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SECOND FIVE-YEAR REVIEW REPORT FOR ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE ALLEGAN AND KALAMAZOO COUNTIES, MICHIGAN

Prepared by

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LIST OF ACRONYMS

AOC	Administrative Order on Consent
BRA	Baseline Risk Assessment
BERA	Baseline Ecological Risk Assessment
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R.	Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
FRDL	Former Residual Dewatering Lagoons
FS	Feasibility Study
GSI	Groundwater Surface Water Interface
HHRA	Human Health Risk Assessment
HRDL	Historic Residual Dewatering Lagoon
ICs	Institutional Controls
KRSG	Kalamazoo River Study Group
KSSS	King Street Storm Sewer
MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
MDOT	Michigan Department of Transportation
mg/kg	Milligrams per Kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NREPA	Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994PA 451
NPL	National Priorities List
O&M	Operation & Maintenance
OU	Operable Unit
PCBs	Polychlorinated Biphenyls
ppm	Parts per Million
PRP	Potentially Responsible Party
RAOs	Remedial Action Objectives
RA	Remedial Action
RD	Remedial Design
RD/RA	Remedial Design/Remedial Action
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
Site	Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
SMOA	Superfund Memorandum of Agreement
SVOCs	Semi-Volatile Organic Compounds
TBERA	Terrestrial Baseline Ecological Risk Assessment
ug/L	Micrograms per Liter
UU/UE	Unlimited Use and Unrestricted Exposure
VOCs	Volatile Organic Compounds

EXECUTIVE SUMMARY

The Allied Paper Inc./Portage Creek/Kalamazoo River Superfund site (Site) is located in Allegan and Kalamazoo Counties, Michigan. The Site includes disposal areas, paper mill properties, approximately 80 miles of the Kalamazoo River (from Morrow Dam to Lake Michigan), adjacent river banks and contiguous floodplains, as well as a 3-mile stretch of Portage Creek. The U.S. Environmental Protection Agency (EPA) has identified six operable units (OUs) for response action at the Site including:

- OU1 - Allied Paper, Inc./Bryant Mill Pond;
- OU2 - Willow Boulevard/A-Site Landfill;
- OU3 - King Highway Landfill;
- OU4 - 12th Street Landfill;
- OU5 – 80-miles of the Kalamazoo River including a 3-mile stretch of Portage Creek; and
- OU7 – Former Plainwell Paper Mill Property.

The Site currently does not have an operable unit 6. If source investigation activities at any of the remaining paper mill properties (the former Allied Paper Company Monarch Mill property, portions of the former Allied Paper Company Bryant Mill property, and the former Allied Paper Company King Mill property and King Street Storm Sewer area) results in a determination that a specific paper mill property is a source of contamination at the Site, EPA will designate that (those) paper mill property (properties) as OU6. On June 30, 2009, EPA approved Georgia-Pacific's Source Investigation Report that documents the Georgia-Pacific Corporation Kalamazoo Mill and former Hawthorne Mill property is not a source of contamination at the Site. The investigation of the remaining three mill properties listed above has not yet begun.

This is the second five-year review for the Site. The triggering action for this statutory review is the completion of the first five-year review on October 18, 2007. This second five-year review report includes a protectiveness determination for OU2, OU3, and OU4. This report does not include a protectiveness determination for OU1, OU5, or OU7 because remedial action (RA) work has not yet started at those OUs. However, all six OUs are discussed in this site-wide five-year review report and any future remedies at OU1, OU5 and OU7 will be reviewed on the same five-year review schedule.

The remedy at OU2 is expected to be protective of human health and the environment upon completion of the remedy, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. The RA for OU2 began in April 2011 and is expected to be completed in 2013. During 2011, the waste at the Willow Boulevard Landfill portion of OU2 was consolidated and covered with an impermeable cap. The vegetated soil cover for this portion of OU2 was installed in 2012. EPA expects the installation of the impermeable cover at the A-Site portion of OU2 to be completed in 2012 and the installation of the OU2-wide groundwater monitoring system to be completed in 2013. Institutional controls restricting the use of site groundwater, site use, and for protection of the remedy were recorded and filed in 2010. Once the RA is completed EPA expects the remedy at OU2 to be protective of human health and the environment. EPA will make that determination by inspecting the landfill cover and evaluating groundwater and methane monitoring data. In addition, there is a restrictive covenant in place that restricts certain use of the property including use that interferes with

measures necessary to assure the effectiveness and integrity of the remedial action and use of site groundwater.

The remedy at OU3 currently protects human health and the environment in the short term. The landfill cap is generally in good condition and prevents PCB-contaminated material in the landfill from migrating, via erosion or surface water runoff, into the Kalamazoo River. The cap is also an effective barrier that prevents exposure, via direct contact, to the contaminated material by on-site workers, trespassers, and anglers. The cap also minimizes infiltration of rainwater and reduces the potential for leachate generation and the potential for polychlorinated biphenyls (PCBs) in groundwater to migrate into the Kalamazoo River. Public access to the landfill is restricted by a locked chain-link fence and sheet pile, which prevents people from being exposed to the contaminated material. Methane generated within the landfill is passively managed and mitigated by gas collection trenches installed outside of the landfill. These trenches are largely effective with methane only occasionally detected at off-site probes beyond the lateral extent of the trenches. Additional trenching (or some alternative) may need to be installed to extend the lateral capture of methane migration at the OU3 boundary. Some institutional controls (ICs) are in place at OU3, but require revision, while other ICs are not yet in place. In order for the remedy to be protective in the long term, the following actions will need to be taken: (1) implement revised and new ICs; (2) mitigate any off-site migration of methane gas, and (3) properly maintain the landfill. Long-term protectiveness requires compliance with effective ICs. EPA will ensure that long-term stewardship of OU3, as well as every other operable unit of the Site, includes implementation and maintenance of each component of the selected remedy, including any necessary ICs, and proper maintenance of the landfill.

The remedy at OU4 currently protects human health and the environment in the short term. The remedy has been constructed, and exposure pathways that could result in unacceptable risks are being controlled. The following issues need to be addressed as part of operation and maintenance (O&M) at OU4: 1) erosion is occurring at the toe of the landfill where water exits the soil cover drainage feature, and 2) the current access controls do not prevent trespass. Weyerhaeuser, a potentially responsible party (PRP) for OU4, will evaluate additional access controls. Evaluation of groundwater monitoring data will continue until sufficient data is available to determine contaminant trends. Long-term protectiveness requires compliance with existing ICs. Since the last five-year review, the ICs at OU4 have been modified to include a groundwater use prohibition. EPA will ensure that long-term stewardship of OU4, as well as every other operable unit of the Site, includes implementation and maintenance of each component of the selected remedy, including any necessary ICs.

Five Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Allied Paper, Inc./Portage Creek/Kalamazoo River		
EPA ID: MID006007306		
Region: 5	**State:** MI	**City/County:** Allegan and Kalamazoo Counties

SITE STATUS	
NPL Status: Final	
Multiple OUs? Yes	**Has the site achieved construction completion?** No

REVIEW STATUS
Lead agency: EPA
Author name (Federal or State Project Manager): James Saric
Author affiliation: EPA
Review period: 02/23/2012 – October 2012
Date of site inspection: August 7, 2012
Type of review: Statutory
Review number: 2
Triggering action date: 10/18/2007
Due date *(five years after triggering action date)*: 10/18/2012

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU2

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 3	Issue Category: Institutional Controls			
	Issue: Effective ICs are needed on all site properties and need to be monitored and maintained. Institutional controls are needed for the landfill property and the land located within the site security fence that is currently owned by MDOT and the City of Kalamazoo. Additionally, MDEQ will not approve the Final Completion of Construction Report and the Final O&M Plan until the MDOT and City of Kalamazoo property ownership issues are resolved. Until these reports are approved, MDEQ cannot issue a Certification of Completion of Construction for the landfill and without this certification, under the terms of the agreement between MDEQ and Georgia-Pacific, the appropriate restrictive covenants cannot be recorded with the Kalamazoo County Register of Deeds.			
	Recommendation: Submit a plan to MDEQ and EPA for 1) resolving property ownership issues with respect to the MDOT and City of Kalamazoo properties, 2) finalizing the Final Completion of Construction Report and the Final O&M Plan, and 3) implementing all required ICs.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	State/EPA	October 2013

OU(s): 3	Issue Category: Remedy Performance			
	Issue: Methane gas has migrated off-site in concentrations that exceed threshold criteria and will need to be mitigated.			
	Recommendation: Submit an updated landfill gas mitigation plan to MDEQ that will satisfy its concerns about the off-site mitigation of methane gas at the south end of the landfill.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	State/EPA	October 2013

OU(s): 4	Issue Category: Site Access/Security			
	Issue: Access controls are inadequate. A chain-link fence is present along the south side of the landfill but there is no fence on the north, east, or west sides of the landfill. Trespassers and anglers can freely enter the property and use the river banks to fish and have access to the landfill cap and associated gas vents. Additionally, the fence on the southern side of the landfill does not restrict foot traffic. The current access configuration does not prevent vandals from damaging the remedy.			
	Recommendation: Complete evaluation of access controls along with evaluation of potential use of OU4 as an eco-park (i.e., wildlife viewing area) so that final decisions about long-term access controls can be made.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/State	December 2012

OU(s): 4	Issue Category: Operations and Maintenance			
	Issue: Ongoing erosion at the toe of the landfill over the pore water collection discharge area.			
	Recommendation: Repair or reconstruct drainage feature at toe of landfill.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/State	October 2013

Protectiveness Statement(s)	
Operable Unit: 2	*Protectiveness Determination:* Will be Protective

Protectiveness Statement:
The remedy at OU2 is expected to be protective of human health and the environment upon completion of the remedy, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. The RA for OU2 began in April 2011 and is expected to be completed in 2013. During 2011, the waste at the Willow Boulevard Landfill portion of OU2 was consolidated and covered with an impermeable cap. The vegetated soil cover for this portion of OU2 was installed in 2012. EPA expects the installation of the impermeable cover at the A-Site portion of OU2 to be completed in 2012 and the installation of the OU2-wide groundwater monitoring system to be completed in 2013. Institutional controls restricting the use of site groundwater, site use, and for protection of the remedy were recorded and filed in 2010. Once the RA is completed EPA expects the remedy at OU2 to be protective of human health and the environment. EPA will make that determination by inspecting the landfill cover and evaluating groundwater and methane monitoring data. In addition, there is a restrictive covenant in place that restricts certain use of the property including use that interferes with measures necessary to assure the effectiveness and integrity of the remedial action and use of site groundwater.

Operable Unit: 3	*Protectiveness Determination:* Short-term Protective

Protectiveness Statement:
The remedy at OU3 currently protects human health and the environment in the short term. The landfill cap is generally in good condition and prevents PCB-contaminated material in the landfill from migrating, via erosion or surface water runoff, into the Kalamazoo River. The cap is also an effective barrier that prevents exposure, via direct contact, to the contaminated material by on-site workers, trespassers, and anglers. The cap also minimizes infiltration of rainwater and reduces the potential for leachate generation and the potential for PCBs in groundwater to migrate into the Kalamazoo River. Public access to the landfill is restricted by a locked chain-link fence and sheet pile, which prevents people from being exposed to the contaminated material. Methane generated within the landfill is passively managed and mitigated by gas collection trenches installed outside of the landfill. These trenches are largely effective with methane only occasionally detected at off-site probes beyond the lateral extent of the trenches. Additional trenching (or some alternative) may need to be installed to extend the lateral capture of methane migration at the OU3 boundary. Some ICs are in place at OU3, but require revision, while other ICs are not yet in place. In order for the remedy to be protective in the long term, the following actions will need to be taken: (1) implement revised and new ICs; (2) mitigate any off-site migration of methane gas, and (3) properly maintain the landfill. Long-term protectiveness requires compliance with effective ICs. EPA will ensure that long-term stewardship of OU3, as well as every other operable unit of the Site, includes implementation and maintenance of each component of the selected remedy, including any necessary ICs, and proper maintenance of the landfill.

Operable Unit:	*Protectiveness Determination:*
4	Short-term Protective

Protectiveness Statement:

The remedy at OU4 currently protects human health and the environment in the short term. The remedy has been constructed, and exposure pathways that could result in unacceptable risks are being controlled. The following issues need to be addressed as part of O&M at OU4: 1) erosion is occurring at the toe of the landfill where water exits the soil cover drainage feature, and 2) the current access controls do not prevent trespass. Weyerhaeuser, a PRP for OU4, will evaluate additional access controls. Evaluation of groundwater monitoring data will continue until sufficient data is available to determine contaminant trends. Long-term protectiveness requires compliance with existing ICs. Since the last five-year review, the ICs at OU4 have been modified to include a groundwater use prohibition. EPA will ensure that long-term stewardship of OU4, as well as every other operable unit of the Site, includes implementation and maintenance of each component of the selected remedy, including any necessary ICs.

Five-Year Review Report

I. Introduction

EPA has conducted a five-year review of the remedial actions implemented at the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. The Michigan Department of Environmental Quality (MDEQ) assisted EPA in providing an analysis of information in support of this five-year review. The five-year review was conducted from February 2012 through October 2012, and is the second five-year review conducted at this Site. This report documents the results of the review.

The purpose of five-year reviews is to determine whether the remedial actions that have allowed hazardous substances, pollutants or contaminants to remain at a site are protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify issues found during the review, if any, and recommendations to address them.

This review is required by statute. EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA §121(c), as amended, states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

EPA interpreted this requirement further in the NCP; 40 C.F.R. §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

This is the second five-year review for the Allied Paper, Inc./Portage Creek/Kalamazoo River Site. The triggering action for this statutory review is the completion of the first five-year review on October 18, 2007. This five-year review is required due to the fact that the remedial actions for OU2, OU3, and OU4 leave hazardous substances, pollutants, or contaminants on site at levels

that do not allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of six OUs including:

- OU1 - Allied Paper, Inc./Bryant Mill Pond;
- OU2 - Willow Boulevard/A-Site Landfill;
- OU3 - King Highway Landfill;
- OU4 - 12th Street Landfill;
- OU5 - 80-miles of the Kalamazoo River including a 3-mile stretch of Portage Creek; and
- OU7 - Former Plainwell Paper Mill Property.

The Site currently does not have an operable unit 6. If source investigation activities at any of the remaining paper mill properties (the former Allied Paper Company Monarch Mill [Monarch Mill property], portions of the former Allied Paper Company Bryant Mill [Bryant Mill property], and the former Allied Paper Company King Mill and King Street Storm Sewer area [King Mill property]) results in a determination that a specific paper mill property is a source of contamination at the Site, EPA will designate that (those) paper mill property (properties) as OU6. On June 30, 2009, EPA approved Georgia-Pacific's Source Investigation Report that documents the Georgia-Pacific Corporation Kalamazoo Mill and former Hawthorne Mill [Hawthorne Mill property] is not a source of contamination at the Site. The investigation of the three remaining mill properties listed above has not yet begun.

All OUs are in various stages of the Superfund cleanup process. OU1, OU5, and OU7 are in the Remedial Investigation/Feasibility Study (RI/FS) stage. A Record of Decision (ROD) containing the selected cleanup remedy has been issued for OU2, OU3, and OU4. The remedial action was completed at OU3 and OU4 and is underway at OU2. EPA's five-year review guidance requires remedies to be evaluated for protectiveness at only those OUs where on-site construction of the RA has started (i.e., OU2, OU3, and OU4 at this Site). However, all six OUs are discussed in this site-wide five-year review report; background information on OU1, OU5 and OU7 is included to help the reader better understand the nature and extent of the contamination at the Site in general. Any future remedies at OU1, OU5, and OU7 will be reviewed on the same five-year review schedule.

II. Site Chronology

Table 1 below lists the chronology of events for the Allied Paper, Inc./Portage Creek/Kalamazoo River Site.

Table I: Chronology of Site Events

Month/Year	***Events and Milestones***
April 1970-1971	*Initial discovery of problem or contamination*
August 30, 1990	*EPA placed Site on the National Priorities List (NPL)*
December 1990	*Administrative agreement signed between the Michigan Department of Natural Resources (MDNR) and certain PRPs for RI/FS work at the Site*
July 1993	*RI/FS start at OU4*
July/September 1994	*RI/FS complete at OU3*
July 1997	*RI/FS complete at OU4*
February 1998	*ROD issued by MDEQ (successor to MDNR) for OU3, with EPA concurrence*
June 1998	*122(h) cash-out agreement signed between EPA and Millennium Holdings for Time-Critical Removal Action at Bryant Mill Pond of OU1*
June 1998	*Remedial Design (RD) Start at OU3*
1998-1999	*Removal Action at Bryant Mill Pond of OU1*
February 2000	*Administrative agreement signed between MDEQ and Georgia-Pacific for implementation of the Remedial Design/Remedial Action (RD/RA) at OU3*
September 2001	*ROD Issued by MDEQ for OU4, with EPA concurrence*
January/February 2002	*Site-Specific Amendment to 2002 Superfund Memorandum of Agreement(SMOA) signed between EPA and MDEQ*
September 2002	*Remedial Design complete at OU3*
October 2002	*Construction Start at OU3*
December 2004	*Consent Decree (CD) signed by the United States and Weyerhaeuser Company for RD/RA at OU4 and for RI/FS and RD/RA at OU7*
January 2006	*RI/FS complete at OU2*
September 2006	*ROD issued by EPA for OU2, with MDEQ concurrence*
February 2007	*Administrative Order on Consent (AOC) signed for Time-Critical Removal Action at Plainwell Impoundment Area of OU5*
February 2007	*AOC signed for Supplemental RI/FS for OU5*
March 2007	*Removal Action start at Plainwell Impoundment Area of OU5*
February 2007	*OU5 Area 1 Supplemental RI/FS initiated*
November 2007	*Emergency Response Action for Former Plainwell Mill (OU7) banks start*

March 2008	*OU1 RI approved by EPA*
May 2008	*RI start at OU7*
November 2008	*Emergency Response Action for OU7 completed*
May 2009	*CD signed by the United States and Georgia-Pacific for RD/RA at OU2*
June 2009	*Removal Action at Plainwell Impoundment of OU5 complete*
June 2009	*AOC signed for Time-Critical Removal Action at Plainwell 2 Dam Impoundment of OU5*
August 2009	*Removal Action start at Plainwell 2 Dam Impoundment of OU5*
March 2010	*RD complete at OU 4*
April 2010	*Remedial Action construction start at OU4*
December 2010	*Removal Action complete at Plainwell Dam Impoundment in Area 1 of OU 5*
December 2010	*Supplemental RI/FS start in Area 2 of OU 5*
April 2011	*Remedial Design complete at OU2*
April 2011	*Remedial Action start at OU 2*
July 2011	*Action Memorandum signed to conduct Time-Critical Removal Action at Portage Creek Area of OU 5*
September 2011	*Removal Action construction start at Portage Creek of OU 5*
May 2012	*Supplemental RI/FS start in Area 3 of OU 5*
October 2012	*Remedial Action completion at OU4*

III. Background

A. Site History

The Site is located in both Allegan and Kalamazoo Counties of Michigan. The Site includes disposal areas, paper mill properties, approximately 80 miles of the Kalamazoo River (from Morrow Lake Dam to Lake Michigan), adjacent river banks and floodplains, as well as a 3-mile stretch of Portage Creek (see Figure 1, Site Location Map). EPA placed the Site on the National Priorities List on August 30, 1990.

The Site is primarily contaminated with PCBs from former paper mills, although other former industrial operations also used PCBs along the Kalamazoo River. The former paper mills recycled and/or de-inked and repulped carbonless copy waste paper which, between the 1950s and 1970s, contained PCBs as an ink carrier. The wastewater from the paper manufacturing

operations was historically discharged to the Kalamazoo River. Processed residuals were placed into on-site lagoons for dewatering or into disposal areas directly on the land. The former lagoons and disposal areas later became known as the landfill OUs.

The MDNR (predecessor to MDEQ) first became concerned about the presence of PCBs in the Kalamazoo River in 1971, after routine surface water and biota sampling at the mouth of the river indicated that PCBs were discharging to Lake Michigan via the Kalamazoo River and that the PCBs were widely bioavailable for uptake by fish and aquatic organisms.

The Site comprises six OUs:

- OU1 - Allied Paper, Inc./Bryant Mill Pond;
- OU2 - Willow Boulevard/A-Site Landfill;
- OU3 - King Highway Landfill;
- OU4 - 12th Street Landfill;
- OU5 – 80-miles of the Kalamazoo River including a 3-mile stretch of Portage Creek; and
- OU7 – former Plainwell Paper Mill Property.

In addition to OU7, four other former paper mill properties (the Monarch, Bryant, King, and Hawthorne Mill properties) were associated with the Superfund site. Pursuant to the AOC for a Supplemental RI/FS for OU5 executed between certain PRPs and EPA in February 2007, these four former paper mill properties are to be investigated to determine whether any of the mill properties is a source of PCBs to the Site. If any mill property is a source of PCBs to the Site, then EPA will designate that mill property as OU6. The OU will then be investigated under the Superfund RI/FS process. The Hawthorne Mill property has been investigated and EPA determined that it is not a source of contamination to the Site. Accordingly, EPA has determined that no additional investigation of the Hawthorne Mill property is required for the Site.

Six former hydroelectric dams, three owned by the State of Michigan and three by private companies, are also located within the Superfund Site. One of the dams, the Lake Allegan Dam, is an operating hydropower dam; the remaining five dams are no longer operational. In the 1970s, the State of Michigan partially dismantled its three dams (Plainwell, Otsego and Otsego City). As the state dismantled the dams, the water level in the river dropped and the contaminated sediment that was once underwater became exposed on the riverbanks and floodplain areas behind the state-owned dams. EPA and MDEQ currently estimate that the Site contains approximately 113,000 lbs of PCBs in the river sediment and floodplain soil.

When the Site was listed on the NPL in 1990, it was designated a state–lead site for purposes of conducting the RI/FS. On December 28, 1990, MDNR signed an administrative agreement with several PRPs, pursuant to which the PRPs agreed to perform an RI/FS for the entire Site. Three PRPs signed the administrative agreement with MDNR, including Millennium Holdings LLC (formerly HM Holdings), Georgia-Pacific LLC (formerly known as Georgia-Pacific Corporation), and Plainwell Inc. (formerly Simpson Plainwell Paper Company). (Plainwell Inc. and Millennium Holdings LLC later filed for bankruptcy.) These three PRPs formed a group and

were collectively known as the Kalamazoo River Study Group (KRSG). Although not officially identified as a PRP by the State of Michigan, the Fort James Corporation joined the KRSG and agreed to help fund the RI/FS for the Site. EPA later identified another PRP, the Weyerhaeuser Company, in 2002.

In 1998, EPA signed a cash-out agreement with Millennium Holdings LLC for a time-critical removal action at the Bryant Mill Pond area of OU1. EPA conducted the time-critical removal action using the funds from the cash out agreement and supplemental federal funds. The removal action is discussed in more detail in Section III.B.1 of this five-year review report.

In 2002, certain areas of the Site were re-designated as federal-lead due to the agencies' belief that re-designation of certain areas of the Site was in the best interest of the public. Roles and responsibilities for each OU are outlined in a February 2002 Site-Specific Amendment to the Enforcement Agreement for State-Enforcement Lead Sites in Michigan, under the Superfund Memorandum of Agreement between MDEQ and EPA. Since 2002, EPA has been the lead agency on all OUs except OU3 (King Highway Landfill); MDEQ has retained the lead on OU3. In accordance with an April 2007 Site-Specific Amendment to the 2002 Site-Specific Amendment to the SMOA, EPA acquired the lead for OU1 (Allied Paper, Inc./Bryant Mill Pond) in 2008 after EPA accepted the state-approved RI Report and determined that no additional response activities were necessary to complete the RI.

In 2007 an AOC was signed between Georgia-Pacific LLC, Millennium Holdings LLC, MDEQ and EPA to implement a time-critical removal action in the Plainwell dam area of the Kalamazoo River in OU5. Work began in March 2007 and was completed in June 2009. A total of 130,000 cubic yards of contaminated in-stream and bank sediment were removed by this action.

In 2007 another AOC was signed between Georgia-Pacific LLC, Millennium Holdings LLC and EPA to conduct a Supplemental RI/FS for OU5, which includes the Kalamazoo River and Portage Creek from Morrow Dam to the confluence of Lake Michigan. OU5 consists of seven discreet areas, each requiring its own supplemental RI/FS.

On January 6, 2009, Lyondell Chemical Company and 79 affiliated debtors filed for bankruptcy under Chapter 11 reorganization. One of the debtors was Millennium Holdings, LLC. In January 2009, Millennium Holdings ceased all work at the Site. On April 23, 2010, the U.S. Bankruptcy Court approved Lyondell's reorganization plan. EPA received approximately $100 million (of its court-approved claim of more than $900 million) to be used at the Site from the U.S.'s settlement with the debtors in the bankruptcy action. Georgia-Pacific continues addressing its obligations to complete the supplemental RI/FS according to the 2007 AOC.

In June 2009, Georgia-Pacific LLC and EPA entered into an AOC to conduct a time-critical removal action in the Plainwell 2 Dam area of OU5. This removal project began in August 2009 and was completed in December 2010. Approximately 18,000 cubic yards of soil and debris were removed by this action.

In July 2011, EPA issued an Action Memorandum to complete a time-critical removal action along Portage Creek, in a 1.8-mile stretch immediately downstream of OU1 to the confluence of the Kalamazoo River. The removal work began in September 2011 and will take two to four years to complete. EPA anticipates that this project will remove approximately 17,000 cubic yards of contaminated soil and sediment.

B. Operable Units

B.1. Operable Unit 1

Physical Characteristics

The Allied Paper Inc./Bryant Mill Pond (OU1) encompasses 89 acres along Portage Creek in the City of Kalamazoo in Kalamazoo County, Michigan. OU1 is bordered by Cork Street to the south, Alcott Street to the north, a Conrail Railroad line to the west, and residential/commercial properties to the east (see Figure 2, OU1 Location Map).

Land and Resource Use

According to the MDEQ RI Report, OU1 and areas in the vicinity of OU1 are zoned for industrial, commercial, and residential purposes. Industrial and commercial properties are located to the north and south of OU1 and along portions of the east and west sides of OU1. Residential properties are located along a portion of the east side of OU1 and to the west beyond the railroad tracks. OU1 is an inactive disposal area, but groundwater is being collected along collection sumps and treated prior to being discharged to the City of Kalamazoo Wastewater Treatment Plant. Wetlands are present at OU1.

History of Contamination

When the former paper mills on the Kalamazoo River recycled and/or de-inked and repulped waste paper that included carbonless copy paper, PCBs and other contaminants were present in the wastewater produced from the paper manufacturing process. The wastewater contained large quantities of suspended particles – primarily cellulose and clay. PCBs adsorb to the suspended particles in the wastewater. PCBs were present in the manufacturing process from at least 1957 until well after production of carbonless copy paper containing PCBs stopped in the 1970s. In the 1950s, the mills began building primitive clarifiers and dewatering or settling lagoons to remove solid particles, and the clarified wastewater was discharged to the rivers and creeks (i.e., Portage Creek at OU1).

OU1 is divided into individual study areas based on former historic operations (see Figure 3, OU1 Site Plan). According to the RI Report, these areas include the former operational areas, which include the following: the Bryant Historic Residuals Dewatering Lagoon (HRDL) and Former Residuals Dewatering Lagoons (FRDLs), Monarch HRDL, Type III Landfill, Western Disposal Area, and the Alcott Street Properties. All areas

received processed wastewater and/or dewatered paper residuals from paper manufacturing operations at the former Bryant and Monarch mills. In addition to receiving the processed wastewater and/or dewatered paper residuals, the Type III landfill area received non-process industrial wastes (such as cardboard, packing strips, waste paper and demolition materials). The operational history and volume of contamination for each area of OU1 are discussed below.

- **Former Operational Areas** (Bryant HRDL and FRDLs, Monarch HRDL, Type III Landfill, and Western Disposal Area).

    - Bryant HRDL and FRDLs – This area consists of six lagoons covering approximately 22 acres. The lagoons were used to settle out residuals from the wastewater generated at the Bryant mills. A clarifier and the earthen-diked HRDL were the primary treatment system, built in 1954. The series of five FRDLs were later added to dewater residuals. The HRDL was filled and has not been used for disposal since the late 1970s*. The FRDLs have not been used for disposal since 1989*.

    - Monarch HRDL – This 7-acre lagoon was used as part of the initial primary treatment facility for process waste from the Monarch Mill. The facility consisted of a clarifier and an earthen-diked dewatering lagoon. After clarification, the wastewater supernatant was discharged to Portage Creek and the settled residuals were pumped to the Monarch HRDL for dewatering. The Monarch HRDL was used from the early 1950s until the 1960s.

    - Type III Landfill – This 13-acre area was originally licensed as a landfill in 1966 to receive non-process wastes pursuant to State of Michigan requirements. It was then licensed as a Type II landfill and later the designation was changed to a Type III landfill in 1985 to receive residuals and demolition wastes (Type II landfills can accept municipal solid waste, while Type III landfills can accept construction/demolition and industrial wastes). Over the period of use (1966 until the late 1980s), the landfill area received various types of industrial waste and residuals.

    - Western Disposal Area – This area covers approximately 19 acres and is located along the western edge of the Bryant HRDL, southwest of the former Type III landfill. According to the RI Report, this area was used as a disposal area for dewatered residuals mined from the HRDLs and FRDLs. By 1986 most of the areas were filled in, and vegetation was established by 1991.

* The only exception to this was EPA's time-critical removal action at the Bryant Mill Pond area in 1998-1999. All contaminated materials excavated during the removal action were consolidated in the Bryant HRDL and FRDLs.

- **Former Bryant Mill Pond** – Particles in the wastewater discharged from the mills to Portage Creek settled out in the 29-acre Bryant Mill Pond. As explained in more detail below, EPA conducted a time-critical removal action between 1998 and 1999 to address PCBs in the sediment.

- **Residential/Commercial Areas** (including but not limited to the following: former Panelyte property and marsh, Stryker Corporation property, Conrail property, clay seam area, and east bank area).

    - Panelyte Property and Marsh – This area encompasses approximately 23 acres and contains a fill area located at the southwestern end of the property. This property is a Brownfields Site which is being addressed under a state grant. Surface water from the Panelyte fill area and Western Disposal area drains toward the Panelyte marsh.

    - Stryker Corporation Property – The parking lots of the Stryker property were constructed over parts of the former Bryant Mill Pond.

    - Conrail Property – The railroad property extends along the western edge of OU1.

    - Clay Seam Area – The clay seam is a body of residuals covering approximately a quarter of an acre that is present as a small, nearly vertical bluff on the east side of Portage Creek. Native soils underlie the clay seam at the elevation of the water line. The clay seam extends up to approximately 80 feet inland from the bank of Portage Creek.

    - East Bank Area – A floodplain area along the eastern bank of Portage Creek. Approximately 1,700 cubic yards of residuals were removed from this area in 2002 by the PRPs as a voluntary interim response measure (see below).

Response Activities

Voluntary Response Activities

Between 2000 and 2005, the PRPs conducted a number of interim response measures to stop or prevent the migration of PCBs from OU1 into Portage Creek. The interim response measures were voluntarily conducted by the PRPs, and not under an administrative order with MDEQ or EPA. The interim response measures included the installation of sheetpile along the Bryant HRDL and FRDLs to stabilize the existing berm and prevent the Bryant Mill Pond residuals from eroding back into Portage Creek, capping the Bryant HRLD and FRDLS to

prevent erosion and infiltration of rainwater, and installation of a groundwater recovery system. The purpose of the groundwater recovery system was to maintain groundwater levels within a foot of the historic norm behind the sheetpile to mitigate the potential for raised groundwater levels to saturate previously unsaturated residuals. In addition, a wastewater treatment plant was installed in the fall of 2004 and began operation in February 2005 to treat recovered groundwater at OU1.

EPA Time-Critical Removal Action

In 1999, pursuant to a cash-out agreement with Millennium Holdings LLC, EPA completed a time-critical removal action at the Bryant Mill Pond area, the pond that received wastewater discharged by the former Bryant Mills. Approximately 150,000 cubic yards of PCB-contaminated sediment were excavated from the Bryant Mill Pond in an effort to clean up this upstream area, since it served as a significant source of PCBs to the Kalamazoo River. In 2003, an additional 1,000 cubic yards of contaminated material were removed from the Portage Creek floodplains. All contaminated material excavated during the time-critical removal action was consolidated in the OU1 Bryant HRDL and FRDLs.

Basis for Taking Action

The RI/FS for OU1 has not yet been completed nor a ROD issued, so EPA has not yet documented a basis for taking action at OU1. The remedial status of OU1 is discussed below.

Remedial Status

On October 26, 2006, MDEQ disapproved the OU1 Revised RI Report prepared by Millennium Holdings, LLC and decided to complete the report internally. MDEQ submitted a state-modified RI Report for OU1 to EPA in March 2007. EPA approved the RI Report in March 2008 and became the lead agency, in accordance with the process discussed in Section III.A. of this five-year review report. Millennium Holdings, LLC was developing the FS Report, but ceased activities on the Site in January 2009 with the bankruptcy filing. EPA assumed responsibility for completing the FS and expects to finalize the FS Report in the fall of 2012. EPA anticipates issuing a ROD for OU1 in 2013.

Since a ROD has not been issued for OU1, there is no remedial action to discuss or evaluate; therefore, OU1 is not discussed further in this five-year review report.

B.2. Operable Unit 2

Physical Characteristics

The Willow Boulevard/A-Site Landfill (OU2) is located southeast of the intersection of Business I-94 and Highway M-96 in Kalamazoo Township, Michigan. OU2 is bordered by the Kalamazoo River to the north and northwest, Davis Creek to the east, and Willow Boulevard Road, former Olmstead Creek, and residential areas to the south (see Figure 4, OU2 Location Map).

OU2 is approximately 32-acres in size and consists of two disposal areas: the Willow Boulevard Landfill and the A-Site Landfill. OU2 also includes impacted areas adjacent to and/or near the Willow Boulevard/A-Site Landfills (see Figure 5, OU2 Site Plan).

The A-Site Landfill occupies approximately 22-acres and contains approximately 475,400 cubic yards of PCB-contaminated material. The Willow Boulevard Landfill (including the Drainageway Area) occupies approximately 11-acres and contains an estimated volume of 152,100 cubic yards of contaminated residuals. Impacted areas adjacent to and/or near the landfills include the area east of Davis Creek, the area south of the A-Site berm (including former Olmstead Creek), and the area near monitoring well AMW-3A. The area east of Davis Creek is approximately 3.5 acres in size with an estimated volume of 3,800 cubic yards of contaminated materials. The area south of the A-Site berm is approximately 2.5 acres in size with an estimated volume of 2,900 cubic yards of contaminated materials. The AMW-3A area is approximately 0.25 acres in size with an estimated volume of 100 cubic yards of PCB-contaminated residual, soil, and sediment.

Land and Resource Use

Land use in the vicinity of OU2 includes industrial, commercial, and residential properties. The A-Site Landfill and Willow Boulevard Landfill are zoned for industrial use. The land south of OU2 is zoned residential and industrial. OU2 is currently an inactive landfill. Wetland areas are also present at OU2.

No private, commercial, or industrial water wells were identified within ¼ mile of OU2. However, ten wells were identified within ½ mile of OU2. Four of the ten wells are public water supply wells owned by the City of Kalamazoo. Four are domestic wells, one well is an industrial well, and the usage of the last well is not known. It is not known whether any of the domestic wells within ½ mile of OU2 are being used for drinking water, though groundwater is migrating north toward the Kalamazoo River and not toward the residential area to the south.

History of Contamination

The Willow Boulevard and A-Site landfills were used to dispose of dewatered paper-making residuals from the former Allied Paper King Mill and the Georgia-Pacific Kalamazoo Mill, both located in Kalamazoo, Michigan. PCBs were part of the paper mills' waste streams between the 1950s and 1980s. Process residuals from the paper manufacturing operations were disposed at the Willow Boulevard and A-Site landfills. Over time, PCB-contaminated residuals from the landfills eroded and migrated into the soil and sediment of adjacent areas and/or into the Kalamazoo River. Surface water runoff from the landfills and adjacent areas also transported PCBs directly into the Kalamazoo River. Therefore, the landfills and adjacent areas are sources of PCBs to the river and Davis Creek, which empties into the Kalamazoo River.

The A-Site Landfill was originally a series of dewatering (or drainage) lagoons. Paper waste from the King Mill was piped to the A-Site lagoons, and water was allowed to settle out. Paper residuals accumulated within the lagoons, and over time, the A-Site became known as the A-Site Landfill. The A-Site lagoons were active between 1960 and 1967. Operations at the King Mill ended in 1971, and the mill was demolished in 1978. Georgia-Pacific purchased the A-Site in 1975 and used it to dispose of paper waste dug up from the King Highway dewatering lagoons until 1977. From 1977 to 1987, the A-Site received dewatered paper-making waste from the Kalamazoo King Mill filter presses. The A-Site ceased to be an active disposal area in 1987, when the King Highway Landfill operations began. The Willow Boulevard Landfill was acquired by Georgia-Pacific from the Kalamazoo Paper Company in 1967. From mid-1960 until 1975, dewatered paper residuals from the Kalamazoo Mill and the King Highway Lagoons were disposed at the Willow Boulevard Landfill. Disposal activities occurred from the mid-1960s until operations stopped in 1975.

Response Activities

Voluntary Response Activities

Between 1992 and 1999, Georgia-Pacific conducted a number of interim response measures to eliminate or reduce erosion of PCB-containing residual and soil from the landfill into the Kalamazoo River. The interim response measures were voluntarily conducted by Georgia-Pacific, and not under an administrative order with MDEQ or EPA.

In 1992, GP installed a chain-link fence around the landfill and reseeded the western portion of the A-Site Landfill to promote vegetative growth. In 1998, approximately 1,500 linear feet of sheet pile was installed between the A-Site and the Kalamazoo River to stabilize the earthen berm along the river and mitigate soil erosion. In 1999, approximately 7,000 cubic yards of PCB-contaminated residual and sediment were excavated from the western bank of the Kalamazoo

River adjacent to the landfill. The excavated material was placed into the eastern side of the Willow Boulevard portion of OU2. The landfill was then regraded to promote drainage and covered with 6 inches of clean sand as a temporary cover. A portion of the river's edge was also backfilled to create a sand berm along the Kalamazoo River. Geotextile and riprap were placed along a portion of the river's edge to reduce erosion of the riverbanks.

EPA Time-Critical Removal Action

On November 7, 2006, Georgia-Pacific signed an AOC with EPA to perform a time-critical removal action at the former Refuse Area of the former Georgia-Pacific Kalamazoo Mill property and at the Oxbow Area of the former Hawthorne Mill property. The former Kalamazoo Mill and Hawthorne Mill property is located north of OU2, across the Kalamazoo River. During the removal action, Georgia-Pacific removed approximately 33,203 cubic yards of PCB-containing soil/residual from the Refuse Area and approximately 17,488 cubic yards of PCB-containing soil/residual from the Oxbow Area. Georgia-Pacific also removed contaminated soil from a transformer pad, wastewater pipeline, and from an underground pipe that was located at the former Kalamazoo Mill property. Material excavated from the transformer pad was sent to an off-site licensed landfill for disposal and material excavated from the wastewater pipeline and underground pipe was consolidated into the A-Site. The removal action started in November 2006 and was completed in June 2007. The portion of the A-Site that received the contaminated residual/soil was covered and a berm was constructed to keep surface water runoff from entering Davis Creek and the Kalamazoo River.

Basis for Taking Action

PCBs are the primary contaminant of concern and primary risk-driver at OU2. The media of concern are PCB-contaminated residuals within the Willow Boulevard and A-Site Landfills and PCB-contaminated residual, soil, and/or sediment in areas adjacent to the landfills including the Willow Drainageway, the area south of the A-Site Berm, the area east of Davis Creek, and the area near monitoring well AMW-3A.

The RI for OU2 was conducted between 1993 and 2000. The maximum PCB concentration in surficial residuals at the Willow Boulevard Landfill was 270 milligrams per kilogram (mg/kg), and the maximum concentration in subsurface residuals was 160 mg/kg. Surficial soil samples were not collected at the Willow Drainageway. The maximum PCB concentration in subsurface soil at the Drainageway was 30 mg/kg. The maximum PCB concentration in surface soil at the Area South of the A-Site berm was 14 mg/kg, and the maximum concentration in subsurface soil was 73 mg/kg. The maximum PCB concentration in surface sediment at the Former Olmstead Creek was 7.6 mg/kg. The maximum PCB concentration in surface residual, soil, and sediment at the area east of Davis Creek was 36 mg/kg; no subsurface soil samples were collected at this area

during the RI. The maximum PCB concentration in surface soil at the AMW-3A area was 5.9 mg/kg, and the maximum concentration in subsurface soil was 62 mg/kg. PCB concentrations in surface soil samples collected at residential properties adjacent to the landfills were either not-detect or below the State of Michigan residential cleanup criteria of 4.0 mg/kg.

A quantitative risk assessment was not conducted at OU2. Instead, potential risks associated with exposure pathways at OU2 were qualitatively assessed to determine which media would need to be targeted for remediation. Exposure pathways assessed in the qualitative risk assessment conducted at OU2 included the following: ingestion of and dermal contact with contaminated residuals, soil, and sediment; inhalation of airborne releases; and erosion into aquatic habitat. Media evaluated included air, surface soils, residuals and sediment, subsurface soils, surface water, and groundwater/leachate. Potential risks associated with exposure pathways were qualitatively assessed by comparing maximum PCB concentrations detected during the RI with cleanup criteria based on future land use and protective ranges established in the *Final (Revised) Baseline Ecological Risk Assessment* dated April 2003 (BERA). State of Michigan Part 201 Generic Cleanup Criteria were used in the qualitative assessment of potential risk at OU2.

