WMW-4B. Original well overdrilled, removed, and borehole filled with bentonite/cement grout.

Water Levels

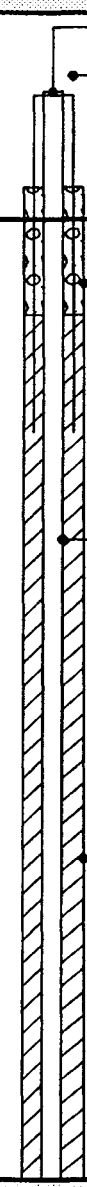
Date / Time	Elevation	TOC
	▼	NA
	▽	NA
	▽	NA

Project: 645.82
Script: Kalaold
Date: 12/15/00

Date Start/Finish: 7/20/93 - 7/21/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Jim Page **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287627.0 **Easting:** 12803493.9 **Well Casing Elev.:** 774.39 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 30 ft. **Ground Surface Elev.:** 772.1 ft. **Geologist:** David W. Lay	**Well No. WMW-4B** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
gs elevation 772.1 ft.										**GROUND SURFACE**
		W70001		2 2 2 2	4	1.5	0.6 0.6			Light Grey CLAY, some fine sand and paper fibers, trace gravel, soft, damp.
	770			5 3 3 3	6	0.2	1.8			
		W70004		2 1		1.5	17.6			
5				2 2	3					
		W70005		1 1		1.5	18.9			
	765			1 1	2					
		W70006		1 WOH WOH WOH	<1	1.3	15.2			
10		W70007		WOH WOH WOH 1	<1	2.0	18.9			
	760	W70008		11 4 2 3	6	0.5	11.5			
15				6 9		1.3	1.8			Brown fine to coarse SAND, trace silt and fine gravel, medium dense, wet.

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	756.31 ▼	18.08
10/11/93	756.34 ▼	18.05
12/15/93	756.44 ▽	17.95

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

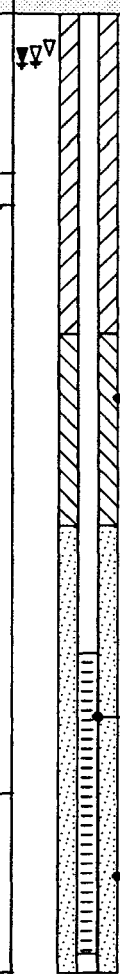
Operable Unit:
Willow Boulevard/A-Site

Well No. WMW-4B

Total Depth = 30 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description
				13	22					Brown fine to coarse SAND, trace silt and fine gravel, medium dense. wet.
				10						
				4		1.4	3.0			
				2						
	755			1	3					
				4						
				3		1.6	0.6			Dark Grey fine SAND, loose, wet.
				4						Dark Grey fine to coarse SAND, trace shells, loose, wet.
				4	8					
				4						
20				2		2.0	0.0			
				3						
				3	6					
				4						
	750			2		1.8	0.6			
				1						
				2	3					
				3						
				5		2.0	4.2			
				8						
25				6	14					
				5						1" layer of black peat.
				3		2.0	1.8			
				4						
	745			4	8					
				6						Light Brown fine SAND, loose, wet.
				2		1.3	0.6			
				4						
				6	10					
				8						
30										End of boring at 30.0 ft. BGS.
	740									
35										

Well Construction



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Water Levels

Date / Time	Elevation	TOC
10/08/93	756.31	18.08
10/11/93	756.34	18.05
12/15/93	756.44	17.95

Project: 645.82

Script: Kalaold
Date: 12/15/00

Date Start/Finish: 9/11/93 - 9/13/93 **Drilling Company:** Mateco Drillers **Driller's Name:** Tom Green **Drilling Method:** Hollow Stem Auger **Bit Size:** N/A-in. **Auger Size** : 4.25-in. **Rig Type:** CME-750 **Spoon Size:** 2-in. **Hammer Weight:** 140-lb **Height of Fall:** 30-in.	**Northing:** 287635.3 **Easting:** 12803488.0 **Well Casing Elev.:** 774.54 ft. **Corehole Depth:** N/A ft. **Borehole Depth:** 22 ft. **Ground Surface Elev.:** 772.2 ft. **Geologist:** Robert G. Patchett	**Well No. WMW-4A** **Operable Unit:** Willow Boulevard/A-Site **Site:** Allied Paper Inc., /Portage Creek/ Kalamazoo River Superfund Site

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 772.2 ft.										**GROUND SURFACE**	Vented Casing Cap 4-in diameter steel protective casing stick-up approx. 2 ft. above ground surface (not including cap)
										Light Grey CLAY, some fine sand and paper fibers, trace gravel, medium stiff, damp.	Cement pad 0.5 ft. AGS to 1.5 ft. BGS
	770										2-in diameter well casing, stainless steel, 2.5 ft. stick-up
5											Cement Grout 1.5 ft. to 10.5 ft. BGS
	765										
10											Bentonite Slurry Seal 10.5 to 12.5 ft. BGS
	760									Dark Grey fine to coarse SAND and SILT, medium dense, damp.	
				6 4 5 6	9	0.8					
15											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:

Boring log augmented from the adjacent borehole WMW-4B.

Water Levels

Date / Time	Elevation	TOC
10/08/93	756.55	17.99
10/11/93	756.46	18.08
12/15/93	756.43	18.11

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

Operable Unit:
Willow Boulevard/A-Site

Well No. WMW-4A

Total Depth = 22 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
										Dark Grey fine to coarse SAND and SILT, medium dense, damp.	0.01 stainless steel screen from 12.7 to 20 ft. BGS; Sandpack from 12.5 to 21.8 ft. BGS
	755										
20											
	750									End of boring at 22.0 ft. BGS.	
25											
	745										
30											
	740										
35											

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Remarks:
Boring log augmented from the adjacent borehole WMW-4B.

Water Levels

Date / Time	Elevation	TOC
10/08/93	756.55	17.99
10/11/93	756.46	18.08
12/15/93	756.43	18.11

Project: 645.82

Script: Kalaold
Date: 12/15/00

Appendix B

Boring Logs for Supplemental Investigations

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

TABLE 1

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

WILLOW BOULEVARD/A-SITE OPERABLE UNIT

SUMMARY OF SOIL BORING DATA

TRANSECT NO.	BORING ID	DEPTH OF BORING	SAMPLE ID	SAMPLE INTERVAL
1	DWA-SB-1	8'	-	-
	DWA-SB-2	6'	-	-
	DWA-SB-3	6'	-	-
2	DWA-SB-4	8'	-	-
	DWA-SB-5	10'	-	-
	DWA-SB-6	10'	-	-
"Beach"	DWA-SB-7	10'	-	-
	DWA-SB-8	8'	-	-
3	DWA-SB-9	8'	-	-
	DWA-SB-10	14'	-	-
	DWA-SB-11	14'	-	-
	DWA-SB-12	8'	-	-
4	DWA-SB-13	6'	-	-
	DWA-SB-14	16'	W70315	12-13'
			W70316	13-13.8'
	DWA-SB-15	12'	-	-
5	DWA-SB-16	6'	-	-
	DWA-SB-17	14'	-	-
6	DWA-SB-18	6'	-	-
	DWA-SB-19	18'	-	-
	DWA-SB-20	4'	-	-
7	DWA-SB-21	6'	-	-
	DWA-SB-22	4'	-	-
	DWA-SB-23	16'	-	-
	DWA-SB-24	14'	-	-
8	DWA-SB-25	8'	-	-
	DWA-SB-26	10'	W70317	4.5-6.5'
			W70318	6.5-7'
	DWA-SB-27	20'	-	-
"Beach"	DWA-SB-28	12'	-	-
	DWA-SB-29	12'	-	-
9	DWA-SB-30	8'	-	-
	DWA-SB-31	8'	-	-
	DWA-SB-32	12'	-	-
10	DWA-SB-33	8'	-	-
	DWA-SB-34	10'	-	-
11	DWA-SB-35	10'	-	-
	DWA-SB-36	10'	-	-
12	DWA-SB-37	10'	-	-
	DWA-SB-38	14'	W70319	4-5.1'
			W70320	5.1-5.5'
	DWA-SB-39	10'	-	-
13	DWA-SB-40	10'	-	-
	DWA-SB-41	12'	-	-
	DWA-SB-42	10'	-	-

TABLE 1

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

WILLOW BOULEVARD/A-SITE OPERABLE UNIT

SUMMARY OF SOIL BORING DATA

TRANSECT NO.	BORING ID	DEPTH OF BORING	SAMPLE ID	SAMPLE INTERVAL
14	DWA-SB-43	10'	-	-
	DWA-SB-44	10'	-	-
	DWA-SB-45	12'	-	-
15	DWA-SB-46	10'	-	-
	DWA-SB-47	10'	-	-
	DWA-SB-48	10'	-	-
	DWA-SB-49	12'	-	-
	DWA-SB-50	16'	-	-
16	DWA-SB-51	12'	W70321	7-8'
			W70322	8-9'
	DWA-SB-52	8'	-	-
	DWA-SB-53	6'	-	-
17	DWA-SB-54	10'	-	-
	DWA-SB-55	6'	-	-
18	DWA-SB-56	6'	-	-
	DWA-SB-57	6'	-	-
19	DWA-SB-58	6'	-	-
	DWA-SB-59	4'	-	-
1	FLA-SB-1	10'	W70323	6.7-7.7'
	FLA-SB-2	8'	-	-
	FLA-SB-3	8'	-	-
	FLA-SB-4	8'	-	-
2	FLA-SB-5	8'	W70324	2.6-2.9'
	FLA-SB-6	8'	-	-
	FLA-SB-7	10'	W70325	4-4.7'
			W70326	4.7-5.5'
3	FLA-SB-8	10'	W70327	4.8-5.8'
	FLA-SB-9	8'	-	-
	FLA-SB-10	8'	-	-
4	FLA-SB-11	10'	W70328	6-8'
	FLA-SB-12	10'	W70329	4-4.8'
			W70330	4.8-5.9'
5	FLA-SB-13	10'	W70331	4-6'
	FLA-SB-14	10'	-	-
	FLA-SB-15	8'	-	-
6	FLA-SB-16	10'	W70332	4.3-5.8'
	FLA-SB-17	8'	-	-
	FLA-SB-18	10'	W70333	2-3.1'
			W70334	3.1-3.6'
7	FLA-SB-19	8'	W70335	6.3-7.0'
	FLA-SB-20	6'	-	-
	FLA-SB-21	6'	-	-

TABLE 1

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

WILLOW BOULEVARD/A-SITE OPERABLE UNIT

SUMMARY OF SOIL BORING DATA

TRANSECT NO.	BORING ID	DEPTH OF BORING	SAMPLE ID	SAMPLE INTERVAL
8	FLA-SB-22	12'	W70336	8.3-10'
			W70337 (dupe)	
	FLA-SB-23	4'	-	-
	FLA-SB-24	8'	W70338	0-2'
			W70339	2-3'
9	FLA-SB-25	10'	W70340	6.5-7.0'
	FLA-SB-26	4'	-	-
	FLA-SB-27	10'	-	-
	DWA-FLA-1	8'	-	-
	DWA-FLA-2	4'	-	-
	DWA-FLA-3	8'	W70341	2.0-2.8'
	DWA-FLA-4	8'	W70342	2.0-2.5'
	SB-ADKINS-1	8'	-	-
	SB-ADKINS-2	10'	-	-
	SB-ADKINS-3	8'	-	-
	SB-ADKINS-4	10'	-	-
	SB-ADKINS-5	12'	-	-
	SB-ADKINS-6	8'	-	-
	SB-ADKINS-7	8'	-	-
	SB-ADKINS-8	8'	-	-
	SB-ADKINS-9	8'	-	-
	SB-3A-201	6'	-	-
	SB-3A-202	8'	-	-
	SB-3A-203	8'	-	-
	SB-3A-204	6'	-	-
	SB-3A-205	6'	-	-
	SB-3A-206	6'	-	-
	SB-3A-207	6'	-	-
	SB-3A-208	8'	-	-
	SB-3A-209	6'	-	-
	SB-3A-210	6'	-	-
	SB-3A-211	6'	-	-
	SB-3A-212	6'	-	-
	SB-3A-213	6'	-	-