Based upon the results of the RI and the qualitative assessment of risk to human health and ecological receptors, a response action at OU2 was deemed to be warranted because PCB concentrations in residuals, soil, and sediment at OU2 exceeded the Part 201 Generic Commercial II/Industrial Land Use Criteria of 16 mg/kg PCB (in soil) protective of human health for on-site workers and/or trespassers, the Generic Residential Land Use Criteria of 4 mg/kg PCB (in soil) protective of human health for residential land use, and/or the cleanup range of 5.5 to 8.1 mg/kg PCB (in soil) for the protection of ecological receptors (American Robin) established in the BERA. Additionally, a response action at OU2 was also deemed to be warranted because of the potential migration of PCBs from the landfills and adjacent areas (via erosion or surface water runoff) into the Kalamazoo River and because PCB concentrations in sediment of the wetland areas may present an unacceptable risk to people or animals (e.g., mink) who consume fish.

Because a ROD was issued that selected a remedial action for OU2, this OU is further discussed in the remaining sections of this five-year review report.

B.3. Operable Unit 3

Physical Characteristics

The King Highway Landfill (OU3) is located within the City of Kalamazoo, Kalamazoo Township, Michigan. OU3 includes the King Highway Landfill, the King Street Storm Sewer (KSSS) floodplain, and contaminated river sediments adjacent to the landfill. The OU3 ROD requires the cleanup of these areas, as well as five former waste lagoon areas located at the Georgia-Pacific Mill in Kalamazoo (herein referred to as the "Mill

Lagoons"). Waste material from the Mill Lagoons was excavated and disposed in the King Highway Landfill. The Mill Lagoons are located north of the landfill across the Kalamazoo River (see Figure 6, OU3 Location Map, and Figure 7, OU3 Site Plan).

The King Highway Landfill occupies approximately 15 acres. The Mill Lagoons occupy approximately 7 acres, and the KSSS occupies approximately 1 acre. OU3 is bordered by King Highway (M-96) to the south, the Grand Trunk Railroad right-of-way to the west, and the KSSS floodplain and the Kalamazoo River to the north and to the east.

Land and Resource Use

The King Highway Landfill is zoned for industrial or secondary commercial use. The land immediately adjacent to the south and southwest of the landfill is classified for industrial or secondary commercial use. The land that contains the Mill Lagoons, located at the Georgia-Pacific Mill Property, is zoned for industrial use.

Future land use at the King Highway Landfill property will remain industrial. Institutional controls were required by the ROD. Some ICs are in place, but require revision, while other ICs are not yet in place. The landfill or areas with waste includes multiple parcels, some of which may have ICs in place. As part of the Institutional Control Plan for OU3, appropriate restrictive covenants will be recorded on all deeds for all the parcels which make up OU3. GP is working with the City of Kalamazoo to grant access for a bike path along the border of the property.

The Georgia-Pacific Lagoons were addressed as a part of the OU3 ROD. The projected land use at the Georgia-Pacific Mill Lagoons is expected to be restricted to industrial use with no public access.

History of Contamination

During a 15-year period, Georgia-Pacific de-inked office waste paper, which contained carbonless copy paper contaminated with PCBs, at two of the mills located at the Georgia-Pacific Kalamazoo Mill property. Originally, the Kalamazoo Paper Mill consisted of five mills, three for making paper products, and two for finishing and converting. Mills 1 and 3 both performed de-inking operations starting in the early 1950s. Mill 3 discontinued de-inking in the late 1960s, was refurbished, and resumed operations in 1975. Mill 1 de-inked continuously until the late 1970s. Raw paper waste from all the mills was routed to a clarifier. The clarifier effluent was pumped directly into the Kalamazoo River until 1964, at which time it was rerouted to the City of Kalamazoo Wastewater Treatment Plant.

The underflow from the clarifier was dewatered and disposed at various locations over the years. From the mid-1950s until the late 1950s, residuals were placed in the Mill Lagoons on the Georgia-Pacific Kalamazoo Mill property. In the late 1950s residuals

were sent for dewatering to the King Highway lagoons, which later became the King Highway Landfill. The Mill Lagoons were then only used as an emergency backup system. Georgia-Pacific dewatered residuals in the King Highway lagoons until 1977. After 1977, the King Highway lagoons were not utilized until the lagoons were licensed in 1983 by the MDEQ as a landfill for disposal of paper-making residuals. From 1987 to 1998, Georgia-Pacific used the King Highway Landfill for the disposal of dewatered paper-making residuals. Over time, the contaminated residuals migrated, via erosion or surface water runoff, from the landfills into adjacent areas and/or the Kalamazoo River.

The King Highway Landfill is a mono-fill of paper residuals. The landfill covers 15 acres and consists of four cells: Cells 1, 2, 3, and 4. The total volume of residuals in the landfill is estimated at 282,000 cubic yards. Cells 1, 2, and 3 were first licensed by the MDEQ in 1983 under the Michigan Solid Waste Management Action (Act 641) as a Type III landfill. Cell 4 was never permitted as an operating landfill. The majority of residuals in Cell 4 were submerged in a pond formed by the transport of water from the other three cells to Cell 4 through a culvert in the dikes. The four cells were separated by dikes approximately 10 to 20 feet high. These dikes were constructed of sand and gravel in the 1950s and were used as access roads. Access roads and no-fill areas comprise 7.9 acres of the King Highway Landfill. During construction of the sedimentation basin, nearby well installation, and during installation of landfill gas cutoff trenches, residuals contiguous with the landfill cells were encountered. Residuals were also encountered on parts of those no-fill areas as well as on property not owned by GP (i.e., City of Kalamazoo and MDOT).

Response Activities

Voluntary Response Activities

Pre-ROD interim measures were voluntarily conducted by Georgia-Pacific, and not under an administrative order with MDEQ. In 1994 and 1996, approximately 1,000 linear feet of sheet piling was installed to stabilize the berm along the northern sides of Cells 1, 2, and 3 of the landfill. The purpose of this interim measure was to prevent berm failure and subsequent migration of contaminated residuals from the landfill into the Kalamazoo River. In 1998, PCB-contaminated material was excavated from the King Street Storm Sewer, the Mill Lagoons, and from areas directly adjacent to the landfill cells. This included a portion of the Kalamazoo River directly adjacent to the sheet piling. Though these actions were required in the ROD for OU3, they are considered to be voluntary actions as they were conducted prior to the February 9, 2000, AOC for response actions at OU3. All known materials were consolidated back into the landfill from those areas.

Basis for Taking Action

The RI for OU3 was conducted in 1993. The maximum PCB concentration in the landfill

surface residuals was 3.6 mg/kg. PCB concentrations generally increase with depth through the residuals. However, PCB concentrations in the top eight feet of residuals in Cell 4 are as high as 69 mg/kg. Tests of the residuals that were added to the landfill later in its operational history did not detect PCBs with the exception of one sample in 1987 that contained 6.5 mg/kg PCBs. The maximum PCB concentration found in the top 16 feet of residuals in Cells 1, 2, and 3 was 8.8 mg/kg. Concentrations exceeding 50 mg/kg PCB were detected at depths of 16 to 30 feet. The maximum concentration in the subsurface residuals was 310 mg/kg. Soil below the King Highway Landfill has a maximum PCB concentration of 9.9 mg/kg.

Total PCB concentrations from samples collected in the KSSS floodplain had PCB concentrations ranging from 0.37 mg/kg to 99 mg/kg. The maximum PCB concentration found in the berms adjacent to the landfill was 77 mg/kg. Analytical results from samples collected at the Mill Lagoons showed PCB concentrations in surface residuals ranging from 0.2 to 110 mg/kg. PCBs were detected in three subsurface residual samples in the Mill Lagoons at concentrations ranging from 3.4 to 70 mg/kg. Five soil samples were collected below the Mill Lagoons. PCBs from native soils, below the lagoons, ranged from 0.043 to 2.9 mg/kg.

PCBs were not detected in groundwater at OU3 above performance standards. However, PCBs were detected in a leachate sample collected from Monitoring Well 10R at a concentration of 1.4 micrograms per liter (ug/L). One surface water sample was collected from the pond in Cell 4 and analyzed for PCBs. The analytical results show a PCB concentration of 0.026 ug/L.

The presence of PCB-contaminated residuals, soils, and sediment in areas outside the landfill and the Mill Lagoons is evidence that PCBs were migrating, via erosion or surface water runoff, from the landfill and the Mill Lagoons, into adjacent areas and the Kalamazoo River. Additionally, the landfill berms were eroding by surface water run-off and the continued flow of the Kalamazoo River. As a result of the information gained during the RI, the state concluded that OU3 and the Mill Lagoons are sources and potential sources of PCB contamination to the Kalamazoo River and its floodplain in the vicinity of OU3 and the Mill Lagoons.

A Baseline Risk Assessment (BRA) was conducted at OU3 to evaluate risks to human health and the environment under unremediated conditions. Because the waste at OU3 is identical (i.e., the wastes was generated from the same source at similar concentrations) to the wastes at the Mill Lagoons, and because the routes of exposure and the receptors are also the same, the MDEQ determined that the BRA for OU3 is applicable to the Mill Lagoons. Therefore, a separate BRA for the Mill Lagoons was not conducted. The BRA concluded that the primary migration pathway for the release of PCBs into the river is erosion of residuals from the landfill berms and floodplains and the Mill Lagoons. The largest potential risk and migration pathway is the release of PCB-contaminated residuals due to failure of the landfill berms.

Based upon the results of the RI and BRA, a response action at OU3 and the Mill Lagoons was necessary to eliminate or reduce the potential migration of PCBs to the Kalamazoo River. The largest potential risks identified for ecological receptors were due to past releases of PCBs from the landfill, its berms, and floodplains of the Mill Lagoons. The ecological risk assessment recognized that organisms and fish in the Kalamazoo River bioaccumulate PCBs and pass them up the food chain to other organisms which would feed upon them. The bioaccumulation food chain effects present the greatest potential risk to ecological and human health, via consumption of fish from the Kalamazoo River.

Because a ROD was issued that selected a remedial action for OU3, this OU is further discussed in the remaining sections of this five-year review report.

B.4. Operable Unit 4

Physical Characteristics

The 12th Street Landfill (OU4) is located in Otsego Township, approximately ½ mile northwest of the City of Plainwell in Allegan County, Michigan. The landfill occupies approximately 6.5 acres and is bordered by the Kalamazoo River to the east, by wetlands to the north and west, by industrial developed land to the south and southeast, and by a gravel pit operation to the south and southwest (see Figure 8, OU4 Location Map, and Figure 9, OU4 Site Plan).

The 12th Street Landfill is located within an environmentally sensitive area. The adjacent woodlands, wetlands, and the former powerhouse discharge channel provide suitable habitat for fish, turtles, and amphibians. Small mammals (i.e., mice, squirrels, woodchucks, mink, raccoons, fox and muskrats) and birds inhabit the areas surrounding the landfill. The Kalamazoo River is part of a bird migratory flyway route for waterfowl species, and the areas surrounding the 12th Street Landfill provide a migratory stopover that attracts and supports waterfowl. During nesting season, vegetation in the area provides cover and materials for nesting. Larger mammals, such as white-tailed deer, also use the landfill as evidenced by deer paths running over the top and along the sides of the landfill. Muskrat dens have been observed in the wetlands and there is evidence of extensive burrowing into the sides of the landfill by fox and woodchuck.

Land and Resource Use

Land use in the immediate vicinity of OU4 is characterized as industrial with residential property to the south and southwest. Wetlands are present north and northwest of the OU and the Kalamazoo River and former Plainwell Dam are located to the east and southeast.

The 12th Street Landfill is zoned industrial and will remain industrial in the future. A restrictive covenant running with the land from the owner of the landfill property to MDEQ as the grantee (MDEQ Reference No: RC-RRD-03-052 on USEPA Site No. 059B) is already in place (see Attachment 6, Restrictive Covenant for OU4). EPA is a third party beneficiary of this restrictive covenant. The restrictive covenant was recorded with the Allegan County Registry of Deeds on March 25, 2005, to restrict future land use at the landfill property. The existing restrictive covenant was amended on July 15, 2012, to prohibit the use of groundwater at the OU.

History of Contamination

The 12th St. Landfill was used from 1955 to 1981 for disposal of PCB-containing paper residuals consisting mostly of water, wood fiber, and mineral matter. PCBs were introduced into some of the residuals as a result of the paper manufacturing operations at the former Plainwell Paper Mill between 1957 and 1962. Over time, the contaminated residuals migrated, via erosion or surface water runoff, from the landfill into the adjacent wetlands, woodland areas, adjacent property, and into the powerhouse channel of the Kalamazoo River. The landfill is comprised mostly of paper residuals with some concrete rubble, construction debris, waste lumber, and corroded steel drums. The 12th Street Landfill contains an estimated 208,000 cubic yards of PCB-contaminated residuals. The 12th Street Landfill was closed in 1984 and covered with soil and seeded to promote vegetation.

Response Activities

No voluntary response actions were taken at OU4.

Basis for Taking Action

Sampling during the December 1996 RI confirmed the presence of paper residuals in the berm, in the adjacent wetland area, and in the former powerhouse discharge channel. Soil/residual samples were collected from soil and monitoring well borings that were located outside the landfill perimeter, and from two sediment cores collected in the former powerhouse discharge channel adjacent to the east side of the landfill. Elevated PCB concentrations were reported in 24 of the 45 samples analyzed, including both samples collected from the former powerhouse discharge channel, with a maximum PCB concentration of 158 mg/kg. Elevated concentrations of inorganic compounds were also detected in several samples at levels exceeding applicable criteria. Trace concentrations of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and pesticides were also reported.

Groundwater samples were collected from 15 monitoring wells and analyzed for VOCs, SVOCs, inorganic compounds, pesticides, and PCBs. PCBs were not detected and all other results were either non-detect or below the Part 201 Industrial and Commercial

Drinking Water Criteria and Groundwater Surface Water Interface (GSI) Criteria, with the exception of bis(2-ethuylhexyl) phthalate, which was detected in groundwater at a concentration of 290 ug/L. In 1995, a second round of groundwater samples was collected from each monitoring well. In that round of sampling, groundwater analysis was limited to PCBs only, and the results indicated non-detectable concentrations.

Three leachate wells were sampled in 1993 and again in 1995. Analytical results from the 1993 sampling event indicated that trace concentrations of various VOCs, SVOCs, and aldrin were present as well as an elevated concentration of toluene (680 ug/L) in leachate collected from one leachate well. The toluene concentration exceeded GSI criteria. In 1995, leachate samples were analyzed only for PCBs. Results indicated that leachate collected from one well had a PCB concentration of 1.4 ug/L.

Due to the similarities between the King Highway Landfill (OU3) and the 12th Street Landfill (OU4), such as similar waste (PCB-contaminated residuals generated from the same paper recycling process at similar concentrations), identical routes of exposure, and identical receptors, it was assumed that there was a similar level of unacceptable risk at the 12th Street Landfill as at OU3. Therefore, the King Highway Landfill BRA was used to assess the risks to human health and ecological receptors at OU4.

Based upon the results of the RI and BRA, a response action at OU4 was necessary to eliminate or reduce the potential migration of PCBs to the Kalamazoo River. The largest potential risks identified for ecological receptors were due to past releases of PCBs from the landfill into the Kalamazoo River. The ecological risk assessment recognized that organisms and fish in the Kalamazoo River bioaccumulate PCBs and pass them up the food chain to other organisms which would feed upon them. The bioaccumulation food chain effects present the greatest potential risk to ecological and human health, via consumption of fish from the Kalamazoo River.

Because a ROD was issued that selected a remedial action for OU4, this OU is further discussed in the remaining sections of this five-year review report.

B.5. Operable Unit 5

Physical Characteristics

Operable Unit 5 is located in Allegan and Kalamazoo Counties in southwestern Michigan. OU5 includes approximately 80 miles of the Kalamazoo River and a 3-mile stretch of Portage Creek (see Figure 10, OU5 Site Map).

Land and Resource Use

The Kalamazoo River is used for recreational purposes (i.e., swimming, boating, and fishing). River water is not used as a drinking water source and is not expected to be

used as a drinking water source in the future. Wetland areas are present along areas of the river. Land use in the floodplains adjacent to the river includes a mix of recreational, agricultural, residential and commercial use.

History of Contamination

Former paper mill operations, as previously discussed, were the source of the PCB contamination. Although PCB use in the manufacture of carbonless copy paper was discontinued in 1971, the waste streams of the Kalamazoo area paper mills most likely contained PCBs for at least a decade after 1971. The PCB-contaminated wastes from these paper mills were initially discharged directly to the Kalamazoo River and Portage Creek. Later, waste effluents were sent to clarifiers prior to being discharged to the river and creek. The bottom sludge from these clarifiers was placed in at least four disposal areas (landfills) along the river. Because the PCBs were associated with suspended fine clay particles, the clarifiers were ineffective in stopping the discharge of PCBs. The soils, sediment, water column, groundwater, and biota in and adjacent to an 80-mile stretch of the Kalamazoo River and a 3-mile stretch of Portage Creek are contaminated with PCBs.

EPA and MDEQ estimate that approximately 113,000 lbs of PCBs are currently located in the aquatic system. Today, the ongoing, uncontrolled erosion of contaminated paper wastes and soils from the river banks is the most significant source of PCB loading to the Kalamazoo River. Further, the presence of PCB-contaminated paper wastes in the river system, including streambed sediments and adjacent floodplain sediments, continues to expose ecological receptors, and human receptors who consume fish at unacceptable levels. A fish advisory, which is currently a published and posted warning to humans to not consume the fish in the Kalamazoo River, has been in place since the 1970s.

In 2003, MDEQ completed a Site-Wide Final (Revised) Human Health Risk Assessment (HHRA) and Baseline Ecological Risk Assessment for OU5. The HHRA quantitatively assessed potential risk to human health for different exposure pathways, including the consumption of fish, direct contact with contaminated floodplain soils, and inhalation of dust and volatile emissions from floodplain soils behind the state-owned dams. The HHRA concluded the most significant exposure pathway is the consumption of fish from the river because fish bioaccumulate PCBs from exposure to PCB-contaminated material, surface water, and prey. Recreational activities, including swimming, boating, and wading in the river, do not pose a health risk to people. The BERA concluded that sensitive consumers, such as mink, are the most at risk compared to other ecological receptors. Birds (represented by the American Robin) that consume a substantial amount of earthworms are also at significant risk if foraging takes place in the contaminated areas, and terrestrial mammals (represented by the red fox) may be at some risk if foraging is concentrated in river areas whose prey reside in contaminated areas and have taken up substantial amounts of PCBs.

Consistent with the 2007 AOC between EPA, Georgia-Pacific LLC, and Millennium Holdings, LLC, the risk assessments (HHRA and BERA) can be revised in each area-wide RI/FS for OU5. A new Terrestrial Baseline Ecological Risk Assessment (TBERA) was developed for Area 1 of OU5, building upon information from the BERA. The TBERA also concluded that risks to ecological receptors may exist. EPA approved the TBERA as part of the Area 1 RI in June 2012.

Response Activities

EPA Time-Critical Removal Action: Plainwell Dam

On February 27, 2007, Georgia-Pacific and Millennium Holdings, LLC signed an AOC with EPA and the State of Michigan to conduct a time-critical removal action in an area of the Kalamazoo River called the "Plainwell Impoundment." Work began in March 2007 and was completed in June 2009. A total of 130,000 cubic yards of contaminated in-stream and bank sediment were removed by this action. Consistent with the federal Toxic Substances Control Act, sediments containing PCB concentrations greater than 50 parts per million (ppm, equivalent to mg/kg) were disposed at Environmental Quality Co.'s Wayne Disposal Landfill in Belleville, Michigan. Sediments with concentrations less than 50 ppm, which represent 80 percent of the waste material, were disposed at Allied Waste's C and C Landfill near Marshall, Michigan, and its Ottawa Farms Landfill near Coopersville, Michigan. The estimated cost of this project was $30 million. This project also rerouted the Kalamazoo River to its original channel and removed the dam near Plainwell. The Kalamazoo River is now free-flowing from Kalamazoo to Otsego City, Michigan, with the exception of the diversion structures associated with the Plainwell Dam #2.

EPA Time-Critical Removal Action: Plainwell 2 Dam

In June 2009, Georgia-Pacific LLC and EPA entered into a legal agreement committing Georgia-Pacific to conduct a time-critical removal action in the Plainwell #2 Dam area. This second removal action project began in August 2009 approximately three miles upstream of the earlier Plainwell Dam cleanup, and included a two-mile stretch of the Kalamazoo River. The project was completed in December 2010. Approximately 11,000 linear feet of riverbank was cleared, excavated and restored, with approximately 18,000 cubic yards of soil and debris disposed off-site at the Allied Waste C&C Landfill in Marshall, Michigan, and at Ottawa County Farms Landfill in Coopersville, Michigan.

EPA Time-Critical Removal Action: Portage Creek

In July 2011, EPA signed an action memorandum to conduct a time-critical removal action along a 1.8-mile stretch of Portage Creek from Alcott Street to the

confluence of the Kalamazoo River. EPA began implementing this PCB hot-spot excavation project in September 2011. The project will take two to four field seasons to complete and will remove approximately 17,000 cubic yards of contaminated soil and sediment at a cost of about $16 million.

Basis for Taking Action

The Supplemental RI/FSs for OU5 have not been completed, and no RODs have been issued for OU5. As a result, EPA has not yet documented a basis for taking any final remedial actions at this OU. The remedial status of OU5 is discussed below.

Remedial Status

On February 27, 2007, Georgia-Pacific Corporation and Millennium Holdings, LLC signed an AOC with EPA to conduct a Supplemental RI/FS investigation for the entire 80-mile stretch of the Kalamazoo River. OU 5 is divided into seven areas each separated by a dam. Area 1 is the most upstream area from Morrow Dam to the former Plainwell Dam. EPA approved the SRI Report for Area 1 on June 27, 2012. The FS Report for Area 1 is scheduled to be submitted to EPA in November 2012. The SRI for Area 2, which is the area of the Kalamazoo River from the former Plainwell Dam to the Otsego City dam, began in December 2010 and is due to EPA in November 2012. The SRI for Area 3, which is the area of the Kalamazoo River from the Otsego City dam to the Otsego dam, began in June 2012 and sampling is underway. Samples of river sediment and bank soil are being collected at specific locations along the river (see Figure 10, OU5 Site Map).

Since a ROD has not been issued for OU5, there is no remedial action to discuss or evaluate; therefore, OU5 is not discussed further in this five-year review report.

B.6. Operable Unit 7

Physical Characteristics

The former Plainwell Paper Mill (OU7) is located in the City of Plainwell, Allegan County, Michigan (see Figure 11, OU7 Location Map). The 34-acre mill property is bordered by the Kalamazoo River to the north, the Plainwell central business district to the east, residential property to the south, and commercial properties and the City of Plainwell Wastewater Treatment Plant to the west.

Land and Resource Use

Operable Unit 7 was formerly zoned industrial. In 2006, the City of Plainwell purchased the mill property and the mill property was rezoned as residential. Land use in the

immediate vicinity of OU7 is characterized as industrial, commercial, and residential. A restrictive covenant running with the land from the former owner of the property to MDEQ (MDEQ Reference No: RC-RRD-201-05-001on USEPA Site No. 059B) is already in place (see Attachment 7, Restrictive Covenant for OU7). EPA is a third-party beneficiary of this restrictive covenant, which was recorded with the Allegan County Registry of Deeds on March 25, 2005. The restrictive covenant provides, among other things, that owners of the mill property must take reasonable steps to stop any continuing release of hazardous substances, and may not use the property in a manner that causes existing contamination to migrate beyond the property's boundaries. The restrictive covenant further provides that as response activities are performed at this property, MDEQ and EPA may require modifications to the covenant to assure the integrity and effectiveness of any selected remedial action.

History of Contamination

Between 1910 and 1962, various owners of the Plainwell Paper Mill obtained pulp through the de-inking and repulping of used paper. PCBs were introduced into the residuals as a result of the use of carbonless copy paper, which between approximately the 1950s and 1970s contained PCBs. Wastewater from the de-inking operations was discharged directly to the Kalamazoo River until 1954. After 1954, a clarifier was installed adjacent to the mill and wastewater was treated primarily by clarification. The clarified effluent was discharged into the Kalamazoo River. The underflow from the clarifier was dewatered in a series of on-site lagoons. The secondary treatment system was updated in 1983 with the installation of a second clarifier.

Historically, twice a year each lagoon was excavated and the material was taken to the 12th Street Landfill, located near the Plainwell Dam. The waste lagoons were taken out of service in 1983 when the second clarifier was installed. Four former waste lagoons are presently covered with soil and are well vegetated. Other lagoons were filled with soil after being cleaned out and are almost entirely located under the mill's present wastewater treatment facilities.

Response Activities

Emergency Response Action: Plainwell Mill Southern Banks

In 2007, at the request of the City of Plainwell, Weyerhaeuser conducted an emergency response action for the excavation of the southern banks of the Kalamazoo River adjacent to OU7 to abate a potential release from the banks of the mill property. The emergency action included only those activities made necessary as a result of the Plainwell Dam removal. An Emergency Response Action approach was authorized by EPA, on June 29, 2007, in accordance with the emergency action provisions of the Operable Unit #4 and the Plainwell, Inc. Mill Property of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund

Site Consent Decree, which became effective February 22, 2005. Weyerhaeuser began work in November 2007 and completed the work in November 2008. Excavation activities were conducted in four stages (Zone A through Zone D), each stage addressing a separate section of the adjacent Plainwell Mill banks, which were selected based on similar bank and/or river conditions. Removal activities began with Zone A, a 600-foot length of river bank adjacent to the west end of OU7, and then moved upstream to Zone B, a 700-foot length of river bank east of Zone A, followed by Zone D, a 650-foot length of river bank adjacent to the east end of OU7, and finally Zone C, a 650-foot length of river bank area situated between Zones B and D. Excavation on shore was considered complete when visible residuals were removed and PCB concentrations in composite verification samples collected from underlying soils were less than 4 mg/kg. Excavation of floodplain and near-shore sediments was considered complete when the original river bottom was encountered or when residuals were no longer visible in soil and sediment samples and PCB concentrations in verification samples collected from the underlying material were less than 1 mg/kg. Areas where PCB concentrations exceeding target levels remained in place were covered with geotextile fabric and 6 inches of clean soil or stone. Excavated areas were backfilled with clean fill material, graded, and stabilized with rip-rap. Weyerhaeuser removed a total of approximately 3,500 cubic yards of sediment and floodplain soil. Consistent with the federal Toxic Substances Control Act, sediments containing PCB concentrations greater than 50 ppm were segregated and disposed (59.67 tons) at Environmental Quality Co.'s Wayne Disposal Landfill in Belleville, Michigan. Sediments with concentrations less than 50 ppm (4,704 tons) were disposed at Waste Management Westside Landfill in Three Rivers, Michigan.

Basis for Taking Action

OU7 is in the RI/FS stage of the Superfund process. The RI/FS has not been completed, and a ROD has not been issued for OU7. As a result, EPA has not yet documented a basis for taking action at OU7. The remedial status of OU7 is discussed below.

Remedial Status

In December 2004, Weyerhaeuser signed a Consent Decree which, among other things, obligated the company to conduct the RI/FS and RD/RA for the Plainwell Mill property. RI Phase I field sampling and analysis activities were conducted between May and December 2008 and included a historical information review, a geophysical survey, installation of test pits along the banks of the Kalamazoo River to the north of the mill buildings, and an initial groundwater evaluation and assessment of the on-site coal tunnel. Phase 2 of the RI was conducted between January and June 2010 and included PCB investigation activities near the mill

buildings banks. A draft RI Report was submitted to EPA in June 2011, and EPA provided comments on the draft report in February 2012.

As noted above, effective ICs are in place at OU7. The ICs were negotiated as part of the bankruptcy settlement with Plainwell Inc., a former owner of the property. The ICs will be reevaluated after the selection of a remedy for OU7.

Since a ROD has not been issued for OU7, there is no remedial action to discuss or evaluate; therefore, OU7 is not discussed further in this five-year review report.

IV. Remedial Actions

Remedial actions were selected in RODs that were issued for OU2, OU3, and OU4. Therefore, for each of these OUs, the following subsections describe the selected remedy (including ICs), its implementation, and system operations, where applicable.

A. Operable Unit 2

Remedy Selection

Remedial action objectives (RAOs) for the Willow Boulevard/A-Site Landfill (OU2) were developed based upon the findings of the November 2004 RI and the human health risk evaluation in the RI. The RAOs for OU2 include:

- Eliminate exposure to PCB-contaminated material exceeding applicable land-use and/or risk based cleanup criteria;
- Prevent PCB migration, via erosion or surface water runoff, into the Kalamazoo River; and
- Mitigate, to the extent practicable, adverse effects to the environment due to implementation of a remedial action.

The OU2 ROD was signed on September 27, 2006. The remedy selected in the ROD includes:

- Excavation of PCB-contaminated residuals, soil, and sediment from areas outside the landfill and consolidation of excavated material into the A-Site Landfill portion of OU2;
- Creating a clean buffer between the Kalamazoo River and the Willow Boulevard Landfill portion of OU2;
- Implementation of bank stabilization and erosion control measures to protect against bank and/or dike failure and migration of PCB-contaminated residuals into the Kalamazoo River.
- On-site disposal of PCB-contaminated material in accordance with a 40 C.F.R. § 761.61 risk-based disposal approval;
- Installing a fence that encompasses the landfill to restrict access to the landfill;

- Implementing deed restrictions limiting future land use to industrial and/or commercial use; and
- Long-term groundwater monitoring.

Remedy Implementation

On May 18, 2009, EPA and Georgia-Pacific signed a Consent Decree for the implementation of the remedy at OU2. Remedial design work began in 2010 with the Preliminary Design Report being submitted in July 2010. The Final Remedial Design Report was submitted in May of 2011 and approved by EPA on April 27, 2011. The RA site work began in May 2011 with clearing and grubbing of the Willow Boulevard Landfill. EPA anticipates that RA site work will be completed in the spring of 2013. Current completed activities include consolidation of wastes from the areas surrounding the Willow Boulevard and A-Site Landfills and capping, storm water management, and initial turf establishment at the Willow Boulevard Landfill. Capping and storm water management efforts at the A-Site Landfill are currently under construction. Major RA construction activities are anticipated to conclude with installation of the long-term monitoring network in late 2012 or the spring of 2013.

Institutional Controls

Since the last five-year review, the ICs at OU2 have been completed and recorded to prevent use of site groundwater and inconsistent land use, and for the protection of the remedy currently under construction (see Attachment 5). Table 2 summarizes the institutional controls for the restricted areas at OU2.

Table 2: Institutional Controls Summary for OU2

Media, remedy components & areas that do not support UU/UE based on current conditions	*Objectives of IC*	*Title of Institutional Control Instrument Implemented*
Groundwater – On Site	Prohibit groundwater use	Declaration of Restrictive Covenants and Environmental Protection Easement, July 22, 2010
Other Remedial Action Components	Prohibit Inconsistent Uses and protect the integrity of the remedy components	Declaration of Restrictive Covenants and Environmental Protection Easement, July 22, 2010

As noted above, a restrictive covenant is in place to restrict future use of the landfill property. The restrictive covenant prohibits any activity or use that would interfere with the landfill cap, prohibits excavation, restricts property uses to those compatible with industrial use, and restricts the use of site groundwater at this OU.

Current Compliance

The remedy is currently under construction. Compliance will be evaluated after completion of the remedial action.

Long-Term Stewardship

Compliance with effective ICs is required to assure long-term protectiveness. EPA will ensure that long-term stewardship of OU2, as well as every other OU of the Site, includes implementation and maintenance of each component of the selected remedy, including any necessary ICs. Along with implementation of effective ICs, assurance plans (such as the O&M Plan) must be developed to assure proper maintenance and monitoring of effective ICs. The plan would include regular inspection of ICs at the Site and annual certification to EPA that ICs are in place and effective.

B. Operable Unit 3

Remedy Selection

The RAOs for the King Highway Landfill (OU3) were developed based upon the findings of the July 1994 RI and the human health risk evaluation in the RI. The RAOs identified in the September1994 Focused Feasibility Study include:

- Reduce the potential migration of PCBs to the Kalamazoo River that could result from erosion of residuals from behind the dike that physically separates the residuals from the river, or failure of the dike;
- Restrict the potential for PCB migration from leachate to groundwater;
- Restrict the potential transport of PCB-containing soil/residuals along the dike to the river in surface runoff or by erosion of soils/residuals due to river flows; and
- Restrict the potential contact with PCB-containing soil/residuals and surface water by workers and trespassers at the King Highway Landfill.

The ROD for OU3 and the Georgia-Pacific Five Former Lagoons was signed by MDEQ in October 1997, and EPA concurred on the ROD in February 1998. The remedy selected in the OU3 ROD includes:

- Excavation and consolidation of PCB-contaminated soils, sediments, and residuals from the landfill berms, the KSSS floodplain, the Georgia-Pacific Mill Lagoons, and the river sediment adjacent to the King Highway Landfill, and containment of the excavated material into the King Highway Landfill;
- Construction of a State of Michigan Part 115 landfill-compliant cap over the landfill;
- Erosion protection on the berms of the landfill designed to protect against a 100-year flood event;

- Installation of new groundwater monitoring wells and abandonment of wells that are no longer needed;
- Long-term groundwater and surface water monitoring for 30 years after capping;
- Landfill gas monitoring;
- Implementing deed restrictions limiting future land use;
- Implementing access restrictions by enclosing the entire King Highway Landfill and the Mill Lagoons (only during remediation) with a fence; and
- Placing a permanent marker at the King Highway Landfill and posting warning signs at the entry gates and on the fence every 200 feet.

The purpose of the selected remedy at the King Highway Landfill and the Mill Lagoons is to prevent direct contact with PCB-contaminated residuals and eliminate or reduce the potential migration of PCBs from the landfill and the Mill Lagoons into the Kalamazoo River. The selected remedy addresses OU3 and the Mill Lagoons by reducing the current and potential migration of PCBs into the Kalamazoo River.

Cleanup goals for soil at OU3 and the Mill Lagoons were based on the anticipated future land use, which was expected to remain industrial. Both properties are zoned for industrial use, therefore, the limited industrial cleanup criteria for soil established in Sections 20120(a) and 20121(b) of Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.20101(0) *et seq.* (NREPA), were used. At the time the ROD was signed, the limited industrial cleanup criterion for PCBs in soil was 21 mg/kg, but this standard was later reduced to 16 mg/kg. The ROD required that all visible PCB-contaminated residual, soil, and sediment from the KSSS floodplain and the river adjacent to the landfill be excavated and consolidated back into the landfill. The ROD did not impose numerical cleanup criteria for the KSSS floodplain and river adjacent to the landfill because these actions were considered an interim response action. However, if the confirmatory sampling at the KSSS floodplain showed that a residential cleanup criterion of 1 mg/kg PCB or lower had been achieved, then the action at the KSSS floodplain would be accepted as a final RA.

Remedy Implementation

On February 8, 2000, a Consent Order was signed by Georgia-Pacific and the State of Michigan, whereby Georgia-Pacific agreed to implement the remedy for OU3 and the Georgia-Pacific Five Former Lagoons. The remedial design started on June 30, 1999, and was completed on September 27, 2002. There were no difficulties or changes that occurred during the remedial design. Georgia-Pacific voluntarily started construction of the remedial action in 1996, before the ROD was issued and before the Consent Order was executed.

At the time the Consent Order was signed in February 2000, the landfill cap had already been constructed. The next on-site mobilization that occurred was on October 21, 2002, when the long-term groundwater monitoring well network was installed. This date of on-site construction of the RA is the date that "triggered" the initial five-year review requirement.

Georgia-Pacific submitted a Final Report for Completion of Construction for the King Highway Landfill OU3 and the Mill Lagoons to the MDEQ in May 2004 and a post-closure O&M Plan in June 2004. As of this five-year review, the MDEQ has not yet approved the Final Completion of Construction Report or the Final O&M Plan. However, additional components of the remedy were, and are, still needed to ensure long-term protectiveness, including the following: methane gas mitigation efforts (trenches); resolution of property ownership issues for components of the remedy constructed beyond property owned by Georgia-Pacific and residuals that were discovered to be contiguous with the landfill extending onto adjacent properties; related remediation efforts for those residuals; and implementation of appropriate ICs. Therefore, new drafts of the Completion of Construction Report and O&M plan are necessary to reflect the current status of the OU. The review of these draft documents is being conducted by MDEQ concurrent with the remaining mitigation efforts.

Institutional Controls

At the King Highway Landfill, a locked chain-link fence and sheet pile enclose the landfill and restrict public access to the landfill and potential for exposure to PCB-contaminated material. Warning signs are posted along the fence every 200 feet, and permanent markers will be posted on both ends of the landfill after deed restrictions on the site parcels are recorded with the Kalamazoo County Register of Deeds. The Mill Lagoons property is also fenced to restrict public access to the property.

Two draft restrictive covenants have been prepared for OU3 and final details are being worked out between the State of Michigan and Georgia-Pacific LLC. The first restrictive covenant covers the landfill property portion of OU3, and the second covers the Mill Lagoons property, also part of OU3.

Restrictive Covenant for the King Highway Landfill Property

The King Highway Landfill restrictions as set forth in the draft restrictive covenant include: prohibitions on any use of the property that would interfere with response activities at the property; prohibitions on construction/use of wells for consumption, irrigation or any use except those necessary for response activities; prohibitions on construction of any new buildings or structures unless the structures are outside the remedy area and are approved by MDEQ; prohibitions on excavation or other intrusive activity that could affect the integrity of the landfill cap; and restrictions on uses other than those necessary to implement the remedial action. An Access License Easement under negotiation between the City of Kalamazoo and Georgia-Pacific provides the city and its contractors access across the landfill property to access a city force main; the access road covered by the easement is described on a survey that will be recorded with the restrictive covenant.

The restrictions for the landfill property cover six parcels owned by Georgia-Pacific. Georgia-Pacific owned three of the parcels (known as 1, 2, and 10) at the time of the

previous five-year review, and acquired three of the parcels (known as Parcel A, B, and the Triangle Parcel) from 2006-2008 after it was identified that parts of the OU3 remedy were installed on land not owned by Georgia-Pacific, including land within the Michigan Department of Transportation (MDOT) right-of-way along King Highway.[1] In addition, landfill gas monitoring results at the time revealed that methane gas was migrating offsite.

To address these conditions, Georgia-Pacific purchased the Triangle parcel from MDOT, and Parcels A and B from MDOT and the City of Kalamazoo, respectively, and these parcels will be subject to the terms of the restrictive covenant. Georgia-Pacific also implemented a series of contingency actions to address the methane gas, including releasing potentially trapped gases, installing ventilators on passive gas riser vents, installing four landfill gas cutoff trenches and other barriers at the sides of the landfill, installing additional permanent gas monitoring probes, and increasing the frequency of landfill gas monitoring. While investigating and addressing the issues regarding the methane gas, additional residuals were discovered beyond the extent of the landfill and within the MDOT right-of-way. Georgia-Pacific performed additional investigations in the area, secured a permit to work on the MDOT property, and re-excavated in certain areas, removing visible residuals. In addition, Georgia-Pacific took soil borings for evaluation of the need for additional excavation, and a test pit was excavated for taking confirmation samples. The investigation and remedial activities conducted in the MDOT right-of-way are documented in reports submitted to MDEQ.

The portion of the King Highway right-of-way impacted by residuals was not available for purchase from MDOT, and therefore an approach for addressing remaining contamination was agreed upon as follows (in summary): Georgia-Pacific executed an Environmental License Agreement with MDOT for property within the MDOT right-of-way along King Highway, identified as "Parcel C" in documents submitted to MDEQ and filed with the Kalamazoo County Register of Deeds. The Environmental License Agreement delineates and provides notice of an area within the right-of-way where residual contamination remains, and provides for a bond from Georgia-Pacific for the purpose of covering additional costs that MDOT may incur due to the presence of the contamination if future construction is necessary within the right-of-way. The Environmental License was signed in March 2010. MDEQ approved the completed remedial activities within the right-of-way on December 29, 2010. The remedial activities included excavation of the top foot of soil and disposing the materials at a solid waste landfill, placing an orange geotextile demarcation layer along the bottom of the excavation, backfilling the area with a minimum of one foot of clean topsoil, and grading, seeding and mulching the topsoil to promote proper drainage and revegetation.

[1] At the time of the 2007 five-year review, it was not known that residuals contiguous with the landfill extended onto adjacent properties.

On January 28, 2011, Georgia-Pacific recorded a Notice of Environmental Conditions with the Kalamazoo County Register of Deeds to place a notice in the chain of title regarding the location and nature of the PCB contamination remaining within the MDOT right-of-way, as well as the exposure barrier and clean fill placed over the residuals. Permanent markers for the right-of-way were placed between May 11 and May 18, 2011.

Restrictive Covenant on the Mill Lagoons Property

No decision had been made regarding restrictions on the Mill Lagoons portion of OU3 at the time the 2007 five-year review was completed. Georgia-Pacific, in consultation with MDEQ and EPA, has agreed to record a restrictive covenant restricting the uses of the Mill Lagoons property to substantially the same extent the King Highway Landfill is restricted, including: prohibitions on any use of the property that would interfere with response activities at the property; prohibitions on construction/use of wells for consumption, irrigation or any use except those necessary for response activities; prohibitions on construction of any new buildings or structures unless the structures are outside the remedy area and are approved by MDEQ; and restrictions on uses other than those necessary to implement the remedial action, with the exception of the following limited allowed uses:

- A recreational trail crossing a portion of the Mill Lagoons property that is owned and will be maintained by Kalamazoo County. An easement from Georgia-Pacific to Kalamazoo County executed on May 15, 2012, allows access to the recreational non-motorized path, prescribes allowed uses, requires maintenance, and describes the area covered by the easement and on which recreational uses are allowed by the restrictive covenant (the easement will be attached to the restrictive covenant and recorded with it). The easement also acknowledges the Superfund status of the Mill Lagoons property and commits the county to complying with all laws and rules that apply to the Mill Lagoons property. The draft restrictive covenant creates an express exception for recreational use for the easement area, fencing, and benches within the fenced area. Kalamazoo County has also provided its consent to the terms of the draft restrictive covenant, which will be recorded with the restrictive covenant. New surveys depicting the trail location are being prepared for recording as well.

- An Access License Agreement allowing Kalamazoo County access to construct and maintain the non-motorized path crossing a portion of the Mill Lagoons property, also executed on May 15, 2012. The Access License grants a temporary construction license for installation of the recreational trail, prohibits soil excavation or removal, and acknowledges the Superfund status of the Mill Lagoons property and commits the county to complying with all laws and rules that apply to the Mill Lagoons property. The license expires on the earlier of completion of the trail or December 31, 2012.

- Portions of the City of Kalamazoo sanitary sewer line, as well as a force main and pump station, are located on and under the Mill Lagoons property and are served by

an access road for maintenance. The sewer lines are identified in existing easements recorded at Liber 820, page 1483, and Liber 811, page 780. An Access License Agreement for construction and maintenance of the force main, sewer line, and pump station in areas covered by the restrictive covenants is under discussion between the City of Kalamazoo and Georgia-Pacific to address the city's plans for sewer improvements in the near future. The Access License Agreement, when executed, will be recorded and will reference the Restrictive Covenant for the Mill Lagoons Property and the Landfill Property as needed. The draft restrictive covenant language addresses the city's plans by providing for an allowed use within the sewer easements and forthcoming Access License Agreement for sewer installation or maintenance work.

Table 3 summarizes the institutional controls for these restricted areas at OU3.

Table 3: Institutional Controls Summary for OU3

Media, remedy components & areas that do not support UU/UE based on current conditions	*Objectives of IC*	*Title of Institutional Control Instrument Implemented*
Landfill – Capped Area	Prohibit use except maintenance and assure integrity of the landfill cap	Institutional controls are being evaluated
Groundwater – On Site	Prohibit groundwater use	Institutional controls are being evaluated
Other Remedial Action Components	Prohibit inconsistent uses and protect the integrity of the remedy components	Institutional controls are being evaluated
Georgia-Pacific Mill Property	Use limited to industrial use and a recreational bike trail	Institutional controls are being evaluated

System Operations and O&M Costs

GP has submitted a document that summarizes the previous five years of O&M costs for OU3, as is required by the AOC. The "maintenance" category is not itemized, but the dollar amounts are a significant percentage. Operation and maintenance costs were estimated in the ROD to be $125,000 per year. The actual annual O&M cost is $250,000. These costs are mostly attributed to activities performed pursuant to the *Hydrogeologic Monitoring Plan* and the *Landfill Gas Monitoring Plan*, which were developed pursuant to the requirements of the AOC (and which were developed years after the Focused Feasibility Study and ROD). Some of the activities performed include water level measurements, ultra low-flow groundwater sampling, data analysis and evaluation, design of various landfill gas control devices, and regulatory reporting – none of which were contemplated as part of the development of the annual O&M cost estimate presented in the 1994 Focused FS. Actual costs of physical cap maintenance and repair are less

than those estimated in the 1994 Focused FS, as there have not been any significant repair activities required thus far for the cap. A significant portion of the current annual O&M costs associated with on-site maintenance activities have been associated with the installation of several landfill gas control devices over the past several years.

C. Operable Unit 4

Remedy Selection

The RAOs for the 12th Street Landfill (OU4) were developed based upon the findings of the RI and the human health risk evaluation in the RI. The RAOs identified in the July 1997 Focused Feasibility Study Report include:

- Reduce the potential migration of PCBs to the Kalamazoo River that could result from erosion of residuals;
- Reduce the potential migration of PCBs to the adjacent property and wetlands that could result from erosion of residuals;
- Restrict the potential for PCB migration from leachate to groundwater; and
- Restrict the potential contact with PCB-containing soil/residuals by any workers or trespassers, or any anglers along the river.

MDEQ signed the ROD for OU4 on September 28, 2001. EPA concurred on September 28, 2001. The OU4 ROD requires the cleanup of the 12th Street Landfill and four areas adjacent to the landfill into which PCBs have migrated including: the woodland area, wetlands, adjacent property, and the former powerhouse channel.

The remedy selected in the 12th Street Landfill OU 4 ROD includes:

- Excavation of PCB-contaminated residuals, soil, and sediment from areas adjacent to the landfill and consolidation of the excavated material back into the landfill;
- Creating a hydraulic barrier between the east side of the landfill along the former powerhouse discharge channel;
- Restoration of areas that are excavated, cleared and grubbed, or otherwise affected by the remedial action;
- Construction of a side wall containment system around the outside of the landfill that provides side slope stability, 500-year event flood protection, and erosion control;
- Construction of a cover (cap) over the landfill that consists of, from bottom up, a six-inch-thick granular fill layer, 30-mil-thick geomembrane liner, 24-inch-thick general fill layer, and a six-inch-thick vegetative layer;
- Installation of a groundwater monitoring network and abandonment of wells no longer in use;
- Long-term groundwater monitoring and, during excavation activities, short-term surface water monitoring;

- Deed restrictions to restrict future land use; and
- Access restrictions including constructing a fence surrounding the landfill with warning signs and permanent markers posted along the fence.

Remedy Implementation

The Consent Decree for RD/RA work addresses the 12th Street Landfill OU4 and also requires a RI/FS investigation and RD/RA implementation at the former Plainwell Mill property (OU7). The Consent Decree for RD/RA was agreed to by EPA and Weyerhaeuser in December 2004, and entered by the U.S. District Court on February 15, 2005. However, at the request of EPA, the start of the remedial design phase of the remedy was put on hold pending the outcome of settlement negotiations for the Plainwell Dam removal action. Settlement negotiations ended on February 27, 2007. In May 2007, EPA notified Weyerhaeuser to begin the design phase of the 12th Street Landfill remedy and to initiate the RI at the former Plainwell Mill Property OU7.

Weyerhaeuser completed an emergency response at OU4 in accordance with the Consent Decree in anticipation of the future removal of the Plainwell Dam. The Plainwell Dam is located just upstream and adjacent to the landfill. Weyerhaeuser completed removal of contaminated sediments in the adjacent powerhouse channel and grading and armoring of the riverbanks along the Kalamazoo River adjacent to the 12th Street Landfill. The work represented a portion of the work associated with implementation of the remedial action that was selected in the ROD. The remaining components of the selected remedy were designed during the remedial design phase of work that started with the submittal of the Preliminary Design Report in October 2008. The final Remedial Design Report was approved in March of 2010. RA field work began in April 2010 and included consolidation of waste, capping, storm water management, turf establishment, and installation of a long-term groundwater monitoring network. Weyerhaeuser completed the RA field work in November 2010. EPA granted the Certification of Completion of the RA on October 1, 2012. Initial operation and maintenance efforts include repair of erosion during turf establishment and placement of additional topsoil and seeding over the perimeter pore water discharge trench to prevent undercutting of the rip-rap-filled shallow trench and surface erosion.

Quarterly groundwater monitoring began in October 2011. Two quarters of monitoring have been completed so far. Low-level concentrations of arsenic and cyanide have been detected at concentrations that exceed applicable State of Michigan generic criteria at one or more monitoring locations. Evaluation of groundwater monitoring data will continue until sufficient data is available to determine contaminant trends.

Institutional Controls

Access restrictions are currently inadequate at the 12th Street Landfill. A chain-link fence was installed on the south side of the landfill and warning signs were posted. However, OU4 is not fenced on the north, east, and west sides of the landfill, and the OU is easily accessible by the public.

Since the last five-year review, the ICs at OU4 have been modified to prohibit the use of groundwater. Table 4 summarizes the institutional controls for the restricted areas at OU4.

Table 4: Institutional Controls Summary for OU4

Media, remedy components & areas that do not support UU/UE based on current conditions	*Objectives of IC*	*Title of Institutional Control Instrument Implemented*
Groundwater – On Site	Prohibit groundwater use	Amendment to Declaration of Restrictive Covenants and Environmental Protection Easement, July 19, 2012
Other Remedial Action Components	Prohibit inconsistent uses and protect the integrity of the remedy components	Declaration of Restrictive Covenants and Environmental Protection Easement, March 22, 2005

As noted above, a restrictive covenant is already in place to restrict future use of the landfill property. The restrictive covenant prohibits any excavation that would interfere with the landfill cap and the amendment to the restrictive covenant prohibits of the use of on-site groundwater.

Current Compliance

The access restrictions are currently inadequate to prevent trespassing and/or remedy vandalism at the landfill. A fence needs to be constructed to prevent access and possibly other measures need to be employed to ensure long-term protectiveness. During the RD phase, Weyerhaeuser requested permission to only install limited fencing so the use of OU4 as an eco-park could be evaluated. EPA expects to discuss this potential use of OU4 and long-term access controls with Weyerhaeuser by the end of 2012.

Long-Term Stewardship

Compliance with effective ICs is required to assure long-term protectiveness. EPA will ensure that long-term stewardship of OU4, as well as every other operable unit of the Site, includes implementation and maintenance of each component of the selected remedy, including any necessary ICs. Along with implementation of effective ICs, assurance plans (such as the O&M Plan) must be developed to assure proper maintenance and monitoring of effective ICs. The plan would include regular inspection of ICs at the site and annual certification to EPA that ICs are in place and effective.

V. Progress Since the Last Review

Protectiveness Statements from Prior Review

The prior five-year review contained the following protectiveness statements for OU3 and OU4.

OU3 – King Highway Landfill: *"The remedy at OU3 currently protects human health and the environment in the short-term. The landfill cap is in good condition and prevents PCB-contaminated material in the landfill from migrating, via erosion or surface water runoff, into the Kalamazoo River. The cap is also an effective barrier that prevents exposure, via direct contact, to the contaminated material by on-site workers, trespassers, and anglers. The cap also minimizes infiltration of rainwater and reduces the potential for leachate generation and the potential for PCBs in groundwater to migrate into the Kalamazoo River. Public access to the landfill is restricted by a locked chain-link fence and sheet pile, where present, and prevents people from being exposed to the contaminated material. Institutional controls are not yet in place. However, in order for the remedy to be protective in the long-term, the following actions will need to be taken: (1) submit a schedule or plan to U.S. EPA and MDEQ for resolving ownership issues with respect to the MDOT and city of Kalamazoo properties and for implementing ICs at the landfill and MDOT and city of Kalamazoo properties; and (2) submit a landfill gas mitigation plan to MDEQ that will satisfy its concerns about the off-site migration of methane gas at the south end of the landfill. Long-term protectiveness requires compliance with effective ICs. U.S. EPA will ensure that long-term stewardship of OU3, as well as every other operable unit of the Site, includes implementation and maintenance of each component of the selected remedy, including any necessary ICs."*

OU4 12th Street Landfill: *"The remedy at the 12th Street Landfill OU4 is not protective because the remedy has not yet been constructed and because access controls are inadequate to protect trespassers from short-term risks associated with remedy construction. A chain-link fence is installed along the west side of the landfill but not on the east, north, and south sides of the landfill and trespassers can easily gain access to the landfill. A chain-link fence will need to be installed on all sides of the landfill to prevent public access to the property and prevent trespassers from being exposed to PCB-contaminated material during the on-going construction activities. Long-term protectiveness requires compliance with existing ICs. Although ICs are in place, an evaluation is necessary of whether groundwater use at the landfill needs to be restricted and, if so, whether existing ICs appropriately restrict or prevent groundwater use at the landfill property. This evaluation will be made during the remedial design phase of the remedy. U.S. EPA will ensure that long-term stewardship of OU4, as well as every other operable unit of the Site, includes implementation and maintenance of each component of the selected remedy, including any necessary ICs."*

Issues and Recommendations from Prior Review

During the first five-year review, several issues were identified at OU3 and OU4. The information below provides information on the actions that have been taken to address those issues.

OU3 King Highway Landfill:

Table 5: Actions Taken at OU3 Since the Last Five-Year Review

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Institutional controls are not in place at the landfill property, including the land currently owned by MDOT and city of Kalamazoo which is located within the site security fence. The remedy is not protective until effective ICs are placed on both properties and are monitored and maintained.	An IC Plan will be prepared documenting the IC evaluation activities and necessary corrective measures. The IC plan is necessary to evaluate what ICs are necessary and develop a schedule for their implementation. The IC plan will also evaluate how to ensure long-term stewardship of the OU and long-term protectiveness of the remedy.	EPA	April 18, 2008	The IC plan was completed on September 14, 2007. Two draft restrictive covenants have been prepared for OU3 and final details are being worked out between the State of Michigan and Georgia-Pacific LLC. The first restrictive covenant covers the landfill property portion of OU3, and the second covers the Mill Lagoons property, also part of OU3.	Sept. 2007 (IC plan); January 2011 (draft restrictive covenant); Ongoing
MDEQ approval of the Final Completion of Construction Report and the Final O&M Plan is pending resolution of the MDOT and city of Kalamazoo property ownership issues.	Submit a schedule or plan to U.S. EPA and MDEQ for 1) resolving issues associated with the MDOT and city of Kalamazoo properties and 2) implementing ICs at the landfill property and the MDOT and city of Kalamazoo properties	PRP	November 15, 2007	Two draft restrictive covenants have been prepared for OU3 and final details are being worked out between the State of Michigan and Georgia-Pacific LLC. The first restrictive covenant covers the landfill property portion of OU3, and the second covers the Mill Lagoons property, also part of OU3.	January 2011 (draft restrictive covenant); Ongoing
Methane gas has migrated off-site in concentrations that exceed threshold criteria and will need to be mitigated.	Submit a landfill gas mitigation plan to MDEQ that will satisfy its concerns about the off-site mitigation of methane gas at the south end of the landfill	PRP	November 2007	Georgia-Pacific constructed gas collection trenches and additional monitoring locations to evaluate the effectiveness of the mitigation efforts.	2007-2012

Other actions that have been taken at OU3 since the last five-year review include the following:

- Acquisition of the Triangle Parcel at the southwest corner of the King Highway Landfill and Parcels A and B along the southern boundary of the King Highway Landfill to ensure that all structures and/or components of the remedy were located on property owned by Georgia-Pacific.

- Excavation and off-site disposal of some PCB-containing soils/residuals from the western portion of the MDOT right-of-way located south of the site security fence. As part of this remedial activity, a certain area of PCB-containing soils/residuals was left in place. This area, referred to as Parcel C, was delineated through visual observation and analytical testing via the advancement of soil borings and the excavation of test pits. The top one foot of material in Parcel C was excavated and an orange non-woven geotextile was placed at the bottom of the excavation. The area was then backfilled with a one-foot-thick layer of clean backfill material, graded, seeded, and mulched to promote drainage and facilitate revegetation. A *Final Environmental License Agreement Associated with the MDOT R-O-W* was executed between MDOT and Georgia-Pacific; this was the mechanism by which MDOT allowed the PCB-containing soils/residuals to remain within its property. In parallel with the Final License Agreement, the *Final Notice of Environmental Conditions Affecting Property Controlled by the MDOT* was developed in coordination with MDEQ and recorded with the Kalamazoo County Register of Deeds on January 28, 2011, to notify any potential future owners of the property that PCB-containing material remained below grade within this area.

- Installation of permanent markers in the MDOT right-of-way to notify the public of the environmental conditions that exist – specifically, PCB-containing residuals present below the demarcation layer installed one foot below grade within Parcel C.

OU4 12th Street Landfill:

Table 6: Actions Taken at OU4 Since the Last Five-Year Review

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Access controls are inadequate. A chain-link fence is present along the south side of the landfill but there is no fence on the north, east, or west sides of the landfill. Trespassers and anglers can freely enter the property and use the river banks to fish and may become exposed to contaminated material.	Install a chain-link fence on the north, east, and west sides of landfill; post warning signs every 200 feet along the fence and on all entry gates; and place permanent markers around the boundary of the landfill describing the restricted area and the nature of the restrictions.	PRP	December 2007	Not yet completed; a fence needs to be constructed to prevent access and possibly other measures employed to prevent exposures until the remedy is fully implemented. During the RD phase, Weyerhaeuser requested permission to install limited fencing so the use of OU4 as an eco-park could be evaluated. EPA expects to discuss this potential use of OU4 and long-term access controls with Weyerhaeuser by the end of 2012.	Planned for May 2013

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
It is unclear whether groundwater use at the landfill needs to be restricted and, if so, whether existing ICs appropriately restrict groundwater use within the landfill property.	Evaluate whether groundwater use at the landfill should be restricted and, if so, amend existing ICs as necessary to ensure that ICs adequately restrict groundwater use at the landfill property.	PRP	April 2008	The use of groundwater has been restricted through the Amendment to Declaration of Restrictive Covenants and Environmental Protection Easement, July 19, 2012.	July 19, 2012

Other actions that have been taken at OU4 since the last five-year review include the following:

- The final Remedial Design Report was approved in March 2010. RA field work began in April 2010 and included consolidation of waste, capping, storm water management, turf establishment, and installation of a long-term groundwater monitoring network. Weyerhaeuser completed the RA field work in November 2010, and EPA granted the Certification of Completion of the RA on October 1, 2012. Initial operation and maintenance efforts include repair of erosion during turf establishment and placement of additional topsoil and seeding over the perimeter pore water discharge trench to prevent undercutting of the rip-rap-filled shallow trench and surface erosion.

- Quarterly groundwater monitoring began in October 2011. Two quarters of monitoring have been completed. Low-level concentrations of arsenic and cyanide have been detected at concentrations that exceed applicable State of Michigan criteria at one or more monitoring locations. Evaluation of groundwater monitoring data will continue until sufficient data is available to determine contaminant trends.

VI. Five-Year Review Process

Administrative Components of the Five-Year Review Process

The EPA Remedial Project Manager (RPM), James Saric, notified the MDEQ and Georgia-Pacific of the start of the second five-year review in a letter dated February 23, 2012. The EPA RPM headed the five-year review team and was assisted by co-RPMs Michael Berkoff and Sheila Desai, and the MDEQ Project Managers, Paul Bucholtz, Keith Krawczyk, and Kristi Zakrzewski.

The review schedule included the following components:

Community Notification
Document Review
Data Review
Site Inspection
Five-Year Review Report Development and Review

Community Notification and Involvement

In September 2012, the EPA Office of Public Affairs placed an ad in the local newspapers announcing that the five-year review was in progress and requesting that any interested parties contact the EPA RPM or Community Involvement Coordinator for additional information. Copies of the newspaper notices are included in Appendix A. Since the announcement notice was issued, no member of the community has contacted EPA regarding the five-year review.

Document Review

The five-year review included a review of relevant documents, which are listed in Appendix B.

Data Review

The five-year review included a review of relevant data reports listed in Appendix C. The findings of the data are discussed throughout this five-year review report. Since the last five-year review, groundwater samples at OU3 have been collected quarterly through 2010 and then biannually since 2011. PCBs have not been detected in the vast majority of those groundwater samples. When detected, PCBs are significantly below the 0.2 µg/L screening level. At OU4, quarterly groundwater monitoring began in April 2011. PCBs have not been detected in the vast majority of those samples. When detected, PCBs are significantly below the 0.2 µg/L screening level. Monitoring wells have yet to be installed at OU2. The groundwater monitoring results for OU3 and OU4 are included in Attachment 2.

Site Inspection

Willow Boulevard/A-Site Landfill OU2

The five-year review site inspection of OU2 was conducted on August 7, 2012, with Kristi Zakrzewski from MDEQ, Garry Griffith from Georgia-Pacific, and Michael Berkoff from EPA participating. The photographs and site inspection log are included in Attachments 3 and 4, respectively.

During the inspection, EPA observed that the gas venting sand layer was being placed upon the A-Site portion of OU2. Installation of the landfill cover was complete at the Willow portion of OU2, but the groundwater monitoring system had not yet been installed.

King Highway Landfill OU3

The five-year review site inspection of OU3 was conducted on August 7, 2012, with Keith Krawczyk from MDEQ, Garry Griffith from Georgia-Pacific, and Michael Berkoff from EPA participating. The photographs and site inspection log are included in Attachments 3 and 4, respectively.

At the time of the inspection, weather conditions were sunny with an air temperature in the mid-80s. The activities conducted during the inspection included a walk through the OU to assess the physical integrity of the components of the remedy, including the landfill cap, groundwater monitoring wells, gas vents, security fence, etc.

The landfill cap was in good condition. The vegetative cover had a few distressed areas. Most of these areas appear to be due to the lack of precipitation. There was one distressed area at which methane was detected on May 31, 2012 (see Figure 7, OU3 Site Map). The presence of methane in the soil would indicate that methane is migrating up through some compromise to the geosynthetic liner. On August 27, 2012, contractors for Georgia-Pacific excavated the area and discovered a tear and several small holes in the geomembrane liner. The contractors then replaced that section of the liner, tested its integrity and then backfilled the area. Georgia-Pacific's contractors completed the work on August 29, 2012. Erosion was observed in the southeast corner of the landfill with the toe of the liner visible in four locations. Erosion of the soil cover, in the form of a gully, was also observed along the southern border of the landfill near the sedimentation outlet. The second location is outside of the landfill cap. Georgia-Pacific expressed its intent to address both of these areas. During the inspection, the inspection team observed another distressed area on the eastern toe of the landfill, which was similar in appearance to the distressed area at which methane had been detected. Georgia-Pacific agreed to sample the soil in this area for methane. The inspection team observed some settling within the drainage swale along the northern landfill cap access road. That settling prevents drainage as designed. Georgia-Pacific agreed to regrade the area. Some gas vents appeared to be slightly tipped but the surrounding cap did not appear to be compromised. Otherwise, the cap appeared to be fairly well maintained with no other noticeable depressions, cracks, or odors. The areas in need of repair will be addressed as a part of the regular O&M of the landfill.

Groundwater wells were in good condition and properly secured. Gas monitoring probes and passive gas vents were also in good condition, properly secured, and functioning properly. A locked, chain-link fence surrounds the landfill and effectively restricts public access to the landfill. At the time of the inspection, warning signs were posted every 200 feet on the fence. Permanent markers will be posted on each side of the property at the time the restrictive covenant is recorded with the City of Kalamazoo Registry of Deeds.

Interviews were conducted with Keith Krawczyk, MDEQ project manager, and Garry Griffith, Georgia-Pacific project manager, during the August 7, 2012, site inspection.

Though the MDEQ project manager is generally satisfied with the overall operation and maintenance of the OU3 remedy, he is dissatisfied with the O&M Manager's responsiveness in addressing problems as they arise and the overall quality of the site inspections. The Georgia-Pacific project manager addressed these concerns, stating that future inspections would be conducted by different personnel and that they would be more prepared for the inspections, and an appropriate response would be completed to address issues identified during the inspections.

No interviews with the public were conducted or necessary during the five-year review period as community interest regarding OU3 is minimal.

12th Street Landfill OU4:

The five-year review site inspection of OU4 was conducted on August 7, 2012, with Kristi Zakrzewski from MDEQ, Jodie Dembowske of Conestoga Rovers & Associates, and Michael Berkoff from EPA participating. The photographs and site inspection log are included in Attachments 3 and 4, respectively.

At the time of the inspection, weather conditions were sunny with an air temperature in the mid-80s. The activities conducted during the inspection included a walk through the OU to assess the physical integrity of the components of the remedy, including the landfill cap, groundwater monitoring wells, gas vents, security fence, etc.

The landfill cap was in good condition. The vegetative cover had a few distressed areas, which appear to be due to the lack of precipitation. At the toe of the landfill, on the northern, southern and western sides, the site team observed a band of erosion. The area corresponds with the zone at which water exits the cap drainage layer. Portions of the geotextile layer that make up the drainage feature were exposed. This band of erosion had been observed at the landfill on multiple previous site visits. The previous remedy for the problem was to add soil patches to the eroded areas. The inspection team agreed that repairs are needed to prevent further erosion. Otherwise, the cap appeared to be fairly well maintained with no noticeable depressions, cracks, or odors.

Groundwater wells were in good condition and properly secured. Gas monitoring probes and passive gas vents were also in good condition, properly secured, and functioning properly. As previously discussed, access controls do not currently prevent trespass. At the time of the inspection, warning signs were not posted every 200 feet on the fence and permanent markers were not posted on each side of the property. EPA and MDEQ are evaluating Weyerhaeuser's proposed signage, which will be installed once approved. The restrictive covenant is recorded with the City of Kalamazoo Registry of Deeds.

VII. Technical Assessment

A. Operable Unit 2

Question A: Is the remedy functioning as intended by the decision documents?

No. Implementation of the remedy is not yet complete, as the landfill cover is not in place at the A-Site Landfill. Groundwater monitoring wells are not in place at the Willow portion, so it is not yet possible to determine if the remedy is operating as intended at that portion of the OU. However, once completed it is anticipated that the remedy will function as designed. Site controls implemented as a part of the RA mitigate the possibility for off-site transport and exposure to contaminated materials.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid?

Yes. The exposure assumptions, toxicity data, risk assessment methods, and RAOs at the time of the ROD are still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. No additional information has been identified that would call into question the protectiveness of the remedy.

B. Operable Unit 3

Question A: Is the remedy functioning as intended by the decision documents?

Yes. The landfill remedy (capping and containment) is operating and functioning as intended by the ROD and the Consent Order. The landfill cap is generally in good condition and prevents PCB-contaminated material in the landfill from migrating, via erosion or surface water runoff, into the Kalamazoo River. The cap is also an effective barrier that prevents exposure, via direct contact, to the contaminated material by on-site workers, trespassers, and anglers. The cap also minimizes infiltration of rainwater and reduces the potential for leachate generation and, consequently, the migration of PCBs in groundwater into the Kalamazoo River. PCBs were not detected in groundwater above the performance standard.

Access restrictions are in place and prevent exposure to the contaminated material. The locked chain-link fence and sheet piling restricts public access to the landfill via Route M-89 and via the Kalamazoo River. Warning signs are posted every 200 feet along the perimeter fence notifying the public that the area is hazardous due to the buried paper-making residuals. Although not required at the time of this five-year review, permanent markers were installed along the MDOT property to demarcate the extent of residuals left in place. Signs have been posted on all entry gates and every 200 feet along the chain link fence.

As previously discussed, not all institutional controls are in place. However, the objectives of the ICs are being met since the public is not directly exposed to PCB-contaminated residuals or to PCBs via groundwater. The landfill property is zoned industrial and will remain industrial in the future via local zoning ordinances and the anticipated deed restrictions. Groundwater at the landfill property is not used for any purpose; therefore, there are no exposure pathways to on-site workers or the public from groundwater. All immediate threats have been addressed and no additional actions, other than the recommended actions identified in Section VIII of this five-year review, are anticipated.

Methane gas has migrated off-site in concentrations that exceed threshold criteria. However, Georgia-Pacific has constructed gas collection trenches to address this issue and additional

monitoring locations have been established to evaluate the effectiveness of the mitigation efforts.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid?

Yes, except that since the date of the Consent Order implementing the ROD, the Michigan cleanup standard for PCBs in soil has become less stringent. The exposure assumptions, toxicity data, risk assessment methods, and RAOs at the time of the ROD are still valid. However, when the ROD was issued, the State of Michigan Part 201 limited industrial cleanup criterion for PCBs in soil was 21 mg/kg and when the Consent Order for RD/RA was signed, the industrial cleanup criterion for direct contact with PCBs in soil was 9.9 mg/kg. Today, the PCB industrial land use criteria is 16 mg/kg for PCBs in soil. The landfill and the Mill Lagoons were remediated to achieve the industrial land use criterion of 9.9 mg/kg as specified in the Consent Order. Because the landfill and Mill Lagoons were remediated to a level that is below today's standards, the change in cleanup levels has no effect on the protectiveness of the OU3 remedy. The remedy is progressing as expected and is achieving the RAOs.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. Methane migration could be an issue as it is occasionally detected outside of the capture zone of the gas collection trenches outside of the Georgia-Pacific property, and always detected at those gas wells within the perimeter fence above the lower explosive limit. It is possible that this issue is now very localized to GW-13. Additional gas collection trenches have been installed along with new monitoring locations, though more may be required. Continued monitoring is necessary and will be conducted to determine if this is an issue in the future.

B. Operable Unit 4

Question A: Is the remedy functioning as intended by the decision documents?

No. The major activities involved in construction of the landfill are complete, and EPA approved the Certification of Remedial Action Completion in early October 2012. Although ICs are in place, engineered access restrictions are inadequate to protect trespassers from damaging the components of the remedy, and the lack of access controls could potentially result in future exposure to PCB-contaminated material. Except for the lack of access controls, it appears that the rest of the remedy is operating as intended. EPA has agreed to let Weyerhaeuser evaluate access controls as a part of its evaluation of the landfill as a wildlife viewing area. This evaluation should be complete by the end of 2012.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid?

Yes. The exposure assumptions and RAOs used at the time of the remedy selection are still valid. The OU4 ROD did not specify cleanup numbers for industrial soils. Instead, the ROD

established visual criteria as the primary method by which PCB-contaminated material would be identified. Post-excavation sampling was then compared to Michigan Part 201 criteria; specifically, confirmation samples at OU4 were compared to the residential/commercial criterion of 4 mg/kg PCB.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. No additional information has been identified that would call into question the protectiveness of the remedy.

VIII. Issues

The tables in this section highlight the issues identified for OU2, OU3 and OU4 during the five-year review, based upon document reviews and discussions with the MDEQ project manager(s).

Willow Boulevard/A-Site Landfill OU2

No issues were identified at OU2.

King Highway Landfill OU3

MDEQ has not yet approved the Construction Completion Report and it may require further revision and augmentation before approval. Monitoring and maintenance of the landfill needs improvement.

Some of the landfill remedy components were built on properties that are not owned by Georgia-Pacific. These properties are located within the security fence at OU3, but are owned by MDOT and the City of Kalamazoo. Georgia-Pacific needs to continue to work toward resolution of this issue and implement the necessary ICs.

The following table summarizes the issues at OU3 that affect the protectiveness of the remedy.

Table 7: Issues Identified at OU3

Issues	Affects Current Protectiveness	Affects Future Protectiveness
Effective ICs are needed on all site properties and need to be monitored and maintained. Institutional controls are needed for the landfill property and the land located within the site security fence that is currently owned by MDOT and the City of Kalamazoo. Additionally, MDEQ will not approve the Final Completion of Construction Report and the Final O&M Plan until the MDOT and City of Kalamazoo property ownership issues are resolved. Until these reports are approved, MDEQ cannot issue a Certification of Completion of Construction for the landfill and without this certification, under the terms of the agreement between MDEQ and Georgia-Pacific, the appropriate restrictive covenants cannot be recorded with the Kalamazoo County Register of Deeds.	No	Yes
Methane gas has migrated off-site in concentrations that exceed threshold criteria and will need to be mitigated.	No	Yes

12th Street Landfill OU4

The following table summarizes the issues at OU4 that affect the protectiveness of the remedy.

Table 8: Issues Identified at OU4

Issues	Affects Current Protectiveness	Affects Future Protectiveness
Access controls are inadequate. A chain-link fence is present along the south side of the landfill but there is no fence on the north, east, or west sides of the landfill. Trespassers and anglers can freely enter the property and use the river banks to fish and have access to the landfill cap and associated gas vents. Additionally, the fence on the southern side of the landfill does not restrict foot traffic. The current access configuration does not prevent vandals from damaging the remedy.	No	Yes
Ongoing erosion at the toe of the landfill over the pore water collection discharge area.	No	Yes

IX. Recommendations and Follow-Up Actions

The recommended follow-up actions to address the issues identified in Section VIII of this report for OU3 and OU4 are presented in Table 9 and Table 10, respectively.

Table 9: Recommendations and Follow-Up Actions for OU3

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
Effective ICs are needed on all site properties and need to be monitored and maintained. Institutional controls are needed for the landfill property and the land located within the site security fence that is currently owned by MDOT and the City of Kalamazoo. Additionally, MDEQ will not approve the Final Completion of Construction Report and the Final O&M Plan until the MDOT and City of Kalamazoo property ownership issues are resolved. Until these reports are approved, MDEQ cannot issue a Certification of Completion of Construction for the landfill and without this certification, under the terms of the agreement between MDEQ and Georgia-Pacific, the appropriate restrictive covenants cannot be recorded with the Kalamazoo County Register of Deeds.	Submit a plan to MDEQ and EPA for 1) resolving property ownership issues with respect to the MDOT and City of Kalamazoo properties, 2) finalizing the Final Completion of Construction Report and the Final O&M Plan, and 3) implementing all required ICs.	PRP	EPA and MDEQ	October 2013	No	Yes
Methane gas has migrated off-site in concentrations that exceed threshold criteria and will need to be mitigated.	Submit an updated landfill gas mitigation plan to MDEQ that will satisfy its concerns about the off-site mitigation of methane gas at the south end of the landfill.	PRP	EPA and MDEQ	October 2013	No	Yes

Table 10: Recommendations and Follow-Up Actions for OU4

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
Access controls are inadequate. A chain-link fence is present along the south side of the landfill but there is no fence on the north, east, or west sides of the landfill. Trespassers and anglers can freely enter the property and use the river banks to fish and have access to the landfill cap and associated gas vents. Additionally, the fence on the southern side of the landfill does not restrict foot traffic. The current access configuration does not prevent vandals from damaging the remedy.	Complete evaluation of access controls along with evaluation of potential use of OU4 as an eco-park (i.e., wildlife viewing area) so that final decisions about long-term access controls can be made.	PRP	EPA and MDEQ	December 2012	No	Yes
Ongoing erosion at the toe of the landfill over the pore water collection discharge area.	Repair or reconstruct drainage feature at toe of landfill.	PRP	EPA and MDEQ	October 2013	No	Yes

X. Protectiveness Statements

The remedy at OU2 is expected to be protective of human health and the environment upon completion of the remedy, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. The RA for OU2 began in April 2011 and is expected to be completed in 2013. During 2011, the waste at the Willow Boulevard Landfill portion of OU2 was consolidated and covered with an impermeable cap. The vegetated soil cover for this portion of OU2 was installed in 2012. EPA expects the installation of the impermeable cover at the A-Site portion of OU2 to be completed in 2012 and the installation of the OU2-wide groundwater monitoring system to be completed in 2013. Institutional controls restricting the use of site groundwater, site use, and for protection of the remedy were recorded and filed in 2010. Once the RA is completed EPA expects the remedy at OU2 to be protective of human

health and the environment. EPA will make that determination by inspecting the landfill cover and evaluating groundwater and methane monitoring data. In addition, there is a restrictive covenant in place that restricts certain use of the property including use that interferes with measures necessary to assure the effectiveness and integrity of the remedial action and use of site groundwater.

The remedy at OU3 currently protects human health and the environment in the short term. The landfill cap is generally in good condition and prevents PCB-contaminated material in the landfill from migrating, via erosion or surface water runoff, into the Kalamazoo River. The cap is also an effective barrier that prevents exposure, via direct contact, to the contaminated material by on-site workers, trespassers, and anglers. The cap also minimizes infiltration of rainwater and reduces the potential for leachate generation and the potential for PCBs in groundwater to migrate into the Kalamazoo River. Public access to the landfill is restricted by a locked chain-link fence and sheet pile, which prevents people from being exposed to the contaminated material. Methane generated within the landfill is passively managed and mitigated by gas collection trenches installed outside of the landfill. These trenches are largely effective with methane only occasionally detected at off-site probes beyond the lateral extent of the trenches. Additional trenching (or some alternative) may need to be installed to extend the lateral capture of methane migration at the OU3 boundary. Some ICs are in place at OU3, but require revision, while other ICs are not yet in place. In order for the remedy to be protective in the long term, the following actions will need to be taken: (1) implement revised and new ICs; (2) mitigate any off-site migration of methane gas, and (3) properly maintain the landfill. Long-term protectiveness requires compliance with effective ICs. EPA will ensure that long-term stewardship of OU3, as well as every other operable unit of the Site, includes implementation and maintenance of each component of the selected remedy, including any necessary ICs, and proper maintenance of the landfill.

The remedy at OU4 currently protects human health and the environment in the short term. The remedy has been constructed, and exposure pathways that could result in unacceptable risks are being controlled. The following issues need to be addressed as part of O&M at OU4: 1) erosion is occurring at the toe of the landfill where water exits the soil cover drainage feature, and 2) the current access controls do not prevent trespass. Weyerhaeuser, a PRP for OU4, will evaluate additional access controls. Evaluation of groundwater monitoring data will continue until sufficient data is available to determine contaminant trends. Long-term protectiveness requires compliance with existing ICs. Since the last five-year review, the ICs at OU4 have been modified to include a groundwater use prohibition. EPA will ensure that long-term stewardship of OU4, as well as every other operable unit of the Site, includes implementation and maintenance of each component of the selected remedy, including any necessary ICs.

XI. Next Review

The next five-year review for the Allied Paper, Inc./Portage Creek/Kalamazoo River Site is required within five years from the signature date of this review.