Date Start/Finish: 3-25-99 / 3-25-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-1 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.4	0.0			Brown fine SAND and SILT, trace medium to coarse Sand and roots, damp. Orange-brown fine to medium SAND and SILT, trace coarse Sand, damp.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	2.0	0.0			Orange-brown fine SAND, little medium to coarse Sand, trace fine Gravel, trace Silt.	
5		(4-6')		NA	NA	2.0	0.0			Brown fine to coarse SAND, trace fine to medium Gravel, saturated.	
		(6-8')		NA	NA	2.0	0.0			Brown to orange-brown fine to coarse SAND, little fine to medium Gravel, trace Silt, saturated.	
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-25-99 / 3-25-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 6.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-2 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Apparent residuals - gray CLAY-like materials.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.5	0.0				
5		(4-6')		NA	NA	1.8	0.0			Gray fine to coarse SAND, little medium to coarse Gravel, trace Silt, saturated.	
										End of boring at 6.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB-2.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 3-25-99 / 3-25-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 6.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-3 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Gray CLAY-like material, trace fine to coarse Sand, trace fine to medium Gravel. (Apparent residuals)	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.2	0.0				
5		(4-6')		NA	NA	1.7	0.0			Gray-black fine SAND, saturated.	
										End of boring at 6.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB-3.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 3-25-99 / 3-25-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-4 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.1	0.0			Brown fine SAND and SILT, trace medium to coarse Sand and roots, damp.	
		(2-4')		NA	NA	2.0	0.0			Orange-brown fine to medium SAND, trace coarse Sand, trace fine to medium Gravel, damp.	Backfilled borehole with bentonite/cement grout.
5		(4-6')		NA	NA	2.0	0.0			Saturated.	
		(6-8')		NA	NA	1.8	0.0			Brown fine to coarse SAND, little to some fine to medium Gravel, trace Silt, saturated.	
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-25-99 / 3-25-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-5 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.8	0.0			Gray residuals, trace fine to coarse Sand, damp.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.8	0.0				
5		(4-6')		NA	NA	1.5	0.0				
		(6-8')		NA	NA	2.0	0.0				
		(8-10')		NA	NA	2.0	0.0			Gray-black medium to coarse SAND and fine to medium GRAVEL, trace Silt and fine Sand, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones		
Date / Time	Elevation	Depth

Date Start/Finish: 3-25-99 / 3-25-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-6 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.4	0.0			Gray residuals.	
		(2-4')		NA	NA	1.7	0.0				
5		(4-6')		NA	NA	1.8	0.0				Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	2.0	0.0				
		(8-10')		NA	NA	1.9	0.0			Black highly degraded organics. Gray-brown fine to medium SAND, trace coarse Sand, trace fine to coarse Gravel, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones		
Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB-6.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 3-25-99 / 3-25-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-7 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.3	0.0			Gray residuals.	
		(2-4')		NA	NA	1.2	0.0				
5		(4-6')		NA	NA	2.0	0.0				Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	2.0	0.0				
		(8-10')		NA	NA	1.8	0.0			Gray fine to medium SAND, some coarse Sand, trace Silt, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-25-99 / 3-25-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-8 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Gray residuals.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.4	0.0				
5		(4-6')		NA	NA	1.8	0.0				
		(6-8')		NA	NA	2.0	0.0			Black fine SAND and SILT, saturated.	
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-25-99 / 3-25-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-9 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.6	0.0			Gray residuals.	
		(2-4')		NA	NA	1.6	0.0				
5		(4-6')		NA	NA	1.5	0.0				Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	1.0	0.0			Dark gray fine to coarse SAND and fine to coarse GRAVEL, some Silt, saturated.	
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-25-99 / 3-25-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 14.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-10 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.6	0.0			Brown fine to caorse SAND, little fine to medium Gravel and Silt.	
		(2-4')		NA	NA	1.6	0.0			Gray residuals.	
5		(4-6')		NA	NA	1.8	0.0				
		(6-8')		NA	NA	2.0	0.0				Backfilled borehole with bentonite/cement grout.
		(8-10')		NA	NA	2.0	0.0				
10		(10-12')		NA	NA	2.0	0.0				
		(12-14')		NA	NA	1.0	0.0			Black highly degraded organics and CLAY.	
										End of boring at 14.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones		
Date / Time	Elevation	Depth

Date Start/Finish: 3-26-99 / 3-26-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 14.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-11 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.7	0.0			Orange-brown SILT and CLAY, little fine to coarse Sand, fine to coarse Gravel. At base, gray residual.	
		(2-4')		NA	NA	1.8	0.0			Gray residuals.	
5		(4-6')		NA	NA	1.9	0.0				
		(6-8')		NA	NA	2.0	0.0				Backfilled borehole with bentonite/cement grout.
		(8-10')		NA	NA	2.0	8.2				
10		(10-12')		NA	NA	2.0	22.1				
		(12-14')		NA	NA	1.7	0.0			Black highly degraded natural organics.	
										Fine to coarse SAND, little fine to medium Gravel, trace Silt, saturated.	
										End of boring at 14.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-26-99 / 3-26-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-12 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.6	0.0			Brown fine SAND, little medium to coarse Sand, trace Silt, trace fine to medium Gravel and roots, damp.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.2	0.0				
5		(4-6')		NA	NA	1.0	0.0			Saturated.	
		(6-8')		NA	NA	2.0	0.0				
										Gray-brown fine to coarse SAND, trace fine to medium Gravel, trace Silt, saturated.	
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-26-99 / 3-26-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 6.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-13 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Gray-brown fine to medium SAND, trace coarse Sand and fine to medium Gravel, damp. Degraded wood.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.5	0.0			Dark brown highly degraded oragnics and SILT. Gray-brown fine to medium SAND, little coarse Sand, trace fine to medium Gravel, saturated.	
5		(4-6')		NA	NA	2.0	0.0			Gray-brown fine to coarse SAND, little fine to medium Gravel, trace Silt, trace organics, saturated.	
										End of boring at 6.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-26-99 / 3-26-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 16.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-14 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Gray residuals.	
		(2-4')		NA	NA	1.7	0.0			Dry.	
5		(4-6')		NA	NA	2.0	0.0				
		(6-8')		NA	NA	2.0	0.0			Moist.	
		(8-10')		NA	NA	1.6	0.0			Wet.	Backfilled borehole with bentonite/cement grout.
10		(10-12')		NA	NA	2.0	0.0				
		(12-14')		NA	NA	1.8	0.0			Sample W70315 @ 12-13.0 ft. BGS.	
		(14-16')		NA	NA	1.9	0.0			Black highly degraded organics and SILT. Dark gray fine to medium SAND, trace coarse Sand, trace fine to medium Gravel. Sample W70316 @13-13.8 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Client:
Willow Blvd OU Drainage Way Area

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

Soil Boring No: DWA-SB-14

Total Depth = 16.0 ft.

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
		(14-16')		NA	NA	1.9	0.0			Gray fine SAND, saturated.	
										End of boring at 16.0 ft. BGS.	
20											
25											
30											
35											

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Remarks:

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB14.LOG
Script: 99nbbl
Date: 06/22/99

Date Start/Finish: 3-26-99 / 3-26-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 12.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-15 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.7	0.0			Gray residuals.	
		(2-4')		NA	NA	1.5	0.0			Moist.	
5		(4-6')		NA	NA	1.8	0.0				
		(6-8')		NA	NA	2.0	0.0				Backfilled borehole with bentonite/cement grout.
		(8-10')		NA	NA	2.0	0.0				
10		(10-12')		NA	NA	2.0	0.0				
										Black highly degraded natural organics.	
										End of boring at 12.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-26-99 / 3-26-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 6.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-16 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.1	0.0			Brown fine SAND and SILT, trace medium to coarse Sand, trace fine Gravel.	
		(2-4')		NA	NA	2.0	0.0			Gray-brown fine SAND, little medium to coarse Sand, trace fine Gravel, trace Silt.	Backfilled borehole with bentonite/cement grout.
5		(4-6')		NA	NA	2.0	0.0			As above, orange-brown.	
										End of boring at 6.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-26-99 / 3-26-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 14.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-17 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.6	0.0			Orange-brown fine to coarse SAND, trace fine to medium Gravel, moist. Gray residuals.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	0.6	0.0				
5		(4-6')		NA	NA	0.9	0.0				
		(6-8')		NA	NA	2.0	0.0				
		(8-10')		NA	NA	1.2	0.0				
10		(10-12')		NA	NA	2.0	0.0				
		(12-14')		NA	NA	2.0	0.0			Gray fine SAND, saturated.	
										End of boring at 14.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-29-99 / 3-29-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 6.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-18 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.8	0.0			Brown fine SAND and SILT, little medium to coarse Sand, trace fine to medium Gravel, trace glass and brick.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.5	0.0			Brown to orange-brown fine SAND, little medium to coarse Sand, trace fine to medium Gravel and Silt, wet.	
5		(4-6')		NA	NA	1.7	0.0			As above, saturated.	
										End of boring at 6.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-29-99 / 3-29-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 18.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-19 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Brown to orange-brown fine to coarse SAND, little fine to medium Gravel, trace roots and Silt, damp.	
		(2-4')		NA	NA	1.5	0.0			Orange-brown fine SAND, trace medium to coarse SAND, trace fine to medium Gravel.	
5		(4-6')		NA	NA	2.0	0.0				
		(6-8')		NA	NA	1.8	0.0				
		(8-10')		NA	NA	1.8	0.0				Backfilled borehole with bentonite/cement grout.
10		(10-12')		NA	NA	1.7	0.0				
		(12-14')		NA	NA	1.5	0.0			Gray residuals.	
		(14-16')		NA	NA	0.8	0.0				
15										Dark brown highly degraded natural organics.	

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Client:
Willow Blvd OU Drainage Way Area

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

Soil Boring No: DWA-SB-19

Total Depth = 18.0 ft.

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
		(14-16')		NA	NA	0.8	0.0			Dark brown highly degraded natural organics.	
		(16-18')		NA	NA	1.8	0.0			Dark gray fine SAND, saturated.	
										End of boring at 18.0 ft. BGS.	
20											
25											
30											
35											

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Remarks:

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB19.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 3-29-99 / 3-29-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 4.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-20 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.0	0.0			Orange-brown fine SAND, little medium to coarse Sand, trace fine to medium Gravel and Silt, damp.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.0	0.0				
5										Refusal at 4.0 ft. BGS. End of boring at 4.0 ft. BGS.	
10											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB20.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 3-29-99 / 3-29-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 6.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-21 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.0	0.0			Orange-brown fine SAND and SILT, trace medium to coarse Sand, trace fine Gravel, damp.	
		(2-4')		NA	NA	1.8	0.0			Orange-brown fine SAND, trace medium to coarse Sand, fine to medium Gravel and Silt, damp.	Backfilled borehole with bentonite/cement grout.
5		(4-6')		NA	NA	2.0	0.0			As above, saturated.	
										End of boring at 6.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-29-99 / 3-29-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 4.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-22 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.0	0.0			Brown fine SAND and SILT, trace medium to coarse Sand, trace fine Gravel, damp.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	2.0	0.0			Orange-brown fine SAND.	
										Refusal at 4.0 ft. BGS. End of boring at 4.0 ft. BGS.	
5											
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-29-99 / 3-29-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 16.0 feet **Geologist:** Ron Kuhn	**Soil Boring No: DWA-SB-23** **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.8	0.0			Orange-brown fine to coarse SAND, trace fine to medium Gravel and Silt, damp.	
		(2-4')		NA	NA	1.6	0.0			Brown fine SAND, trace medium to coarse SAND and SILT, damp.	
5		(4-6')		NA	NA	2.0	0.0				
		(6-8')		NA	NA	1.6	0.0				
		(8-10')		NA	NA	1.6	0.0				Backfilled borehole with bentonite/cement grout.
10		(10-12')		NA	NA	1.0	0.0			Dark gray fine to coarse SAND, little fine to medium Gravel, trace Silt, wet. Saturated.	
		(12-14')		NA	NA	1.2	0.0			Gray-brown fine SAND, trace medium to coarse Sand, trace fine Gravel, saturated.	
15		(14-16')		NA	NA	2.0	0.0			Gray fine to coarse SAND, little fine to medium Gravel, trace Silt, saturated. (Native)	

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Client:
Willow Blvd OU Drainage Way Area

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

Soil Boring No: DWA-SB-23

Total Depth = 16.0 ft.