Attachments

Attachment 1: Site Maps (Figures 1- 11)
Attachment 2: Post-Closure Monitoring Groundwater Sample Results 2007-2012
Attachment 3: Photos Documenting Site Conditions
Attachment 4: Site Inspection Report
Attachment 5: Restrictive Covenant for OU2
Attachment 6: Restrictive Covenant for OU4
Attachment 7: Restrictive Covenant for OU7

Appendices

Appendix A: Newspaper Public Notices
Appendix B: List of Documents Reviewed for the Five-Year Review
Appendix C: List of Data Reviewed for the Five-Year Review

ATTACHMENTS

Figures

Attachment 1

Site Maps (Figures 1-11)

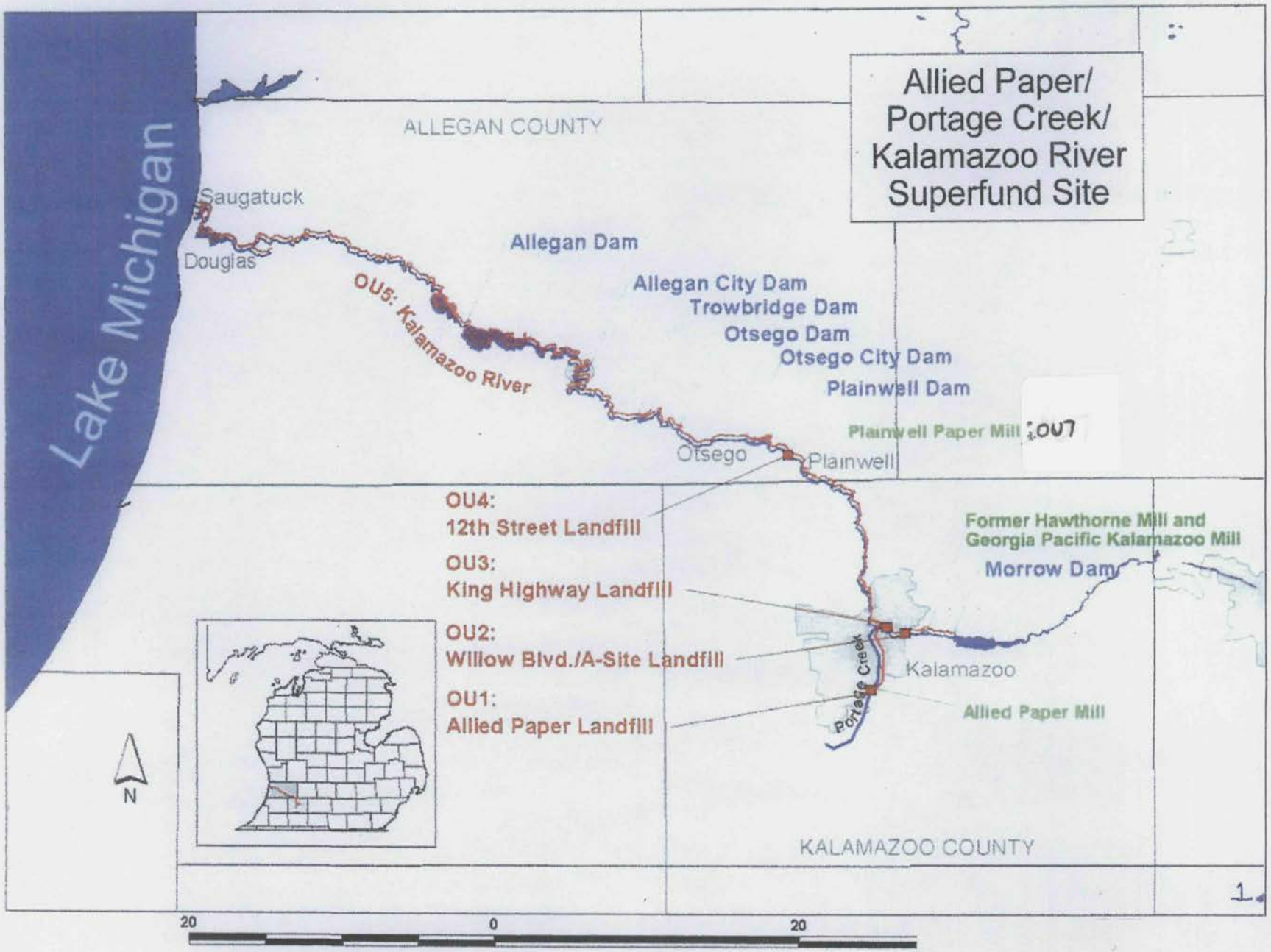
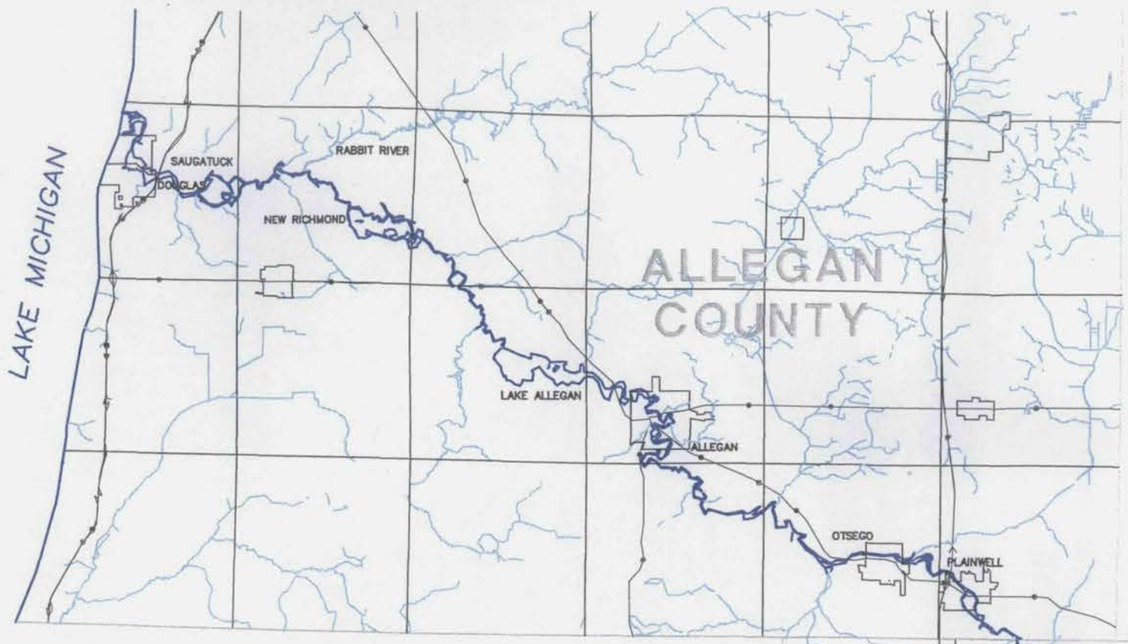
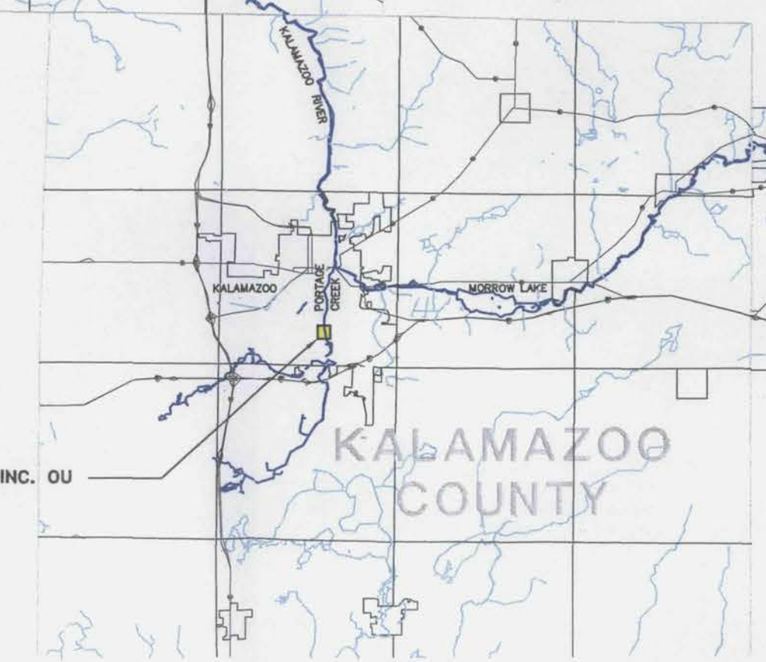
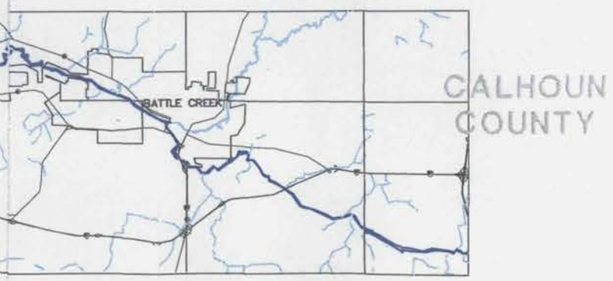


FIGURE 1 - Site Location Map

DRAFT
FOR STATE REVIEW







NOTE:

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

ALLIED PAPER, INC. OU

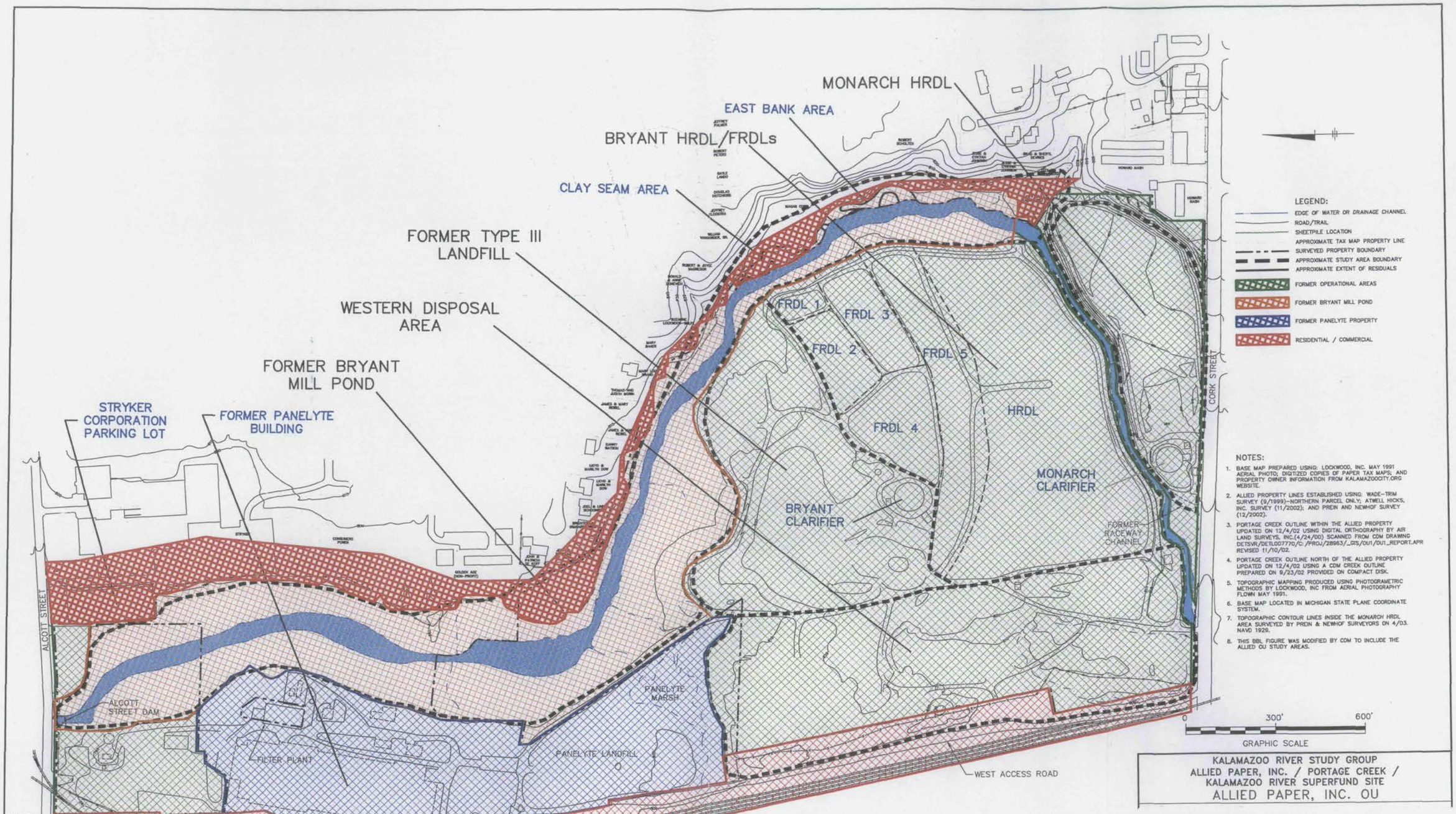
0 5 MILES 10 MILES

GRAPHIC SCALE

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

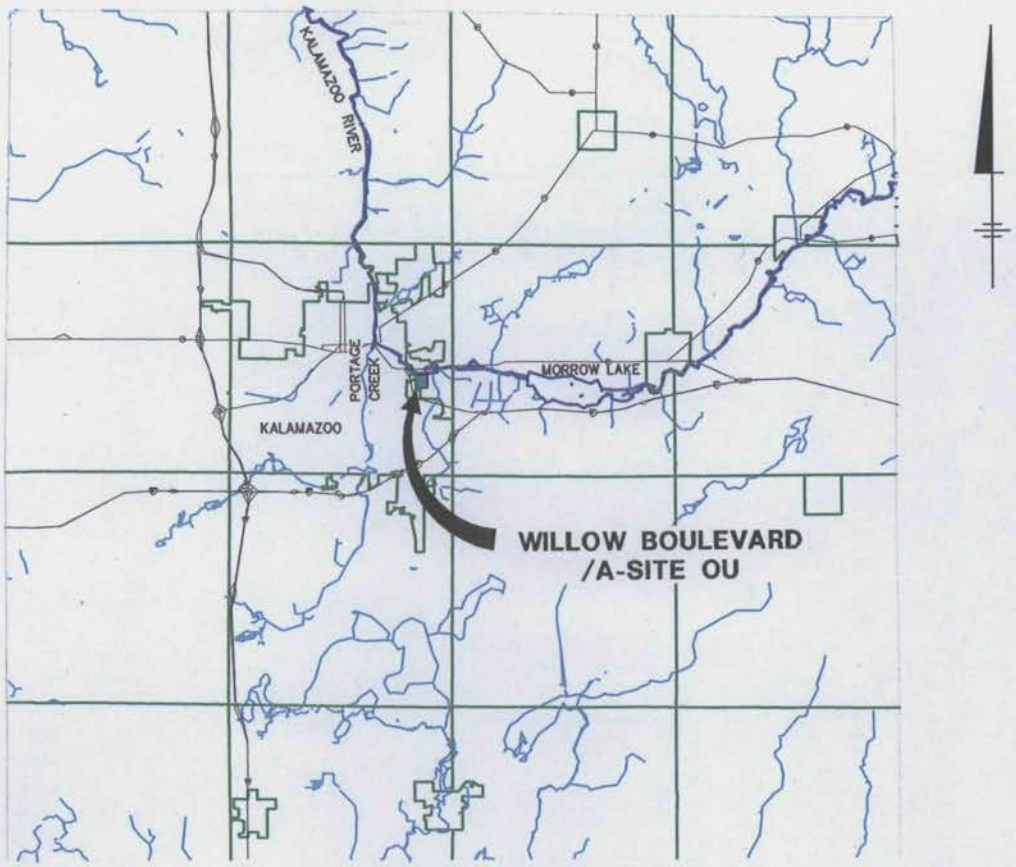
FIGURE 2 - OU1 Location Map

X: (NONE)
L: ON= * OFF= REF*
P: PAGESET/PLT-BL
12/15/03 SYR-54-RLP PGL RCA
64560007/RIREPORT/64551SM1.DWG

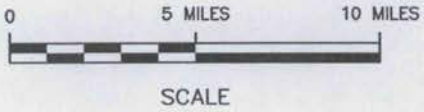


X: 64560X03, X08.DWG
L: ON= * OFF= REF*
P: PAGESET/PLT-DL
12/17/03 54-RCB RCA
64560007/RIREPORT/64560T02.DWG

FIGURE 3 - OU1 Site Plan



KALAMAZOO COUNTY



NOTE:

KALAMAZOO COUNTY MAPPING OBTAINED FROM MICHIGAN RESOURCE INFORMATION SYSTEM.

KALAMAZOO RIVER STUDY GROUP
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
REMEDIAL INVESTIGATION/FOCUSED FEASIBILITY STUDY
WILLOW BOULEVARD/A-SITE OU

LOCATION PLAN

FIGURE 4 - OU2 Location Map

P: DJA-G3-4
2/22/01 SYR-54-DJO JER GMS
64581640/64581G03.DWG

LEGEND

- ELEVATION CONTOUR (NGVD 1929)
- EDGE OF WATER OR DRAINAGE CHANNEL
- UNPAVED ROAD/TRAIL
- APPROXIMATE A-SITE BOUNDARY
- GEORGIA-PACIFIC PROPERTY BOUNDARY OUTSIDE OF A-SITE
- FORMER LAGOON AREA
- EXISTING SHEETPILE WALL

NOTES:

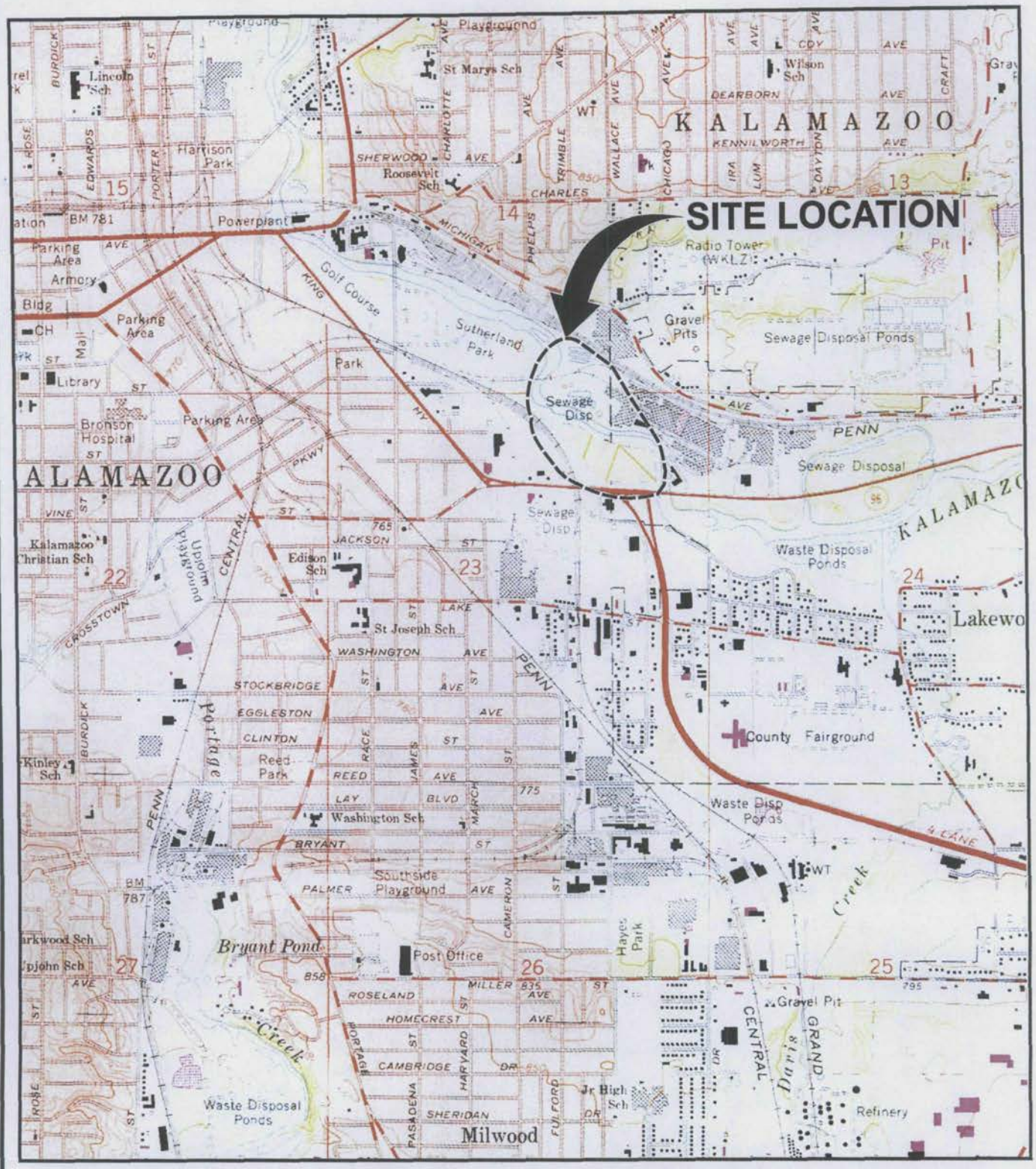
1. UNLESS OTHERWISE INDICATED ALL SAMPLE LOCATIONS SURVEYED BY WADE-TRIM INC. OCTOBER 1993 THROUGH AUGUST 1996. SAMPLES ARN-1 THROUGH ARN-5 AND WRN-1 THROUGH WRN-5 WERE SURVEYED BY BBL JULY 1993.
2. TOPOGRAPHIC MAPPING PRODUCED USING PHOTOGRAMMETRIC METHODS BY LOCKWOOD, INC. FROM AERIAL PHOTOGRAPHY FLOWN APRIL 1991. KALAMAZOO RIVER SOUTH BANK, EAST OF DAVIS CREEK REVISED PER CURRENT CONDITIONS. ADDITIONAL TOPOGRAPHIC CHANGES AFTER APRIL 1991 ARE NOT SHOWN.
3. ALL LOCATIONS ARE APPROXIMATE.

150' 0 300'
SCALE

KALAMAZOO RIVER STUDY GROUP
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
REMEDIAL INVESTIGATION/FOCUSED FEASIBILITY STUDY
WILLOW BOULEVARD/A-SITE OU

FIGURE 5 - OU2 Site Plan

X: 64581X03
L:ON=*, OFF=*REF*, WBL*, *N-*, ON=WBL-SPL
P: FIG-2-3
2/23/01 SYR-54-RLP DJP GMS
64581640/64581008.DWG



REFERENCE: Base Map Source: USGS 7.5 Min. Topo. Quad., Kalamazoo, MI (1967, Photorevised 1973).

2000' 0 2000'

APPROXIMATE SCALE 1" = 2000'

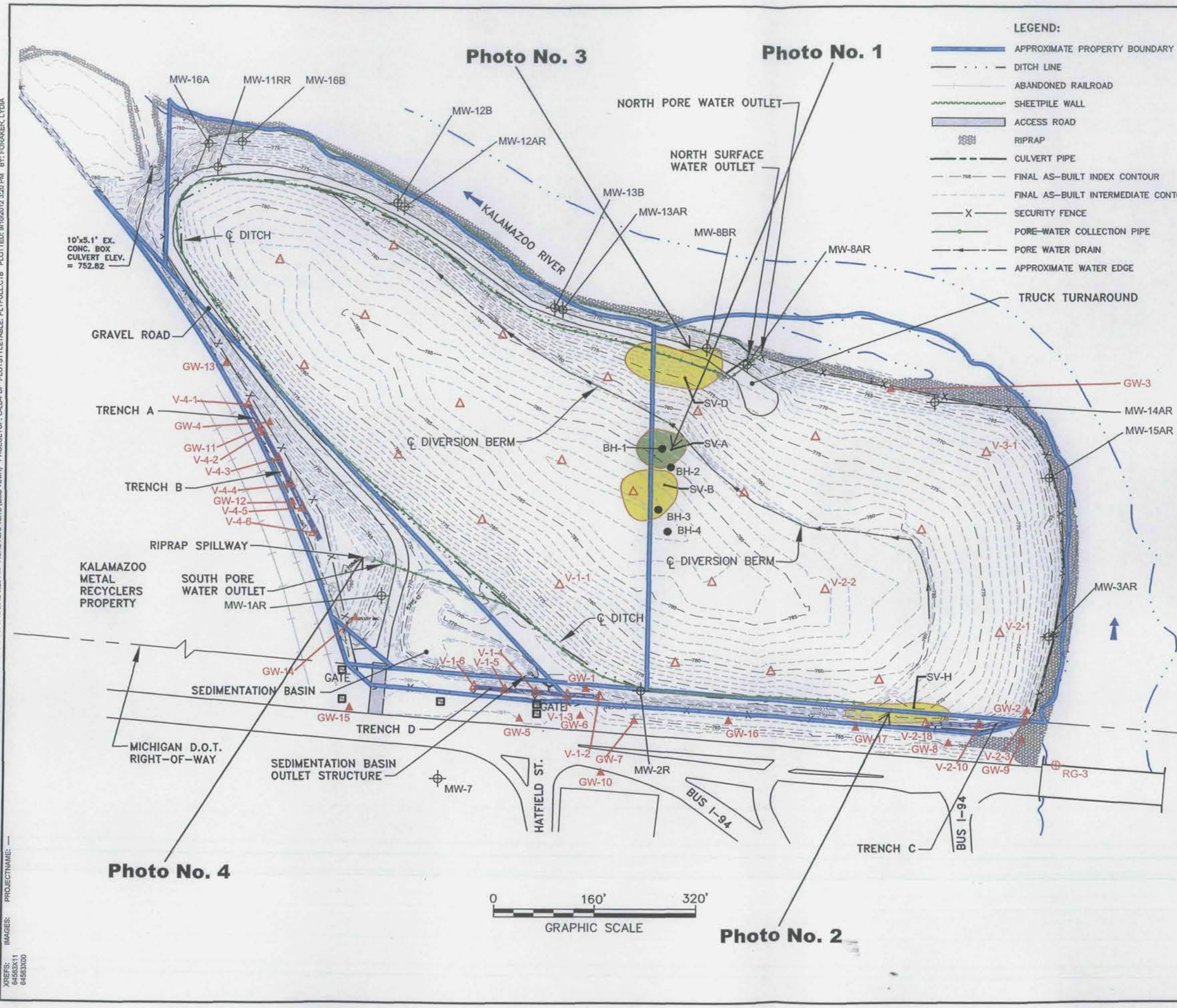
AREA LOCATION

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

EPA 5-YEAR REVIEW REPORT
KHL-OU AND MILL LAGOONS

FIGURE 6 - OU3 Location Map

08/03/07 SYR-D85-DJH-KLS
84583675/64583N01.CDR



LEGEND:

- APPROXIMATE PROPERTY BOUNDARY
- DITCH LINE
- ABANDONED RAILROAD
- SHEETPILE WALL
- ACCESS ROAD
- RIPRAP
- CULVERT PIPE
- FINAL AS-BUILT INDEX CONTOUR
- FINAL AS-BUILT INTERMEDIATE CONTOUR
- SECURITY FENCE
- PORE-WATER COLLECTION PIPE
- PORE WATER DRAIN
- APPROXIMATE WATER EDGE
- GAS VENTS (ORIGINAL 23; ONLY FOUR WERE GIVEN IDs)
- V-1-2 CUTOFF TRENCH GAS VENTS
- LANDFILL GAS CUTOFF TRENCH
- FLOW DIRECTION
- MW-14 MONITORING WELL
- RG-3 RIVER GAUGE STATION
- GW-2 LOCATION OF GAS MONITORING PROBES
- BH-2 TEMPORARY BOREHOLE LOCATION
- SV-B APPROXIMATE LOCATION OF STRESSED VEGETATION AREA REPAIRED DURING WEEK OF AUGUST 27, 2012
- SV-A APPROXIMATE LOCATION OF GEOMEMBRANE LINER PATCHED WITH NEW 40 MIL LLDPE TO REPAIR BREACH ON AUGUST 28, 2012

NOTES:

1. BASE MAP INFORMATION OBTAINED FROM CADD DRAWING FILE DEVELOPED BY RMT, INC., ANN ARBOR, MICHIGAN (CADD FILE: L1630SU01.DWG AS-BUILT SURVEY; 8/21/00).
2. FINAL AS-BUILT CONTOUR ELEVATIONS ARE SHOWN AND ARE BASED ON A FIELD SURVEY BY ATWELL-HICKS, INC., DATED 9/27/00 WITH REVISIONS DATED 10/23/00, 12/21/01, 12/10/02, AND 7/24/03.
3. FINAL AS-BUILT CONTOUR ELEVATIONS OF SEDIMENTATION BASIN ARE BASED ON A FIELD SURVEY BY PREIN & NEWHOF, DATED 2/3/04.
4. PROPERTY BOUNDARY, AND FINAL AS-BUILT CONTOUR ELEVATIONS OF PARCEL C AND SURROUNDING AREAS BASED ON A FIELD SURVEY BY PREIN & NEWHOF, DATED 11/19/2010.
5. ELEVATIONS ARE BASED ON NGVD OF 1929 (MSL).
6. PROPERTY SURVEY PERFORMED BY WILKINS & WHEATON ENGINEERING CO., INC., ON 7/1/96.
7. TOPOGRAPHIC CONTOUR INTERVAL IS 1 FOOT.
8. LOCATIONS OF GW-5, GW-6, GW-7, GW-8, GW-9, AND GW-10 ARE BASED ON A FIELD SURVEY BY TERRA CONTRACTING LLC, DATED 9/23/05.
9. LOCATION OF GW-11 IS BASED ON A FIELD SURVEY BY TERRA CONTRACTING LLC, DATED 1/11/06.
10. LOCATIONS OF RG-6, V-4-4, V-4-5, AND V-4-6 ARE BASED ON A FIELD SURVEY BY TERRA CONTRACTING LLC, DATED 6/7/06.
11. LOCATIONS OF V-1-2 THROUGH V-1-6, V-2-3, V-2-10, AND V-2-18 ARE BASED ON MULTIPLE FIELD SURVEYS CONDUCTED BY TERRA CONTRACTING, LLC. IN APRIL 2008. GAS VENTS V-2-4 THROUGH V-2-9, AND V-2-11 THROUGH V-2-17 ARE NOT SHOWN FOR CLARITY PURPOSES (THESE VENTS ARE LOCATED ALONG TRENCH C).
12. LOCATION OF GW-12 IS APPROXIMATE.
13. LOCATIONS OF GW-13 THROUGH GW-17 BASED ON FIELD SURVEY CONDUCTED BY PREIN & NEWHOF ON 11/1/11.
14. LOCATION OF SHEETPILE WALL AND A PORTION OF THE MONITORING WELLS ARE BASED ON A FIELD SURVEY BY ATWELL-HICKS, INC. DATED 9/27/00.
15. PARCELS 1, 2, 10, A, B, AND THE TRIANGLE PARCEL ARE OWNED BY GEORGIA-PACIFIC.
16. GEORGIA-PACIFIC PURCHASED THE "TRIANGLE PARCEL" FROM THE MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) IN EARLY 2006.
17. GEORGIA-PACIFIC PURCHASED PARCELS A (PREVIOUSLY OWNED BY MDOT) AND B (PREVIOUSLY OWNED BY THE CITY OF KALAMAZOO) IN JUNE 2008, WHICH ARE LOCATED IN THE PORTION OF THE KING HIGHWAY (M-96) RIGHT-OF-WAY THAT IS ENCLOSED BY THE KING HIGHWAY LANDFILL SITE BOUNDARY FENCE.
18. STRESSED VEGETATION AREAS SV-C, AND SV-E THROUGH SV-G ORIGINALLY IDENTIFIED IN THE JUNE 27, 2012 STRESSED VEGETATION SAMPLING RESULTS AND WORK PLAN WERE NOT REPAIRED DURING THE WEEK OF AUGUST 27, 2012 AS THE GRASS GROWTH IN THESE AREAS HAD IMPROVED SINCE THEIR ORIGINAL DISCOVERY DUE TO RECENT RAINFALL AND DID NOT REQUIRE TOPSOIL APPLICATION

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

STRESSED VEGETATION AND GEOMEMBRANE LINER REPAIR ACTIVITIES

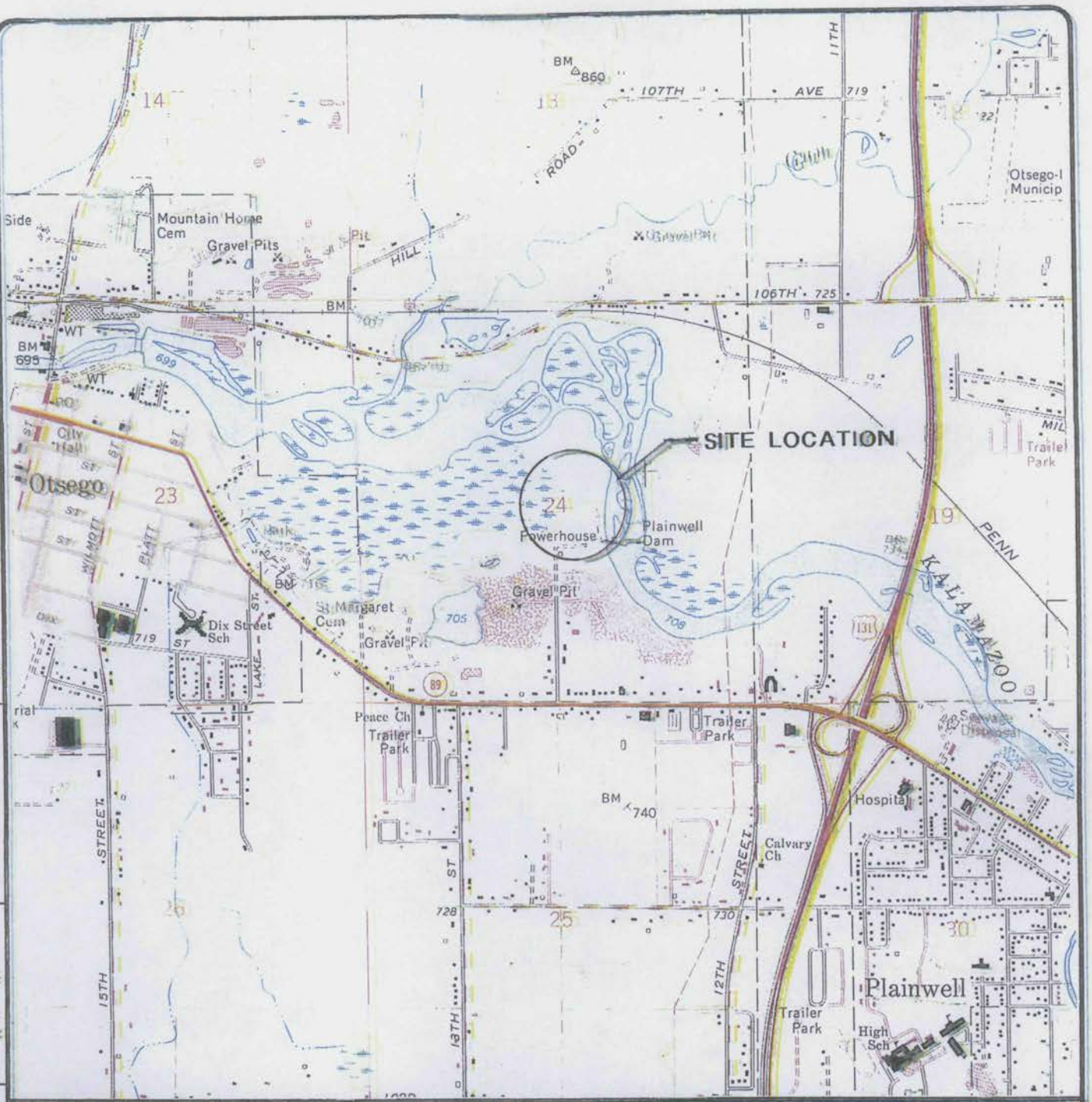
CURRENT STATUS OF COMPLETED STRESSED VEGETATION AND GEOMEMBRANE LINER REPAIR

ARCADIS

FIGURE 7

FIGURE 7 - OU3 Site Plan

CITY: SYRACUSE DIV/GROUP: ENVCAD DB: G. STOWELL L: POSENAUER L: FORAKER LD: PICD: COWIN PM: D. PENNIMAN TM: D. PENNIMAN LYR: ON=*; OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\B0064583\00300\907\DWG\GEOMEMBRANE\64583G01.DWG LAYOUT: 1 SAVED: 9/10/2012 3:20 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: C.I.B.-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 9/10/2012 3:20 PM BY: FORAKER, LYDIA
XREFS: 64583X11 64583X00 IMAGES: PROJECTNAME: —



SOURCE: USGS 7.5 MIN. TOPOGRAPHIC MAP, OTSEGO, MICHIGAN QUADRANGLE, 1967, PHOTOREVISED 1973.

GERAGHTY & MILLER, INC.
Environmental Services

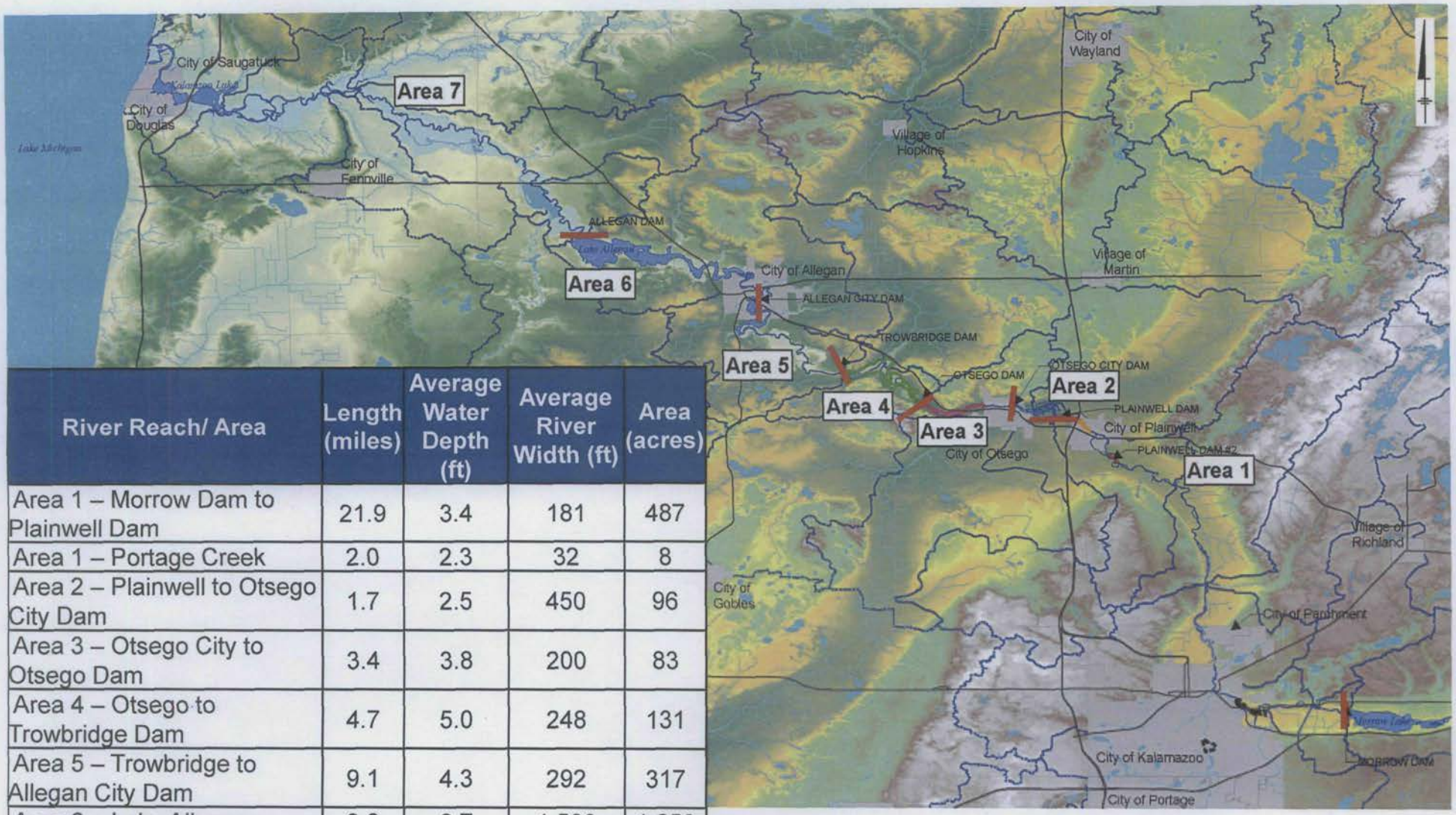
SIT
REMEDIAL INVEST
12th STRE
ALLIED PAP
KALAMAZO

FIGURE 8 - OU4 Location Map

DRAFTER: S COMER | APPROVED: D COWIN | CHECKED: D COWIN | DRAWING: CI09101-A1-1 | FILE NO.: NON-CAD | PRJCT NO.: CI0091.001 | DWG DATE: 2/4/94

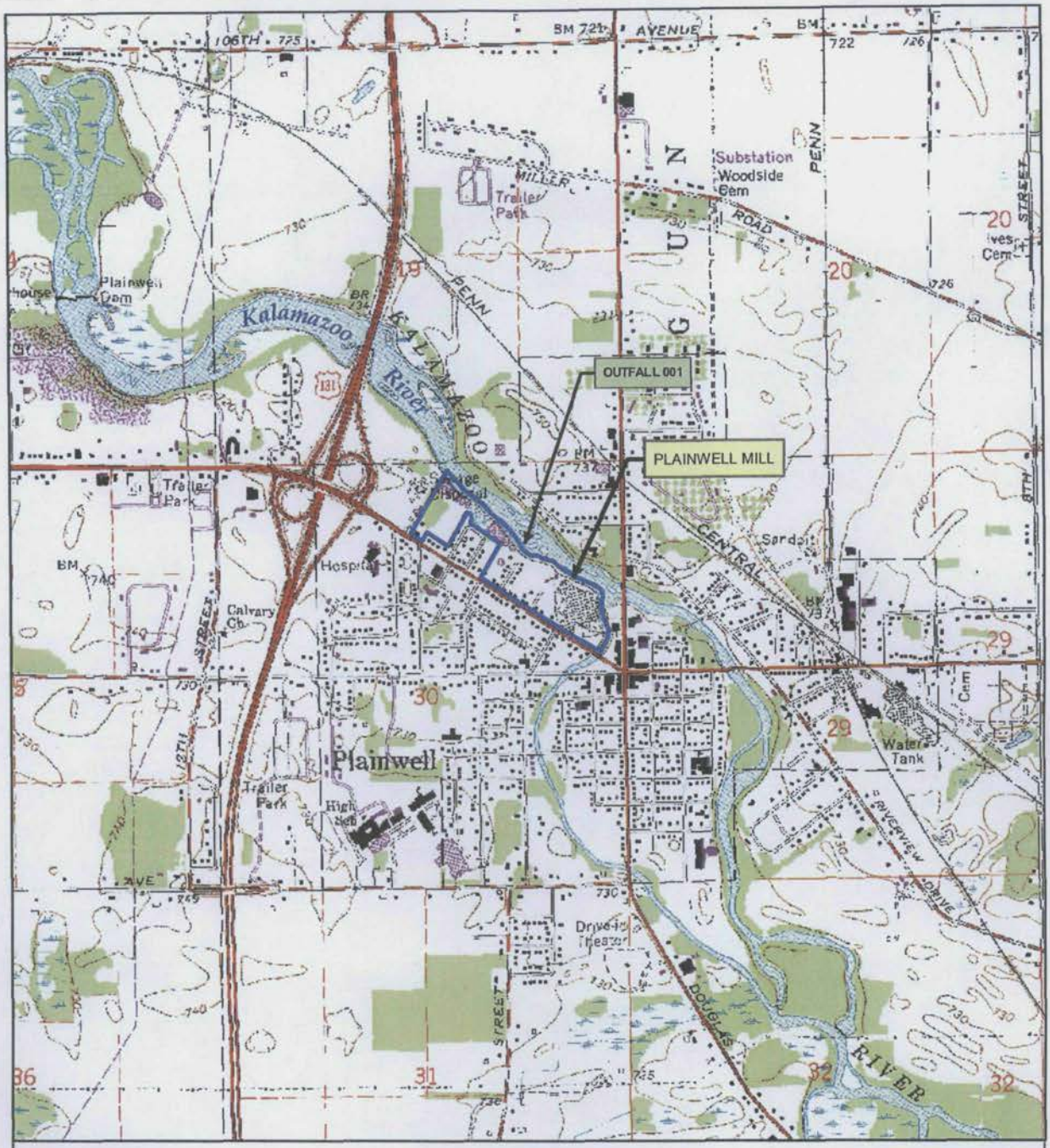
FIGURE 9 - OU4 Site Plan

The Seven Areas of Operable Unit 5 (The Kalamazoo River and Portage Creek)



River Reach/ Area	Length (miles)	Average Water Depth (ft)	Average River Width (ft)	Area (acres)
Area 1 – Morrow Dam to Plainwell Dam	21.9	3.4	181	487
Area 1 – Portage Creek	2.0	2.3	32	8
Area 2 – Plainwell to Otsego City Dam	1.7	2.5	450	96
Area 3 – Otsego City to Otsego Dam	3.4	3.8	200	83
Area 4 – Otsego to Trowbridge Dam	4.7	5.0	248	131
Area 5 – Trowbridge to Allegan City Dam	9.1	4.3	292	317
Area 6 – Lake Allegan	9.8	6.7	1,500	1,650
Area 7 – Allegan Dam to Lake Michigan	26	5.5	212	670

FIGURE 10 - OU5 Site Map



LEGEND

PROPERTY BOUNDARIES

0 1,000 2,000 4,000 FEET

1 INCH EQUALS 2,000 FEET

1:24,000

N

PROJECT LOCATION

BASE MAP FROM USGS 7.5 MINUTE QUADRANGLE, OSTEGO, 1967, REVISED 1973.

RMT
744 Heartland Trail
Madison, WI 53717 - 1934
P.O. Box 8923
Madison, WI 53708 - 8923
Phone: 608-831-4444
Fax: 608-831-3021

SITE L

PLAINWELL MILL B
PLA
PLAINV

Figure 11 - OU7 Location Map

D:\05130\03\51300301.mxd 8/29/2007 15:00:31

Attachment 2

Post-Closure Monitoring Groundwater Sample Results

2007-2012

Attachment 2A

OU3 Results

TABLE 1

DRAFT

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85378 MW-7 02/05/07	H85379 MW-1AR 02/06/07	H85380 MW-2R 02/06/07	H85381 MW-16A 02/06/07	H85382 MW-11RR 02/06/07	H85383 Equip. Blank [MW-11RR] 02/06/07	H85384 MW-12B 02/07/07	H85385 MW-16B 02/07/07	H85386 MW-12AR 02/07/07	H85387 MW-13B 02/07/07	H85388 MW-8AR 02/08/07	H85389 DUP [MW-16AR] 02/08/07
VOCs															
Acetone	1,700	--	µg/L	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.7]	ND [9.7]	ND [9.4]	ND [9.6]	ND [9.7]	ND [9.9]	ND [10]	ND [9.6]	ND [9.5]	ND [9.7]	ND [9.4]	ND [9.4]
Naphthalene	13	--	µg/L	ND [9.7]	ND [9.7]	ND [9.4]	ND [9.6]	ND [9.7]	ND [9.9]	ND [10]	ND [9.6]	ND [9.5]	ND [9.7]	ND [9.4]	ND [9.4]
Phenol	210	--	µg/L	ND [9.7]	ND [9.7]	ND [9.4]	ND [9.6]	ND [9.7]	ND [9.9]	ND [10]	ND [9.6]	ND [9.5]	ND [9.7]	ND [9.4]	ND [9.4]
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.053]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1221	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.053]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1232	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.053]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1242	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.053]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1248	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.053]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1254	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.053]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1260	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.053]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Total PCBs	0.2	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.053]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Metals															
Barium	--	2,300	µg/L	78.2 B	413	214	442	424	ND [9.8]	283	519	668	225	499	501
Calcium	--	--	µg/L	172,000	221,000	157,000	168,000	151,000	476 B	134,000	152,000	210,000	144,000	196,000	197,000
Chromium[6]	11	--	µg/L	ND [10]	ND [10]	ND [10]	ND [10]	ND [10]	1.3 B	ND [10]	ND [10]	ND [10]	ND [10]	ND [10]	ND [10]
Iron	--	--	µg/L	4,370	83,500	9,650	10,200	4,550	49.7 B	4,890	7,590	39,600	8,330	35,500	35,800
Sodium	--	--	µg/L	61,700	4,090 B	98,500	72,400	79,800	777 B	91,000	80,600	51,300	95,400	43,500	43,400
Thallium	--	160	µg/L	ND [6.9]	15.5 B	ND [6.9]	ND [6.9]	ND [6.9]	ND [6.9]	ND [6.9]	ND [6.9]	ND [6.9]	ND [6.9]	ND [6.9]	8.5 B
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	ND [2.7]	ND [2.7]	ND [2.7]	ND [2.7]	ND [2.7]	ND [2.7]	ND [2.7]	ND [2.7]	ND [2.7]	ND [2.7]	ND [2.7]	ND [2.7]
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	430	740	460	510	450	1.8 B	370	480	810	390	620	630
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	ND [20]	24.3	ND [20]	ND [20]	ND [20]	ND [20]	ND [20]	ND [20]	36.7	ND [20]	34.6	30.5
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	0.032 B	ND [0.1]	0.085 B	ND [0.1]	ND [0.1]	ND [0.1]	0.037 B	ND [0.1]	ND [0.1]	ND [0.1]	0.039 B	ND [0.1]
Sulfate	--	--	mg/L	140	2.4	34	51	62	ND [0.2]	76	42	3.2	69	15	14
Total Alkalinity	--	--	mg/L	430	740	460	510	450	1.8 B	370	480	810	390	620	630
Total Organic Carbon	--	--	mg/L	3.8	6.4	4.1	7.7	5	ND [1]	1.9	7.6	14.8	3.2	7.2	7.1
Total Suspended Solids	--	--	mg/L	39.2	51.3	12.8	17.4	12.6	ND [0.5]	10.6	16.9	23.2	9.2	20.1	20.1

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85390 MW-13AR 02/08/07	H85391 MW-8BR 02/08/07	H85392 MW-14AR 02/09/07	H85393 MW-15AR 02/09/07	H85394 DUP [MW-15AR] 02/09/07	H85395 MW-3AR 02/09/07	H85396 MW-7 05/07/07	H85397 MW-2R 05/08/07	H85398 MW-1AR 05/08/07	H85399 MW-11RR 05/08/07	H85400 MW-16A 05/08/07	H85401 Equip. Blank [MW-11RR] 05/08/07
VOCs															
Acetone	1,700	--	µg/L	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.4]	ND [9.4]	ND [9.5]	ND [9.6]	ND [9.8]	ND [9.7]	ND [9.7]	ND [9.4]	ND [9.7]	ND [9.7]	ND [9.4]	ND [9.5]
Naphthalene	13	--	µg/L	ND [9.4]	ND [9.4]	ND [9.5]	ND [9.6]	ND [9.8]	ND [9.7]	ND [9.7]	ND [9.4]	ND [9.7]	ND [9.7]	ND [9.4]	ND [9.5]
Phenol	210	--	µg/L	ND [9.4]	ND [9.4]	ND [9.5]	ND [9.6]	ND [9.8]	ND [9.7]	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1221	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1232	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1242	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1248	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1254	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1260	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Total PCBs	0.2	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Metals															
Barium	--	2,300	µg/L	655	266	246	270	268	428	54.5 B	160 B	421	401	431	ND [11.5]
Calcium	--	--	µg/L	266,000	152,000	143,000	153,000	152,000	197,000	161,000	154,000	237,000	156,000	173,000	157 B
Chromium[8]	11	--	µg/L	ND [10]	ND [10]	ND [10]	ND [10]	ND [10]	ND [10]	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	66,100	9,620	8,780	9,800	9,720	61,100	3,790	8,490	97,300	4,350	10,900	ND [15.8]
Sodium	--	--	µg/L	13,900	103,200 E,J	116,100 E,J	141,500 E,J	140,200 E,J	72,200	52,400	64,200	3,920 B	82,200	71,300	351 B
Thallium	--	160	µg/L	ND [6.9]	ND [6.9]	ND [6.9]	ND [6.9]	ND [6.9]	7.7 B	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	ND [2.7]	ND [2.7]	ND [2.7]	ND [2.7]	ND [2.7]	ND [2.7]	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	840	480	430	430	430	560	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	34.6	24.3 J	ND [20]	ND [20]	ND [20]	ND [20]	22.9	ND [20]	29.3	27.1	20.8	22.9
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	ND [0.1]	ND [0.1]	ND [0.1]	ND [0.1]	ND [0.1]	0.9904	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	3.9	43	65	73	74	30	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	840	480	430	430	430	560	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	7.5	4.3	3.2	3.5	3.8	4.4	5.5	3.7	5.7	5.4	8.2	ND [1]
Total Suspended Solids	--	--	mg/L	22.9	8.8	19.5	21.3	19.7	54	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

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POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85402 MW-12B 05/09/07	H85403 MW-16B 05/09/07	H85404 MW-12AR 05/09/07	H85405 MW-13B 05/09/07	H85406 MW-13AR 05/09/07	H85407 MW-8AR 05/10/07	H85408 DUP [MW-8AR] 05/10/07	H85409 MW-8BR 05/10/07	H85410 MW-15AR 05/10/07	H85411 DUP [MW-15AR] 05/10/07	H85412 MW-14AR 05/10/07	H85413 MW-3AR 05/11/07
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.6]	ND [9.4]	3.9 J	ND [9.6]	ND [9.4]	ND [10]	ND [9.8]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.9]	ND [9.4]
Naphthalene	13	--	µg/L	ND [9.6]	ND [9.4]	ND [9.5]	ND [9.6]	ND [9.4]	ND [10]	ND [9.8]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.9]	ND [9.4]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]
Aroclor 1221	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]
Aroclor 1232	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]
Aroclor 1242	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]
Aroclor 1248	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]
Aroclor 1254	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]
Aroclor 1260	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]
Total PCBs	0.2	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]
Metals															
Barium	--	2,300	µg/L	260	494	629	203	705	482	479	262	273	249	226	244
Calcium	--	--	µg/L	132,000	154,000	211,000	144,000	308,000	197,000	192,000	153,000	158,000	154,000	147,000	168,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	4,690	8,160	51,200	7,400	87,300	35,000	33,900	10,600	10,200	9,940	9,340	33,900
Sodium	--	--	µg/L	89,500	81,400	41,300	96,000	9,040	52,700	51,200	99,600	154,000	150,000	118,000	104,000
Thallium	--	160	µg/L	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	31.4	33.5	37.7	ND [20]	29.3	25	27.1	22.9	27.1	ND [20]	ND [20]	31.4
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	8.2	7.3	12.2	2.9	6.5	9	9.4	4.4	4.9	4.7	5	4.7
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85414 MW-7 08/06/07	H85415 MW-2R 08/06/07	H85416 MW-11RR 08/08/07	H85417 Equip. Blank [MW-11RR] 08/08/07	H85418 MW-1AR 08/08/07	H85419 MW-16B 08/08/07	H85420 MW-16A 08/08/07	H85421 MW-12B 08/08/07	H85422 MW-13B 08/08/07	H85423 MW-12AR 08/09/07	H85424 MW-13AR 08/09/07	H85425 MW-8AR 08/09/07
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.8]	ND [9.6]	ND [9.4]	ND [9.8]	ND [10]	ND [10]	ND [10]	ND [10]	ND [9.4]	ND [9.4]	ND [9.5]	ND [10]
Naphthalene	13	--	µg/L	ND [9.8]	ND [9.6]	ND [9.4]	ND [9.8]	ND [10]	ND [10]	ND [10]	ND [10]	ND [9.4]	ND [9.4]	ND [9.5]	ND [10]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.053]
Aroclor 1221	--	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.053]
Aroclor 1232	--	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.053]
Aroclor 1242	--	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.053]
Aroclor 1248	--	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.048]	ND [0.047] UJ	ND [0.048]	ND [0.053]
Aroclor 1254	--	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.048]	ND [0.047] UJ	ND [0.048]	ND [0.053]
Aroclor 1260	--	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.048]	ND [0.047] UJ	ND [0.048]	ND [0.053]
Total PCBs	0.2	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.048]	ND [0.047] UJ	ND [0.048]	ND [0.053]
Metals															
Barium	--	2,300	µg/L	68.8 B	157 B	417	ND [11.1]	410	407	476	272	198 B	613	558	475
Calcium	--	--	µg/L	168,000	154,000	160,000	ND [884]	233,000	169,000	153,000	140,000	146,000	216,000	243,000	202,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	4,650	10,100	5,850	ND [18.6]	98,400	11,300	7,940	5,590	6,960	51,400	62,400	27,700
Sodium	--	--	µg/L	64,800	100,000	86,400	ND [1,230]	2,530 B	76,000	83,000	94,300	100,000	60,800	43,200	86,300
Thallium	--	160	µg/L	ND [6] UJ	ND [6] UJ	ND [6] UJ	ND [6] UJ	ND [6] UJ	ND [6] UJ	ND [6] UJ	ND [6] UJ	ND [6] UJ	ND [6] UJ	ND [6] UJ	ND [6] UJ
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	ND [20]	25.2	ND [20]	ND [20]	ND [20]	ND [20]	ND [20]	ND [20]	ND [20]	35.8	23	37.9
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	4.1	4	5.7	ND [1]	5.6	7.5	6.9	2.3	3.1	13.3	8.7	14.3
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

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POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85426 DUP [MW-8AR] 08/09/07	H85427 MW-8BR 08/09/07	H85428 MW-15AR 08/10/07	H85429 DUP [MW-15AR] 08/10/07	H85430 MW-14AR 08/10/07	H85431 MW-3AR 08/10/07	H85432 MW-7 10/29/07	H85433 MW-1AR 10/30/07	H85434 MW-2R 10/30/07	H85435 MW-11RR 10/30/07	H85437 MW-16A 10/30/07	H85438 MW-12B 10/30/07
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [10]	ND [9.5]	ND [10]	ND [10]	ND [9.7]	ND [9.4]	ND [9.6]	ND [9.4]	ND [9.4]	ND [9.6]	ND [10]	ND [10]
Naphthalene	13	--	µg/L	ND [10]	ND [9.5]	ND [10]	ND [10]	ND [9.7]	ND [9.4]	ND [9.6]	ND [9.4]	ND [9.4]	ND [9.6]	ND [10]	ND [10]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.051]	ND [0.048]	ND [0.051] UJ	ND [0.05] UJ	ND [0.05]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.047]
Aroclor 1221	--	--	µg/L	ND [0.051]	ND [0.048]	ND [0.051] UJ	ND [0.05] UJ	ND [0.05]	ND [0.048]	ND [0.048] UJ	ND [0.047] UJ	ND [0.047] UJ	ND [0.048] UJ	ND [0.047] UJ	ND [0.047] UJ
Aroclor 1232	--	--	µg/L	ND [0.051]	ND [0.048]	ND [0.051] UJ	ND [0.05] UJ	ND [0.05]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.047]
Aroclor 1242	--	--	µg/L	ND [0.051]	ND [0.048]	ND [0.051] UJ	ND [0.05] UJ	ND [0.05]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.047]
Aroclor 1248	--	--	µg/L	ND [0.051]	ND [0.048]	ND [0.051] UJ	ND [0.05] UJ	ND [0.05]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.047]
Aroclor 1254	--	--	µg/L	ND [0.051]	ND [0.048]	ND [0.051] UJ	ND [0.05] UJ	ND [0.05]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.047]
Aroclor 1260	--	--	µg/L	ND [0.051]	ND [0.048]	ND [0.051] UJ	ND [0.05] UJ	ND [0.05]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.047]
Total PCBs	0.2	--	µg/L	ND [0.051]	ND [0.048]	ND [0.051] UJ	ND [0.05] UJ	ND [0.05]	ND [0.048]	ND [0.048] UJ	ND [0.047] UJ	ND [0.047] UJ	ND [0.048] UJ	ND [0.047] UJ	ND [0.047] UJ
Metals															
Barium	--	2,300	µg/L	483	300	255 J	252 J	253 J	202 J	70.9 B	314	236	434	410	268
Calcium	--	--	µg/L	207,000	179,000	158,000 J	156,000 J	160,000 J	159,000 J	156,000	193,000	185,000	153,000	165,000	139,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	28,600	14,600	10,100 J	10,100 J	11,100 J	14,500 J	2,510	65,400	14,900	5,110	9,690	5,110
Sodium	--	--	µg/L	88,200	103,000	153,000 J	152,000 J	112,000 J	157,000 J	73,000	4,420 B	69,500	84,300	76,700	94,600
Thallium	--	160	µg/L	ND [6] UJ	ND [6] UJ	ND [6] UJ	ND [6] UJ	ND [6] UJ	ND [6] UJ	ND [0.9]	ND [0.9]	ND [0.9]	ND [0.9]	ND [0.9]	ND [0.9]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	33.7	ND [20]	ND [20] UJ	ND [20] UJ	ND [20] UJ	ND [20] UJ	ND [20] UJ	30.2 J	ND [20] UJ	ND [20] UJ	22 J	ND [20] UJ
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	14.4	5.7	4.4 J	4.1 J	4.5 J	4 J	3.2	7	4.5	6.1	7.5	2.3
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

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POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85439 MW-16B 10/30/07	H85440 MW-13B 10/31/07	H85441 MW-12AR 10/31/07	H85442 MW-13AR 10/31/07	H85443 MW8BR 10/31/07	H85444 MW-8AR 10/31/07	H85445 DUP [MW-8AR] 10/31/07	H85446 MW-14AR 11/01/07	H85447 DUP [MW-14AR] 11/01/07	H85448 MW-3AR 11/02/07	H85449 MW-15AR 11/02/07	H85450 MW-2R 02/11/08
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND [5]
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.7]	ND [9.4]	ND [9.6]	ND [9.4]	ND [9.4]	ND [9.6]	ND [9.8]	ND [9.4]	ND [9.4]	ND [9.7]	ND [9.8]	ND [9.5]
Naphthalene	13	--	µg/L	ND [9.7]	ND [9.4]	ND [9.6]	ND [9.4]	ND [9.4]	ND [9.6]	ND [9.8]	ND [9.4]	ND [9.4]	ND [9.7]	ND [9.4]	ND [9.5]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND [9.5]
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.046]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1221	--	--	µg/L	ND [0.047] UJ	ND [0.047] UJ	ND [0.047] UJ	ND [0.047] UJ	ND [0.047] UJ	ND [0.047] UJ	ND [0.048] UJ	ND [0.046] UJ	ND [0.049] UJ	ND [0.049] UJ	ND [0.049] UJ	ND [0.049]
Aroclor 1232	--	--	µg/L	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.046]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1242	--	--	µg/L	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.046]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1248	--	--	µg/L	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.046]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1254	--	--	µg/L	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.046]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1260	--	--	µg/L	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.046]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]
Total PCBs	0.2	--	µg/L	ND [0.047] UJ	ND [0.047] UJ	ND [0.047] UJ	ND [0.047] UJ	ND [0.047] UJ	ND [0.047] UJ	ND [0.048] UJ	ND [0.046] UJ	ND [0.049] UJ	ND [0.049] UJ	ND [0.049] UJ	ND [0.049]
Metals															
Barium	--	2,300	µg/L	477	211	638	685	286	550	559	250	256	649	253	223
Calcium	--	--	µg/L	150,000	151,000	220,000	286,000	166,000	235,000	239,000	158,000	160,000	239,000	154,000	151,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND [10]
Iron	--	--	µg/L	7,390	7,840	50,800	69,500	12,500	33,800	34,000	11,000	11,200	51,500	9,600	14,400
Sodium	--	--	µg/L	84,400	101,000	72,700	28,600	114,000	40,300	39,400	113,000	115,000	78,300	142,000	64,100
Thallium	--	160	µg/L	ND [0.9]	ND [0.9]	ND [0.9]	ND [0.9]	ND [0.9]	ND [0.9]	ND [0.9]	ND [0.9]	ND [0.9]	ND [0.9]	ND [0.9]	ND [0.67]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.1 B
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	26.1 J	26.1 J	48.6 J	40.5 J	ND [20] UJ	26.1 J	24.1 J	ND [20] UJ	ND [20] UJ	24.1	26.1 J	ND [20]
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND [100]
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	19
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	460
Total Organic Carbon	--	--	mg/L	6	3	13.6	9.2	5	9	7.9	4.7	4.7	6.5	5.6	4
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23.7

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85451 MW-17 02/11/08	H85452 MW-1AR 02/12/08	H85453 MW-11RR 02/12/08	H85455 MW-16A 02/12/08	H85456 MW-16AB 02/13/08	H85457 MW-12AR 02/13/08	H85458 MW-12B 02/13/08	H85459 MW-8BR 02/14/08	H85460 MW-13B 02/14/08	H85461 MW-13AR 02/14/08	H85462 MW-8AR 02/14/08	H85463 DUP [MW-8AR] 02/14/08
VOCs															
Acetone	1,700	--	µg/L	ND [5]	ND [5]	ND [5]	ND [5]	ND [5]	ND [5]	ND [5]	ND [5]	ND [5]	ND [5]	ND [5]	ND [5]
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.8]	ND [9.9]	ND [9.5]	ND [9.8]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]
Naphthalene	13	--	µg/L	ND [9.8]	ND [9.9]	ND [9.5]	ND [9.8]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]
Phenol	210	--	µg/L	ND [9.8]	ND [9.9]	ND [9.5]	ND [9.8]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.05]	ND [0.05]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.047]	ND [0.05]	ND [0.052]	ND [0.052]	ND [0.048]	ND [0.05]	ND [0.05]
Aroclor 1221	--	--	µg/L	ND [0.05]	ND [0.05]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.047]	ND [0.05]	ND [0.052]	ND [0.052]	ND [0.048]	ND [0.05]	ND [0.05]
Aroclor 1232	--	--	µg/L	ND [0.05]	ND [0.05]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.047]	ND [0.05]	ND [0.052]	ND [0.052]	ND [0.048]	ND [0.05]	ND [0.05]
Aroclor 1242	--	--	µg/L	ND [0.05]	ND [0.05]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.047]	ND [0.05]	ND [0.052]	ND [0.052]	0.066	ND [0.05]	ND [0.05]
Aroclor 1248	--	--	µg/L	ND [0.05]	ND [0.05]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.047]	ND [0.05]	ND [0.052]	ND [0.052]	ND [0.048]	ND [0.05]	ND [0.05]
Aroclor 1254	--	--	µg/L	ND [0.05]	ND [0.05]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.047]	ND [0.05]	ND [0.052]	ND [0.052]	ND [0.048]	ND [0.05]	ND [0.05]
Aroclor 1260	--	--	µg/L	ND [0.05]	ND [0.05]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.047]	ND [0.05]	ND [0.052]	ND [0.052]	ND [0.048]	ND [0.05]	ND [0.05]
Total PCBs	0.2	--	µg/L	ND [0.05]	ND [0.05]	ND [0.049]	ND [0.049]	ND [0.05]	ND [0.047]	ND [0.05]	ND [0.052]	ND [0.052]	0.066	ND [0.05]	ND [0.05]
Metals															
Barium	--	2,300	µg/L	67.5 B	305	423	397	516	567	286	252	200 B	891	354	353
Calcium	--	--	µg/L	159,000	206,000	156,000	169,000	163,000	195,000	147,000	154,000	145,000	307,000	199,000	198,000
Chromium[6]	11	--	µg/L	ND [0.14]	ND [0.14]	ND [10]	ND [10]	ND [10]	ND [10]	ND [10]	ND [10]	ND [10]	ND [10]	ND [0.14]	ND [10]
Iron	--	--	µg/L	3,120	70,600	4,180	8,590	8,310	47,200	5,370	10,300	7,200	95,100	34,700	34,500
Sodium	--	--	µg/L	71,500	4,480 B	87,900	76,600	88,800	71,500	98,700	109,000	102,000	3,940 B	14,700	19,200
Thallium	--	160	µg/L	ND [0.67]	ND [0.67]	ND [0.67]	ND [0.67]	ND [0.67]	ND [0.67]	ND [0.67]	ND [0.67]	ND [0.67]	ND [0.67]	ND [0.67]	ND [0.67]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	0.97 B	1.5 B	2 B	1.7 B	1.5 B	2 B	1.2 B	0.83 B	0.89 B	1.2 B	1.3 B	1.1 B
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	ND [20]	28.2	ND [20]	24.1	24.1	52.7 J	ND [20]	ND [20]	ND [20]	22	ND [20]	ND [20]
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	ND [100]	ND [100]	ND [100]	ND [100]	ND [100]	ND [100]	ND [100]	ND [100]	ND [100]	ND [100]	ND [100]	ND [100]
Sulfate	--	--	mg/L	110	0.53	53	50	35	0.75	77	38	61	10	8.5	9.4
Total Alkalinity	--	--	mg/L	420	580	460	520	480	680	380	440	400	910	530	530
Total Organic Carbon	--	--	mg/L	3.4	7.1	9	8.1	6.9	12.2	2.2	3.5	2.8	7.1	4.1	4.6
Total Suspended Solids	--	--	mg/L	32.9	62.2	11.6	20.8	20.6	64.8	11.4	21.9	15.2	89.4	42.9	44.4

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85464 MW-14AR 02/14/08	H85465 DUP [MW-14AR] 02/14/08	H85466 MW-15AR 02/15/08	H85467 MW-3AR 02/15/08	H85468 MW-7 05/12/08	H85469 MW-1AR 05/13/08	H85470 MW-2R 05/13/08	H85471 MW-11RR 05/13/08	H85473 MW-16A 05/14/08	H85474 MW-16B 05/14/08	H85475 MW-12AR 05/14/08	H85476 MW-12B 05/14/08
VOCs															
Acetone	1,700	--	µg/L	ND [5]	ND [5]	ND [5]	ND [5]	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.4]	ND [9.4]	ND [9.5]	ND [9.5]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.5]	ND [11]	ND [10]	ND [9.7]
Naphthalene	13	--	µg/L	ND [9.4]	ND [9.4]	ND [9.5]	ND [9.5]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.5]	ND [11]	ND [10]	ND [9.7]
Phenol	210	--	µg/L	ND [9.4]	ND [9.4]	ND [9.5]	ND [9.5]	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.05]	ND [0.052]	ND [0.047]	ND [0.048]	ND [0.062]	ND [0.069]	ND [0.049]	ND [0.05]	ND [0.056] UJ	ND [0.053]	ND [0.053]	ND [0.047]
Aroclor 1221	--	--	µg/L	ND [0.05]	ND [0.052]	ND [0.047]	ND [0.048]	ND [0.062]	ND [0.069]	ND [0.049]	ND [0.05]	ND [0.056] UJ	ND [0.053]	ND [0.053]	ND [0.047]
Aroclor 1232	--	--	µg/L	ND [0.05]	ND [0.052]	ND [0.047]	ND [0.048]	ND [0.062]	ND [0.069]	ND [0.049]	ND [0.05]	ND [0.056] UJ	ND [0.053]	ND [0.053]	ND [0.047]
Aroclor 1242	--	--	µg/L	ND [0.05]	ND [0.052]	ND [0.047]	ND [0.048]	ND [0.062]	ND [0.069]	ND [0.049]	ND [0.05]	ND [0.056] UJ	ND [0.053]	ND [0.053]	ND [0.047]
Aroclor 1248	--	--	µg/L	ND [0.05]	ND [0.052]	ND [0.047]	ND [0.048]	ND [0.062]	ND [0.069]	ND [0.049]	ND [0.05]	ND [0.056] UJ	ND [0.053]	ND [0.053]	ND [0.047]
Aroclor 1254	--	--	µg/L	ND [0.05]	ND [0.052]	ND [0.047]	ND [0.048]	ND [0.062]	ND [0.069]	ND [0.049]	ND [0.05]	ND [0.056] UJ	ND [0.053]	ND [0.053]	ND [0.047]
Aroclor 1260	--	--	µg/L	ND [0.05]	ND [0.052]	ND [0.047]	ND [0.048]	ND [0.062]	ND [0.069]	ND [0.049]	ND [0.05]	ND [0.056] UJ	ND [0.053]	ND [0.053]	ND [0.047]
Total PCBs	0.2	--	µg/L	ND [0.05]	ND [0.052]	ND [0.047]	ND [0.048]	ND [0.062]	ND [0.069]	ND [0.049]	ND [0.05]	ND [0.056] UJ	ND [0.053]	ND [0.053]	ND [0.047]
Metals															
Barium	--	2,300	µg/L	233	228	254	432	65 B	286	216	405	450	532	598	271
Calcium	--	--	µg/L	153,000	150,000	155,000	176,000	166,000	193,000	186,000	166,000	198,000	178,000	225,000	150,000
Chromium[6]	11	--	µg/L	ND [10]	ND [10]	ND [10]	ND [10]	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	9,770	9,600	9,950	55,700	39,100	64,600	17,200	4,270	11,600	9,180	56,300	5,360
Sodium	--	--	µg/L	119,000	117,000	140,000	14,400	60,200	5,130	82,600	86,800	76,200	92,000	56,600	101,000
Thallium	--	160	µg/L	ND [0.67]	ND [0.67]	ND [0.67]	ND [0.67]	ND [0.6]	ND [0.6]	ND [0.6]	ND [0.6]	ND [0.6]	ND [0.6]	ND [0.6]	ND [0.6]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	1.5 B	0.78 B	2.6 B	1.3 B	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	ND [20]	ND [20]	ND [20]	ND [20]	22	46.6	ND [20]	ND [20]	36.4	28.2	36.4	ND [20]
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	ND [100]	ND [100]	110	ND [100]	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	57	58	52	3.1	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	420	430	430	510	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	8.4 J	4.8 J	5.2	6.1	3.4	9.7	7.7	6.3	9.3	10.1	11.1 J	2.1
Total Suspended Solids	--	--	mg/L	19.6	18.8	20.9	72.2	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85477 MW-13AR 05/15/08	H85478 MW-13B 05/15/08	H85479 MW-8AR 05/15/08	H85480 DUP [MW-8AR] 05/15/08	H85481 MW-8BR 05/15/08	H85482 MW-14AR 05/15/08	H85483 DUP [MW-14AR] 05/15/08	H85484 MW-15AR 05/16/08	H85485 MW-3AR 05/16/08	H85486 MW-7 08/05/08	H85487 MW-2R 08/05/08	H85488 MW-1AR 08/05/08
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [11]	ND [10]	ND [11]	ND [11]	ND [9.8]	ND [9.9]	ND [10]	ND [9.8]	ND [10]	ND [9.5]	ND [9.5]	ND [9.5]
Naphthalene	13	--	µg/L	ND [11]	ND [10]	ND [11]	ND [11]	ND [9.8]	ND [9.9]	ND [10]	ND [9.8]	ND [10]	ND [9.5]	ND [9.5]	ND [9.5]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.053]	ND [0.049]	ND [0.049]	ND [0.054]	ND [0.049]	ND [0.049]	ND [0.053]	ND [0.054]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.049] UJ
Aroclor 1221	--	--	µg/L	ND [0.053]	ND [0.049]	ND [0.049]	ND [0.054]	ND [0.049]	ND [0.049]	ND [0.053]	ND [0.054]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.049] UJ
Aroclor 1232	--	--	µg/L	ND [0.053]	ND [0.049]	ND [0.049]	ND [0.054]	ND [0.049]	ND [0.049]	ND [0.053]	ND [0.054]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.049] UJ
Aroclor 1242	--	--	µg/L	0.036 J	ND [0.049]	ND [0.049]	ND [0.054]	ND [0.049]	ND [0.049]	ND [0.053]	ND [0.054]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.049] UJ
Aroclor 1248	--	--	µg/L	ND [0.053]	ND [0.049]	ND [0.049]	ND [0.054]	ND [0.049]	ND [0.049]	ND [0.053]	ND [0.054]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.049] UJ
Aroclor 1254	--	--	µg/L	ND [0.053]	ND [0.049]	ND [0.049]	ND [0.054]	ND [0.049]	ND [0.049]	ND [0.053]	ND [0.054]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.049] UJ
Aroclor 1260	--	--	µg/L	ND [0.053]	ND [0.049]	ND [0.049]	ND [0.054]	ND [0.049]	ND [0.049]	ND [0.053]	ND [0.054]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.049] UJ
Total PCBs	0.2	--	µg/L	0.036 J	ND [0.049]	ND [0.049]	ND [0.054]	ND [0.049]	ND [0.049]	ND [0.053]	ND [0.054]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.049] UJ
Metals															
Barium	--	2,300	µg/L	845	196 B	436	438	268	255	260	311	215	67.7 B	178 B	387
Calcium	--	--	µg/L	316,000	149,000	211,000	212,000	175,000	176,000	176,000	185,000	172,000	166,000	156,000	226,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	93,900	7,200	33,900	34,100	13,500	11,000	11,000	14,600	28,400	55,700	11,600	82,600
Sodium	--	--	µg/L	9,560	107,000	58,900	59,200	108,000	131,000	131,000	175,000	113,000	50,500	80,400	23,500
Thallium	--	160	µg/L	ND [0.6]	ND [0.6]	ND [0.6]	ND [0.6]	ND [0.6]	ND [0.6]	ND [0.6]	ND [0.6]	ND [0.6]	ND [25]	ND [0.92]	ND [25]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	30.2	ND [20]	26.1	22	ND [20]	ND [20]	22	ND [20]	ND [20]	26.1	ND [20]	34.3
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	7.4	3	6.7	8.3	7	5.1	5.5 J	4.9	4.2	4.2	4.6	6.9
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

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POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85489 MW-11RR 08/06/08	H85490 MW-16A 08/06/08	H85492 MW-16B 08/06/08	H85493 MW-12B 08/06/08	H85494 MW-12AR 08/07/08	H85495 MW-13B 08/07/08	H85496 MW-13AR 08/07/08	H85497 MW-8BR 08/07/08	H85498 MW-8AR 08/07/08	H85499 DUP [MW-8AR] 08/07/08	H85500 MW-15AR 08/08/08	H85501 MW-14AR 08/08/08
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.4]	ND [10]	ND [9.5]	ND [9.9]	ND [9.9]	ND [9.4]	ND [10]	ND [9.6]	ND [10]	ND [10]	ND [9.9]	ND [9.6]
Naphthalene	13	--	µg/L	ND [9.4]	ND [10]	ND [9.5]	ND [9.9]	ND [9.9]	ND [9.4]	ND [10]	ND [9.6]	ND [10]	ND [10]	ND [9.9]	ND [9.6]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.049]	ND [0.047] UJ	ND [0.047]	ND [0.049]	ND [0.047]
Aroclor 1221	--	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.049]	ND [0.047] UJ	ND [0.047]	ND [0.049]	ND [0.047]
Aroclor 1232	--	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.049]	ND [0.047] UJ	ND [0.047]	ND [0.049]	ND [0.047]
Aroclor 1242	--	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.049]	ND [0.047] UJ	ND [0.047]	ND [0.049]	ND [0.047]
Aroclor 1248	--	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.049]	ND [0.047] UJ	ND [0.047]	ND [0.049]	ND [0.047]
Aroclor 1254	--	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.049]	ND [0.047] UJ	ND [0.047]	ND [0.049]	ND [0.047]
Aroclor 1260	--	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.049]	ND [0.047] UJ	ND [0.047]	ND [0.049]	ND [0.047]
Total PCBs	0.2	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.049]	ND [0.047] UJ	ND [0.047]	ND [0.049]	ND [0.047]
Metals															
Barium	--	2,300	µg/L	448	420	505	262	598	193 B	744	273	444	467	257	233
Calcium	--	--	µg/L	162,000	174,000	166,000	141,000	217,000	142,000	291,000	172,000	202,000	215,000	156,000	150,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	5,930	10,700	8,240	5,030	53,100	6,910	65,000	14,000	29,100	30,800	9,550	8,980
Sodium	--	--	µg/L	89,100	77,100	88,400	95,100	58,600	99,900	23,000	80,300	59,400	63,200	156,000	120,000
Thallium	--	160	µg/L	ND [0.92]	ND [0.92]	ND [0.92]	1.1 B	3.3 B	ND [0.92]	ND [0.92]	ND [0.92]	ND [0.92]	ND [0.92]	ND [0.92]	ND [0.92]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	ND [20]	24.1	ND [20]	ND [20]	38.4 J	ND [20]	32.3	ND [20]	40.5	38.4	ND [20]	ND [20]
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	7.8	8.5	7.8	2.7	12.7	4.1	8.7	9.5	14.5	13.7	5.3	5.2
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

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POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85502 / DUP [MW-14AR] / 08/08/08	H85503 / MW-3AR / 08/08/08	H85504 / MW-7 / 11/03/08	H85505 / MW-2R / 11/03/08	H85506 / MW-1AR / 11/04/08	H85507 / MW-16A / 11/04/08	H85508 / MW-11RR / 11/04/08	H85510 / MW-16B / 11/05/08	H85511 / MW-12B / 11/05/08	H85512 / MW-12AR / 11/05/08	H85513 / MW-13B / 11/05/08	H85514 / MW-8BR / 11/06/08
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [10]	ND [10]	ND [9.5]	ND [10]	ND [9.5] UJ	ND [9.7] UJ	ND [9.5] UJ	ND [9.5]	ND [9.4]	ND [9.5]	ND [9.7]	ND [9.5]
Naphthalene	13	--	µg/L	ND [10]	ND [10]	ND [9.5]	ND [10]	ND [9.5] UJ	ND [9.7] UJ	ND [9.5] UJ	ND [9.5]	ND [9.4]	ND [9.5]	ND [9.7]	ND [9.5]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.048] UJ	ND [0.049]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1221	--	--	µg/L	ND [0.048] UJ	ND [0.049]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1232	--	--	µg/L	ND [0.048] UJ	ND [0.049]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1242	--	--	µg/L	ND [0.048] UJ	ND [0.049]	ND [0.048]	ND [0.047]	ND [0.047]	0.027 J	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1248	--	--	µg/L	ND [0.048] UJ	ND [0.049]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1254	--	--	µg/L	ND [0.048] UJ	ND [0.049]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1260	--	--	µg/L	ND [0.048] UJ	ND [0.049]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Total PCBs	0.2	--	µg/L	ND [0.048] UJ	ND [0.049]	ND [0.048]	ND [0.047]	ND [0.047]	0.027 J	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.047]
Metals															
Barium	--	2,300	µg/L	236	250	66.6 B	183 B	267	441	449	491	257	621	192 B	236
Calcium	--	--	µg/L	149,000	168,000	153,000	141,000	166,000	179,000	158,000	162,000	142,000	228,000	143,000	157,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	8,970	16,000	24,600	15,100	53,200	11,700	4,380	8,190	5,160	65,300	7,240	12,400
Sodium	--	--	µg/L	120,000	165,000	54,300	51,000	13,000	80,200	92,700	88,700	99,100	51,900	98,200	90,700
Thallium	--	160	µg/L	ND [0.92]	ND [0.92]	ND [25] UB	ND [0.77]	ND [25] UB	ND [25] UB	ND [0.77]	ND [25] UB	ND [25] UB	ND [25] UB	ND [0.77]	ND [25] UB
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	ND [20]	ND [20]	ND [20]	28.2	22	48.6	ND [20]	28.2	ND [20]	28.2 J	ND [20]	ND [20]
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	5.3	5.1	3.7	5.2	7.3	10.3	6.9	7	2.2	12.5	4	4.4
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85515 MW-13AR 11/06/08	H85516 MW-14AR 11/06/08	H85517 DUP [MW-14AR] 11/06/08	H85518 MW-8AR 11/06/08	H85519 DUP [MW-8AR] 11/06/08	H85520 MW-15AR 11/07/08	H85521 MW-3AR 11/07/08	H85522 MW-7 02/02/09	H85523 MW-1AR 02/03/09	H85524 MW-2R 02/03/09	H85525 MW-11RR 02/03/09	H85526 MW-16A 02/03/09
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	ND [5] UJ	ND [2.5] UB,J	ND [5] UJ	ND [2.3] UB,J	ND [5] UJ
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.5]	ND [9.4]	ND [9.6]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.6]	ND [10]	ND [10]	ND [10]	ND [9.5]	ND [9.7]
Naphthalene	13	--	µg/L	ND [9.5]	ND [9.4]	ND [9.6]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.6]	ND [10]	ND [10]	ND [10]	ND [9.5]	ND [9.7]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	ND [10]	ND [10]	ND [10]	ND [9.5]	ND [9.7]
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.049]
Aroclor 1221	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.049]
Aroclor 1232	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.049]
Aroclor 1242	--	--	µg/L	0.073	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.049]
Aroclor 1248	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.049]
Aroclor 1254	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.049]
Aroclor 1260	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.049]
Total PCBs	0.2	--	µg/L	0.073	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.049]
Metals															
Barium	--	2,300	µg/L	735	247	247	465	466	212	176 B	62 B	266	174 B	437	414
Calcium	--	--	µg/L	256,000	165,000	166,000	216,000	214,000	138,000	116,000	165,000	184,000	163,000	155,000	173,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	ND [0.14]	ND [0.14]	ND [0.14]	0.38 B	0.46 B
Iron	--	--	µg/L	52,800	10,700	10,800	36,600	36,600	8,700	10,100	4,470	56,200	9,930	3,930	10,700
Sodium	--	--	µg/L	42,300	131,000	133,000	44,500	44,500	141,000	120,000	50,600	16,600	110,000	90,700	80,300
Thallium	--	160	µg/L	ND [25] UB	ND [25] UB	ND [0.77]	ND [0.77]	ND [25] UB	ND [25] UB	ND [25] UB	ND [25] UB	ND [25] UB	ND [25] UB	ND [25] UB	ND [25] UB
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	ND [0.5]	ND [0.5]	ND [50] UB	ND [50] UB	ND [50] UB
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	370	530	460	450	500
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	40.5	ND [20]	ND [20]	42.5	42.5	ND [20]	ND [20]	31.5	27.2	75	ND [20]	20.6
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	0.033 J	ND [0.1]	ND [0.1]	ND [0.1]	ND [0.1]
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	180	0.38	56	45	36
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	10.1	4	4.4	13	12.9	4.5	5.5	4.5	7.8	4.5	5.7	9.1
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	15.4	70	19.4	11.6	25.3

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85528 MW-16B 02/04/09	H85529 MW-12B 02/04/09	H85530 MW-13B 02/04/09	H85531 MW-12AR 02/04/09	H85532 MW-13AR 02/05/09	H85533 MW-8BR 02/05/09	H85534 DUP [MW-8BR] 02/05/09	H85535 MW-8AR 02/05/09	H85536 MW-14AR 02/05/09	H85537 MW-15AR 02/06/09	H85538 DUP [MW-15AR] 02/06/09	H85539 MW-3AR 02/06/09
VOCs															
Acetone	1,700	--	µg/L	ND [5] UJ	ND [5] UJ	ND [5] UJ	ND [5] UJ	ND [5] UJ	ND [5] UJ	ND [5] UJ	ND [5] UJ	ND [5] UJ	ND [5] UJ	ND [5] UJ	ND [5] UJ
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [10]	ND [10]	ND [10]	ND [9.8]	ND [10]	ND [9.9]	ND [9.7]	ND [9.8]	ND [9.8]	ND [9.5]	ND [9.4]	ND [10]
Naphthalene	13	--	µg/L	ND [10]	ND [10]	ND [10]	ND [9.8]	ND [10]	ND [9.9]	ND [9.7]	ND [9.8]	ND [9.8]	ND [9.5]	ND [9.4]	ND [10]
Phenol	210	--	µg/L	ND [10]	ND [10]	ND [10]	ND [9.8]	ND [10]	ND [9.9]	ND [9.7]	ND [9.8]	ND [9.8]	ND [9.5]	ND [9.4]	ND [10]
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.047]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1221	--	--	µg/L	ND [0.047]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	0.041 J	ND [0.049]
Aroclor 1232	--	--	µg/L	ND [0.047]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1242	--	--	µg/L	ND [0.047]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1248	--	--	µg/L	ND [0.047]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1254	--	--	µg/L	ND [0.047]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1260	--	--	µg/L	ND [0.047]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]
Total PCBs	0.2	--	µg/L	ND [0.047]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.051]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	0.041 J	ND [0.049]
Metals															
Barium	--	2,300	µg/L	473	243	187 B	583	729	245	235	427	264	256	258	261
Calcium	--	--	µg/L	155,000	128,000	139,000	208,000	246,000	157,000	152,000	195,000	174,000	165,000	163,000	164,000
Chromium[6]	11	--	µg/L	0.32 B	ND [0.14]	ND [0.14]	0.82 B	0.53 B	ND [0.14]	0.25 B	ND [0.14]	ND [0.14]	0.31 B	ND [0.14]	ND [0.14]
Iron	--	--	µg/L	7,140	4,590	6,500	63,000	56,800	11,800	11,400	31,000	10,400	9,640	9,560	20,800
Sodium	--	--	µg/L	86,900	90,800	96,600	58,600	38,400	99,800	96,800	71,400	152,000	168,000	171,000	118,000
Thallium	--	160	µg/L	ND [25] UB	ND [25] UB	ND [25] UB	ND [25] UB	2.6 B	2.3 B	2.1 B	3.6 B	1.2 B	3 B	2.5 B	3.2 B
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	ND [50] UB	ND [0.5]	ND [50] UB	ND [50] UB	ND [0.5]	ND [0.5]	ND [50] UB	ND [50] UB	ND [0.5]	ND [50] UB	ND [50] UB	ND [50] UB
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	470	350	390	680	680	450	450	640	450	410	410	470
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	29.3	ND [20]	20.6	72.8 J	53.3	20.6	25	53.3	42.4	29.3	ND [20]	48.9
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	ND [0.1]	ND [0.1]	ND [0.1]	ND [0.1]	ND [0.1]	0.1 J	ND [0.1]	ND [0.1]	ND [0.1]	0.033 J	0.033 J	ND [0.1]
Sulfate	--	--	mg/L	34	71	58	0.8	0.14 J	37	38	2.9	59	84	80	42
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	8.6	2.7	3.4	17.3	9.4	4	3.8	14.2	4.1	4.4	4.3	5.3
Total Suspended Solids	--	--	mg/L	18.9	11.2	13.8	84.8	71.7	24.9	23.6	50.2	23.2	19.4	21.2	36.1

See Notes on Page 27.