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
		(14-16')		NA	NA	2.0	0.0			Gray fine to coarse SAND, little fine to medium Gravel, trace Silt, saturated. (Native)	
										End of boring at 16.0 ft. BGS.	
20											
25											
30											
35											

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Remarks:

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB23.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 3-30-99 / 3-30-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 14.0 feet **Geologist:** Ron Kuhn	**Soil Boring No: DWA-SB-24** **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Brown fine to coarse SAND, trace fine to medium Gravel, trace Silt, damp. Gray residuals.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.2	0.0			Brown fine SAND and SILT, trace roots, damp.	
5		(4-6')		NA	NA	1.4	0.0			Gray residuals.	
		(6-8')		NA	NA	1.7	0.0				
		(8-10')		NA	NA	1.6	0.0			Refusal 12.0 ft. BGS. Preprobed at another location where sampling resumed.	
10		(10-12')		NA	NA	1.7	0.0				
		(12-14')		NA	NA	2.0	0.0			Dark brown highly degraded ORGANICS and SILT, moist to wet. Dark gray fine to medium SAND, little coarse Sand, trace Silt and fine to medium Gravel, saturated.	
15										End of boring at 14.0 ft. BGS.	

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-30-99 / 3-30-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-25 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.8	0.0			Brown fine SAND and SILT, trace medium to coarse Sand, trace roots, damp.	
										Orange-brown fine SAND, trace medium to coarse Sand, trace Silt,	
		(2-4')		NA	NA	1.6	0.0			Orange-brown fine SAND, trace medium to coarse Sand, trace fine to medium Gravel, saturated at 3.0 ft. BGS.	
5		(4-8')		NA	NA	3.6	0.0			Orange-brown fine to coarse SAND, trace fine to medium Gravel, trace Silt, saturated.	Backfilled borehole with bentonite/cement grout.
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-30-99 / 3-30-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-26 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.6	0.0			Dark brown fine SAND and SILT, trace medium to coarse Sand and fine Gravel, damp.	
		(2-4')		NA	NA	1.8	0.0			Orange-brown fine SAND, little Silt, trace medium to coarse Sand, trace fine Gravel, damp. Trace residuals.	
5		(4-6')		NA	NA	1.2	0.0			Gray residuals. Sample W70317 @ 4.5-6.5 ft. BGS. Refusal three times at 6.0 ft. BGS.	Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	1.0	0.0			Dark gray fine SAND and highly degraded natural organics (PEAT). Sample W70318 @ 6.5-7.0 ft. BGS.	
		(8-10')		NA	NA	1.2	0.0			Gray brown fine to coarse SAND, trace fine to medium Gravel, trace Silt, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. Refusal three times at 6.0' bgs.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-30-99 / 3-30-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 20.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-27 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
										Gray residuals.	
		(0-4')		NA	NA	2.0	0.0			Orange-brown fine SAND and SILT, little medium to coarse Sand, trace fine to medium Gravel, damp.	
5		(4-8')		NA	NA	3.0	0.0				
10		(8-12')		NA	NA	3.3	0.0				Backfilled borehole with bentonite/cement grout.
										Gray residuals.	
15		(12-16')		NA	NA	3.3	0.0				

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Client:
Willow Blvd OU Drainage Way Area

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

Soil Boring No: DWA-SB-27

Total Depth = 20.0 ft.

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
		(12-16')		NA	NA	3.3	0.0				Backfilled borehole with bentonite/cement grout.
		(16-20')		NA	NA	2.5	0.0			Dark brown to black highly degraded organics (PEAT).	
20										End of boring at 20.0 ft. BGS.	
25											
30											
35											

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Remarks:

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB27.LOG
Script: 99nbbl
Date: 06/22/99

Date Start/Finish: 3-30-99 / 3-30-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 12.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-29 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-4')		NA	NA	2.0	0.0			Gray fine to medium SAND, little Silt, trace Peat. Gray residuals.	
5		(4-8')		NA	NA	2.5	0.0			Dark to black highly degraded organics (PEAT). Dark gray to black fine SAND, saturated.	Backfilled borehole with bentonite/cement grout.
10		(8-12')		NA	NA	3.5	0.0			Gray fine to coarse SAND, little fine to medium Gravel, trace Silt, saturated.	
										End of boring at 12.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-30-99 / 3-30-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-30 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.8	0.0			Brown to dark brown fine SAND and SILT, little medium to coarse Sand and fine to medium Gravel, trace Peat, damp.	
		(2-4')		NA	NA	1.7	0.0			Orange-brown, saturated.	
5		(4-6')		NA	NA	1.5	0.0			Orange-brown fine to medium SAND, little coarse Sand and fine to medium Gravel, trace Silt, saturated. Coarsening downward.	Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	1.8	0.0				
										End of boring 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-30-99 / 3-30-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-31 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Brown to dark brown fine SAND and SILT, little Peat. Gray residuals. Light brown fine SAND, moist.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	0.9	0.0			Gray residuals, brown natural organics (Peat) in tip of spoon. Gray residuals.	
5		(4-6')		NA	NA	1.2	0.0			Dark brown PEAT and SILT, trace artifact.	
		(6-8')		NA	NA	1.8	0.0			Dark gray fine to coarse SAND, trace fine Gravel and Silt. Dark gray fine SAND, saturated.	
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. Artifact comprised of a dish fragment.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-30-99 / 3-30-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 12.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-32 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
										Brown fine SAND and SILT, trace fine to medium Gravel, moist.	
		(0-4')		NA	NA	2.2	0.0			Gray residuals.	
5		(4-6')		NA	NA	1.8	0.0				Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	1.5	0.0			Refusal at 8.0 ft. bgs. Preprobe at another location where sampling resumed.	
		(8-10')		NA	NA	2.0	0.0			Gray residuals.	
10										Dark brown to black highly degraded natural organics (PEAT) and SILT, little fine Sand, moist to wet.	
		(10-12')		NA	NA	2.0	0.0			Dark gray fine SAND, little medium to coarse Sand, trace Peat.	
										End of boring at 12.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-30-99 / 3-30-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-33 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.8	0.0			Brown fine to medium SAND, little coarse Sand, and fine to medium Gravel, trace Peat, damp.	
		(2-4')		NA	NA	1.5	0.0			Trace coarse Gravel.	
5		(4-6')		NA	NA	2.0	0.0			Grading to a fine to coarse SAND, trace fine Gravel, saturated.	Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	2.0	0.0				
10										End of boring at 8.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-31-99 / 3-31-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-34 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.6	0.0			Gray brown fine SAND and SILT, trace to little medium to coarse Sand, trace fine to medium Gravel, trace roots, wet @ 1.0 ft. bgs.	
		(2-4')		NA	NA	1.3	0.0			Gray residuals.	
5		(4-6')		NA	NA	2.0	0.0				Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	1.7	0.0			Gray black highly degraded natural organics (PEAT) and SILT, wet.	
		(8-10')		NA	NA	1.6	0.0				
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB34.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 3-31-99 / 3-31-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Tamara Hauptfleisch	**Soil Boring No:** DWA-SB-35 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Dark brown fine SAND and SILT, little highly degraded natural Organics (peat), trace medium to coarse Sand, trace fine to medium Gravel, roots damp.	
										Light brown fine to medium SAND, little coarse Sand, trace fine Gravel ,damp.	
		(2-4')		NA	NA	1.2	0.0			Dark brown fine SAND and SILT, little medium to coarse Sand, trace fine to medium Gravel, trace roots, Saturated.	
5		(4-6')		NA	NA	1.5	0.0				Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	1.8	0.0				
		(8-10')		NA	NA	2.0	0.0			Gray to black fine SAND and SILT, little highly degraded Natural Organics, saturated.	
										Gray brown fine SAND, little Silt, trace fine to medium Gravel, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-31-99 / 3-31-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-38 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Dark brown fine SAND and SILT, trace Cinders and Peat. Gray residuals.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.6	0.0				
5		(4-6')		NA	NA	1.8	0.0				
		(6-8')		NA	NA	1.7	0.0			Dark gray to black highly degraded natural organics (PEAT), wet.	
		(8-10')		NA	NA	2.0	0.0			Dark brown to gray fine SAND, trace fine to medium Gravel and medium to coarse Sand, glass fragment, saturated. Gray fine SAND, some medium to coarse Sand, trace Silt, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-31-99 / 3-31-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-37 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Dark brown fine SAND and SILT, little medium to coarse Sand, Slag and Cinders, trace fine to medium Gravel and Roots, damp.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.5	0.0			Gray brown fine SAND and SILT, little medium to coarse Sand, trace fine to medium Gravel and Roots, wet.	
5		(4-6')		NA	NA	1.2	0.0			Dark brown fine SAND and SILT, little medium to coarse SAND, trace fine to medium Gravel, saturated.	
		(6-8')		NA	NA	2.0	0.0			Brown fine SAND, trace medium to coarse Sand, fine to medium Gravel and Silt, saturated.	
		(8-10')		NA	NA	1.9	0.0				
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-31-99 / 3-31-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 14.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-38 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Gray residuals.	
		(2-4')		NA	NA	1.2	0.0			Brown fine SAND, trace Concrete, trace medium to coarse Sand, damp. Gray black fine to coarse SAND and grey residuals.	
5		(4-6')		NA	NA	1.5	0.0			Gray residuals. Sample W70319 @ 4-5.1' bgs. Dark brown fine SAND and SILT, little highly degraged natural organics (Peat), trace medium to coarse Sand, saturated. Sample W70320 @ 5.1-5.5' bgs.	
		(6-8')		NA	NA	2.0	0.0			Gray brown fine SAND and SILT, little medium to coarse Sand, trace fine to medium Gravel, saturated.	Backfilled borehole with bentonite/cement grout.
10		(8-10')		NA	NA	1.5	0.0			Gray black highly degraded natural organics (PEAT) and SILT, saturated.	
		(10-12')		NA	NA	1.5	0.0				
		(12-14')		NA	NA	2.0	0.0			Brown fine SAND, trace Silt, saturated.	
15										End of boring at 14.0 ft. BGS.	