TABLE 1

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POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85540 MW-7 05/18/09	H85541 MW-1AR 05/19/09	H85542 MW-2R 05/19/09	H85543 MW-11RR 05/19/09	H85544 MW-16A 05/19/09	H85546 DUP [MW-16A] 05/19/09	H85547 MW-16B 05/20/09	H85548 MW-12B 05/20/09	H85551 MW-13B 05/20/09	H85552 MW-12AR 05/20/09	H85553 MW-13AR 05/21/09	H85554 DUP [MW-13AR] 05/21/09
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.8]	ND [9.9]	ND [9.7]	ND [9.9]	ND [9.8]	ND [9.9]	ND [9.8]	ND [9.8]	ND [9.7]	ND [9.7]	ND [9.8]	ND [9.7]
Naphthalene	13	--	µg/L	ND [9.8]	ND [9.9]	ND [9.7]	ND [9.9]	ND [9.8]	ND [9.9]	ND [9.8]	ND [9.8]	ND [9.7]	ND [9.7]	ND [9.8]	ND [9.7]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1221	--	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1232	--	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1242	--	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	0.05	0.039 J
Aroclor 1248	--	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1254	--	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.049]	ND [0.049]
Aroclor 1260	--	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.049]	ND [0.049]
Total PCBs	0.2	--	µg/L	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	0.05	0.039 J
Metals															
Barium	--	2,300	µg/L	84.1 B	398	179 B	434	440	444	474	265	191 B	550	1,090	1,090
Calcium	--	--	µg/L	175,000	246,000	164,000	152,000	166,000	168,000	151,000	133,000	139,000	190,000	292,000	293,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	5,700	86,800	10,800	4,120	14,600	14,500	7,320	4,330	6,540	62,700	86,800	86,800
Sodium	--	--	µg/L	63,300	19,800	119,000	85,900	76,200	78,200	80,400	88,900	89,900	51,400	11,800	11,800
Thallium	--	160	µg/L	ND [25] UB	ND [25] UB	ND [25] UB	ND [25] UB	ND [0.69]	ND [0.69]	ND [25] UB	ND [25] UB	ND [25] UB	ND [25] UB	ND [25] UB	ND [25] UB
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	22.8	31.5	29.3	25	33.7	35.9 J	ND [20]	ND [20]	ND [20]	38	35.9	38
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	4	8.6	4.6	5.5	8.7	8.1	7	2.1	2.5	12.7	7.1	7.7
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

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POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85555 MW-14AR 05/21/09	H85556 MW-8BR 05/21/09	H85557 MW-8AR 05/21/09	H85558 MW-15AR 05/22/09	H85559 MW-3AR 05/22/09	H85560 MW-7 08/17/09	H85561 MW-1AR 08/18/09	H85562 MW-2R 08/18/09	H85563 MW-11RR 08/18/09	H85564 MW-16A 08/19/09	H85566 MW-16B 08/18/09	H85567 MW-12B 08/18/09
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.8]	ND [9.7]	ND [9.8]	ND [9.8]	ND [9.6]	ND [9.9]	ND [10]	ND [9.6]	ND [9.6]	ND [9.5]	ND [9.5]	ND [9.7]
Naphthalene	13	--	µg/L	ND [9.8]	ND [9.7]	ND [9.8]	ND [9.8]	ND [9.6]	ND [9.9]	ND [10]	ND [9.6]	ND [9.6]	ND [9.5]	ND [9.5]	ND [9.7]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.047]
Aroclor 1221	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.049]	0.024 J	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.047]
Aroclor 1232	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.047]
Aroclor 1242	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.047]
Aroclor 1248	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.047]
Aroclor 1254	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.047]
Aroclor 1260	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.047]
Total PCBs	0.2	--	µg/L	ND [0.048]	ND [0.048]	ND [0.049]	0.024 J	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.047]
Metals															
Barium	--	2,300	µg/L	252	261	420	256	212	71.8 B	371	145 B	444	422	479	242
Calcium	--	--	µg/L	147,000	164,000	233,000	148,000	167,000	169,000	230,000	133,000	155,000	170,000	158,000	130,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	9,580	13,000	42,900	10,100	29,900	5,380	80,900	11,100	5,060	12,300	8,020	4,990
Sodium	--	--	µg/L	193,000	109,000	10,300	149,000	23,100	56,600	20,000	96,400	84,900	77,000	84,900	91,700
Thallium	--	160	µg/L	ND [0.69]	ND [25] UB	ND [0.69]	ND [25] UB	ND [25] UB	2.3 B	3.3 B	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.5]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	33.7	ND [20]	ND [20]	ND [20]	ND [20]	ND [20]	33.7	ND [20]	ND [20]	20.6	ND [20]	ND [20]
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	4.4	4.1	4.9	3.9	3.7	3.9	6.4	4	6.3	8.8	6.1	1.8
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85568 MW-12AR 08/19/09	H85569 MW-13B 08/19/09	H85570 MW-13AR 08/19/09	H85571 DUP [MW-13AR] 08/19/09	H85572 MW-8BR 08/19/09	H85573 MW-8AR 08/19/09	H85574 MW-14AR 08/20/09	H85575 DUP [MW-14AR] 08/20/09	H85576 MW-15AR 08/20/09	H85577 MW-3AR 08/21/09	H85578 MW-11RR 11/10/09	H85579 MW-1AR 11/10/09
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.5]	ND [9.6]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.7]	ND [9.5]	ND [9.7]	ND [9.5]	ND [9.6]
Naphthalene	13	--	µg/L	ND [9.5]	ND [9.6]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.7]	ND [9.5]	ND [9.7]	ND [9.5]	ND [9.6]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.05]	ND [0.05]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1221	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	0.048 J	ND [0.05]	ND [0.05]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1232	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.05]	ND [0.05]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1242	--	--	µg/L	ND [0.047]	ND [0.047]	0.064	0.05	ND [0.048]	ND [0.048]	ND [0.05]	ND [0.05]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1248	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.05]	ND [0.05]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1254	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.05]	ND [0.05]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1260	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.05]	ND [0.05]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Total PCBs	0.2	--	µg/L	ND [0.047]	ND [0.047]	0.064	0.05	ND [0.048]	0.048 J	ND [0.05]	ND [0.05]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Metals															
Barium	--	2,300	µg/L	546	193 B	841	827	249	436	281	277	228	218	476	283
Calcium	--	--	µg/L	195,000	147,000	263,000	258,000	171,000	205,000	171,000	169,000	152,000	136,000	157,000	166,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	58,100	7,360	71,200	69,700	14,900	40,700	10,900	10,700	8,970	16,700	5,670	57,200
Sodium	--	--	µg/L	67,200	96,600	33,600	33,000	89,900	34,700	175,000	174,000	109,000	86,800	89,600	13,700
Thallium	--	160	µg/L	ND [1.1]	ND [1.1]	2.2 B	1.7 B	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]	ND [1.1]	ND [25] UB	ND [0.5]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	46.7	ND [20]	20.6	20.6	ND [20]	31.5	ND [20]	ND [20]	ND [20]	ND [20]	33.7	ND [20]
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	11.8 J	2.6	8.4	8.1	4.8	8.8	4.2	4.4	4.2	3.9	6.8	7.6
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85580 MW-16A 11/10/09	H85582 MW-16B 11/10/09	H85583 MW-12B 11/10/09	H85584 MW-12AR 11/11/09	H85585 MW-13B 11/11/09	H85586 MW-13AR 11/11/09	H85587 DUP [MW-13AR] 11/11/09	H85588 MW-8BR 11/11/09	H85589 MW-8AR 11/12/09	H85590 MW-14AR 11/12/09	H85591 DUP [MW-14AR] 11/12/09	H85592 MW-15AR 11/12/09
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.6]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.7]	ND [9.6]	ND [9.6]	ND [9.7]
Naphthalene	13	--	µg/L	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.6]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.7]	ND [9.6]	ND [9.6]	ND [9.7]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1221	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	0.053
Aroclor 1232	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1242	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	0.079	0.055	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1248	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1254	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Aroclor 1260	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]
Total PCBs	0.2	--	µg/L	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	0.079	0.055	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	0.053
Metals															
Barium	--	2,300	µg/L	431	516	248	536	203	850	842	241	407	268	258	284
Calcium	--	--	µg/L	162,000	158,000	132,000	189,000	142,000	265,000	263,000	153,000	215,000	164,000	158,000	172,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	12,200	8,450	5,150	52,900	7,670	72,800	72,200	13,900	32,900	11,100	10,800	10,800
Sodium	--	--	µg/L	81,800	89,600	96,200	67,900	93,700	19,200	18,800	93,000	23,000	364,000	360,000	326,000
Thallium	--	160	µg/L	ND [0.5]	ND [0.5]	0.6 B	ND [0.5]	ND [0.5]	ND [0.5]	ND [25] UB	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.5]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	35.9	44.6	ND [20]	42.4	ND [20]	42.4	33.7	ND [20]	25.5	22	22	23.8
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	8.4	6.6	2	12	2.9	8.3	8.8	4.4	6.9	4.8	4.9	5.5
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85593 MW-3AR 11/12/09	H85594 MW-2R 11/13/09	H85595 MW-7 11/09/09	H85596 MW-2R 02/15/10	H85597 MW-7 02/16/10	H85598 MW-11RR 02/16/10	H85599 DUP [MW-11RR] 02/16/10	H85600 MW-1AR 02/16/10	H85602 MW-16A 02/16/10	H85603 MW-16B 02/16/10	H85604 MW-12B 02/17/10	H85605 MW-12AR 02/17/10
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	1.3 J	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.7]	ND [9.6]	ND [9.4]	ND [9.5]	ND [9.6]	ND [9.7]	ND [10]	ND [9.7]	ND [9.4]
Naphthalene	13	--	µg/L	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.7]	ND [9.6]	ND [9.4]	ND [9.5]	ND [9.6]	ND [9.7]	ND [10]	ND [9.7]	ND [9.4]
Phenol	210	--	µg/L	NA	NA	NA	ND [9.7]	ND [9.6]	ND [9.4]	ND [9.5]	ND [9.6]	ND [9.7]	ND [10]	ND [9.7]	ND [9.4]
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.048] UJ	ND [0.048]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]
Aroclor 1221	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.048] UJ	ND [0.048]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]
Aroclor 1232	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.048] UJ	ND [0.048]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]
Aroclor 1242	--	--	µg/L	0.025 J	ND [0.047]	ND [0.048] UJ	ND [0.048]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]
Aroclor 1248	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.048] UJ	ND [0.048]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]
Aroclor 1254	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.048] UJ	ND [0.048]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]
Aroclor 1260	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.048] UJ	ND [0.048]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]
Total PCBs	0.2	--	µg/L	0.025 J	ND [0.047]	ND [0.048] UJ	ND [0.048]	ND [0.049]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]
Metals															
Barium	--	2,300	µg/L	346	160 B	118 B	142 BJ	87.1 BJ	421 J	411 J	255 J	396 J	489 J	239 J	532 J
Calcium	--	--	µg/L	204,000	133,000	214,000	145,000	195,000	146,000	149,000	179,000	158,000	156,000	130,000	195,000
Chromium[6]	11	--	µg/L	NA	NA	NA	ND [0.11]	ND [0.11]	ND [10] UB	ND [0.11]	ND [0.11]	ND [0.11]	ND [10] UB	ND [10] UB	ND [10] UB
Iron	--	--	µg/L	35,300	15,100	12,400	10,700	5,070	4,190	5,310	57,300	10,900	7,500	4,720	48,900
Sodium	--	--	µg/L	86,800	449,000	59,400	69,200 J	51,900 J	91,100 J	92,100 J	9,470 J	87,800 J	90,400 J	106,000 J	71,100 J
Thallium	--	160	µg/L	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.63]	ND [0.63]	ND [0.63]	ND [0.63]	ND [0.63]	ND [0.63]	ND [0.63]	ND [0.63]	ND [0.63]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	ND [0.36]	ND [0.36]	ND [0.36]	ND [0.36]	ND [50] UB	ND [0.36]	ND [0.36]	ND [0.36]	ND [0.36]
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	390	320	450	440	520	520	480	360	710
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	ND [20]	ND [20]	25	ND [20]	ND [20]	27.3	ND [20]	20.3	27.3	20.3	23.8	43
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	0.027 J	0.11	0.018 J	ND [0.1]	0.03 J	0.037 J	NA	0.04 J	NA
Sulfate	--	--	mg/L	NA	NA	NA	62	320	33	39	0.58	23	29	69	1
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	6	4.1	5.9	4.8	4.9	5.6	5.5	6.3	9.6	8.1	2.4	14.7
Total Suspended Solids	--	--	mg/L	NA	NA	NA	18.4	27.8	11.1	13.3	55.1	26.8	18.5	9.3	63.9

See Notes on Page 27.

TABLE 1

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POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85606 MW-13B 02/17/10	H85607 DUP [MW-13B] 02/17/10	H85608 MW-13AR 02/17/10	H85609 MW-8BR 02/18/10	H85610 MW-8AR 02/18/10	H85611 MW-14AR 02/18/10	H85612 MW-3AR 02/18/10	H85613 MW-15AR 02/18/10	H85614 MW-7 05/24/10	H85615 MW-2R 05/24/10	H85616 MW-1AR 05/24/10	H85617 MW-11RR 05/24/10
VOCs															
Acetone	1,700	--	µg/L	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	ND [5.0]	NA	NA	NA	NA
SVOCs															
4-Methylphenol[6]	71	--	µg/L	ND [9.4]	ND [9.4]	ND [9.8]	ND [9.4]	ND [9.4]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.4]	ND [9.4]	ND [9.4]	ND [10]
Naphthalene	13	--	µg/L	ND [9.4]	ND [9.4]	ND [9.8]	ND [9.4]	ND [9.4]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.4]	ND [9.4]	ND [9.4]	ND [10]
Phenol	210	--	µg/L	ND [9.4]	ND [9.4]	ND [9.8]	ND [9.4]	ND [9.4]	ND [9.5]	ND [9.5]	ND [9.5]	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.049]	ND [0.049]	ND [0.047]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.047]
Aroclor 1221	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.049]	ND [0.049]	ND [0.047]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.047]
Aroclor 1232	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.049]	ND [0.049]	ND [0.047]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.047]
Aroclor 1242	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.049]	0.057	ND [0.047]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.047]
Aroclor 1248	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.049]	ND [0.049]	ND [0.047]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.047]
Aroclor 1254	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.049]	ND [0.049]	ND [0.047]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.047]
Aroclor 1260	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.049]	ND [0.049]	ND [0.047]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.047]
Total PCBs	0.2	--	µg/L	ND [0.047]	ND [0.047]	ND [0.049]	0.057	ND [0.047]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.047]	ND [0.047]	ND [0.047]
Metals															
Barium	--	2,300	µg/L	169 BJ	174 J	744 J	217 J	417 J	226 J	277 J	291 J	62.3 B	155 B	246	364
Calcium	--	--	µg/L	134,000	130,000	251,000	150,000	232,000	147,000	182,000	178,000	163,000	132,000	186,000	136,000
Chromium[6]	11	--	µg/L	ND [10] UB	ND [10] UB	ND [10] UB	ND [0.11]	ND [0.11]	ND [10] UB	ND [0.11]	ND [10] UB	NA	NA	NA	NA
Iron	--	--	µg/L	5,920	5,900	70,000	13,300	41,000	9,700	18,100	11,400	4,350	15,400	62,700	3,980
Sodium	--	--	µg/L	98,500 J	95,700 J	20,200 J	93,800 J	31,200 J	164,000 J	240,000 J	252,000 J	44,800	49,600	8,070	78,900
Thallium	--	160	µg/L	ND [0.63]	ND [0.63]	ND [0.63]	ND [0.63]	ND [0.63]	ND [0.63]	ND [0.63]	ND [0.63]	ND [3.6]	ND [3.6]	ND [3.6]	ND [3.6]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	ND [0.36]	ND [0.36]	ND [50] UB	ND [0.36]	ND [0.36]	ND [0.36]	ND [0.36]	ND [0.36]	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	380	380	810	440	710	430	440	450	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	ND [20]	23.8	27.3	23.8	37.8	43	30.8	41.3 J	ND [20]	ND [20]	46.5	ND [20]
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	0.021 J	0.076 J	0.12	0.024 J	0.035 J	0.28	NA	0.037 J	NA	NA	NA	NA
Sulfate	--	--	mg/L	53	57	0.26	35	1.2	63	120	90	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	3.4	3.6	11.1	6.2	8.3	6.2	7.2	6.3	3.2	3.4	5.5	5
Total Suspended Solids	--	--	mg/L	10.8	12	38	26.5	61.1	17.8	37.5	23.6	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85619 MW-16B 05/25/10	H85620 MW-16A 05/25/10	H85621 MW-12B 05/25/10	H85622 DUP [MW-12B] 05/25/10	H85623 MW-12AR 05/25/10	H85624 MW-13B 05/26/10	H85625 MW-13AR 05/26/10	H85626 MW-8AR 05/26/10	H85627 MW-8BR 05/26/10	H85628 MW-14AR 05/26/10	H85629 MW-15AR 05/27/10	H85630 DUP [MW-15AR] 05/27/10
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.5]	ND [10]	ND [9.5]	ND [9.5]	ND [9.4]	ND [9.4]	ND [9.5]	ND [9.5]	ND [9.6]	ND [9.5]	ND [9.6]	ND [9.6]
Naphthalene	13	--	µg/L	ND [9.5]	ND [10]	ND [9.5]	ND [9.5]	ND [9.4]	ND [9.4]	ND [9.5]	ND [9.5]	ND [9.6]	ND [9.5]	ND [9.6]	ND [9.6]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.051] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1221	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.051] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1232	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.051] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1242	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.051] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1248	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.051] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1254	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.051] UJ	ND [0.047]	ND [0.047] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]
Aroclor 1260	--	--	µg/L	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.051] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]
Total PCBs	0.2	--	µg/L	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.051] UJ	ND [0.047]	ND [0.047] UJ	ND [0.047]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.047]
Metals															
Barium	--	2,300	µg/L	485	379	228	226	488	160 B	816	271	190 B	222	279	272
Calcium	--	--	µg/L	161,000	156,000	127,000	128,000	185,000	125,000	268,000	199,000	141,000	151,000	170,000	167,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	7,740	12,000	3,800	3,810	43,600	5,970	86,200	26,000	12,000	10,300	11,000	10,900
Sodium	--	--	µg/L	84,700	75,900	90,600	91,600	71,300	87,700	12,700	1,060 B	87,200	154,000	224,000	222,000
Thallium	--	160	µg/L	ND [3.6]	ND [3.6]	ND [3.6]	ND [3.6]	ND [3.6]	ND [3.6]	ND [3.6]	ND [3.6]	ND [3.6]	ND [3.6]	ND [3.6]	ND [3.6]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	20.3	27.3	ND [20]	20.3	36	ND [20]	27.3 J	23.8	ND [20]	ND [20]	ND [20]	27.3
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	7.9	8.3	1.9	1.9	11.9	2.8	6	3.8	3.5	3.8	5.2	5.3
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85631 MW-3AR 05/27/10	H85632 MW-7 08/23/10	H85633 MW-2R 08/23/10	H85634 DUP [MW-2R] 08/23/10	H85635 MW-11RR 08/24/10	H85636 MW-1AR 08/24/10	H85637 Rinse Blank [MW11RR] 08/24/10	H85638 MW-16A 08/24/10	H85639 MW-16B 08/24/10	H85640 MW-12AR 08/24/10	H85641 MW-12B 08/25/10	H85642 MW-13AR 08/25/10
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [10]	ND [9.6]	ND [10]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.6]	ND [9.5]	ND [9.4]	ND [10]	ND [9.6]	ND [9.4]
Naphthalene	13	--	µg/L	ND [10]	ND [9.6]	ND [10]	ND [9.4]	ND [9.4]	ND [9.4]	ND [9.6]	ND [9.5]	ND [9.4]	ND [10]	ND [9.6]	ND [9.4]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.047]
Aroclor 1221	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.047]
Aroclor 1232	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.047]
Aroclor 1242	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	0.044 J
Aroclor 1248	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.047]
Aroclor 1254	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.047]
Aroclor 1260	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	ND [0.047]
Total PCBs	0.2	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]	0.044 J
Metals															
Barium	--	2,300	µg/L	267	75.1 J	135 J	147 J	478	328	ND [200]	428	500	487	252	742
Calcium	--	--	µg/L	171,000	155,000	129,000	137,000	153,000	220,000	318 J	165,000	162,000	188,000	135,000	243,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	23,100	12,500	10,700	11,200	5,880	73,300	33.7 J	12,100	7,650	39,700	5,130	70,200
Sodium	--	--	µg/L	150,000	57,900	70,600	76,800	94,400	12,100	1,100 J	82,800	88,200	82,500	99,000	31,500
Thallium	--	160	µg/L	ND [3.6]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	ND [20]	ND [20]	ND [20]	ND [20]	25.2	33.4	ND [20]	25.2	33.4	45.6	ND [20]	33.4
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	5.1	3.3	4.4	4.4	6.9	6.8	ND [1]	8.9	7.8	12.5	2	6.7
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

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POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85643 MW-13B 08/25/10	H85644 DUP [MW-13B] 08/25/10	H85645 MW-8BR 08/25/10	H85646 MW-8AR 08/26/10	H85647 MW-14AR 08/26/10	H85648 MW-15AR 08/27/10	H85649 MW-3AR 08/27/10	H85650 MW-7 11/15/10	H85651 MW-1AR 11/16/10	H85652 MW-2R 11/16/10	H85653 MW-11RR 11/16/10	H85654 Rinse Blank [MW-11RR] 11/16/10
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.4]	ND [9.4]	ND [9.6]	ND [9.6]	ND [9.6]	ND [9.6]	ND [9.5]	ND [9.6]	ND [9.5]	ND [9.6]	ND [9.6]	ND [9.6]
Naphthalene	13	--	µg/L	ND [9.4]	ND [9.4]	ND [9.6]	ND [9.6]	ND [9.6]	ND [9.6]	ND [9.5]	ND [9.6]	ND [9.5]	ND [9.6]	ND [9.6]	ND [9.6]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]
Aroclor 1221	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]
Aroclor 1232	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]
Aroclor 1242	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.048]	ND [0.048] UJ	ND [0.049]	ND [0.048]	ND [0.048]
Aroclor 1248	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]
Aroclor 1254	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.048]	ND [0.048] UJ	ND [0.049]	ND [0.048]	ND [0.048]
Aroclor 1260	--	--	µg/L	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.049]	ND [0.048]	ND [0.048]
Total PCBs	0.2	--	µg/L	ND [0.047]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.047]	ND [0.048]	ND [0.048] UJ	ND [0.049]	ND [0.048]	ND [0.048]
Metals															
Barium	--	2,300	µg/L	177 J	170 J	213	380	260	304	245	71.6 J	320	151 J	452	ND [200]
Calcium	--	--	µg/L	130,000	125,000	146,000	206,000	169,000	178,000	153,000	166,000	214,000	151,000	155,000	114 J
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	6,660	6,400	12,400	33,800	11,000	11,500	12,300	4,430	77,200	10,700	6,160	ND [200]
Sodium	--	--	µg/L	93,200	89,700	91,400	32,200	185,000	248,000	195,000	51,900	9,160	77,600	96,600	163 J
Thallium	--	160	µg/L	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25] UB
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	ND [20]	23.2	ND [20]	29.3	ND [20]	27.2	ND [20]	ND [20]	21.1	ND [20]	ND [20]	ND [20]
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	3	2.5	4.3	11	5.1	5.7	5.6	3.9	6.4	4	5.7	ND [1]
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

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POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85655 MW-16A 11/16/10	H85656 MW-16B 11/16/10	H85657 MW-12B 11/17/10	H85658 MW-13B 11/17/10	H85659 MW-12AR 11/17/10	H85660 DUP [MW-12AR] 11/17/10	H85661 MW-8BR 11/18/10	H85662 MW-13AR 11/18/10	H85663 MW-8AR 11/18/10	H85664 MW-14AR 11/18/10	H85665 MW-3AR 11/19/10	H85666 MW-15AR 11/19/10
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.6]	ND [9.5]	ND [9.7]	ND [9.6]	ND [9.6]	ND [9.4]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.5]	ND [9.4]
Naphthalene	13	--	µg/L	ND [9.6]	ND [9.5]	ND [9.7]	ND [9.6]	ND [9.6]	ND [9.4]	ND [9.5]	ND [9.5]	ND [9.5] UJ	ND [9.5]	ND [9.5]	ND [9.4]
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]
Aroclor 1221	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]
Aroclor 1232	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]
Aroclor 1242	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]
Aroclor 1248	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]
Aroclor 1254	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]
Aroclor 1260	--	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]
Total PCBs	0.2	--	µg/L	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.047]
Metals															
Barium	--	2,300	µg/L	386	496	250	178 J	580	561	215	667	393	226	242	268
Calcium	--	--	µg/L	158,000	164,000	136,000	131,000	218,000	214,000	150,000	241,000	187,000	151,000	152,000	157,000
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	10,700	7,760	4,960	6,390	42,700	41,800	13,500	64,800	27,900	10,100	10,500	10,100
Sodium	--	--	µg/L	90,700	96,900	101,000	95,800	89,500	87,300	99,800	37,700	81,500	137,000	193,000	222,000
Thallium	--	160	µg/L	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]	ND [25]
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	ND [20]	ND [20]	ND [20]	ND [20]	37.4	25.2	ND [20]	ND [20]	23.2	31.3	ND [20]	ND [20]
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	7.2	6.9	2.5	2.6	15.3 D	14.9	3.8	8.4	14.4	4.4	5.2	5.1
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85667 DUP [MW-15AR] 11/19/10	H85668 MW-7 05/09/11	H85669 MW-2R 05/09/11	H85670 MW-1AR 05/09/11	H85671 MW-16A 05/10/11	H85672 MW-11RR 05/10/11	H85673 RINSE BLANK [MW-11RR] 05/10/11	H85674 MW-16B 05/10/11	H85675 DUP [MW-16B] 05/10/11	H85676 MW-12B 05/10/11	H85677 MW-12AR 05/11/11	H85678 MW-13B 05/11/11
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	ND [9.5]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	13	--	µg/L	ND [9.5]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.050] UJ
Aroclor 1221	--	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.050] UJ
Aroclor 1232	--	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.050] UJ
Aroclor 1242	--	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.050] UJ
Aroclor 1248	--	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.050] UJ
Aroclor 1254	--	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.050] UJ
Aroclor 1260	--	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.050] UJ
Total PCBs	0.2	--	µg/L	ND [0.047]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048] UJ	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.048]	ND [0.050] UJ
Metals															
Barium	--	2,300	µg/L	265	265	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	--	--	µg/L	156,000	156,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium[8]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	9,900	9,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	--	--	µg/L	219,000	219,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	--	160	µg/L	ND [25]	ND [25]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	ND [20]	ND [20]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	5.1	6.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85679 DUP [MW-13B] 05/11/11	H85680 MW-13AR 05/11/11	H85681 MW-8BR 05/11/11	H85682 MW-8AR 05/11/11	H85683 MW-14AR 05/11/11	H85684 MW-15AR 05/11/11	H85685 MW-3AR 05/11/11	H85686 MW-2R 06/04/12	H85687 MW-1AR 06/04/12	H85688 MW-16A 06/04/12	H85689 MW-11RR 06/04/12	H85690 Rinse Blank [MW-11RR] 06/04/12
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	13	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.050] UJ	ND [0.048] UJ	ND [0.049] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.052]	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.050]
Aroclor 1221	--	--	µg/L	ND [0.050] UJ	ND [0.048] UJ	ND [0.049] UJ	ND [0.048] UJ	ND [0.048] UJ	0.052 J	ND [0.048] UJ	ND [0.052]	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.050]
Aroclor 1232	--	--	µg/L	ND [0.050] UJ	ND [0.048] UJ	ND [0.049] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.052]	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.050]
Aroclor 1242	--	--	µg/L	ND [0.050] UJ	ND [0.048] UJ	ND [0.049] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.052]	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.050]
Aroclor 1248	--	--	µg/L	ND [0.050] UJ	ND [0.048] UJ	ND [0.049] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.052]	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.050]
Aroclor 1254	--	--	µg/L	ND [0.050] UJ	ND [0.048] UJ	ND [0.049] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.052]	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.050]
Aroclor 1260	--	--	µg/L	ND [0.050] UJ	ND [0.048] UJ	ND [0.049] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.048] UJ	ND [0.052]	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.050]
Total PCBs	0.2	--	µg/L	ND [0.050] UJ	ND [0.048] UJ	ND [0.049] UJ	ND [0.048] UJ	ND [0.048] UJ	0.052 J	ND [0.048] UJ	ND [0.052]	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.050]
Metals															
Barium	--	2,300	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	--	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	--	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	--	160	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85691 MW-16B 06/05/12	H85692 MW-12AR 06/05/12	H85693 DUP [MW-12AR] 06/05/12	H85694 MW-13B 06/05/12	H85695 MW-12B 06/05/12	H85696 MW-13AR 06/05/12	H85697 MW-3AR 06/05/12	H85698 MW-15AR 06/05/12	H85699 Rinse Blank [MW-15AR] 06/06/12	H85700 Rinse Blank [MW-14AR] 06/06/12	H85701 MW-14AR 06/06/12	H85702 DUP [MW-14AR] 06/06/12
VOCs															
Acetone	1,700	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs															
4-Methylphenol[5]	71	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	13	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	210	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
Aroclor 1016	--	--	µg/L	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.049]	ND [0.053]	ND [0.048]	ND [0.047]	ND [0.055]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.049]
Aroclor 1221	--	--	µg/L	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.049]	ND [0.053]	ND [0.048]	ND [0.047]	ND [0.055]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.049]
Aroclor 1232	--	--	µg/L	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.049]	ND [0.053]	ND [0.048]	ND [0.047]	ND [0.055]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.049]
Aroclor 1242	--	--	µg/L	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.049]	ND [0.053]	ND [0.048]	ND [0.047]	ND [0.055]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.049]
Aroclor 1248	--	--	µg/L	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.049]	ND [0.053]	ND [0.048]	ND [0.047]	ND [0.055]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.049]
Aroclor 1254	--	--	µg/L	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.049]	ND [0.053]	ND [0.048]	ND [0.047]	ND [0.055]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.049]
Aroclor 1260	--	--	µg/L	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.049]	ND [0.053]	ND [0.048]	ND [0.047]	ND [0.055]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.049]
Total PCBs	0.2	--	µg/L	ND [0.049]	ND [0.054]	ND [0.048]	ND [0.049]	ND [0.053]	ND [0.048]	ND [0.047]	ND [0.055]	ND [0.048]	ND [0.047]	ND [0.049]	ND [0.049]
Metals															
Barium	--	2,300	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	--	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium[6]	11	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	--	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	--	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	--	160	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	--	1,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Suspended Solids	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 27.

TABLE 1

POST-REMEDIATION GROUNDWATER SAMPLING ANALYTICAL RESULTS SUMMARY

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
KING HIGHWAY LANDFILL OPERABLE UNIT

Sample ID: / Well ID: / Date Collected:	Generic GSI Values	Site Specific WQBEL	Units	H85703 MW-8BR 06/06/12	H85704 MW-8AR 06/06/12	H85705 MW-7 06/06/12
VOCs						
Acetone	1,700	--	µg/L	NA	NA	NA
SVOCs						
4-Methylphenol[5]	71	--	µg/L	NA	NA	NA
Naphthalene	13	--	µg/L	NA	NA	NA
Phenol	210	--	µg/L	NA	NA	NA
PCBs						
Aroclor 1016	--	--	µg/L	ND [0.055]	ND [0.053]	ND [0.048]
Aroclor 1221	--	--	µg/L	ND [0.055]	ND [0.053]	ND [0.048]
Aroclor 1232	--	--	µg/L	ND [0.055]	ND [0.053]	ND [0.048]
Aroclor 1242	--	--	µg/L	ND [0.055]	ND [0.053]	ND [0.048]
Aroclor 1248	--	--	µg/L	ND [0.055]	ND [0.053]	ND [0.048]
Aroclor 1254	--	--	µg/L	ND [0.055]	ND [0.053]	ND [0.048]
Aroclor 1260	--	--	µg/L	ND [0.055]	ND [0.053]	ND [0.048]
Total PCBs	0.2	--	µg/L	ND [0.055]	ND [0.053]	ND [0.048]
Metals						
Barium	--	2,300	µg/L	NA	NA	NA
Calcium	--	--	µg/L	NA	NA	NA
Chromium[6]	11	--	µg/L	NA	NA	NA
Iron	--	--	µg/L	NA	NA	NA
Sodium	--	--	µg/L	NA	NA	NA
Thallium	--	160	µg/L	NA	NA	NA
Zinc	--	1,200	µg/L	NA	NA	NA
Vanadium	12	--	µg/L	NA	NA	NA
Miscellaneous						
Bicarbonate Alkalinity	--	--	mg/L	NA	NA	NA
Carbonate Alkalinity	--	--	mg/L	NA	NA	NA
Chemical Oxygen Demand	--	--	mg/L	NA	NA	NA
Hydroxide Alkalinity	--	--	mg/L	NA	NA	NA
Nitrate/Nitrite Nitrogen	--	--	mg/L	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA
Total Alkalinity	--	--	mg/L	NA	NA	NA
Total Organic Carbon	--	--	mg/L	NA	NA	NA
Total Suspended Solids	--	--	mg/L	NA	NA	NA

Notes:

1. ND - Not detected. Practical quantitation limits are shown in brackets.
2. NA - Not analyzed.
3. µg/L - Micrograms per liter.
4. mg/L - Milligrams per liter.
5. GSI Value is for methylphenols.
6. *Total Chromium is being analyzed, but the GSI Value refers to Chromium (VI) oxidation state.*
7. The Generic GSI Values are obtained from the KHL-OU Hydrogeologic Monitoring Plan (September 2002).
8. The WQBEL values are per the MDEQ Surface Water Quality Division, as recommended in a January 22, 1998 interoffice communication.
9. Sample IDs H85549 and H85550 correspond to Matrix Spike/Matrix Spike Duplicate samples associated with Sample ID H85548, and were therefore not included hereon.

Definitions of Data Qualifiers:

B - The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).
J - The compound/analyte was positively identified; however, the associated numerical value is an estimated concentration only.
UJ - The compound/analyte was not detected above the reported sample quantitation/detection limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation/detection.
UB - The compound/analyte was considered non-detect at the listed value due to associated blank contamination.

Attachment 2B

OU4 Results

TABLE 2

SUMMARY OF
APRIL 2010 FOLLOW-UP GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location					*MW-101S*	*MW-101S*	*MW-101D*	*MW-102S*	*MW-102D*	*MW-102D*
Sample Identification					*GW-56393-040611-EV-002*	*GW-56393-040611-EV-003*	*GW-56393-040611-EV-001*	*GW-56393-040811-EV-017*	*GW-56393-040811-EV-015*	*GW-56393-040811-EV-016*
Sample Date					*4/6/2011*	*4/6/2011*	*4/6/2011*	*4/8/2011*	*4/8/2011*	*4/8/2011*
Sample Elevation (feet AMSL)					*702.35 - 663.35*	*702.35 - 663.35*	*664.33 - 589.33*	*701.18 - 691.18*	*664.43 - 619.43*	*664.43 - 619.43*
Screen Depth (feet bgs)					*32-39*	*32-39*	*70-75*	*3-10*	*40-45*	*40-45*
Sample Type		*Groundwater Cleanup Criteria* [1]				*Duplicate*				*Duplicate*
	Units	*a*	*b*	*c*						
Metals										
Aluminum	µg/L	50	50	-	8.7	9.6	**185**[ab]	**65.6**[ab]	43.1	**67.2**[ab]
Antimony	µg/L	6	6	130	0.05 U	0.02 J	0.11	0.05 U	0.05 U	0.05 U
Arsenic	µg/L	10	10	10	0.19 J	0.25 J	1.10	0.44 J	0.18 J	0.44 J
Barium	µg/L	2000	2000	1400	73.1	72.7	78.9	81.8	68.8	83.4
Beryllium	µg/L	4	4	41	0.004 J	0.020 U	0.022	0.005 J	0.004 J	0.004 J
Cadmium	µg/L	5	5	5.1	0.005 J	0.005 J	0.021	0.023	0.006 J	0.025
Chromium	µg/L	100	100	11	0.41	0.49	1.11	0.34 U	0.26 U	0.31 U
Cobalt	µg/L	40	100	100	0.124	0.128	1.040	0.515	0.153 J	0.506 J
Copper	µg/L	1000	1000	23	0.77	0.79	2.94	0.93	0.78	0.94
Iron	µg/L	300	300	-	80.8	68.5	**1510**[ab]	**426 J**[ab]	171 J	**430 J**[ab]
Lead	µg/L	4	4	34	0.041	0.048	1.200	0.207	0.183	0.208
Magnesium	µg/L	400000	1100000	-	25300	24900	24300	29000	24200	28900
Manganese	µg/L	50	50	5200	2.94	2.90	**65.8**[ab]	**579**[ab]	8.35 J	**577 J**[ab]
Mercury	µg/L	2	2	0.0013	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	µg/L	100	100	130	1.03	1.07	2.41	2.15	0.92	2.11
Selenium	µg/L	50	50	5	0.3 J	0.4 J	1.0 U	1.0 U	1.0 U	1.0 U
Silver	µg/L	34	98	0.2	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Sodium	µg/L	120000	350000	-	23400	23000	24900	20000	20900	19900
Thallium	µg/L	2	2	3.7	0.003 J	0.003 J	0.020 J	0.051	0.020 U	0.051
Vanadium	µg/L	4.5	62	12	0.17 J	0.16 J	1.08	0.36	0.26	0.34
Zinc	µg/L	2400	5000	310	0.78	1.21	52.4	1.27	1.46	1.43
PCBs										
Aroclor-1016 (PCB-1016)	µg/L	-	-	-	0.021 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Aroclor-1221 (PCB-1221)	µg/L	-	-	-	0.041 UJ	0.040 UJ	0.040 UJ	0.040 UJ	0.040 UJ	0.040 UJ
Aroclor-1232 (PCB-1232)	µg/L	-	-	-	0.021 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Aroclor-1242 (PCB-1242)	µg/L	-	-	-	0.021 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Aroclor-1248 (PCB-1248)	µg/L	-	-	-	0.021 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Aroclor-1254 (PCB-1254)	µg/L	-	-	-	0.021 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Aroclor-1260 (PCB-1260)	µg/L	-	-	-	0.021 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Total PCBs	µg/L	0.5	0.5	0.2	ND	ND	ND	ND	ND	ND

TABLE 2

SUMMARY OF
APRIL 2010 FOLLOW-UP GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location					*MW-101S*	*MW-101S*	*MW-101D*	*MW-102S*	*MW-102D*	*MW-102D*
Sample Identification					*GW-56393-040611-EV-002*	*GW-56393-040611-EV-003*	*GW-56393-040611-EV-001*	*GW-56393-040811-EV-017*	*GW-56393-040811-EV-015*	*GW-56393-040811-EV-016*
Sample Date					*4/6/2011*	*4/6/2011*	*4/6/2011*	*4/8/2011*	*4/8/2011*	*4/8/2011*
Sample Elevation (feet AMSL)					*702.35 - 663.35*	*702.35 - 663.35*	*664.33 - 589.33*	*701.18 - 691.18*	*664.43 - 619.43*	*664.43 - 619.43*
Screen Depth (feet bgs)					*32-39*	*32-39*	*70-75*	*3-10*	*40-45*	*40-45*
Sample Type	*Groundwater Cleanup Criteria* [1]					*Duplicate*				*Duplicate*
	Units	*a*	*b*	*c*						
Volatile Organic Compounds										
Acetone	µg/L	730	2100	1700	R	R	R	R	R	R
Benzene	µg/L	5	5	200	0.50 UJ	0.50 UJ	0.50 UJ	0.50 U	0.50 U	0.50 U
Bromobenzene	µg/L	18	50	-	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Bromodichloromethane	µg/L	80	80	ID	0.50 UJ	0.50 UJ	0.58	0.50 UJ	0.50 UJ	0.50 UJ
Bromoform	µg/L	80	80	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Bromomethane (Methyl bromide)	µg/L	10	29	35	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	13000	38000	2200	R	R	R	R	R	R
N-Butylbenzene	µg/L	80	230	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Carbon disulfide	µg/L	800	2300	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Carbon tetrachloride	µg/L	5	5	45	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chlorobenzene	µg/L	100	100	25	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chlorobromomethane	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chloroethane	µg/L	430	1700	1100	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chloroform (Trichloromethane)	µg/L	80	80	350	0.50 UJ	0.50 UJ	1.1	0.50 UJ	0.090 J	0.50 UJ
Chloromethane (Methyl chloride)	µg/L	260	1100	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.080 J	0.080 J	0.080 J
2-Chlorotoluene	µg/L	150	420	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
4-Chlorotoluene	µg/L	-	-	-	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Cymene (p-Isopropyltoluene)	µg/L	-	-	-	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.2	0.2	-	R	R	R	2.0 UJ	2.0 UJ	2.0 UJ
Dibromochloromethane	µg/L	80	80	ID	0.50 UJ	0.50 UJ	0.24 J	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	0.05	5.7	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Dibromomethane	µg/L	80	230	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dichlorobenzene	µg/L	600	600	13	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,3-Dichlorobenzene	µg/L	6.6	19	28	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,4-Dichlorobenzene	µg/L	75	75	17	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Dichlorodifluoromethane (CFC-12)	µg/L	1700	4800	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1-Dichloroethane	µg/L	880	2500	740	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dichloroethane	µg/L	5	5	360	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1-Dichloroethene	µg/L	7	7	130	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
cis-1,2-Dichloroethene	µg/L	70	70	620	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
trans-1,2-Dichloroethene	µg/L	100	100	1500	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,3-Dichloropropane	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dichloropropane	µg/L	5	5	230	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
2,2-Dichloropropane	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1-Dichloropropene	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
cis-1,3-Dichloropropene	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ

TABLE 2

SUMMARY OF
APRIL 2010 FOLLOW-UP GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location					*MW-101S*	*MW-101S*	*MW-101D*	*MW-102S*	*MW-102D*	*MW-102D*
Sample Identification					*GW-56393-040611-EV-002*	*GW-56393-040611-EV-003*	*GW-56393-040611-EV-001*	*GW-56393-040811-EV-017*	*GW-56393-040811-EV-015*	*GW-56393-040811-EV-016*
Sample Date					*4/6/2011*	*4/6/2011*	*4/6/2011*	*4/8/2011*	*4/8/2011*	*4/8/2011*
Sample Elevation (feet AMSL)					*702.35 - 663.35*	*702.35 - 663.35*	*664.33 - 589.33*	*701.18 - 691.18*	*664.43 - 619.43*	*664.43 - 619.43*
Screen Depth (feet bgs)					*32-39*	*32-39*	*70-75*	*3-10*	*40-45*	*40-45*
Sample Type	*Groundwater Cleanup Criteria* [1]					*Duplicate*				*Duplicate*
	Units	*a*	*b*	*c*						
trans-1,3-Dichloropropene	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Ethylbenzene	µg/L	74	74	18	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Hexachlorobutadiene	µg/L	15	42	0.053	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
2-Hexanone	µg/L	1000	2900	ID	R	R	R	20 UJ	20 UJ	20 UJ
Isopropyl benzene	µg/L	800	2300	28	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
4-Methyl-2-pentanone(MIBK)	µg/L	1800	5200	ID	R	R	R	R	R	R
Methylene chloride	µg/L	5	5	1500	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Naphthalene	µg/L	520	1500	11	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
N-Propylbenzene	µg/L	80	230	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
2-Phenylbutane (sec-Butylbenzene)	µg/L	80	230	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Styrene	µg/L	100	100	80	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
tert-Butylbenzene	µg/L	80	230	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,1,2,2-Tetrachloroethane	µg/L	8.5	35	78	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1,1,2-Tetrachloroethane	µg/L	77	320	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Tetrachloroethene	µg/L	5	5	60	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Toluene	µg/L	790	790	270	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2,4-Trichlorobenzene	µg/L	70	70	99	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,2,3-Trichlorobenzene	µg/L	-	-	-	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,1,1-Trichloroethane	µg/L	200	200	89	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1,2-Trichloroethane	µg/L	5	5	330	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Trichloroethene	µg/L	5	5	200	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Trichlorofluoromethane (CFC-11)	µg/L	2600	7300	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2,3-Trichloropropane	µg/L	42	120	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2,4-Trimethylbenzene	µg/L	63	63	17	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,3,5-Trimethylbenzene	µg/L	72	72	45	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Vinyl chloride	µg/L	2	2	13	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
o-Xylene	µg/L	280	280	41	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
m&p-Xylenes	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Field Parameters										
Conductivity, field	mS/cm	-	-	-	0.67	0.67	0.676	0.699	0.595	0.595
Dissolved oxygen (DO), field	mg/L	-	-	-	4.07	4.07	3.82	0.58	0.76	0.76
Oxidation reduction potential (ORP), field	millivolts	-	-	-	84	84	91	154	139	139
pH, field	s.u.	6.5 - 8.5	6.5 - 8.5	-	8.21	8.21	8.21	8.5	8.34	8.34
Temperature, field	Deg C	-	-	-	7.96	7.96	9.25	6.6	8.27	8.27
Turbidity, field	NTU	-	-	-	6.33	6.33	56.9	46.9	14.4	14.4

TABLE 2

SUMMARY OF
APRIL 2010 FOLLOW-UP GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location					MW-103D	MW-104S	MW-104D	MW-105S	MW-105D	MW-106S
Sample Identification					*GW-56393-040711-EV-014*	*GW-56393-040711-EV-012*	*GW-56393-040711-EV-013*	*GW-56393-040711-EV-010*	*GW-56393-040711-EV-011*	*GW-56393-040711-EV-008*
Sample Date					*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/7/2011*
Sample Elevation (feet AMSL)					*674.37 - 639.37*	*684.86 - 658.86*	*663.48 - 618.48*	*699.89 - 687.89*	*662.79 - 615.79*	*701.89 - 692.89*
Screen Depth (feet bgs)					*30-35*	*20-25*	*40-45*	*5-12*	*42-47*	*2-9*
Sample Type	*Groundwater Cleanup Criteria* [1]									
	Units	*a*	*b*	*c*						
Metals										
Aluminum	µg/L	50	50	-	10.5	**97.4**[ab]	18.4	33.1	7.6	27.8
Antimony	µg/L	6	6	130	0.05 U	0.05 U	0.07 U	0.05 U	0.05 U	0.11 U
Arsenic	µg/L	10	10	10	0.50 U	0.43 J	0.28 J	0.25 J	0.50 U	**15.3**[ab]
Barium	µg/L	2000	2000	1400	67.3	73.4	79.1	146	74.4	538
Beryllium	µg/L	4	4	41	0.020 U	0.005 J	0.020 U	0.020 U	0.020 U	0.003 J
Cadmium	µg/L	5	5	5.1	0.011 J	0.010 J	0.017 J	0.013 J	0.005 J	0.009 J
Chromium	µg/L	100	100	11	0.29 U	0.35 U	0.60	0.24 U	0.22 U	0.40
Cobalt	µg/L	40	100	100	0.117	0.302	0.293	0.608	0.126	0.760
Copper	µg/L	1000	1000	23	0.62	0.92	0.76	0.76	0.92	1.68
Iron	µg/L	300	300	-	19.6 J	**474 J**[ab]	34.4 J	**419 J**[ab]	16.8 J	**20800 J**[ab]
Lead	µg/L	4	4	34	0.032	0.323	0.080	0.111	0.070	0.330
Magnesium	µg/L	400000	1100000	-	25300	25500	25600	31800	26000	37000
Manganese	µg/L	50	50	5200	5.05	13.5	**83.7**[ab]	**208**[ab]	2.12	**483**[ab]
Mercury	µg/L	2	2	0.0013	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	µg/L	100	100	130	1.15	1.24	1.43	1.92	0.98	1.87
Selenium	µg/L	50	50	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Silver	µg/L	34	98	0.2	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Sodium	µg/L	120000	350000	-	22400	24800	24900	25000	21900	21500
Thallium	µg/L	2	2	3.7	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Vanadium	µg/L	4.5	62	12	0.18 J	0.48	0.25	0.18 J	0.14 J	0.29
Zinc	µg/L	2400	5000	310	1.52	1.50	2.48	0.92	1.23	4.82
PCBs										
Aroclor-1016 (PCB-1016)	µg/L	-	-	-	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Aroclor-1221 (PCB-1221)	µg/L	-	-	-	0.040 UJ	0.040 UJ	0.040 UJ	0.040 UJ	0.040 UJ	0.040 UJ
Aroclor-1232 (PCB-1232)	µg/L	-	-	-	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Aroclor-1242 (PCB-1242)	µg/L	-	-	-	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Aroclor-1248 (PCB-1248)	µg/L	-	-	-	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Aroclor-1254 (PCB-1254)	µg/L	-	-	-	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Aroclor-1260 (PCB-1260)	µg/L	-	-	-	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Total PCBs	µg/L	0.5	0.5	0.2	ND	ND	ND	ND	ND	ND

TABLE 2

SUMMARY OF
APRIL 2010 FOLLOW-UP GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location					*MW-103D*	*MW-104S*	*MW-104D*	*MW-105S*	*MW-105D*	*MW-106S*
Sample Identification					*GW-56393-040711-EV-014*	*GW-56393-040711-EV-012*	*GW-56393-040711-EV-013*	*GW-56393-040711-EV-010*	*GW-56393-040711-EV-011*	*GW-56393-040711-EV-008*
Sample Date					*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/7/2011*
Sample Elevation (feet AMSL)					*674.37 - 639.37*	*684.86 - 658.86*	*663.48 - 618.48*	*699.89 - 687.89*	*662.79 - 615.79*	*701.89 - 692.89*
Screen Depth (feet bgs)					30-35	20-25	40-45	5-12	42-47	2-9
Sample Type	*Groundwater Cleanup Criteria* [1]									
	Units	*a*	*b*	*c*						
Volatile Organic Compounds										
Acetone	µg/L	730	2100	1700	R	R	R	R	R	R
Benzene	µg/L	5	5	200	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromobenzene	µg/L	18	50	-	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Bromodichloromethane	µg/L	80	80	ID	0.50 UJ	0.50 UJ	0.45 J	0.50 UJ	0.50 UJ	0.50 UJ
Bromoform	µg/L	80	80	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Bromomethane (Methyl bromide)	µg/L	10	29	35	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	13000	38000	2200	R	R	R	R	R	R
N-Butylbenzene	µg/L	80	230	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Carbon disulfide	µg/L	800	2300	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Carbon tetrachloride	µg/L	5	5	45	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chlorobenzene	µg/L	100	100	25	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chlorobromomethane	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chloroethane	µg/L	430	1700	1100	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chloroform (Trichloromethane)	µg/L	80	80	350	0.50 UJ	0.50 UJ	0.58	0.50 UJ	0.090 J	0.50 UJ
Chloromethane (Methyl chloride)	µg/L	260	1100	ID	0.12 J	0.50 UJ	0.29 J	0.50 UJ	0.50 UJ	0.50 UJ
2-Chlorotoluene	µg/L	150	420	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
4-Chlorotoluene	µg/L	-	-	-	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Cymene (p-Isopropyltoluene)	µg/L	-	-	-	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.2	0.2	-	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Dibromochloromethane	µg/L	80	80	ID	0.50 UJ	0.50 UJ	0.38 J	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	0.05	5.7	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Dibromomethane	µg/L	80	230	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dichlorobenzene	µg/L	600	600	13	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,3-Dichlorobenzene	µg/L	6.6	19	28	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,4-Dichlorobenzene	µg/L	75	75	17	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Dichlorodifluoromethane (CFC-12)	µg/L	1700	4800	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1-Dichloroethane	µg/L	880	2500	740	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dichloroethane	µg/L	5	5	360	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1-Dichloroethene	µg/L	7	7	130	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
cis-1,2-Dichloroethene	µg/L	70	70	620	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
trans-1,2-Dichloroethene	µg/L	100	100	1500	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,3-Dichloropropane	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dichloropropane	µg/L	5	5	230	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
2,2-Dichloropropane	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1-Dichloropropene	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
cis-1,3-Dichloropropene	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ

TABLE 2

SUMMARY OF
APRIL 2010 FOLLOW-UP GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location					*MW-103D*	*MW-104S*	*MW-104D*	*MW-105S*	*MW-105D*	*MW-106S*
Sample Identification					*GW-56393-040711-EV-014*	*GW-56393-040711-EV-012*	*GW-56393-040711-EV-013*	*GW-56393-040711-EV-010*	*GW-56393-040711-EV-011*	*GW-56393-040711-EV-008*
Sample Date					*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/7/2011*
Sample Elevation (feet AMSL)					*674.37 - 639.37*	*684.86 - 658.86*	*663.48 - 618.48*	*699.89 - 687.89*	*662.79 - 615.79*	*701.89 - 692.89*
Screen Depth (feet bgs)					*30-35*	*20-25*	*40-45*	*5-12*	*42-47*	*2-9*
Sample Type	*Groundwater Cleanup Criteria* [1]									
	Units	*a*	*b*	*c*						
trans-1,2-Dichloropropene	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Ethylbenzene	µg/L	74	74	18	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Hexachlorobutadiene	µg/L	15	42	0.053	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
2-Hexanone	µg/L	1000	2900	ID	20 UJ	20 UJ	20 UJ	20 UJ	20 UJ	20 UJ
Isopropylbenzene	µg/L	800	2300	28	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
4-Methyl-2-pentanone(MIBK)	µg/L	1800	5200	ID	R	R	R	R	R	R
Methylene chloride	µg/L	5	5	1500	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Naphthalene	µg/L	520	1500	11	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
N-Propylbenzene	µg/L	80	230	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
2-Phenylbutane (sec-Butylbenzene)	µg/L	80	230	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Styrene	µg/L	100	100	80	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
tert-Butylbenzene	µg/L	80	230	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,1,2,2-Tetrachloroethane	µg/L	8.5	35	78	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1,1,2-Tetrachloroethane	µg/L	77	320	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Tetrachloroethene	µg/L	5	5	60	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Toluene	µg/L	790	790	270	0.50 UJ	0.060 J	0.060 J	0.50 UJ	0.50 UJ	0.090 J
1,2,4-Trichlorobenzene	µg/L	70	70	99	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,2,3-Trichlorobenzene	µg/L	-	-	-	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,1,1-Trichloroethane	µg/L	200	200	89	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1,2-Trichloroethane	µg/L	5	5	330	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Trichloroethene	µg/L	5	5	200	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Trichlorofluoromethane (CFC-11)	µg/L	2600	7300	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2,3-Trichloropropane	µg/L	42	120	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2,4-Trimethylbenzene	µg/L	63	63	17	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,3,5-Trimethylbenzene	µg/L	72	72	45	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Vinyl chloride	µg/L	2	2	13	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
o-Xylene	µg/L	280	280	41	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
m&p-Xylenes	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Field Parameters										
Conductivity, field	mS/cm	-	-	-	0.626	0.64	0.648	0.813	0.656	1.171
Dissolved oxygen (DO), field	mg/L	-	-	-	1.33	1.17	0.96	0.23	2.32	0.2
Oxidation reduction potential (ORP), field	millivolts	-	-	-	40	13	40	-12	9	0.84
pH, field	s.u.	6.5 - 8.5	6.5 - 8.5	-	8.22	8.17	8.18	7.94	8.14	7.75
Temperature, field	Deg C	-	-	-	10.68	10.88	10.39	9.75	11.34	8.25
Turbidity, field	NTU	-	-	-	2.94	5	20.5	7.99	4.16	15.6

TABLE 2

SUMMARY OF
APRIL 2010 FOLLOW-UP GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location					*MW-106D*	*MW-107S*	*MW-108S*	*MW-108D*	*MW-109D*
Sample Identification					GW-56393-040711-EV-009	GW-56393-040711-EV-007	GW-56393-040711-EV-005	GW-56393-040711-EV-006	GW-56393-040611-EV-004
Sample Date					*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/6/2011*
Sample Elevation (feet AMSL)					*664.66 - 620.66*	*695.76 - 682.76*	*701.32 - 692.32*	*663.39 - 618.39*	*689.41 - 666.41*
Screen Depth (feet bgs)					*40-45*	*8-13*	*2-9*	*40-45*	*22-27*
Sample Type	*Groundwater Cleanup Criteria* [1]								
	Units	*a*	*b*	*c*					
Metals									
Aluminum	µg/L	50	50	-	6.3	5.2	**74.0** [ab]	28.8	10.7
Antimony	µg/L	6	6	130	0.18	0.06 U	0.07 U	0.08 U	0.03 J
Arsenic	µg/L	10	10	10	0.09 J	0.48 J	0.30 J	0.52	0.16 J
Barium	µg/L	2000	2000	1400	95.9	86.1	78.7	331	74.8
Beryllium	µg/L	4	4	41	0.020 U	0.020 U	0.008 J	0.004 J	0.020 U
Cadmium	µg/L	5	5	5.1	0.012 J	0.111	0.010 J	0.018 J	0.008 J
Chromium	µg/L	100	100	11	0.50	0.22 U	0.46	0.20 U	0.43
Cobalt	µg/L	40	100	100	0.138	0.344	0.238	0.553	0.136
Copper	µg/L	1000	1000	23	0.95	1.37	1.60	1.59	1.33
Iron	µg/L	300	300	-	14.9 J	**830 J** [ab]	275 J	240 J	31.7
Lead	µg/L	4	4	34	0.059	0.058	0.263	0.275	0.079
Magnesium	µg/L	400000	1100000	-	24700	30700	23300	31900	24300
Manganese	µg/L	50	50	5200	36.4	**268** [ab]	24.3	**201** [ab]	2.16
Mercury	µg/L	2	2	0.0013	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	µg/L	100	100	130	1.40	3.91	1.33	2.13	1.17
Selenium	µg/L	50	50	5	1.0 U	1.0 U	1.0 U	1.0 U	0.4 J
Silver	µg/L	34	98	0.2	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Sodium	µg/L	120000	350000	-	30000	21900	20600	54300	21300
Thallium	µg/L	2	2	3.7	0.026	0.213	0.020 U	0.098	0.006 J
Vanadium	µg/L	4.5	62	12	0.13 J	0.09 J	0.30	0.19 J	0.15 J
Zinc	µg/L	2400	5000	310	1.62	4.20	2.90	3.28	1.56
PCBs									
Aroclor-1016 (PCB-1016)	µg/L	-	-	-	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Aroclor-1221 (PCB-1221)	µg/L	-	-	-	0.040 UJ	0.040 UJ	0.040 UJ	0.040 UJ	0.040 UJ
Aroclor-1232 (PCB-1232)	µg/L	-	-	-	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Aroclor-1242 (PCB-1242)	µg/L	-	-	-	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Aroclor-1248 (PCB-1248)	µg/L	-	-	-	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Aroclor-1254 (PCB-1254)	µg/L	-	-	-	0.0083 J	0.020 UJ	0.0056 J	0.020 UJ	0.020 UJ
Aroclor-1260 (PCB-1260)	µg/L	-	-	-	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ	0.020 UJ
Total PCBs	µg/L	0.5	0.5	0.2	0.0083 J	ND	0.0056 J	ND	ND

TABLE 2

SUMMARY OF
APRIL 2010 FOLLOW-UP GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location					*MW-106D*	*MW-107S*	*MW-108S*	*MW-108D*	*MW-109D*
Sample Identification					*GW-56393-040711-EV-009*	*GW-56393-040711-EV-007*	*GW-56393-040711-EV-005*	*GW-56393-040711-EV-006*	*GW-56393-040611-EV-004*
Sample Date					*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/7/2011*	*4/6/2011*
Sample Elevation (feet AMSL)					*664.66 - 620.66*	*695.76 - 682.76*	*701.32 - 692.32*	*663.39 - 618.39*	*689.41 - 666.41*
Screen Depth (feet bgs)					*40-45*	*8-13*	*2-9*	*40-45*	*22-27*
Sample Type	*Groundwater Cleanup Criteria* [1]								
	Units	*a*	*b*	*c*					
Volatile Organic Compounds									
Acetone	µg/L	730	2100	1700	R	R	R	R	R
Benzene	µg/L	5	5	200	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ
Bromobenzene	µg/L	18	50	-	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Bromodichloromethane	µg/L	80	80	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Bromoform	µg/L	80	80	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Bromomethane (Methyl bromide)	µg/L	10	29	35	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	13000	38000	2200	R	R	R	R	R
N-Butylbenzene	µg/L	80	230	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Carbon disulfide	µg/L	800	2300	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Carbon tetrachloride	µg/L	5	5	45	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chlorobenzene	µg/L	100	100	25	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chlorobromomethane	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chloroethane	µg/L	430	1700	1100	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chloroform (Trichloromethane)	µg/L	80	80	350	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chloromethane (Methyl chloride)	µg/L	260	1100	ID	0.10 J	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
2-Chlorotoluene	µg/L	150	420	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
4-Chlorotoluene	µg/L	-	-	-	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Cymene (p-Isopropyltoluene)	µg/L	-	-	-	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.2	0.2	-	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	R
Dibromochloromethane	µg/L	80	80	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	0.05	5.7	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Dibromomethane	µg/L	80	230	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dichlorobenzene	µg/L	600	600	13	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,3-Dichlorobenzene	µg/L	6.6	19	28	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,4-Dichlorobenzene	µg/L	75	75	17	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Dichlorodifluoromethane (CFC-12)	µg/L	1700	4800	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1-Dichloroethane	µg/L	880	2500	740	0.50 UJ	0.50 UJ	0.50 UJ	0.14 J	0.50 UJ
1,2-Dichloroethane	µg/L	5	5	360	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1-Dichloroethene	µg/L	7	7	130	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
cis-1,2-Dichloroethene	µg/L	70	70	620	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
trans-1,2-Dichloroethene	µg/L	100	100	1500	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,3-Dichloropropane	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2-Dichloropropane	µg/L	5	5	230	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
2,2-Dichloropropane	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1-Dichloropropene	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
cis-1,3-Dichloropropene	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ

TABLE 2

SUMMARY OF
APRIL 2010 FOLLOW-UP GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location					MW-106D	MW-107S	MW-108S	MW-108D	MW-109D
Sample Identification					GW-56393-040711-EV-009	GW-56393-040711-EV-007	GW-56393-040711-EV-005	GW-56393-040711-EV-006	GW-56393-040611-EV-004
Sample Date					4/7/2011	4/7/2011	4/7/2011	4/7/2011	4/6/2011
Sample Elevation (feet AMSL)					664.66 - 620.66	695.76 - 682.76	701.32 - 692.32	663.39 - 618.39	689.41 - 666.41
Screen Depth (feet bgs)					40-45	8-13	2-9	40-45	22-27
Sample Type	*Groundwater Cleanup Criteria* [1]								
	Units	*a*	*b*	*c*					
trans-1,3-Dichloropropene	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Ethylbenzene	µg/L	74	74	18	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Hexachlorobutadiene	µg/L	15	42	0.053	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
2-Hexanone	µg/L	1000	2900	ID	20 UJ	20 UJ	20 UJ	20 UJ	R
Isopropyl benzene	µg/L	800	2300	28	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
4-Methyl-2-pentanone(MIBK)	µg/L	1800	5200	ID	R	R	R	R	R
Methylene chloride	µg/L	5	5	1500	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Naphthalene	µg/L	520	1500	11	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
N-Propylbenzene	µg/L	80	230	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
2-Phenylbutane (sec-Butylbenzene)	µg/L	80	230	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Styrene	µg/L	100	100	80	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
tert-Butylbenzene	µg/L	80	230	ID	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,1,2,2-Tetrachloroethane	µg/L	8.5	35	78	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1,1,2-Tetrachloroethane	µg/L	77	320	ID	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Tetrachloroethene	µg/L	5	5	60	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Toluene	µg/L	790	790	270	0.060 J	0.50 UJ	0.50 UJ	0.070 J	0.50 UJ
1,2,4-Trichlorobenzene	µg/L	70	70	99	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,2,3-Trichlorobenzene	µg/L	-	-	-	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,1,1-Trichloroethane	µg/L	200	200	89	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1,2-Trichloroethane	µg/L	5	5	330	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Trichloroethene	µg/L	5	5	200	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Trichlorofluoromethane (CFC-11)	µg/L	2600	7300	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2,3-Trichloropropane	µg/L	42	120	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,2,4-Trimethylbenzene	µg/L	63	63	17	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
1,3,5-Trimethylbenzene	µg/L	72	72	45	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Vinyl chloride	µg/L	2	2	13	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
o-Xylene	µg/L	280	280	41	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
m&p-Xylenes	µg/L	-	-	-	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Field Parameters									
Conductivity, field	mS/cm	-	-	-	--	0.806	0.642	0.905	0.662
Dissolved oxygen (DO), field	mg/L	-	-	-	--	0.22	2.68	0.3	3.18
Oxidation reduction potential (ORP), field	millivolts	-	-	-	--	0.32	98	92	92
pH, field	s.u.	6.5 - 8.5	6.5 - 8.5	-	--	8.04	8.27	8.1	8.15
Temperature, field	Deg C	-	-	-	--	9.77	9.96	10.54	10.36
Turbidity, field	NTU	-	-	-	--	3.79	13.7	10.3	3.27
					--				

TABLE 2

SUMMARY OF
APRIL 2010 FOLLOW-UP GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location					*MW-101S*	*MW-101S*	*MW-101D*
Sample Identification					*GW-56393-040611-EV-002*	*GW-56393-040611-EV-003*	*GW-56393-040611-EV-001*
Sample Date					*4/6/2011*	*4/6/2011*	*4/6/2011*
Sample Elevation (feet AMSL)					*702.35 - 663.35*	*702.35 - 663.35*	*664.33 - 589.33*
Screen Depth (feet bgs)					*32-39*	*32-39*	*70-75*
Sample Type	*Groundwater Cleanup Criteria* [1]					*Duplicate*	
	Units	*a*	*b*	*c*			

Notes:

Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels; Residential and Non-Residential Generic Cleanup Criteria [1]

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 3/25/2011, pursuant to 1994 PA 451 as amended.

a - Residential drinking water criteria.

b - Non-Residential drinking water criteria.

c - Groundwater surface water interface

U - Not present at or above the associated value.

J - Estimated concentration.

UJ - Estimated reporting limit.

R - Rejected.

feet AMSL - feet above mean sea level

feet bgs - feet below ground surface

TABLE 2

SUMMARY OF OCTOBER 2011 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:					*MW-101S*	*MW-101D*	*MW-102S*	*MW-102S*
Sample Identification:					*WG-56393-102511-JV-019*	*WG-56393-102511-JV-018*	*WG-56393-102511-JV-020*	*WG-56393-102511-JV-021*
Sample Date:					*10/25/2011*	*10/25/2011*	*10/25/2011*	*10/25/2011*
Sample Type:								*Duplicate*
		Groundwater Cleanup Criteria [1]						
	Units	a	b	c				
Volatile Organic Compounds								
Acetone	µg/L	730	2100	1700	R	R	R	R
Benzene	µg/L	5	5	200	0.50 U	0.50 U	0.50 U	0.50 U
Bromodichloromethane	µg/L	80	80	ID	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	µg/L	80	80	ID	0.50 U	0.50 U	0.50 U	0.50 U
Bromomethane (Methyl bromide)	µg/L	10	29	35	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	13000	38000	2200	R	R	R	R
Carbon disulfide	µg/L	800	2300	ID	0.50 U	0.50 U	0.50 U	0.50 U
Carbon tetrachloride	µg/L	5	5	45	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	µg/L	100	100	25	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	µg/L	430	1700	1100	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform (Trichloromethane)	µg/L	80	80	350	0.50 U	0.50 U	0.50 U	0.50 U
Chloromethane (Methyl chloride)	µg/L	260	1100	ID	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.2	0.2	-	R	R	R	R
Dibromochloromethane	µg/L	80	80	ID	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	0.05	5.7	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	µg/L	600	600	13	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichlorobenzene	µg/L	6.6	19	28	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	µg/L	75	75	17	0.50 U	0.50 U	0.50 U	0.50 U
Dichlorodifluoromethane (CFC-12)	µg/L	1700	4800	ID	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane	µg/L	880	2500	740	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	µg/L	5	5	360	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	µg/L	7	7	130	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	µg/L	70	70	620	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	µg/L	100	100	1500	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloropropane	µg/L	5	5	230	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	µg/L	-	-	-	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,3-Dichloropropene	µg/L	-	-	-	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	µg/L	74	74	18	0.50 U	0.50 U	0.50 U	0.50 U
2-Hexanone	µg/L	1000	2900	ID	R	R	R	R
Isopropyl benzene	µg/L	800	2300	28	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert butyl ether (MTBE)	µg/L	40	40	7100	0.50 U	0.50 U	0.50 U	0.50 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	1800	5200	ID	R	R	R	R
Methylene chloride	µg/L	5	5	1500	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	µg/L	100	100	80	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	µg/L	8.5	35	78	0.50 U	0.50 U	0.50 U	0.50 U
Tetrachloroethene	µg/L	5	5	60	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	µg/L	790	790	270	0.50 U	0.50 U	0.50 U	0.50 U
1,2,4-Trichlorobenzene	µg/L	70	70	99	2.0 U	2.0 U	2.0 U	2.0 U
1,1,1-Trichloroethane	µg/L	200	200	89	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2-Trichloroethane	µg/L	5	5	330	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene	µg/L	5	5	200	0.50 U	0.50 U	0.50 U	0.50 U

TABLE 2

SUMMARY OF OCTOBER 2011 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:					*MW-101S*	*MW-101D*	*MW-102S*	*MW-102S*
Sample Identification:					*WG-56393-102511-JV-019*	*WG-56393-102511-JV-018*	*WG-56393-102511-JV-020*	*WG-56393-102511-JV-021*
Sample Date:					*10/25/2011*	*10/25/2011*	*10/25/2011*	*10/25/2011*
Sample Type:								*Duplicate*
		Groundwater Cleanup Criteria [1]						
	Units	a	b	c				
Trichlorofluoromethane (CFC-11)	µg/L	2600	7300	-	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl chloride	µg/L	2	2	13	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	µg/L	280	280	41	0.50 U	0.50 U	0.50 U	0.50 U
m&p-Xylenes	µg/L				0.50 U	0.50 U	0.50 U	0.50 U
PCBs								
Aroclor-1016 (PCB-1016)	µg/L	-	-	-	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1221 (PCB-1221)	µg/L	-	-	-	0.040 U	0.040 U	0.040 U	0.040 U
Aroclor-1232 (PCB-1232)	µg/L	-	-	-	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1242 (PCB-1242)	µg/L	-	-	-	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1248 (PCB-1248)	µg/L	-	-	-	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1254 (PCB-1254)	µg/L	-	-	-	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1260 (PCB-1260)	µg/L	-	-	-	0.020 U	0.020 U	0.020 U	0.020 U
Total PCBs	µg/L	0.5	0.5	0.2	ND	ND	ND	ND
Metals								
Magnesium	µg/L	400000	1100000	-	24200	23300	22800	23100
Mercury	µg/L	2	2	0.0013	0.001 U	0.00113 U	0.0012 U	0.00119 U
Sodium	µg/L	120000	350000	-	23800	23400	19200	20200
General Chemistry								
Cyanide (total)	µg/L	200	200	5.2	10 U	10 U	5 J	6 J[c]
Field Parameters								
Conductivity, field	mS/cm	-	-	-	.696	0.670	0.670	0.670
Dissolved oxygen (DO), field	mg/L	-	-	-	3.58	6.15	0.16	0.16
Oxidation reduction potential (ORP), field	millivolts	-	-	-	-29.7	-32.4	-45.0	-45.0
pH, field	s.u.	6.5 - 8.5	6.5 - 8.5	-	7.01	7.36	7.16	7.16
Temperature, field	Deg C	-	-	-	16.19	13.25	18.11	18.11
Turbidity, field	NTU	-	-	-	--	21.1	31.9	31.9

Notes:

Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria [1].

[1] Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 3/25/2011, pursuant to 1994 PA 451 as amended.

a - Residential drinking water criteria.

b - Non-residential drinking water criteria.

c - Groundwater surface water interface.

U - Not present at or above the associated value.

J - Laboratory qualifiers - estimated concentration.

TABLE 2

SUMMARY OF OCTOBER 2011 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-102D*	*MW-103D*	*MW-104S*	*MW-104D*	*MW-105S*	*MW-105D*
Sample Identification:		*WG-56393-102511-JV-022*	*WG-56393-102611-JV-023*	*WG-56393-102611-JV-025*	*WG-56393-102611-JV-024*	*WG-56393-102611-JV-027*	*WG-56393-102611-JV-026*
Sample Date:		10/25/2011	10/26/2011	10/26/2011	10/26/2011	10/26/2011	10/26/2011
Sample Type:							
	Units						
Volatile Organic Compounds							
Acetone	µg/L	R	R	R	R	R	R
Benzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromodichloromethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromomethane (Methyl bromide)	µg/L	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	R	R	R	R	R	R
Carbon disulfide	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon tetrachloride	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform (Trichloromethane)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloromethane (Methyl chloride)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	R	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Dibromochloromethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Dichlorodifluoromethane (CFC-12)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloropropane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,3-Dichloropropene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Hexanone	µg/L	R	R	R	R	R	R
Isopropyl benzene	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert butyl ether (MTBE)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	20 U	20 U	20 U	20 U	20 U	20 U
Methylene chloride	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Tetrachloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2,4-Trichlorobenzene	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1,1-Trichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.12 J	0.50 U
1,1,2-Trichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

TABLE 2

SUMMARY OF OCTOBER 2011 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-102D*	*MW-103D*	*MW-104S*	*MW-104D*	*MW-105S*	*MW-105D*
Sample Identification:		*WG-56393-102511-JV-022*	*WG-56393-102611-JV-023*	*WG-56393-102611-JV-025*	*WG-56393-102611-JV-024*	*WG-56393-102611-JV-027*	*WG-56393-102611-JV-026*
Sample Date:		*10/25/2011*	*10/26/2011*	*10/26/2011*	*10/26/2011*	*10/26/2011*	*10/26/2011*
Sample Type:							
	Units						
Trichlorofluoromethane (CFC-11)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl chloride	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
m&p-Xylenes	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
PCBs							
Aroclor-1016 (PCB-1016)	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1221 (PCB-1221)	µg/L	0.040 U	0.039 U	0.040 U	0.040 U	0.040 U	0.040 U
Aroclor-1232 (PCB-1232)	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1242 (PCB-1242)	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1248 (PCB-1248)	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1254 (PCB-1254)	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1260 (PCB-1260)	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Total PCBs	µg/L	ND	ND	ND	ND	ND	ND
Metals							
Magnesium	µg/L	22700	20500	21700	22200	26700	23200
Mercury	µg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Sodium	µg/L	19600	18400	20200	28000	22800	20500
General Chemistry							
Cyanide (total)	µg/L	9 J[c]	9 J[c]	10 U	10 U	10 U	4 J
Field Parameters							
Conductivity, field	mS/cm	0.607	0.549	0.610	0.621	0.732	0.629
Dissolved oxygen (DO), field	mg/L	1.88	0.25	1.27	1.29	0.27	1.41
Oxidation reduction potential (ORP), field	millivolts	-34.4	27.2	-32.9	-26.1	-65.1	51.7
pH, field	s.u.	7.30	6.98	7.25	7.25	7.10	7.32
Temperature, field	Deg C	15.84	11.65	12.81	12.28	13.25	11.65
Turbidity, field	*NTU*	*3.02*	*9.82*	*1.29*	*2.01*	*3.12*	--

Notes:

Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Scre
Non-Residential Generic Cleanup Criteria [1].

[1] Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 3/
451 as amended.

a - Residential drinking water criteria.

b - Non-residential drinking water criteria.

c - Groundwater surface water interface.

U - Not present at or above the associated value.

J - Laboratory qualifiers - estimated concentration.

TABLE 2

SUMMARY OF OCTOBER 2011 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-106S*	*MW-106D*	*MW-107S*	*MW-108S*	*MW-108D*	*MW-109D*
Sample Identification:		*WG-56393-102611-JV-029*	*WG-56393-102611-JV-028*	*WG-56393-102711-JV-030*	*WG-56393-102711-JV-032*	*WG-56393-102711-JV-031*	*WG-56393-102711-JV-033*
Sample Date:		*10/26/2011*	*10/26/2011*	*10/27/2011*	*10/27/2011*	*10/27/2011*	*10/27/2011*
Sample Type:							
	Units						
Volatile Organic Compounds							
Acetone	µg/L	R	R	R	R	R	20 U
Benzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromodichloromethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromomethane (Methyl bromide)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	R	R	R	R	R	20 U
Carbon disulfide	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon tetrachloride	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform (Trichloromethane)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloromethane (Methyl chloride)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Dibromochloromethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Dichlorodifluoromethane (CFC-12)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.14 J	0.50 U
1,2-Dichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloropropane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,3-Dichloropropene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Hexanone	µg/L	R	R	R	R	R	20 U
Isopropyl benzene	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert butyl ether (MTBE)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	20 U	20 U	20 U	20 U	20 U	20 U
Methylene chloride	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Tetrachloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2,4-Trichlorobenzene	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1,1-Trichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2-Trichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

TABLE 2

SUMMARY OF OCTOBER 2011 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-106S*	*MW-106D*	*MW-107S*	*MW-108S*	*MW-108D*	*MW-109D*
Sample Identification:		*WG-56393-102611-JV-029*	*WG-56393-102611-JV-028*	*WG-56393-102711-JV-030*	*WG-56393-102711-JV-032*	*WG-56393-102711-JV-031*	*WG-56393-102711-JV-033*
Sample Date:		*10/26/2011*	*10/26/2011*	*10/27/2011*	*10/27/2011*	*10/27/2011*	*10/27/2011*
Sample Type:							
	Units						
Trichlorofluoromethane (CFC-11)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl chloride	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
m&p-Xylenes	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
PCBs							
Aroclor-1016 (PCB-1016)	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1221 (PCB-1221)	µg/L	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U
Aroclor-1232 (PCB-1232)	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1242 (PCB-1242)	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1248 (PCB-1248)	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1254 (PCB-1254)	µg/L	0.020 U	0.010 J	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1260 (PCB-1260)	µg/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Total PCBs	µg/L	ND	0.01 J	ND	ND	ND	ND
Metals							
Magnesium	µg/L	42300	23500	27300	23900	26900	24400
Mercury	µg/L	**0.0203**[c]	0.001 U	0.001 U	0.00112 U	0.001 U	0.00022 J
Sodium	µg/L	20800	24400	26700	19500	46100	22300
General Chemistry							
Cyanide (total)	µg/L	**6 J**[c]	10 U	10 U	10 U	10 U	10 U
Field Parameters							
Conductivity, field	mS/cm	1.243	0.662	0.784	0.736	0.817	0.696
Dissolved oxygen (DO), field	mg/L	0.27	2.37	0.27	1.33	0.17	2.28
Oxidation reduction potential (ORP), field	millivolts	190.0	-42.5	-21.2	-63.2	-81.1	-68.9
pH, field	s.u.	6.78	7.34	6.83	7.00	7.28	7.22
Temperature, field	Deg C	13.83	11.74	12.23	12.59	11.82	13.81
Turbidity, field	NTU	4.01	1.95	5.21	8.74	3.82	--

Notes:

Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Scre
Non-Residential Generic Cleanup Criteria [(1)].

[(1)] Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 3/
451 as amended.

a - Residential drinking water criteria.

b - Non-residential drinking water criteria.

c - Groundwater surface water interface

U - Not present at or above the associated value.

J - Laboratory qualifiers - estimated concentration.