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-31-99 / 3-31-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-39 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Gray residuals.	
		(2-4')		NA	NA	1.6	0.0			Moist.	
5		(4-6')		NA	NA	1.8	0.0				Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	1.8	0.0			Dark brown/black highly degraded natural organics (PEAT) and SILT, moist.	
		(8-10')		NA	NA	2.0	0.0			Gray brown fine to coarse SAND, some fine to medium Gravel, trace Silt, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-31-99 / 3-31-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-40 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.0	0.0			Orange-brown fine SAND and SILT, little medium to coarse Sand, trace fine to medium Gravel.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.0	0.0			Gray brown fine SAND, little medium to coarse Sand, damp.	
5		(4-6')		NA	NA	0.8	0.0			Wet.	
		(6-8')		NA	NA	0.3	0.0			Brown fine SAND and SILT, little medium to coarse Sand, little Gravel, saturated.	
		(8-10')		NA	NA	2.0	0.0			Brown fine SAND, trace medium to coarse Sand, fine to medium Gravel and Silt, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-31-99 / 3-31-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 12.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-41 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.3	0.0			Gray residuals.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.4	0.0				
5		(4-6')		NA	NA	1.6	0.0				
		(6-8')		NA	NA	2.0	0.0				
		(8-10')		NA	NA	1.9	0.0			Dark gray to black highly degraded organics (PEAT), trace fine Sand, saturated.	
10		(10-12')		NA	NA	2.0	0.0			Dark gray to black highly degraded organics (PEAT) and SILT. Dark gray fine Sand stringer at 10.5 ft. BGS. Dark gray fine Sand stringer at 11.0 ft. BGS. Dark gray fine Sand stringer at 11.3 ft. BGS. End of boring at 12.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-31-99 / 3-31-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-42 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.4	0.0			Gray residuals.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.3	0.0				
5		(4-6')		NA	NA	1.8	0.0				
		(6-8')		NA	NA	2.0	0.0			Dark brown to black highly degraded natural organics and SILT.	
		(8-10')		NA	NA	2.0	0.0				
10										Dark gray fine to coarse SAND, little fine to medium Gravel, trace Silt, saturated.	
										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-31-99 / 3-31-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-43 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.4	0.0			Brown fine SAND and SILT, little medium to coarse Sand, trace fine to medium Gravel, porcelain and slag, roots, damp.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.2	0.0			Same as above.	
5		(4-6')		NA	NA	2.0	0.0			Orange-brown fine to medium SAND, trace coarse Sand, fine Gravel, Silt, saturated.	
		(6-8')		NA	NA	2.0	0.0			Brown fine SAND, trace medium to coarse sand, trace fine Gravel and Silt, saturated.	
		(8-10')		NA	NA	2.0	0.0			Same as above.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-31-99 / 3-31-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-44 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.8	0.0			Brown fine to coarse SAND and fine to medium GRAVEL, trace coarse fine to medium Gravel.	
		(0-4')		NA	NA	3.5	0.0			Gray residuals.	
5		(4-6')		NA	NA	2.0	0.0				Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	1.7	0.0			Black highly degraed natural organics (peat), trace ceramics, little Silt and fine Sand, saturated.	
		(8-10')		NA	NA	1.9	0.0			Brown gray fine to medium SAND, saturated	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-23-99 / 3-23-99 **Drilling Company:** Parratt Wolff **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 12.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-45 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Brown fine SAND and SILT, trace organics. Gray residuals with red orange fine Sand. Seam	
		(2-4')		NA	NA	1.5	0.0			Gray residuals. Moist	
5		(4-6')		NA	NA	1.6	0.0			Brown gray fine to coarse SAND, little fine to medium Gravel, trace residual material. Gray residuals.	
		(6-8')		NA	NA	0.3	0.0			Same as above.	Backfilled borehole with bentonite/cement grout.
		(8-10')		NA	NA	0.0	0.0			No recovery.	
10		(10-12')		NA	NA	2.0	0.0			Bray brown firm to medium SAND, little fine Gravel, trace Silt, saturated.	
										End of boring at 12.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-1-99 / 4-1-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-46 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.7	0.0			Gray brown fine SAND and SILT, trace to little medium to coarse Sand, trace fine to medium Gravel, damp.	
		(2-4')		NA	NA	1.5	0.0			Black SLAG and CINDERS, trace fine to coarse Sand, trace fine to medium Gravel, trace Silt, damp. Gray brown SILT, trace natural organics, damp.	
5		(4-6')		NA	NA	1.5	0.0			Gray brown fine SAND, little Silt, trace medium to coarse Sand, trace fine to medium Gravel, roots, wet. Saturated	Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	2.0	0.0				
		(8-10')		NA	NA	2.0	0.0			Gray brown fine to coarse SAND, some fine to medium Gravel, trace Silt, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-1-99 / 4-1-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-47 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-4')		NA	NA	3.0	0.0			Brown fine SAND, little medium to coarse Sand, little Silt, trace fine to medium Gravel, trace Slag and Cinders, damp. Gray residuals. Brown fine SAND and Silt, trace Cinders and Glass. Gray black SLAG and CINDERS. Gray brown SILT, trace roots, damp.	
5		(4-8')		NA	NA	3.0	0.0			Dark brown highly degraded natural organics and SILT. Gray brown fine SAND, little medium to coarse Sand, trace Silt and fine to medium Gravel, saturated.	Backfilled borehole with bentonite/cement grout.
		(8-10')		NA	NA	2.0	0.0			Light brown fine SAND, trace Silt, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-1-99 / 4-1-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-48 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-4')		NA	NA	4.0	0.0			Gray brown fine SAND and SILT, trace medium to course Sand and fine to medium Gravel, little Slag and Cinders, trace roots, damp.	
										Gray residuals.	
5		(4-8')		NA	NA	3.0	0.0			Gray to black fine SAND, little Silt, medium to coarse Sand, trace fine Gravel, Ceramic, Porcelin, saturated.	
										Dark gray to black highly degraded natural organics.	
										Gray brown fine SAND,trace fine to medium Gravel and Silt, saturated.	Backfilled borehole with bentonite/cement grout.
		(8-10')		NA	NA	2.0	0.0			Gray brown fine SAND, gray silt seams 0.2" thick at 9-9.2 ft. and 9.5-9.7 ft. BGS, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB48.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 4-1-99 / 4-1-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 12.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-49 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-4')		NA	NA	4.0	0.0			Gray brown fine SAND and SILT, trace medium to coarse Sand and fine to medium Gravel, trace cinders, damp.	
										Gray residuals.	
5		(4-8')		NA	NA	3.0	0.0				Backfilled borehole with bentonite/cement grout.
										Dark gray to black hihgly degraded natuaral organics and SILT.	
10		(8-12')		NA	NA	4.0	0.0			Grey fine, trace medium to coarse Sand, trace fine to medium Gravel, saturated.	
										End of boring at 12.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB49.LOG
Script: 99nbbl
Date: 08/21/99

Date Start/Finish: 4-1-99 / 4-1-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 16.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-50 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-4')		NA	NA	3.0	0.0			Brown fine SAND and SILT, little medium to coarse Sand, trace fine to medium Gravel, trace to little gray residuals, Cinders, coal, slag.	Backfilled borehole with bentonite/cement grout.
5		(4-8')		NA	NA	4.0	0.0				
										Gray residuals.	
10		(8-12')		NA	NA	4.0	0.0				
										Dark gray to black natural organics and SILT, occational fine Sand seams.	
		(12-16')		NA	NA	4.0	0.0				
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Client:
Willow Blvd OU Drainage Way Area

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

Soil Boring No: DWA-SB-50

Total Depth = 16.0 ft.

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
		(12-16')		NA	NA	4.0	0.0			Gray brown fine to coarse SAND, little fine to medium Gravel, trace Silt, saturated.	
										End of boring at 16.0 ft. BGS.	
20											
25											
30											
35											

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Remarks:

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB50.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 4-1-99 / 4-1-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 12.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-51 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-4')		NA	NA	4.0	0.0			Brown fine SAND and SILT, trace medium to coarse Sand and wood, damp.	
										Gray residuals.	
5		(4-8')		NA	NA	3.5	0.0			Sample W70321 @ 7-8 ft. BGS.	Backfilled borehole with bentonite/cement grout.
										Gray-brown fine SAND, little Silt, trace medium to coarse Sand and Shells, saturated.	
										Sample W70322 @ 8-9 ft. BGS.	
10		(8-12')		NA	NA	4.0	0.0			Dark gray to black highly degraded natural organics and SILT.	
										Gray fine to coarse SAND, little fine to medium Gravel, trace Silt, saturated.	
										End of boring at 12.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB51.LOG
Script: 99nbbl
Date: 06/22/99

Date Start/Finish: 4-1-99 / 4-1-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-52 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-4')		NA	NA	3.0	0.0			Brown fine SAND and SILT, trace fine to medium to coarse Sand and fine to medium Gravel, damp. Gray black SLAG and CINDER, white fire BRICK, trace fine to coarse sand, wet.	
5		(4-6')		NA	NA	2.0	0.0			Gray residuals. Gray brown fine SAND, little Silt, trace medium to coarse Sand and Shells, saturated.	Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	2.0	0.0			Dark gray to black highly degraded natural organics. Same as 4.7-7.2 ft. BGS. End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB52.LOG
Script: 99nbbl
Date: 08/22/99

Date Start/Finish: 4-1-99 / 4-1-99 **Drilling Company:** Parratt Wolff **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 6.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-53 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.3	0.0			Brown fine SAND and SILT, trace medium to coarse Sand and fine to medium Gravel, roots moist.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.5	0.0			Gray brown fine SAND and SILT, trace medium to coarse Sand and roots, saturated.	
5		(4-6')		NA	NA	2.0	0.0			Gray fine to coarse SAND, trace fine Gravel, Shells, saturated.	
										End of boring at 6.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-1-99 / 4-1-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-54 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.4	0.0			Brown fine to coarse SAND and SILT, trace fine to medium SAND, fine to medium Gravel, damp.	
		(2-4')		NA	NA	1.2	0.0			Gray residuals.	
5		(4-6')		NA	NA	2.0	0.0				
										Gray brown fine SAND and SILT, trace medium to coarse Sand, Shells, wet.	
		(6-8')		NA	NA	2.0	0.0			Gray fine to medium SAND, trace coarse Sand, Silt seam at 7-7.2 ft. BGS.	
		(8-10')		NA	NA	2.0	0.0			Same as above, saturated.	Backfilled borehole with bentonite/cement grout.
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81 Script: 99nbbl
File: DWA-SB54.LOG Date: 06/22/99

Date Start/Finish: 4-1-99 / 4-1-99 **Drilling Company:** Parratt Wolff **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 6.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-55 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Brown fine SAND and SILT, trace medium to coarse Sand, fine Gravel and roots,wet.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	2.0	0.0			Gray brown fine to medium sand, trace coarse sand, trace fine gravel and shells, saturated.	
5		(4-6')		NA	NA	2.0	0.0			Gray brown coarse sand and fine gravel, trace fine to medium sand, saturated.	
										Gray brown fine to coarse sand, little fine to medium gravel, trace silt, trace shells, mica, saturated.	
										End of boring at 6.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWA-SB55.LOG
Script: 99nbbl
Date: 08/21/99

Date Start/Finish: 4-1-99 / 4-1-99 **Drilling Company:** Parratt Wolff **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 6.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-58 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Brown fine SAND and SILT, trace roots, medium to coarse Sand, fine Gravel, damp. Light orange-brown fine SAND, trace medium to coarse Sand, damp.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	0.8	0.0			Gray residuals.	
5		(4-6')		NA	NA	2.0	0.0			Dark gray to black highly degraded natural organics and SILT, little shells, saturated. Gray fine SAND, trace shells, trace medium to coarse Sand, saturated.	
										End of boring at 6.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-1-99 / 4-1-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 6.0 feet **Geologist:** Tamara Hauptfleisch	**Soil Boring No:** DWA-SB-57 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.4	0.0			Orange-brown clayey SILT, trace fine to coarse Sand, trace roots, wet.	Backfilled borehole with bentonite/cement grout.
										Gray-black fine SAND and SILT, highly degraded natural organics (Peat), trace medium to coarse Sand and fine to medium Gravel, trace shells.	
		(2-4')		NA	NA	1.4	0.0			Orange-brown clayey SILT, trace fine to coarse Sand, trace roots, wet.	
5		(4-6')		NA	NA	2.0	0.0			Gray-black fine to medium SAND, trace coarse Sand, trace fine to medium Gravel and shells, saturated.	
										End of boring at 6.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-1-99 / 4-1-99 **Drilling Company:** Parratt Wolff **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 6.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-58 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Orange brown fine SAND, trace coarse Sand, trace fine Gravel, trace roots and Silt.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	2.0	0.0			Gray residuals. Gray brown fine SAND and SILT, trace fine to medium sand, trace fine to medium Gravel, saturated.	
5		(4-6')		NA	NA	2.0	0.0			Gray brown fine to coarse sand, little fine to medium gravel, trace silt, trace shells, saturated.	
										End of boring at 6.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-1-99 / 4-1-99 **Drilling Company:** Parratt Wolff **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 4.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-SB-59 **Client:** Willow Blvd OU Drainage Way Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.0	0.0			Brown fine SAND and SILT, little medium to coarse Sand, trace fine to medium Gravel, saturated. Gray-black fine to medium SAND, trace Sand, trace coarse sand and fine to medium gravel, saturated.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	2.0	0.0			Gray-brown fine to medium SAND, trace coarse Sand and Shells, saturated.	
										End of boring at 4.0 ft. BGS.	
5											
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-8-99 / 4-8-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-1 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamoazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.0	0.0			Orange-brown fine SAND, little Silt, little medium to coarse Sand, trace fine to medium Gravel and Roots, damp.	
		(2-4')		NA	NA	1.3	0.0			Orange-brown fine SAND and SILT, trace medium to coarse Sand, fine to medium Gravel, wet.	
5		(4-6')		NA	NA	1.2	0.0			Gray-brown fine SAND and SILT, trace Wood, fine Sand, and Roots, moist.	Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	1.7	0.0			Gray-brown Clayey SILT, trace Shells, Root, fine Sand, wet. Sample N70323 @ 6.7-7.7 ft. BGS.	
		(8-10')		NA	NA	2.0	0.0			Gray-brown fine SAND, trace medium to coarse Sand, trace Silt, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-8-99 / 4-8-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-2 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.1	0.0			Brown Clayey SILT, trace Roots, moist to wet.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	2.0	0.0			Gray-brown Clayey SILT, trace Shells, Roots, fine Sand, wet.	
										Gray-brown fine SAND, trace Silt, saturated.	
5		(4-6')		NA	NA	2.0	0.0			Gray-brown Clayey SILT, trace Shells, Roots, fine Sand, wet.	
										Gray-brown Clayey SILT, trace fine Sand, saturated.	
		(6-8')		NA	NA	2.0	0.0				
										End of boring at 8.0 ft. BGS.	
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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-8-99 / 4-8-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-3 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	0.8	0.0			Dark brown highly degraded natural organics (PEAT) and SILT.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.5	0.0				
5		(4-6')		NA	NA	2.0	0.0			Gray brown fine SAND, trace Silt, wet.	
		(6-8')		NA	NA	2.0	0.0				
										End of boring at 8.0 ft. BGS.	
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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-8-99 / 4-8-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-4 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Gray residuals.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.8	0.0				
5		(4-6')		NA	NA	1.5	0.0			Dark brown highly degraded organics (PEAT) and SILT.	
		(6-8')		NA	NA	2.0	0.0			Gray brown fine SAND and SILT, trace Roots, saturated.	
										End of boring at 8.0 ft. BGS.	
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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-8-99 / 4-8-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Tammy Hauptfleisch	**Soil Boring No:** FLA-SB-5 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Brown fine SAND, little Silt, medium to coarse Sand, trace fine to medium Gravel and Roots, damp.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.5	0.0			Brown-gray brown fine SAND and SILT, trace Roots, wet. Sample W70324 @ 2.6-2.9 ft. BGS. White FILL material. Brown-gray brown fine SAND and SILT, trace Roots, wet.	
5		(4-6')		NA	NA	2.0	0.0			Gray-brown fine SAND, little Silt, little medium to coarse Sand, trace fine to medium Gravel, trace Peat, saturated.	
		(6-8')		NA	NA	2.0	0.0			Gray-brown Clayey SILT, trace Shells, fine Sand and Roots. Gray-brown fine to medium SAND, little coarse Sand, trace Silt, saturated.	
										End of boring at 8.0 ft. BGS.	
10											
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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-8-99 / 4-8-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-6 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Dark brown highly degraded natural organics (PEAT) and SILT. Gray brown fine SAND and SILT, trace Roots, moist.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	0.8	0.0			Dark brown PEAT and SILT.	
5		(4-6')		NA	NA	1.2	0.0				
		(6-8')		NA	NA	2.0	0.0			Gray Clayey SILT, trace Shells, saturated. Gray brown fine SAND, trace Silt, saturated.	
										End of boring at 8.0 ft. BGS.	
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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-8-99 / 4-8-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-7 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Gray residuals.	
		(2-4')		NA	NA	1.7	0.0			Sample M70325 @ 4-4.7 ft. BGS.	Backfilled borehole with bentonite/cement grout.
5		(4-6')		NA	NA	1.5	0.0			Dark brown highly degraded natural organics (PEAT) and SILT. Sample M70326 @ 4.7-5.5 ft. BGS.	
		(6-8')		NA	NA	2.0	0.0			Same as above with trace Shells.	
		(8-10')		NA	NA	7.0	0.0			Gray brown fine SAND, trace medium to coarse Sand,trace Silt, saturated.	
10										End of boring at 10.0 ft. BGS.	
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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-8-99 / 4-8-99
Drilling Company: BBL
Driller's Name: Paul Fillipeti
Drilling Method: Driven Split Spoon

Rig Type: Powerprobe Direct Push
Sampling Method: Split Spoon

Borehole Depth: 10.0 feet

Geologist: Ron Kuhn

Soil Boring No: FLA-SB-8

Client:
Willow Blvd/A-Site OU

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

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	0.8	0.0			Brown fine SAND, little Silt, little medium to coarse Sand, trace fine to medium Gravel, damp.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.3	0.0			Gray brown fine to medium SAND, little coarse Sand, little Silt, trace fine to medium Gravel, moist.	
		(4-6')		NA	NA	1.8	0.0			Brown highly degraded natural organics (PEAT) and SILT.	
5										Gray brown Clayey SILT, trace shells, roots, and fine Sand, wet. Sample N70327 @ 4.8-5.8 ft. BGS.	
		(6-8')		NA	NA	2.0	0.0			Gray brown SILT and fine SAND, trace medium to coarse Sand, saturated.	
		(8-10')		NA	NA	2.0	0.0			Gray brown fine to coarse SAND, little fine to medium Gravel, trace Silt, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: FLA-SB-8.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 4-8-99 / 4-8-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-9 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Dark brown highly degraded natural organics (PEAT) and SILT, damp.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.5	0.0				
5		(4-6')		NA	NA	1.8	0.0			Gray brown Clayey SILT, trace Shells, fine Sand, and Roots, wet.	
		(6-8')		NA	NA	2.0	0.0			Gray brown fine to medium SAND, little coarse Sand, trace Silt, saturated.	
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-8-99 / 4-8-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-10 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.3	0.0			Gray residuals.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.3	0.0			Dark brown highly degraded natural organics (PEAT) and SILT.	
5		(4-6')		NA	NA	2.0	0.0			Gray Clayey SILT, trace Roots, Shells, and fine Sand, saturated.	
		(6-8')		NA	NA	2.0	0.0			Gray brown fine to medium SAND, little coarse Sand, trace Silt, trace fine Gravel, saturated.	
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-9-99 / 4-9-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-11 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.0	0.0			Dark brown highly degraded natural organics (PEAT) and SILT, moist.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	0.3	0.0				
5		(4-6')		NA	NA	2.0	0.0				
		(6-8')		NA	NA	2.0	0.0			Gray-brown Clayey SILT, trace Roots, Shells, and fine Sand, wet. Sample W70328 @ 6-8.0 ft. BGS.	
		(8-10')		NA	NA	2.0	0.0			Gray-brown fine to medium SAND, little coarse Sand, trace fine Gravel and Silt, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones		
Date / Time	Elevation	Depth

Date Start/Finish: 4-9-99 / 4-9-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-12 **Client:** Willow Blvd/A-Site **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Gray residuals.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	2.0	0.0				
5		(4-6')		NA	NA	1.9	0.0			Gray brown Clayey SILT and highly degraded natural organics (PEAT), trace Shells, saturated. Sample M70330 @ 4.8-5.9 ft. BGS.	
		(6-8')		NA	NA	2.0	0.0			Gray brown fine to medium SAND, trace coarse Sand, trace Silt, saturated.	
10										End of boring at 8.0 ft. BGS.	

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: FLA-SB12.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 4-12-99 / 4-12-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-13 **Client:** Willow blvd/A-Site **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	0.8	0.0			Dark brown highly degraded natural organics (PEAT) and SILT, moist.	
		(2-4')		NA	NA	2.0	0.0				
5		(4-6')		NA	NA	2.0	0.0			Gray-brown Clayey SILT, trace Roots, Shells, wet. Sample W70331 @ 4-6.0 ft. BGS.	Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	2.0	0.0			Gray-brown fine to coarse SAND, little fine to medium Gravel, trace Silt, saturated.	
		(8-10')		NA	NA	2.0	0.0			Light brown fine SAND, medium Gravel, trace Silt, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: FLA-SB13.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 4-12-99 / 4-12-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-14 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Dark brown highly degraded natural organics and SILT.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.6	0.0				
5		(4-6')		NA	NA	1.4	0.0			Gray-brown Clayey SILT, trace Roots, Shells, wet.	
		(6-8')		NA	NA	2.0	0.0			Gray-brown fine to coarse SAND, trace Silt, trace fine Gravel, saturated.	
		(8-10')		NA	NA	2.0	0.0			Same as above with little fine to medium Gravel.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-12-99 / 4-12-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-15 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	2.0	0.0			Gray residuals.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.6	0.0			Brown highly degraded natural organics (PEAT) and SILT, moist.	
5		(4-6')		NA	NA	2.0	0.0			Gray-brown Clayey SILT, trace Roots, Shells, wet.	
		(6-8')		NA	NA	2.0	0.0			Gray-brown fine to coarse SAND, little fine to medium Gravel, trace Silt, saturated.	
10										End of boring at 8.0 ft. BGS.	

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones		
Date / Time	Elevation	Depth

Project: 645.81
File: FLA-SB15.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 4-9-99 / 4-9-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-16 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.0	0.0			Dark brown highly degraded natural organics (PEAT) and Silt, moist.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.7	0.0				
5		(4-6')		NA	NA	1.8	0.0			Gray-brown clayey SILT, trace Shells, Roots, wet. Sample W70332 @ 4.3-5.8 ft. BGS.	
		(6-8')		NA	NA	2.0	0.0			Gray-brown fine to coarse SAND, trace fine to medium Gravel, trace Silt, saturated.	
										Light brown fine SAND, trace Silt, saturated.	
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: FLA-SB16.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 4-12-99 / 4-12-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-17 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Dark brown highly degraded natural organics (PEAT) and Silt, moist.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.4	0.0				
5		(4-6')		NA	NA	1.7	0.0			Gray-brown clayey SILT, trace Roots, Shells, wet.	
		(6-8')		NA	NA	2.0	0.0			Gray-brown fine to medium SAND, little coarse SAND, trace fine Gravel, trace Silt, saturated.	
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones		
Date / Time	Elevation	Depth

Date Start/Finish: 4-12-99 / 4-12-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-18 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.0	0.0			Gray residuals.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.6	0.0			Sample N70333 @ 2-3.1 ft. BGS. Sample N70334 @ 3.1-3.6 ft. BGS. Dark brown highly degraded natural organics (PEAT) and Silt, moist .	
5		(4-6')		NA	NA	2.0	0.0			Gray-brown clayey SILT, trace Roots, trace Shells, wet. Light brown fine SAND, trace Silt, saturated. Gray-brown fine to medium SAND, trace coarse Sand, trace Silt, saturated.	
		(6-8')		NA	NA	2.0	0.0			Gray-brown fine to coarse SAND, little fine to medium Gravel, trace Silt, saturated.	
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-13-99 / 4-13-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-19 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.6	0.0			Dark brown highly degraded natural organics (PEAT) and Silt, moist.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.0	0.0				
5		(4-6')		NA	NA	2.0	0.0				
		(6-8')		NA	NA	2.0	0.0			Gray-brown clayey SILT, trace Shells, Roots, wet. Gray-brown fine to medium SAND, trace coarse Sand, trace Silt, saturated. Sample M70335 @ 6.3-7.0 ft. BGS. End of boring at 8.0 ft. BGS.	
10											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-13-99 / 4-13-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 6.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-20 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Gray residuals. Dark brown highly degraded natural organics (PEAT) and SILT, moist.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.2	0.0				
5		(4-6')		NA	NA	2.0	0.0			Gray-brown Clayey SILT, trace Roots, Shells, wet. Gray-brown fine to medium SAND, trace coarse Sand, trace Silt, saturated.	
										End of boring at 6.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: FLA-SB20.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 4-13-99 / 4-13-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 6.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-21 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.8	0.0			Gray residuals.	
		(2-4')		NA	NA	1.2	0.0			Dark brown highly degraded natural organics and SILT, moist.	
5		(4-6')		NA	NA	2.0	0.0			Gray-brown fine SAND, trace medium Sand, trace Silt, saturated.	Backfilled borehole with bentonite/cement grout.
		(6-8')			NA	2.0	0.0				
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-9-99 / 4-9-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 12.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-22 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.0	0.0			Dark brown highly degraded natural organics (PEAT) and SILT, moist.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.2	0.0				
5		(4-6')		NA	NA	1.5	0.0				
		(6-8')		NA	NA	1.4	0.0				
		(8-10')		NA	NA	2.0	0.0			Gray-brown Clayey SILT, trace Roots, Shells, wet. Sample W70336 @ 8.3-10.0 ft. BGS. Sample W70338 (Dup 1) @ 8.3-10.0 ft. BGS.	
10		(10-12')		NA	NA	2.0	0.0			Gray-brown fine to medium SAND, trace coarse Sand, trace fine Gravel, saturated.	
										End of boring at 12.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-13-99 / 4-13-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 4.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-23 **Client:** Willow blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-4')		NA	NA	2.0	0.0			Brown fine SAND, SILT and highly degraded natural organics, saturated Gray residuals. Gray-brown fine SAND, trace medium to coarse Sand, trace shells, trace Silt, saturated.	Backfilled borehole with bentonite/cement grout.
										End of boring at 4.0 ft. BGS.	
5											
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. Drove core 4 ft., only obtained 2 ft. recovery. All descriptions multiplied by 2 to account for compression.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-13-99 / 4-13-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-24 **Client:** Willow blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	2.0	0.0			Gray residuals. Sample W70338 @ 0.2 ft. BGS.	
		(2-4')		NA	NA	1.5	0.0			Dark brown highly degraded organics (PEAT) and SILT, moist. Sample W70339 @ 2-3.0 ft. BGS.	Backfilled borehole with bentonite/cement grout.
5		(4-6')		NA	NA	2.0	0.0			Gray-brown clayey SILT, trace Roots, shells, wet. Gray-brown fine SAND, trace Silt, saturated.	
		(6-8')		NA	NA	2.0	0.0				
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: FLA-SB24.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 4-13-99 / 4-13-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-25 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.0	0.0			Dark brown highly degraded natural organics (PEAT) and SILT, moist.	
		(2-4')		NA	NA	1.0	0.0				
5		(4-6')		NA	NA	1.5	0.0			Brown fine to medium SAND, little coarse Sand, trace Silt, trace fine Gravel, wet. Same as 0-4.4 ft. BGS.	Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	1.8	0.0			Gray-brown Clayey SILT, trace Roots, Shells, wet. Gray-brown fine to medium SAND, little coarse Sand, little fine to medium Gravel, saturated. Sample W70340 @ 6.5'-7.0 ft. BGS	
		(8-10')		NA	NA	2.0	0.0				
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: FLA-SB25.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 4-13-99 / 4-13-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 4.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-26 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-4')		NA	NA	1.0	0.0			Gray residuals. Dark brown highly degraded natural organics and Silt, saturated. Gray-brown clayey SILT, trace shells, roots, saturated. End of boring at 4.0 ft. BGS.	Backfilled borehole with bentonite/cement grout.
5											
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. Drove core 4 ft., only obtained 1 ft. recovery. All descriptions multiplied by 4 to account for compression.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: FLA-SB26.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 4-13-99 / 4-13-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 10.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** FLA-SB-27 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	2.0	0.0			Gray residuals.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	2.0	0.0				
5		(4-6')		NA	NA	2.0	0.0			Dark brown highly degraded natural organics (PEAT) and SILT, moist.	
		(6-8')		NA	NA	2.0	0.0			Gray-brown Clayey SILT, trace Shells and Roots, wet.	
		(8-10')		NA	NA	2.0	0.0			Gray-brown fine SAND, little coarse Sand, little fine to medium Gravel, saturated.	
10										End of boring at 10.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 4-14-99 / 4-14-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-FLA-SB-1 **Client:** Willow Blvd/ A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.8	0.0			Brown SAND and SILT, little medium to coarse Sand, little fine to medium Gravel, trace Slag, Papers, Brick, Damp.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.8	0.0			Same as above, saturated.	
5		(4-6')		NA	NA	2.0	0.0			Gray-brown fine to medium SAND, trace Sand, trace fine Gravel, trace Silt, Saturated.	
		(6-8')		NA	NA	2.0	0.0			Gray-brown fine SAND, trace medium to coarse Sand, trace Silt, saturated.	
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81 Script: 99nbbl
File: DWAFLA-LLOG Date: 06/21/99

Date Start/Finish: 4-14-99 / 4-14-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 4.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-FLA-SB-2 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-4')		NA	NA	3.0	0.0			Dark brown highly degraded natuarl organics and SILT, Roots, Wood, orange mottling, saturated.	Backfilled borehole with bentonite/cement grout.
										Gray-brown fine SAND, little Silt, trace Roots, Shells, saturated.	
										End of boring at 8.0 ft. BGS.	
5											
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: DWAFLA-2.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 4-14-99 / 4-14-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-FLA-SB-3 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.0	0.0			Dark brown fine SAND and SILT, trace medium to coarse Sand, trace fine to medium Gravel, trace Roots, moist.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	2.0	0.0			Gray-brown SILT, trace Roots, trace apparent Residuals, slight orange mottling, moist. Sample N70341 @ 2-2.8 ft. BGS. Dark brown highly degraded natural ORGANICS and SILT, trace Shells, Clay, moist.	
5		(4-6')		NA	NA	2.0	0.0			Gray-brown fine to medium SAND, little coarse Sand, trace fine Gravel, trace Silt, wet. Gray-brown fine to medium SAND, little coarse Sand, trace Silt, saturated.	
		(6-8')		NA	NA	2.0	0.0			Same as above and highly degraded natural ORGANICS, little Silt, saturated.	
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81 Script: 09nbbl
File: DWAFLA-3.LOG Date: 06/21/99

Date Start/Finish: 4-14-99 / 4-14-99 **Drilling Company:** BBL **Driller's Name:** Paul Fillipeti **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 8.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** DWA-FLA-SB-4 **Client:** Willow Blvd/A-Site OU **Location:** Allied Paper, Inc./Portage Creek Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.0	0.0			Dark brown fine SAND and SILT, trace Roots, moist.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	2.0	0.0			Gray residuals, Silt, moist. Sample W70342 @2-2.5 ft. BGS. Gray-brown fine SAND and SILT, trace medium to coarse Sand, trace fine to medium Gravel, wet.	
5		(4-6')		NA	NA	2.0	0.0			Gray-brown fine to medium SAND, little medium to coarse Sand, trace Silt, wet.	
		(6-8')		NA	NA	2.0	0.0				
										End of boring at 8.0 ft. BGS.	
10											
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-23-99 / 3-23-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 128045374.45 **Easting:** 286905.82 **Borehole Depth:** 8.0 feet **Ground Surface:** 763.70 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-ADKINS-1 **Client:** Willow Blvd OU Adkins Property **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 763.70 ft.										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Dark brown SILT, little fine Sand, trace medium to coarse Sand, concrete, and fine to medium Gravel, moist. (FILL) Sample W70216 @ 0-2 ft. BGS.	
		(2-4')		NA	NA	2.0	0.0			As above, gray-brown, wet. Sample W70217 @ 2-4 ft. BGS.	
	760										
5		(4-6')		NA	NA	1.2	0.0			Sample W70218 @ 4-6 ft. BGS. Dark brown SILT, trace fine to coarse Sand, organics (degraded), glass, wood, and aluminum. (FILL)	Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	2.0	0.0			Dark gray fine to medium SAND, trace to little Silt, trace coarse Sand, organics, and fine Gravel, saturated. Sample W70219 @ 6-8 ft. BGS. Gray-brown SILT, trace fine Sand, shells, and natural organics, saturated.	
	755									Gray-brown fine to medium SAND, trace coarse Sand, saturated. End of boring at 8.0 ft. BGS.	
10											
	750										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-23-99 / 3-23-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 1280455.93 **Easting:** 286862.76 **Borehole Depth:** 10.0 feet **Ground Surface:** 763.90 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-ADKINS-2 **Client:** Willow Blvd OU Adkins Property **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 763.90 ft.										GROUND SURFACE	
		(0-2')		NA	NA	2.0	0.0			Orange-brown fine SAND, little medium to coarse Sand, trace to little fine to medium Gravel. (FILL) Sample W70220 @ 1.1-2 ft. BGS.	
										Dark brown fine SAND and SILT, trace medium to coarse Sand and fine to medium Gravel. (FILL)	
		(2-4')		NA	NA	1.6	0.0			Gray fine SAND and SILT ("blow ash"). (FILL)	
										Orange brown fine to medium SAND, trace coarse Sand and fine Gravel. (FILL)	
	760									FILL material, dark brown fine SAND and SILT, little medium to coarse Sand, trace glass and ceramic, trace gray ashy material. Sample W70221 @ 2.5-3.0 ft. BGS.	
5		(4-6')		NA	NA	1.1	0.0			Dark brown SILT, trace fine to coarse Sand, moist. (FILL) Sample W70222 @ 4-6 ft. BGS.	Backfilled borehole with bentonite/cement grout.
										Sample W70223 @ 6-8 ft. BGS.	
		(6-8')		NA	NA	0.8	0.0			Gray brown fine SAND, trace medium to coarse Sand, trace fine to medium Sand, wet. (FILL)	
	755	(8-10')		NA	NA	2.0	0.0			Light brown fine to medium SAND, trace coarse Sand and fine to medium Gravel, saturated. Sample W70224 @ 8-10 ft. BGS.	
10										Fine to coarse SAND.	
										Orange-brown fine SAND, saturated.	
										End of boring at 10.0 ft. BGS.	
	750										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: ADKINS-2.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 3-23-99 / 3-23-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12804590.84 **Easting:** 286884.92 **Borehole Depth:** 8.0 feet **Ground Surface:** 763.00 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-ADKINS-3 **Client:** Willow Blvd OU Adkins Property **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 763.00 ft.											
										GROUND SURFACE	
		(0-2')		NA	NA	2.0	0.0			Dark brown fine SAND and SILT, trace fine to medium Gravel, trace root. (FILL) Gray fine SAND and SILT ("blow ash"), wet. (FILL) Sample W70225 @ 0.4-2 ft. BGS. Trace slag, coarse Sand, fine Gravel. Sample W70226 @ 2-3.5 ft. BGS.	Backfilled borehole with bentonite/cement grout.
	760	(2-4')		NA	NA	2.0	0.0			Dark brown SILT, trace snail shells, glass, fine to medium Sand. (FILL) Dark brown SILT, degraded organics, trace Clay, fine to coarse Sand, moist. (FILL) Sample W70227 @ 4-6 ft. BGS.	
5		(4-6')		NA	NA	1.0	0.0			Sample W70228 @ 6-6.8 ft. BGS and sample W70229 @ 6-6.8 ft. BGS.	
		(6-8')		NA	NA	2.0	0.0			Gray brown clayey SILT, moist to wet. (FILL) Gray brown fine to medium SAND, trace coarse Sand, saturated.	
	755									End of boring at 8.0 ft. BGS.	
10											
	750										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-23-99 / 3-23-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 1280462.60 **Easting:** 286847.59 **Borehole Depth:** 10.0 feet **Ground Surface:** 764.30 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-ADKINS-4 **Client:** Willow Blvd OU Adkins Property **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 764.30 ft.										GROUND SURFACE	
		(0-2')		NA	NA	1.65	0.0			Top soil, fine to medium SAND, SILT, organics. (FILL) Sample W70230 @ 0-2 ft. BGS. Orange-brown fine to medium SAND, little coarse Sand. (FILL)	
		(2-4')		NA	NA	2.0	0.0			Brown fine SAND and SILT, trace medium to coarse Sand. (FILL) Orange-brown fine SAND and SILT, trace fine to medium Gravel, damp. (FILL)	
	760	(4-6')		NA	NA	2.0	0.0			Gray-brown fine SAND and SILT ("blow ash"), trace fine to medium Gravel, trace medium Sand, wet, trace white-gray residuals. Samples W70231, W70232 (Duplicate of W70231), and W70233 (MS/MSD of W70231) @2.5-4 ft. BGS. Gray fine SAND and SILT ("blow ash"). (FILL) Sample W70234 @ 4-4.8 ft. BGS.	Backfilled borehole with bentonite/cement grout.
5		(6-8')		NA	NA	0.7	0.0			Dark brown SILT, degraded organics, trace fine Gravel. (FILL) Dark brown SILT and natural organics (roots, leaves), trace Clay, moist. (FILL) Sample W70235 @ 6-8 ft. BGS.	
	755	(8-10')		NA	NA	2.0	0.0			Gray-brown clayey SILT, trace fine Sand. (FILL) Sample W70236 @ 8-8.4 ft. BGS. Light brown fine SAND, little medium to coarse Sand, trace fine to medium Gravel, little Silt, saturated. Sample W70237 @ 8.4-9 ft. BGS.	
10										End of boring at 10.0 ft. BGS.	
	750										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: ADKINS-4.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 3-23-99 / 3-23-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Borehole Depth:** 12.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-ADKINS-5 **Client:** Willow Blvd OU Adkins Property **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
										GROUND SURFACE	
		(0-2')		NA	NA	1.4	0.0			Dark brown fine SAND and SILT, trace medium to coarse Sand, organics. (FILL) Sample W70238 @ 0-2 ft. BGS. Orange-brown fine to medium SAND, little coarse Sand, moist. (FILL)	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.8	0.0			Orange-brown fine SAND and SILT, trace fine to medium Gravel, trace medium to coarse Sand. (FILL) Gray-brown fine SAND and SILT ("blow ash"), trace medium to coarse Sand, trace fine gravel. (FILL) Sample W70239 @ 3.4-3.8 ft. BGS.	
5		(4-6')		NA	NA	2.0	0.0			Gray-brown fine SAND and SILT ("blow ash"), trace medium to coarse Sand. (FILL) Sample W70240 @ 4-6 ft. BGS.	
		(6-8')		NA	NA	0.5	0.0			Dark brown SILT and degraded organics, trace fine Sand, moist. (FILL) Sample W70241 @ 6-8 ft. BGS.	
		(8-10')		NA	NA	2.0	0.0			Gray-brown fine SAND and SILT, trace medium to coarse Sand, trace fine Gravel, saturated. (FILL) Gray-brown fine SAND and SILT ("blow ash"?), trace Clay. (FILL) Sample W70242 @ 9.6-10 ft. BGS.	
10		(10-12')		NA	NA	2.0	0.0			Light brown fine to medium SAND, trace coarse Sand, trace fine to medium Gravel, saturated. Sample W70243 @ 10-12 ft. BGS.	
										End of boring at 12.0 ft. BGS.	
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-23-99 / 3-23-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12804847.47 **Easting:** 286850.13 **Borehole Depth:** 8.0 feet **Ground Surface:** 762.60 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-ADKINS-6 **Client:** Willow Blvd OU Adkins Property **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 762.60 ft.										GROUND SURFACE	
		(0-2')		NA	NA	2.0	0.0			Dark brown fine SAND and SILT, trace medium to coarse Sand, trace roots, topsoil, damp. (FILL) Sample W70244 @ 0-2 ft. BGS. Orange-brown fine to medium SAND, trace coarse Sand, trace fine to medium Gravel, damp. (FILL)	Backfilled borehole with bentonite/cement grout.
	760	(2-4')		NA	NA	2.0	0.0			Gray-brown fine SAND and SILT ("blow ash"), trace medium to coarse Sand, wood, fine to medium Gravel. (FILL) Samples W70245, W70246 (Duplicate of W70245), and W70247 (MS/MSD of W70247) @ 2.2-4 ft. BGS.	
5		(4-6')		NA	NA	1.4	0.0			Dark-brown SILT and degraded natural organics, trace Clay. (FILL) Sample W70248 @ 4-6 ft. BGS. As above, trace shells, little Clay. Sample W70249 @ 6-6.7 ft. BGS.	
		(6-8')		NA	NA	2.0	0.0			Gray-brown fine SAND, little medium to coarse Sand, Silt, trace fine to medium Gravel and shells, saturated. Sample W70250 @ 6.7-8 ft. BGS.	
	755									End of boring at 8.0 ft. BGS.	
10											
	750										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: ADKINS-6.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 3-23-99 / 3-23-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12804638.89 **Easting:** 286790.30 **Borehole Depth:** 8.0 feet **Ground Surface:** 764.30 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-ADKINS-7 **Client:** Willow Blvd OU Adkins Property **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 764.30 ft										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Dark brown fine SAND and SILT, trace medium to coarse Sand, roots. (topsoil) Sample W70251 @ 0-2 ft. BGS.	
										Orange-brown fine SAND and SILT, little medium to coarse Sand, trace to little fine to medium Gravel. (FILL)	
		(2-4')		NA	NA	1.6	0.0			As above, dark-brown, little asphalt. Sample W70252 @ 2-4 ft. BGS.	
										Orange-brown fine SAND. (FILL)	
	760									Orange-brown fine to medium SAND, trace coarse Sand, fine Gravel. (FILL) Sample W70253 @ 4-6 ft. BGS.	Backfilled borehole with bentonite/cement grout.
5		(4-6')		NA	NA	2.0	0.0			Brown fine to Coarse SAND, trace fine to medium Gravel and Silt, saturated. (FILL)	
		(6-8')		NA	NA	2.0	0.0			Gray-brown fine to medium SAND, little coarse Sand, trace fine to medium Gravel, saturated. Sample W70254 @ 6-8 ft. BGS.	
										End of boring at 8.0 ft. BGS.	
	755										
10											
	750										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-23-99 / 3-23-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12804884.56 **Easting:** 286826.19 **Borehole Depth:** 8.0 feet **Ground Surface:** 762.60 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-ADKINS-8 **Client:** Willow Blvd OU Adkins Property **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 762.60 ft.											
										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Dark brown fine SAND and SILT, trace medium to coarse Sand, roots, damp. (topsoil) Sample W70255 @ 0-2 ft. BGS.	
	760	(2-4')		NA	NA	1.5	0.0			Orange-brown fine SAND and SILT, little medium to coarse Sand, trace roots, trace fine to medium Gravel, damp. (FILL) Gray-brown fine SAND and SILT, little medium to coarse Sand, trace fine Gravel, wet. (FILL) Sample W70256 @ 2-4 ft. BGS.	
5		(4-6')		NA	NA	1.2	0.0			Dark brown SILT and degraded natural organics, moist. (FILL) Sample W70257 @ 4-6 ft. BGS.	Backfilled borehole with bentonite/cement grout.
	755	(6-8')		NA	NA	2.0	0.0			Gray-brown fine SAND, little Silt, piece of fine Gravel, saturated. Sample W70258 @ 6-8 ft. BGS.	
										End of boring at 8.0 ft. BGS.	
10											
	750										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-23-99 / 3-23-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12804719.35 **Easting:** 286832.66 **Borehole Depth:** 8.0 feet **Ground Surface:** 761.50 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-ADKINS-9 **Client:** Willow Blvd OU Adkins Property **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 in.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 761.50 ft.										GROUND SURFACE	
	760	(0-2')		NA	NA	1.6	0.0			Gray-brown fine SAND, little Silt, trace medium to coarse Sand and fine Gravel. Sample W70259 @ 0-2 ft. BGS. Dark brown fine SAND and SILT, trace medium to coarse Sand, trace fine to medium Gravel.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.6	0.0			Dark brown clayey SILT, trace degraded natural organics. Sample W70260 @ 2-4 ft. BGS. Gray-brown fine SAND, saturated.	
5		(4-6')		NA	NA	2.0	0.0			Dark brown SILT and highly degraded organics. Sample W70261 @ 4-6 ft. BGS. Wood. Gray-brown fine SAND and SILT, little medium to coarse Sand, trace fine Gravel, saturated.	
	755	(6-8')		NA	NA	2.0	0.0			Brown fine to coarse SAND, and fine to medium GRAVEL. Samples W70262, W70263 (Duplicate of W70262), and W70264 (MS/MSD of W70262) @ 6-8 ft. BGS. Light brown fine SAND, little medium to coarse Sand, trace fine to medium Gravel, saturated. End of boring at 8.0 ft. BGS.	
10											
	750										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No residuals encountered.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: ADKINS-9.LOG
Script: 99nbbl
Date: 06/21/99

Date Start/Finish: 3-24-99 / 3-24-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12805400.91 **Easting:** 286647.24 **Borehole Depth:** 6.0 feet **Ground Surface:** 762.90 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-3A-201 **Client:** Willow Blvd OU 3A Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 762.90 ft.										GROUND SURFACE	
		(0-2')		NA	NA	1.5	0.0			Dark brown fine SAND, little Silt, trace medium to coarse Sand, trace roots, damp. Sample W70266 @ 0-2 ft. BGS.	
	760	(2-4')		NA	NA	1.6	0.0			Brown fine SAND and SILT, trace medium to coarse Sand, trace fine Gravel, moist. Sample W70267 @ 2-4 ft. BGS.	Backfilled borehole with bentonite/cement grout.
										Dark brown SILT and organics, trace fine Sand and fine Gravel, moist.	
										Sample W70268 @ 4-4.7 ft. BGS.	
5		(4-6')		NA	NA	2.0	0.0			Gray-brown silty CLAY, trace rootlets and degraded organics, trace coarse Sand, moist.	
										Gray-brown fine to medium SAND, little coarse Sand and fine to medium Gravel, moist. Sample W70269 @ 4.7-6 ft. BGS.	
										Little Clay.	
										End of boring at 6.0 ft. BGS.	
	755										
10											
	750										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No evidence of fill material.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: SB3A-201.LOG
Script: 99nbbl
Date: 06/22/99

Date Start/Finish: 3-24-99 / 3-24-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12805418.41 **Easting:** 286646.57 **Borehole Depth:** 8.0 feet **Ground Surface:** 763.30 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-3A-202 **Client:** Willow Blvd OU 3A Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 763.30 ft.										GROUND SURFACE	
		(0-2')		NA	NA	1.3	0.0			Dark brown fine SAND and SILT, trace medium to coarse Sand, trace roots, trace fibrous fill material (insulation-like), Sample W70270 @ 0-2 ft. BGS.	
		(2-4')		NA	NA	1.2	0.0			As above, no fibrous material, piece of brick. Sample W70271 @ 2-4 ft. BGS.	
	760									Fine to coarse SAND, trace of Gravel, damp.	
5		(4-6')		NA	NA	2.0	0.0			Gray-brown SILT and highly degraded natural organics, some Clay, trace fine to medium Sand and fine Gravel. Sample W70272 @ 4-6 ft. BGS.	Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	2.0	0.0			Sample W70273 @ 6-8 ft. BGS.	
										Gray-brown fine to coarse SAND, some fine to medium Gravel, saturated.	
										Gray-brown fine SAND.	
	755									End of boring at 8.0 ft. BGS.	
10											
	750										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-24-99 / 3-24-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12805420.74 **Easting:** 286626.23 **Borehole Depth:** 8.0 feet **Ground Surface:** 765.0 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-3A-203 **Client:** Willow Blvd OU 3A Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 765.0 ft.											
	765									GROUND SURFACE	
		(0-2')		NA	NA	0.8	0.0			Dark brown fine SAND and SILT, trace medium to coarse Sand, trace roots, trace fibrous fill material (insulation-like), Sample W70274 @ 0-2 ft. BGS.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	0.4	0.0			Sample W70275 @ 2-4 ft. BGS.	
		(4-6')		NA	NA	1.3	0.0			Sample W70276 @ 4-6 ft. BGS. Brown fine to medium SAND, little coarse Sand, trace fine Gravel and Silt. Gray-brown fine SAND, trace medium to coarse Sand, wet.	
5	760										
		(6-8')		NA	NA	1.8	0.0			Dark brown highly degraded natural organics and SILT. Gray-brown silty CLAY, little fine to medium Sand, trace coarse Sand and fine Gravel. Sample W70277 @ 6.2-6.6 ft. BGS. Trace residuals @ 6.4-6.6 ft. BGS. Gray-brown fine to medium SAND, trace coarse Sand and fine to medium Gravel, little Silt, saturated. Sample W70278 @ 6.6-7.8 ft. BGS. End of boring at 8.0 ft. BGS.	
10	755										
15	750										

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-24-99 / 3-24-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12805397.65 **Easting:** 286595.22 **Borehole Depth:** 6.0 feet **Ground Surface:** 764.40 feet **Geologist:** Ron Kuhn	**Soil Boring No: SB-3A-204** **Client:** Willow Blvd OU 3A Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 764.40 ft										GROUND SURFACE	
		(0-2')		NA	NA	1.7	0.0			Brown fine SAND and SILT, trace medium to coarse Sand, trace fine Gravel and roots, damp. Sample W70279 @ 0-2 ft. BGS.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.8	0.0			Orange-brown fine SAND, trace Silt, trace medium to coarse Sand, and fine Gravel. Sample W70280 @ 2-4 ft. BGS.	
	760									Sample W70281 @ 4-6 ft. BGS.	
5		(4-6')		NA	NA	2.0	0.0			Brown fine to coarse SAND, little fine to medium Gravel, trace Silt, wet.	
										End of boring at 6.0 ft. BGS.	
	755										
10											
	750										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No evidence of fill material.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: SB3A-204.LOG
Script: 99nbbl
Date: 06/22/99

Date Start/Finish: 3-24-99 / 3-24-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12805416.28 **Easting:** 286596.09 **Borehole Depth:** 6.0 feet **Ground Surface:** 764.30 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-3A-205 **Client:** Willow Blvd OU 3A Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 764.30 ft										GROUND SURFACE	
		(0-2')		NA	NA	1.2	0.0			Brown fine SAND and SILT, trace medium to coarse Sand, trace fine Gravel and roots, trace glass, cinders, damp. Sample W70282 @ 0-2 ft. BGS.	
		(2-4')		NA	NA	1.2	0.0			Brown fine SAND and Silt, trace medium to coarse Sand, trace roots, damp. Sample W70283 @ 2-4 ft. BGS.	Backfilled borehole with bentonite/cement grout.
	760	(4-6')		NA	NA	2.0	0.0			Dark brown highly degraded natural organics and SILT, moist. Sample W70284 @ 4-6 ft. BGS.	
5										Orange-brown fine to medium SAND, little coarse Sand, wet.	
										Light brown fine SAND, saturated.	
										End of boring at 6.0 ft. BGS.	
	755										
10											
	750										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No evidence of fill material.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-24-99 / 3-24-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12805414.86 **Easting:** 28706570.27 **Borehole Depth:** 6.0 feet **Ground Surface:** 765.00 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-3A-206 **Client:** Willow Blvd OU 3A Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 765.00 ft.											
	765									**GROUND SURFACE**	
		(0-2')		NA	NA	1.7	0.0			Dark brown fine SAND and SILT, trace medium to coarse Sand and roots, damp. Samples W70285, W70286 (Duplicate of W70285), and W70287 (MS/MSD of W70285) @ 0-2 ft. BGS.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	2.0	0.0			Brown fine SAND, little Silt, trace medium to coarse Sand and roots, damp. Sample W70288 @ 2-4 ft. BGS. Orange-brown fine SAND, trace medium to coarse Sand and fine Gravel, damp.	
5	760	(4-6')		NA	NA	2.0	0.0			Orange-brown fine SAND, little Silt, trace medium to coarse Sand, trace fine Gravel, moist. Sample W70289 @ 4-6 ft. BGS. Orange-brown fine to medium SAND, little coarse Sand, trace fine to medium Gravel, saturated.	
										End of boring at 6.0 ft. BGS.	
10	755										
15	750										

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No evidence of fill material.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: SB3A-206.LOG
Script: 99nbbl
Date: 06/22/99

Date Start/Finish: 3-24-99 / 3-24-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12805397.66 **Easting:** 286496.10 **Borehole Depth:** 6.0 feet **Ground Surface:** 765.30 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-3A-207 **Client:** Willow Blvd OU 3A Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 765.30 ft										GROUND SURFACE	
	765	(0-2')		NA	NA	1.6	0.0			Dark brown to brown fine SAND and SILT, trace medium to coarse Sand, trace fine Gravel and roots, damp. Sample W70290 @ 0-2 ft. BGS.	
		(2-4')		NA	NA	1.5	0.0			Orange-brown fine SAND, trace medium to coarse Sand, trace fine Gravel, moist. Sample W70291 @ 2-4 ft. BGS. Orange-brown silty CLAY, little fine to medium Sand and fine Gravel, moist.	Backfilled borehole with bentonite/cement grout.
5	760	(4-6')		NA	NA	2.0	0.0			Orange-brown fine to medium SAND, trace coarse Sand and fine to medium Gravel, saturated. Sample W70292 @ 4-6 ft. BGS.	
										End of boring at 6.0 ft. BGS.	
10	755										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No evidence of fill material.

Saturated Zones

Date / Time	Elevation	Depth

Project: 645.81
File: SB3A-207.LOG
Script: 99nbbl
Date: 06/22/99

Date Start/Finish: 3-24-99 / 3-24-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12805419.90 **Easting:** 286546.15 **Borehole Depth:** 8.0 feet **Ground Surface:** 765.00 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-3A-208 **Client:** Willow Blvd OU 3A Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 765.00 ft.	765									GROUND SURFACE	
		(0-2')		NA	NA	1.1	0.0			Orange-brown fine SAND, little Silt, little medium to coarse Sand, little fine to medium Gravel, moist. Sample W70293 @ 0-2 ft. BGS.	
		(2-4')		NA	NA	0.7	0.0			Sample W70294 @ 2-4 ft. BGS.	
5	760	(4-6')		NA	NA	0.6	0.0			Sample W70295 @ 4-6 ft. BGS.	Backfilled borehole with bentonite/cement grout.
		(6-8')		NA	NA	1.2	0.0			Orange-brown fine to medium SAND, little coarse Sand, little fine to medium Gravel, saturated. Sample W70296 @ 6-8 ft. BGS.	
										End of boring at 8.0 ft. BGS.	
10	755										
15	750										

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No evidence of fill material.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-24-99 / 3-24-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12805394.28 **Easting:** 286472.42 **Borehole Depth:** 6.0 feet **Ground Surface:** 765.90 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-3A-209 **Client:** Willow Blvd OU 3A Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 765.90 ft.										GROUND SURFACE	
	765	(0-2')		NA	NA	1.5	0.0			Dark brown fine SAND and SILT, trace medium to coarse Sand, trace fine Gravel, roots, and slag, damp. Sample W70297 @ 0-2 ft. BGS.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.4	0.0			Brown to orange-brown fine SAND, little medium to coarse Sand, trace fine Gravel, moist. Sample W70298 @ 2-4 ft. BGS.	
5	760	(4-6')		NA	NA	2.0	0.0			Orange-brown fine SAND, little medium to coarse Sand, trace fine to medium Gravel. Sample W70299 @ 4-6 ft. BGS. Saturated.	
										End of boring at 6.0 ft. BGS.	
10	755										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No evidence of fill material.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-24-99 / 3-24-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12805413.87 **Easting:** 286472.82 **Borehole Depth:** 6.0 feet **Ground Surface:** 765.70 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-3A-210 **Client:** Willow Blvd OU 3A Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 765.70 ft.										GROUND SURFACE	
	765	(0-2')		NA	NA	1.5	0.0			Dark brown fine SAND and SILT, trace medium to coarse Sand, trace fine to medium Gravel and roots, damp. Sample W70300 @ 0-2 ft. BGS. Brown fine SAND, little Silt.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.5	0.0			Brown silty CLAY, trace fine Sand, damp. Sample W70301 @ 2-4 ft. BGS. Orange-brown fine Sand, little Silt, trace medium to coarse SAND and fine to medium Gravel, moist.	
5	760	(4-6')		NA	NA	2.0	0.0			Orange-brown fine to medium SAND, little coarse Sand, trace Silt, trace fine to medium Gravel. Sample W70302 @ 4-6 ft. BGS. Saturated.	
										End of boring at 6.0 ft. BGS.	
10	755										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No evidence of fill material.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-24-99 / 3-24-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12805392.87 **Easting:** 286441.64 **Borehole Depth:** 6.0 feet **Ground Surface:** 766.00 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-3A-211 **Client:** Willow Blvd OU 3A Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 766.00 ft.										GROUND SURFACE	
	765	(0-2')		NA	NA	1.4	0.0			Dark brown fine SAND and SILT, trace medium to coarse Sand, trace fine to medium Gravel, coal, and roots, damp. Sample W70303 @ 0-2 ft. BGS.	
		(2-4')		NA	NA	1.4	0.0			Dark brown fine SAND and SILT, trace medium to coarse Sand. Sample W70304 @ 2-4 ft. BGS. Light brown fine SAND, little medium to coarse Sand, trace fine to medium Gravel, damp.	Backfilled borehole with bentonite/cement grout.
5		(4-6')		NA	NA	2.0	0.0			Orange-brown fine to coarse SAND, little silty Clay, trace fine to medium Gravel, moist. Sample W70305 @ 4-6 ft. BGS. Brown fine SAND, saturated.	
	760									End of boring at 6.0 ft. BGS.	
10	755										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No evidence of fill material.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-24-99 / 3-24-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12805412.47 **Easting:** 286438.21 **Borehole Depth:** 6.0 feet **Ground Surface:** 765.90 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-3A-212 **Client:** Willow Blvd OU 3A Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 765.90 ft.										GROUND SURFACE	
	765	(0-2')		NA	NA	1.3	0.0			Dark brown fine SAND and SILT, trace medium to coarse Sand, trace fine Gravel, slag, and roots, damp. Sample W70306 @ 0-2 ft. BGS.	
		(2-4')		NA	NA	1.6	0.0			Gray-brown fine to medium SAND, little coarse Sand, fine Gravel, Silt, and trace roots. Sample W70307 @ 2-4 ft. BGS.	Backfilled borehole with bentonite/cement grout.
		(4-6')		NA	NA	2.0	0.0			Sample W70308 @ 4-6 ft. BGS. Brown fine SAND, saturated.	
5	760									End of boring at 6.0 ft. BGS.	
10	755										
15											

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No evidence of fill material.

Saturated Zones

Date / Time	Elevation	Depth

Date Start/Finish: 3-24-99 / 3-24-99 **Drilling Company:** BBL **Driller's Name:** **Drilling Method:** Driven Split Spoon **Rig Type:** Powerprobe Direct Push **Sampling Method:** Split Spoon	**Northing:** 12805421.79 **Easting:** 286413.20 **Borehole Depth:** 6.0 feet **Ground Surface:** 764.70 feet **Geologist:** Ron Kuhn	**Soil Boring No:** SB-3A-213 **Client:** Willow Blvd OU 3A Area **Location:** Allied Paper, Inc., /Portage Creek/ Kalamazoo River Superfund Site

DEPTH	ELEVATION	Sample Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID Headspace	Geotechnical Test	Geologic Column	Stratigraphic Description	Soil Boring Construction
gs elevation 764.70 ft.										GROUND SURFACE	
		(0-2')		NA	NA	1.0	0.0			Brown fine SAND and SILT, little medium to coarse Sand, trace fine Gravel and roots. Sample W70309 @ 0-2 ft. BGS.	Backfilled borehole with bentonite/cement grout.
		(2-4')		NA	NA	1.6	0.0			Brown fine SAND, trace medium to coarse Sand and fine Gravel, damp. Samples W70310, W70311 (Duplicate of W70310), and W70312 (MS/MSD of W70310) @ 2-4 ft. BGS. Dark brown highly degraded organics and SILT, trace fine Sand.	
5	760	(4-6')		NA	NA	2.0	0.0			Brown fine to medium SAND, trace coarse Sand, fine Gravel, and Silt, moist. Light brown fine SAND, trace Silt, saturated. Sample W70313 @ 4-6 ft. BGS.	
										End of boring at 6.0 ft. BGS.	
10	755										
15	750										

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Remarks:
Backfilled borehole with bentonite/cement grout. bgs - Below Ground Surface. No evidence of fill material.

Saturated Zones

Date / Time	Elevation	Depth