TABLE 2

SUMMARY OF FEBRUARY 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria* [1]			*MW-101S*	*MW-101D*	*MW-102S*	*MW-102D*	*MW-103D*
Sample Identification:					WG-56393-020612-JV-038	WG-56393-020612-JV-037	WG-56393-020612-JV-040	WG-56393-020612-JV-039	WG-56393-020712-JV-043
Sample Date:					2/6/2012	2/6/2012	2/6/2012	2/6/2012	2/7/2012
Sample Type:									
	Units	*Residential Drinking Water*	*Non-Residential Drinking Water*	*Groundwater Surface Water Interface*					
Volatile Organic Compounds									
Acetone	µg/L	730	2100	1700	20 U	20 U	20 U	20 U	20 U
Benzene	µg/L	5	5	200	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromodichloromethane	µg/L	80	80	ID	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	µg/L	80	80	ID	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromomethane (Methyl bromide)	µg/L	10	29	35	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	13000	38000	2200	20 U	20 U	20 U	20 U	20 U
Carbon disulfide	µg/L	800	2300	ID	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon tetrachloride	µg/L	5	5	45	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	µg/L	100	100	25	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	µg/L	430	1700	1100	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform (Trichloromethane)	µg/L	80	80	350	0.50 U	0.50 U	0.50 U	0.13 J	0.14 J
Chloromethane (Methyl chloride)	µg/L	260	1100	ID	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.2	0.2	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Dibromochloromethane	µg/L	80	80	ID	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	0.05	5.7	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	µg/L	600	600	13	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichlorobenzene	µg/L	6.6	19	28	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	µg/L	75	75	17	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Dichlorodifluoromethane (CFC-12)	µg/L	1700	4800	ID	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane	µg/L	880	2500	740	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	µg/L	5	5	360	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	µg/L	7	7	130	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	µg/L	70	70	620	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	µg/L	100	100	1500	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloropropane	µg/L	5	5	230	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	µg/L	-	-	-	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,3-Dichloropropene	µg/L	-	-	-	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	µg/L	74	74	18	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Hexanone	µg/L	1000	2900	ID	20 U	20 U	20 U	20 U	20 U
Isopropyl benzene	µg/L	800	2300	28	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert butyl ether (MTBE)	µg/L	40	40	7100	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
4-Methyl-2-pentanone [2]	µg/L	1800	5200	ID	20 U	20 U	20 U	20 U	20 U
Methylene chloride	µg/L	5	5	1500	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	µg/L	100	100	80	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	µg/L	8.5	35	78	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Tetrachloroethene	µg/L	5	5	60	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	µg/L	790	790	270	0.50 U	0.50 U	0.060 J	0.070 J	0.50 U
1,2,4-Trichlorobenzene	µg/L	70	70	99	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1,1-Trichloroethane	µg/L	200	200	89	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2-Trichloroethane	µg/L	5	5	330	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene	µg/L	5	5	200	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichlorofluoromethane (CFC-11)	µg/L	2600	7300	-	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl chloride	µg/L	2	2	13	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	µg/L	280	280	41	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
m&p-Xylenes	µg/L				0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

TABLE 2

SUMMARY OF FEBRUARY 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria* [1]			*MW-101S*	*MW-101D*	*MW-102S*	*MW-102D*	*MW-103D*
Sample Identification:					*WG-56393-020612-JV-038*	*WG-56393-020612-JV-037*	*WG-56393-020612-JV-040*	*WG-56393-020612-JV-039*	*WG-56393-020712-JV-043*
Sample Date:					*2/6/2012*	*2/6/2012*	*2/6/2012*	*2/6/2012*	*2/7/2012*
Sample Type:	*Units*	*Residential Drinking Water*	*Non-Residential Drinking Water*	*Groundwater Surface Water Interface*					
Semi-Volatile Organic Compounds									
Acenaphthene	ug/L	1300	3800	38	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Acenaphthylene	ug/L	52	150	ID	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Anthracene	ug/L	43	43	ID	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(a)anthracene	ug/L	2.1	8.5	ID	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(a)pyrene	ug/L	5	5	ID	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(b)fluoranthene	ug/L	1.5	1.5	ID	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(g,h,i)perylene	ug/L	1	1		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(k)fluoranthene	ug/L	1	1		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Butyl benzylphthalate (BBP)	ug/L	1200	2700	67	0.20 U	0.061 J	0.026 J	0.024 J	0.026 J
Carbazole	ug/L	85	350	10	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
4-Chloro-3-methylphenol	ug/L	150	420	7.4	0.49 U	0.48 U	0.48 U	0.48 U	0.50 U
bis(2-Chloroethyl)ether	ug/L	2	8.3	1	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2-Chlorophenol	ug/L	45	130	18	0.49 U	0.48 U	0.48 U	0.48 U	0.50 U
Chrysene	ug/L	1.6	1.6	ID	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Dibenz(a,h)anthracene	ug/L	2	2	ID	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Dibenzofuran	ug/L	ID	ID	4	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
3,3'-Dichlorobenzidine	ug/L	1.1	4.3	0.3	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dichlorophenol	ug/L	73	210	11	0.49 U	0.48 U	0.48 U	0.48 U	0.50 U
Diethyl phthalate	ug/L	5500	16000	110	0.019 J	0.033 J	0.022 J	0.019 J	0.018 J
Dimethyl phthalate	ug/L	73000	210000		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2,4-Dimethylphenol	ug/L	370	1000	380	3.9 U	3.9 U	3.9 U	3.9 U	4.0 U
Di-n-butylphthalate (DBP)	ug/L	880	2500	9.7	0.024 J	0.038 J	0.031 J	0.033 J	0.031 J
4,6-Dinitro-2-methylphenol	ug/L	20	20		2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dinitrotoluene	ug/L	7.7	32		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Di-n-octyl phthalate (DnOP)	ug/L	130	380	ID	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6	6	25	0.98 U	0.96 U	0.96 U	0.96 U	1.0 U
Fluoranthene	ug/L	210	210	1.6	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Fluorene	ug/L	880	2000	12	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobenzene	ug/L	1	1	0.2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobutadiene	ug/L	15	42	0.053	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorocyclopentadiene	ug/L	50	50	ID	0.98 U	0.96 U	0.96 U	0.96 U	1.0 U
Hexachloroethane	ug/L	7.3	21	6.7	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Indeno(1,2,3-cd)pyrene	ug/L	2	2	ID	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Isophorone	ug/L	770	3100	1300	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2-Methylnaphthalene	ug/L	260	750	19	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2-Methylphenol	ug/L	370	1000	30	0.49 U	0.48 U	0.48 U	0.48 U	0.50 U
4-Methylphenol	ug/L	370	1000	30	0.49 U	0.48 U	0.48 U	0.48 U	0.50 U
Naphthalene	ug/L	520	1500	11	0.20 U	0.20 U	0.040 J	0.030 J	0.075 J
Nitrobenzene	ug/L	3.4	9.6	180	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2-Nitrophenol	ug/L	20	58	ID	0.49 U	0.48 U	0.48 U	0.48 U	0.50 U
N-Nitrosodi-n-propylamine	ug/L	5	5		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
N-Nitrosodiphenylamine	ug/L	270	1100		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Pentachlorophenol	ug/L	1	1	G,X	0.98 U	0.96 U	0.96 U	0.96 U	1.0 U
Phenanthrene	ug/L	52	150	2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Phenol	ug/L	4400	13000	450	0.49 U	0.067 J	0.48 U	0.48 U	0.50 U
Pyrene	ug/L	140	140	ID	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2,4,5-Trichlorophenol	ug/L	730	2100		0.49 U	0.48 U	0.48 U	0.48 U	0.50 U
2,4,6-Trichlorophenol	ug/L	120	470	5	0.49 U	0.48 U	0.48 U	0.48 U	0.50 U

TABLE 2

SUMMARY OF FEBRUARY 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria* [1]			*MW-101S*	*MW-101D*	*MW-102S*	*MW-102D*	*MW-103D*
Sample Identification:					*WG-56393-020612-JV-038*	*WG-56393-020612-JV-037*	*WG-56393-020612-JV-040*	*WG-56393-020612-JV-039*	*WG-56393-020712-JV-043*
Sample Date:					*2/6/2012*	*2/6/2012*	*2/6/2012*	*2/6/2012*	*2/7/2012*
Sample Type:	*Units*	*Residential Drinking Water*	*Non-Residential Drinking Water*	*Groundwater Surface Water Interface*					
PCBs									
Aroclor-1016 (PCB-1016)	µg/L	-	-	-	0.021 U	0.021 U	0.021 U	0.020 U	0.021 U
Aroclor-1221 (PCB-1221)	µg/L	-	-	-	0.041 U	0.041 U	0.041 U	0.040 U	0.041 U
Aroclor-1232 (PCB-1232)	µg/L	-	-	-	0.021 U	0.021 U	0.021 U	0.020 U	0.021 U
Aroclor-1242 (PCB-1242)	µg/L	-	-	-	0.021 U	0.021 U	0.021 U	0.020 U	0.021 U
Aroclor-1248 (PCB-1248)	µg/L	-	-	-	0.021 U	0.021 U	0.021 U	0.020 U	0.021 U
Aroclor-1254 (PCB-1254)	µg/L	-	-	-	0.021 U	0.021 U	0.021 U	0.020 U	0.021 U
Aroclor-1260 (PCB-1260)	µg/L	-	-	-	0.021 U	0.021 U	0.021 U	0.020 U	0.021 U
Total PCBs	µg/L	0.5	0.5	0.2	ND	ND	ND	ND	ND
Dioxins									
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ug/L	-	-	-	0.000049 U	0.0000521 U	0.000049 U	0.0000481 U	0.00005 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ug/L	-	-	-	0.00000667 J	0.00000698 J	0.00000626 JK	0.000005 J	0.0000068 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
2,3,4,6,7 8-Hexachlorodibenzofuran (HxCDF)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ug/L	-	-	-	0.0000098 U	0.0000104 U	0.0000098 U	0.00000962 U	0.00001 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ug/L	0.00003	0.00003	0.00001	0.0000098 U	0.0000104 U	0.0000098 U	0.00000962 U	0.00001 U
Total heptachlorodibenzofuran (HpCDF)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
Total heptachlorodibenzo-p-dioxin (HpCDD)	ug/L	-	-	-	0.0000245 U	0.00000186 J	0.0000245 U	0.000024 U	0.000025 U
Total hexachlorodibenzofuran (HxCDF)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
Total hexachlorodibenzo-p-dioxin (HxCDD)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
Total pentachlorodibenzofuran (PeCDF)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
Total pentachlorodibenzo-p-dioxin (PeCDD)	ug/L	-	-	-	0.0000245 U	0.000026 U	0.0000245 U	0.000024 U	0.000025 U
Total tetrachlorodibenzofuran (TCDF)	ug/L	-	-	-	0.0000098 U	0.0000104 U	0.0000098 U	0.00000962 U	0.00001 U
Total tetrachlorodibenzo-p-dioxin (TCDD)	ug/L	-	-	-	0.0000098 U	0.0000104 U	0.0000098 U	0.00000962 U	0.00001 U

TABLE 2

SUMMARY OF FEBRUARY 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria* [1]			*MW-101S*	*MW-101D*	*MW-102S*	*MW-102D*	*MW-103D*
Sample Identification:					*WG-56393-020612-JV-038*	*WG-56393-020612-JV-037*	*WG-56393-020612-JV-040*	*WG-56393-020612-JV-039*	*WG-56393-020712-JV-043*
Sample Date:					*2/6/2012*	*2/6/2012*	*2/6/2012*	*2/6/2012*	*2/7/2012*
Sample Type:	*Units*	*Residential Drinking Water*	*Non-Residential Drinking Water*	*Groundwater Surface Water Interface*					
Metals									
Aluminum	ug/L	50	50	-	7.0	15.6	3.8	3.5	4.5
Antimony	ug/L	6	6	130	0.019 J	0.024 J	0.040 J	0.026 J	0.019 J
Arsenic	ug/L	10	10	10	0.15 J	0.19 J	0.16 J	0.21 J	0.17 J
Barium	ug/L	2000	2000	1400	77.0	80.1	79.2	70.5	64.6
Beryllium	ug/L	4	4	41	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Cadmium	ug/L	5	5	5.1	0.020 U	0.011 J	0.012 J	0.008 J	0.020 U
Chromium (total)	ug/L	100	100	11	0.14 J	0.26	0.05 J	0.14 J	0.17 J
Chromium VI (hexavalent)	ug/L	100	100	11	2.0 U,X	2.0 U,X	2.0 U,X	2.0 U,X	2.0 U,X
Cobalt	ug/L	40	100	100	0.034	0.079	0.176	0.029	0.047
Copper	ug/L	1000	1000	23	0.40	1.37	0.39	0.33	0.33
Iron	ug/L	300	300	-	54.4	84.0	52.9	7.7 J	9.9 J
Lead	ug/L	4	4	34	0.060	0.221	0.020	0.048	0.023
Magnesium	ug/L	400000	1100000	-	24800	24300	26200	23800	23200
Manganese	ug/L	50	50	5200	2.26	3.91	**162**[2b]	0.40	0.57
Mercury	ug/L	2	2	0.0013	**0.00327**[c]	**0.00157**[c]	0.00111	0.00096 J	0.00076 J
Nickel	ug/L	100	100	130	0.24	0.57	0.49	0.19 J	0.26
Selenium	ug/L	50	50	5	0.4 J	1.0 U	1.0 U	0.2 J	0.2 J
Silver	ug/L	34	98	0.2	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Sodium	ug/L	120000	350000	-	23500	25300	20300	21800	22400
Thallium	ug/L	2	2	3.7	0.0019 J	0.0019 J	0.0191 J	0.0025 J	0.0031 J
Vanadium	ug/L	4.5	62	12	0.088 J	0.211	0.074 J	0.107 J	0.097 J
Zinc	ug/L	2400	5000	310	0.94	5.12	0.32 J	0.67	0.52
General Chemistry									
Cyanide (amenable)	ug/L	200	200		10 U	10 U	10 U	10 U	10 U
Cyanide (total)	µg/L	200	200	5.2	10 U	10 U	10 U	10 U	10 U
Field Parameters									
Conductivity	mS/cm	-	-	-	0.544	0.559	0.587	0.511	0.503
Dissolved oxygen (DO)[3]	mg/L	-	-	-	-	-	-	-	-
Oxidation reduction potential (ORP)	millivolts	-	-	-	202	189	77	128	173
pH	s.u.	6.5 - 8.5	6.5 - 8.5	-	7.23	7.25	7.02	7.21	7.37
Temperature	Deg C	-	-	-	9.2	10.8	7	9	9.7
Turbidity	NTU	-	-	-	<3.69	<3.35	4.34	<2.98	<2.68

Notes:

[1] Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 3/25/2011, pursuant to 1994 PA 451 as amended.

[2] Also known as Methyl isobutyl ketone (MIBK)

[3] DO results were not obtained at MW-101S, MW-101D, MW-1-2S, MW-102D, MW-103D, MW-104S, MW-104D, MW-5S, MW-105D, and MW-106S due to DO meter failure

U - Not present at or above the associated value.

J - Laboratory qualifiers - estimated concentration.

TABLE 2

SUMMARY OF FEBRUARY 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-103D*	*MW-104S*	*MW-104D*	*MW-105S*	*MW-105D*	*MW-106S*	*MW-106D*
Sample Identification:		*WG-56393-020712-JV-044*	*WG-56393-020712-JV-046*	*WG-56393-020712-JV-045*	*WG-56393-020712-JV-048*	*WG-56393-020712-JV-047*	*WG-56393-020712-JV-050*	*WG-56393-020712-JV-049*
Sample Date:		*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*
Sample Type:		*Duplicate*						
	Units							
Volatile Organic Compounds								
Acetone	µg/L	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Benzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromodichloromethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromomethane (Methyl bromide)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Carbon disulfide	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon tetrachloride	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform (Trichloromethane)	µg/L	0.16 J	0.50 U	0.50 U	0.50 U	0.080 J	0.50 U	0.50 U
Chloromethane (Methyl chloride)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Dibromochloromethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Dichlorodifluoromethane (CFC-12)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloropropane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,3-Dichloropropene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Hexanone	µg/L	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Isopropyl benzene	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert butyl ether (MTBE)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
4-Methyl-2-pentanone [2]	µg/L	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Methylene chloride	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Tetrachloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.070 J
1,2,4-Trichlorobenzene	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1,1-Trichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.12 J	0.090 J	0.50 U	0.10 J
1,1,2-Trichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichlorofluoromethane (CFC-11)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl chloride	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
m&p-Xylenes	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

TABLE 2

SUMMARY OF FEBRUARY 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-103D*	*MW-104S*	*MW-104D*	*MW-105S*	*MW-105D*	*MW-106S*	*MW-106D*
Sample Identification:		*WG-56393-020712-JV-044*	*WG-56393-020712-JV-046*	*WG-56393-020712-JV-045*	*WG-56393-020712-JV-048*	*WG-56393-020712-JV-047*	*WG-56393-020712-JV-050*	*WG-56393-020712-JV-049*
Sample Date:		*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*
Sample Type:		*Duplicate*						
	Units							
Semi-Volatile Organic Compounds								
Acenaphthene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Acenaphthylene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Anthracene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(a)anthracene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(a)pyrene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(b)fluoranthene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(g,h,i)perylene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(k)fluoranthene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Butyl benzylphthalate (BBP)	ug/L	0.20 U	0.023 J	0.018 J	0.20 U	0.20 U	0.20 U	0.033 J
Carbazole	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
4-Chloro-3-methylphenol	ug/L	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.50 U	0.50 U
bis(2-Chloroethyl)ether	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2-Chlorophenol	ug/L	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.50 U	0.50 U
Chrysene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Dibenz(a,h)anthracene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Dibenzofuran	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
3,3'-Dichlorobenzidine	ug/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dichlorophenol	ug/L	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.50 U	0.50 U
Diethyl phthalate	ug/L	0.015 J	0.022 J	0.038 J	0.017 J	0.031 J	0.032 J	0.023 J
Dimethyl phthalate	ug/L	0.20 U	0.20 U	0.026 J	0.20 U	0.031 J	0.031 J	0.20 U
2,4-Dimethylphenol	ug/L	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	4.0 U	4.0 U
Di-n-butylphthalate (DBP)	ug/L	0.20 U	0.029 J	0.035 J	0.024 J	0.040 J	0.20 U	0.037 J
4,6-Dinitro-2-methylphenol	ug/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dinitrotoluene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Di-n-octyl phthalate (DnOP)	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	1.0 U	1.0 U
Fluoranthene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Fluorene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobenzene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobutadiene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorocyclopentadiene	ug/L	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	1.0 U	1.0 U
Hexachloroethane	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Indeno(1,2,3-cd)pyrene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Isophorone	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2-Methylnaphthalene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2-Methylphenol	ug/L	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	1.2	0.50 U
4-Methylphenol	ug/L	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.50 U	0.50 U
Naphthalene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.027 J	0.033 J
Nitrobenzene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2-Nitrophenol	ug/L	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.50 U	0.50 U
N-Nitrosodi-n-propylamine	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
N-Nitrosodiphenylamine	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Pentachlorophenol	ug/L	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	1.0 U	1.0 U
Phenanthrene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Phenol	ug/L	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.74	0.50 U
Pyrene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.020 J
2,4,5-Trichlorophenol	ug/L	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.50 U	0.50 U
2,4,6-Trichlorophenol	ug/L	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U	0.50 U	0.50 U

TABLE 2

SUMMARY OF FEBRUARY 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-103D*	*MW-104S*	*MW-104D*	*MW-105S*	*MW-105D*	*MW-106S*	*MW-106D*
Sample Identification:		*WG-56393-020712-JV-044*	*WG-56393-020712-JV-046*	*WG-56393-020712-JV-045*	*WG-56393-020712-JV-048*	*WG-56393-020712-JV-047*	*WG-56393-020712-JV-050*	*WG-56393-020712-JV-049*
Sample Date:		*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*
Sample Type:		*Duplicate*						
	Units							
PCBs								
Aroclor-1016 (PCB-1016)	µg/L	0.020 U	0.021 U	0.021 U	0.020 U	0.021 U	0.020 U,	0.020 U
Aroclor-1221 (PCB-1221)	µg/L	0.040 U	0.041 U	0.041 U	0.040 U	0.041 U	0.040 U,	0.040 U
Aroclor-1232 (PCB-1232)	µg/L	0.020 U	0.021 U	0.021 U	0.020 U	0.021 U	0.020 U,	0.020 U
Aroclor-1242 (PCB-1242)	µg/L	0.020 U	0.021 U	0.021 U	0.020 U	0.021 U	0.020 U,	0.020 U
Aroclor-1248 (PCB-1248)	µg/L	0.020 U	0.021 U	0.021 U	0.020 U	0.021 U	0.020 U,	0.020 U
Aroclor-1254 (PCB-1254)	µg/L	0.020 U	0.021 U	0.021 U	0.020 U	0.021 U	0.020 U	0.020 U
Aroclor-1260 (PCB-1260)	µg/L	0.020 U	0.021 U	0.021 U	0.020 U	0.021 U	0.020 U	0.020 U
Total PCBs	µg/L	ND	ND	ND	ND	ND	ND	ND
Dioxins								
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ug/L	0.000049 U	0.0000481 U	0.0000481 U	0.000049 U	0.0000532 U	0.000051 U	0.00000254 J
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ug/L	0.00000705 J	0.00000542 J	0.00000541 J	0.00000879 J	0.00000973 J	0.00000779 J	0.0000292 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ug/L	0.0000098 U	0.00000962 U	0.00000962 U	0.0000098 U	0.0000106 U	0.0000102 U	0.0000102 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ug/L	0.0000098 U	0.00000962 U	0.00000962 U	0.0000098 U	0.0000106 U	0.0000102 U	0.0000102 U
Total heptachlorodibenzofuran (HpCDF)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
Total heptachlorodibenzo-p-dioxin (HpCDD)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
Total hexachlorodibenzofuran (HxCDF)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
Total hexachlorodibenzo-p-dioxin (HxCDD)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
Total pentachlorodibenzofuran (PeCDF)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
Total pentachlorodibenzo-p-dioxin (PeCDD)	ug/L	0.0000245 U	0.000024 U	0.000024 U	0.0000245 U	0.0000266 U	0.0000255 U	0.0000255 U
Total tetrachlorodibenzofuran (TCDF)	ug/L	0.0000098 U	0.00000962 U	0.00000962 U	0.0000098 U	0.0000106 U	0.0000102 U	0.0000102 U
Total tetrachlorodibenzo-p-dioxin (TCDD)	ug/L	0.0000098 U	0.00000962 U	0.00000962 U	0.0000098 U	0.0000106 U	0.0000102 U	0.0000102 U

TABLE 2

SUMMARY OF FEBRUARY 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-103D*	*MW-104S*	*MW-104D*	*MW-105S*	*MW-105D*	*MW-106S*	*MW-106D*
Sample Identification:		*WG-56393-020712-JV-044*	*WG-56393-020712-JV-046*	*WG-56393-020712-JV-045*	*WG-56393-020712-JV-048*	*WG-56393-020712-JV-047*	*WG-56393-020712-JV-050*	*WG-56393-020712-JV-049*
Sample Date:		*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*	*2/7/2012*
Sample Type:		*Duplicate*						
	Units							
Metals								
Aluminum	ug/L	4.0	8.0	4.7	2.1	7.0	2.4	2.8
Antimony	ug/L	0.012 J	0.016 J	0.021 J	0.021 J	0.021 J	0.146	0.085
Arsenic	ug/L	0.17 J	0.21 J	0.23 J	0.14 J	0.21 J	5.77	0.24 J
Barium	ug/L	63.7	74.2	66.9	114	80.6	443	81.4
Beryllium	ug/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Cadmium	ug/L	0.020 U	0.07 J	0.008 J	0.010 J	0.020 U	0.029	0.008 J
Chromium (total)	ug/L	0.18 J	0.23	0.31	0.25	0.30	0.23	0.36
Chromium VI (hexavalent)	ug/L	2.0 U,X	2.0 U,X	2.0 U,X	2.0 U,X	2.0 U,X	2.0 U,X	2.0 U,X
Cobalt	ug/L	0.050	0.038	0.034	0.179	0.037	0.578	0.019 J
Copper	ug/L	0.28	0.43	0.27	0.35	0.38	0.50	0.34
Iron	ug/L	10.0 J	38.3	13.7 J	48.5	36.7	**8220**[ab]	9.9 J
Lead	ug/L	0.014 J	0.042	0.027	0.032	0.067	0.016 J	0.020 J
Magnesium	ug/L	23400	24100	22800	30800	25200	40500	24200
Manganese	ug/L	0.45	1.62	0.73	**98.1**[ab]	1.48	**479**[ab]	0.41
Mercury	ug/L	0.00054 J	0.00087 J	0.00053 J	0.00058 J	0.00053 J	**0.00447**[c]	0.00053 J
Nickel	ug/L	0.28	0.45	0.2	0.44	0.23	2.47	0.23
Selenium	ug/L	0.2 J	0.2 J	0.2 J	0.2 J	1.0 U	0.3 J	0.3 J
Silver	ug/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Sodium	ug/L	19800	22300	21900	25800	22000	17000	24400
Thallium	ug/L	0.0034 J	0.0009 J	0.0033 J	0.0043 J	0.0200 U	0.0009 J	0.0065 J
Vanadium	ug/L	0.120 J	0.160 J	0.145 J	0.057 J	0.088 J	0.135 J	0.116 J
Zinc	ug/L	0.36 J	0.45 J	0.63	1.40	0.97	40.0	0.92
General Chemistry								
Cyanide (amenable)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyanide (total)	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Field Parameters								
Conductivity	mS/cm	0.503	0.519	0.503	0.847	0.9	1.23	0.724
Dissolved oxygen (DO)[3]	mg/L	-	-	-	-	-	-	2.07
Oxidation reduction potential (ORP)	millivolts	173	188	188	14	212	-119	-31
pH	s.u.	7.37	7.32	7.35	7.01	7.07	6.77	7.25
Temperature	Deg C	9.7	9.2	10.1	8.4	10.8	6.8	10.8
Turbidity	NTU	<2.68	<3.14	<2.73	<2.11	<1.23	<0.95	<1.52

Notes:

[1] Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 3/25/2011, pursuant to 1994 PA 451 as amended.

[2] Also known as Methyl isobutyl ketone (MIBK)

[3] DO results were not obtained at MW-101S, MW-101D, MW-1-2S, MW-102D, MW-103D, MW-104S, MW-104D, MW-5S, MW-105D, and MW-106S due to DO meter failure

U - Not present at or above the associated value.

J - Laboratory qualifiers - estimated concentration.

TABLE 2

SUMMARY OF FEBRUARY 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-107S*	*MW-108S*	*MW-108D*	*MW-109D*
Sample Identification:		*WG-56393-020812-JV-051*	*WG-56393-020812-JV-053*	*WG-56393-020812-JV-052*	*WG-56393-020612-JV-041*
Sample Date:		*2/8/2012*	*2/8/2012*	*2/8/2012*	*2/6/2012*
Sample Type:					
	Units				
Volatile Organic Compounds					
Acetone	µg/L	20 U	20 U	20 U	20 U
Benzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromodichloromethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromomethane (Methyl bromide)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	20 U	20 U	20 U	20 U
Carbon disulfide	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Carbon tetrachloride	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform (Trichloromethane)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Chloromethane (Methyl chloride)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U
Dibromochloromethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Dichlorodifluoromethane (CFC-12)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane	µg/L	0.50 U	0.50 U	0.15 J	0.50 U
1,2-Dichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloropropane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,3-Dichloropropene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
2-Hexanone	µg/L	20 U	20 U	20 U	20 U
Isopropyl benzene	µg/L	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert butyl ether (MTBE)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
4-Methyl-2-pentanone [2]	µg/L	20 U	20 U	20 U	20 U
Methylene chloride	µg/L	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Tetrachloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2,4-Trichlorobenzene	µg/L	2.0 U	2.0 U	2.0 U	2.0 U
1,1,1-Trichloroethane	µg/L	0.50 U	0.50 U	0.12 J	0.50 U
1,1,2-Trichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Trichlorofluoromethane (CFC-11)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl chloride	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U
m&p-Xylenes	µg/L	0.50 U	0.50 U	0.50 U	0.50 U

TABLE 2

SUMMARY OF FEBRUARY 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-107S*	*MW-108S*	*MW-108D*	*MW-109D*
Sample Identification:		*WG-56393-020812-JV-051*	*WG-56393-020812-JV-053*	*WG-56393-020812-JV-052*	*WG-56393-020612-JV-041*
Sample Date:		*2/8/2012*	*2/8/2012*	*2/8/2012*	*2/6/2012*
Sample Type:					
	Units				
Semi-Volatile Organic Compounds					
Acenaphthene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Acenaphthylene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Anthracene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(a)anthracene	ug/L	0.20 U	0.20 U	0.023 J	0.20 U
Benzo(a)pyrene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(b)fluoranthene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(g,h,i)perylene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(k)fluoranthene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Butyl benzylphthalate (BBP)	ug/L	0.021 J	0.20 U	0.027 J	0.024 J
Carbazole	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
4-Chloro-3-methylphenol	ug/L	0.50 U	0.48 U	0.50 U	0.48 U
bis(2-Chloroethyl)ether	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
2-Chlorophenol	ug/L	0.50 U	0.48 U	0.50 U	0.48 U
Chrysene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Dibenz(a,h)anthracene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Dibenzofuran	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
3,3'-Dichlorobenzidine	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dichlorophenol	ug/L	0.50 U	0.48 U	0.50 U	0.48 U
Diethyl phthalate	ug/L	0.025 J	0.021 J	0.028 J	0.021 J
Dimethyl phthalate	ug/L	0.022 J	0.20 U	0.024 J	0.20 U
2,4-Dimethylphenol	ug/L	4.0 U	3.9 U	4.0 U	3.9 U
Di-n-butylphthalate (DBP)	ug/L	0.032 J	0.20 U	0.035 J	0.025 J
4,6-Dinitro-2-methylphenol	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dinitrotoluene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Di-n-octyl phthalate (DnOP)	ug/L	0.20 U	0.20 U	0.019 J	0.20 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	1.0 U	0.96 U	1.0 U	0.96 U
Fluoranthene	ug/L	0.20 U	0.20 U	0.020 J	0.20 U
Fluorene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobenzene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobutadiene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorocyclopentadiene	ug/L	1.0 U	0.96 U	1.0 U	0.96 U
Hexachloroethane	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Indeno(1,2,3-cd)pyrene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Isophorone	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
2-Methylnaphthalene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
2-Methylphenol	ug/L	0.50 U	0.48 U	0.50 U	0.48 U
4-Methylphenol	ug/L	0.50 U	0.48 U	0.50 U	0.48 U
Naphthalene	ug/L	0.036 J	0.20 U	0.042 J	0.039 J
Nitrobenzene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
2-Nitrophenol	ug/L	0.50 U	0.48 U	0.50 U	0.48 U
N-Nitrosodi-n-propylamine	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
N-Nitrosodiphenylamine	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Pentachlorophenol	ug/L	1.0 U	0.96 U	1.0 U	0.96 U
Phenanthrene	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
Phenol	ug/L	0.50 U	0.48 U	0.50 U	0.48 U
Pyrene	ug/L	0.20 U	0.20 U	0.022 J	0.20 U
2,4,5-Trichlorophenol	ug/L	0.50 U	0.48 U	0.50 U	0.48 U
2,4,6-Trichlorophenol	ug/L	0.50 U	0.48 U	0.50 U	0.48 U

TABLE 2

SUMMARY OF FEBRUARY 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-107S*	*MW-108S*	*MW-108D*	*MW-109D*
Sample Identification:		*WG-56393-020812-JV-051*	*WG-56393-020812-JV-053*	*WG-56393-020812-JV-052*	*WG-56393-020612-JV-041*
Sample Date:		*2/8/2012*	*2/8/2012*	*2/8/2012*	*2/6/2012*
Sample Type:					
	Units				
PCBs					
Aroclor-1016 (PCB-1016)	µg/L	0.021 U	0.020 U	0.021 U	0.021 U
Aroclor-1221 (PCB-1221)	µg/L	0.041 U	0.040 U	0.041 U	0.041 U
Aroclor-1232 (PCB-1232)	µg/L	0.021 U	0.020 U	0.021 U	0.021 U
Aroclor-1242 (PCB-1242)	µg/L	0.021 U	0.020 U	0.021 U	0.021 U
Aroclor-1248 (PCB-1248)	µg/L	0.021 U	0.020 U	0.021 U	0.021 U
Aroclor-1254 (PCB-1254)	µg/L	0.021 U	0.020 U	0.021 U	0.021 U
Aroclor-1260 (PCB-1260)	µg/L	0.021 U	0.020 U	0.021 U	0.021 U
Total PCBs	µg/L	ND	ND	ND	ND
Dioxins					
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	ug/L	0.000049 U	0.00005 U	0.00005 U	0.00005 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	ug/L	0.00000719 J	0.00000941 J	0.0000103 J	0.0000066 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	ug/L	0.0000098 U	0.00001 U	0.00001 U	0.00001 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	ug/L	0.0000098 U	0.00001 U	0.00001 U	0.00001 U
Total heptachlorodibenzofuran (HpCDF)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
Total heptachlorodibenzo-p-dioxin (HpCDD)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
Total hexachlorodibenzofuran (HxCDF)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
Total hexachlorodibenzo-p-dioxin (HxCDD)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
Total pentachlorodibenzofuran (PeCDF)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
Total pentachlorodibenzo-p-dioxin (PeCDD)	ug/L	0.0000245 U	0.000025 U	0.000025 U	0.000025 U
Total tetrachlorodibenzofuran (TCDF)	ug/L	0.0000098 U	0.00001 U	0.00001 U	0.00001 U
Total tetrachlorodibenzo-p-dioxin (TCDD)	ug/L	0.0000098 U	0.00001 U	0.00001 U	0.00001 U

TABLE 2

SUMMARY OF FEBRUARY 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-107S*	*MW-108S*	*MW-108D*	*MW-109D*
Sample Identification:		*WG-56393-020812-JV-051*	*WG-56393-020812-JV-053*	*WG-56393-020812-JV-052*	*WG-56393-020612-JV-041*
Sample Date:		*2/8/2012*	*2/8/2012*	*2/8/2012*	*2/6/2012*
Sample Type:					
	Units				
Metals					
Aluminum	ug/L	1.3 J	3.4	2.9	1.1 J
Antimony	ug/L	0.023 J	0.035 J	0.038 J	0.02 J
Arsenic	ug/L	1.81	0.53	1.31	0.13 J
Barium	ug/L	103	99.7	303	81.4
Beryllium	ug/L	0.020 U	0.020 U	0.020 U	0.020 U
Cadmium	ug/L	0.004	0.017 J	0.008 J	0.020 U
Chromium (total)	ug/L	0.047 J	0.09 J	0.15 J	0.11 J
Chromium VI (hexavalent)	ug/L	2.0 U	2.0 U,X	2.0 U,X	2.0 U,X
Cobalt	ug/L	0.648	0.369	0.438	0.037
Copper	ug/L	0.50	0.47	0.20	0.37
Iron	ug/L	**3290**[a,b]	122	**398**[a,b]	11.4 J
Lead	ug/L	0.010 J	0.035	0.018 J	0.009 J
Magnesium	ug/L	28300	24700	27200	24100
Manganese	ug/L	**709**[a,b]	**448**[a,b]	**283**[a,b]	0.17
Mercury	ug/L	0.00057 J	0.00085 J	0.0007 J	0.00081 J
Nickel	ug/L	2.76	0.99	0.84	0.18 J
Selenium	ug/L	1.0 U	1.0 U	1.0 U	0.2 J
Silver	ug/L	0.020 U	0.020 U	0.020 U	0.020 U
Sodium	ug/L	22300	22100	45700	23100
Thallium	ug/L	0.119	0.0101 J	0.0564	0.0032 J
Vanadium	ug/L	0.035 J	0.079 J	0.055 J	0.075 J
Zinc	ug/L	2.16	4.53	0.74	0.36 J
General Chemistry					
Cyanide (amenable)	ug/L	10 U	10 U	4 J	10 U
Cyanide (total)	µg/L	10 U	10 U	4 J	10 U
Field Parameters					
Conductivity	mS/cm	0.875	0.796	0.851	0.552
Dissolved oxygen (DO)[3]	mg/L	0.1	1.03	0	-
Oxidation reduction potential (ORP)	millivolts	-98	7	-88	206
pH	s.u.	6.83	7.02	7.27	7.13
Temperature	Deg C	9.3	9.1	9.4	11.1
Turbidity	NTU	<2.69	<4.12	<3.81	<2.01

Notes:

[1] Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 3/25/2011, pursuant to 1994 PA 451 as amended.

[2] Also known as Methyl isobutyl ketone (MIBK)

[3] DO results were not obtained at MW-101S, MW-101D, MW-1-2S, MW-102D, MW-103D, MW-104S, MW-104D, MW-5S, MW-105D, and MW-106S due to DO meter failure

U - Not present at or above the associated value.

J - Laboratory qualifiers - estimated concentration.

TABLE 2

SUMMARY OF APRIL 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria* [1]			*MW-101S*	*MW-101D*	*MW-102S*	*MW-102D*
Sample Identification:					*WG-56393-020612-JV-038*	*WG-56393-020612-JV-037*	*WG-56393-020612-JV-040*	*WG-56393-020612-JV-039*
Sample Date:					*4/27/2012*	*4/27/2012*	*4/25/2012*	*4/25/2012*
Sample Type:								
Volatile Organic Compounds	*Units*	Residential Drinking Water [a]	Non-Residential Drinking Water [b]	Groundwater Surface Water Interface [c]				
Acetone	µg/L	730	2100	1700	20 U	20 U	20 U	20 U
Benzene	µg/L	5	5	200	0.50 U	0.50 U	0.50 U	0.50 U
Bromodichloromethane	µg/L	80	80	ID	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	µg/L	80	80	ID	0.50 U	0.50 U	0.50 U	0.50 U
Bromomethane (Methyl bromide)	µg/L	10	29	35	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	13000	38000	2200	20 U	20 U	20 U	20 U
Carbon disulfide	µg/L	800	2300	ID	0.50 U	0.50 U	0.50 U	0.50 U
Carbon tetrachloride	µg/L	5	5	45	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	µg/L	100	100	25	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	µg/L	430	1700	1100	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform (Trichloromethane)	µg/L	80	80	350	0.50 U	0.50 U	0.50 U	0.11 J
Chloromethane (Methyl chloride)	µg/L	260	1100	ID	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.2	0.2	-	2.0 U	2.0 U	2.0 U	2.0 U
Dibromochloromethane	µg/L	80	80	ID	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	0.05	5.7	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	µg/L	600	600	13	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichlorobenzene	µg/L	6.6	19	28	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	µg/L	75	75	17	0.50 U	0.50 U	0.50 U	0.50 U
Dichlorodifluoromethane (CFC-12)	µg/L	1700	4800	ID	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane	µg/L	880	2500	740	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	µg/L	5	5	360	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	µg/L	7	7	130	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	µg/L	70	70	620	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	µg/L	100	100	1500	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloropropane	µg/L	5	5	230	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	µg/L	-	-	-	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,3-Dichloropropene	µg/L	-	-	-	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	µg/L	74	74	18	0.50 U	0.50 U	0.50 U	0.50 U
2-Hexanone	µg/L	1000	2900	ID	20 U	20 U	20 U	20 U
Isopropyl benzene	µg/L	800	2300	28	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert butyl ether (MTBE)	µg/L	40	40	7100	0.50 U	0.50 U	0.50 U	0.50 U
4-Methyl-2-pentanone [2]	µg/L	1800	5200	ID	20 U	20 U	20 U	20 U
Methylene chloride	µg/L	5	5	1500	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	µg/L	100	100	80	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	µg/L	8.5	35	78	0.50 U	0.50 U	0.50 U	0.50 U
Tetrachloroethene	µg/L	5	5	60	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	µg/L	790	790	270	0.31 J	0.16 J	0.50 U	0.11 J
1,2,4-Trichlorobenzene	µg/L	70	70	99	2.0 U	2.0 U	2.0 U	2.0 U
1,1,1-Trichloroethane	µg/L	200	200	89	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2-Trichloroethane	µg/L	5	5	330	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene	µg/L	5	5	200	0.50 U	0.50 U	0.50 U	0.50 U
Trichlorofluoromethane (CFC-11)	µg/L	2600	7300	-	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl chloride	µg/L	2	2	13	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	µg/L	280	280	41	0.50 U	0.50 U	0.50 U	0.50 U
m&p-Xylenes	µg/L				0.50 U	0.50 U	0.50 U	0.50 U

TABLE 2

SUMMARY OF APRIL 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria* [1]			*MW-101S*	*MW-101D*	*MW-102S*	*MW-102D*
Sample Identification:					*WG-56393-020612-JV-038*	*WG-56393-020612-JV-037*	*WG-56393-020612-JV-040*	*WG-56393-020612-JV-039*
Sample Date:					*4/27/2012*	*4/27/2012*	*4/25/2012*	*4/25/2012*
Sample Type:								
	Units	Residential Drinking Water [a]	Non-Residential Drinking Water [b]	Groundwater Surface Water Interface [c]				
Volatile Organic Compounds								
Metals								
Cyanide (amenable)	ug/L	200	200		10 U	10 U	10 U	10 U
Cyanide (total)	ug/L	200	200	5.2	10 U	10 U	10 U	10 U
Magnesium	ug/L	400000	1100000		25400	24300	26800	22800
Mercury	ug/L	2	2	0.0013	0.00129	0.00147	0.00074 J	0.00084 J
Sodium	ug/L	120000	350000		24800	26400	23600	21200
PCBs								
Aroclor-1016 (PCB-1016)	ug/L				0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1221 (PCB-1221)	ug/L				0.040 U	0.040 U	0.040 U	0.040 U
Aroclor-1232 (PCB-1232)	ug/L				0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1242 (PCB-1242)	ug/L				0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1248 (PCB-1248)	ug/L				0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1254 (PCB-1254)	ug/L				0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1260 (PCB-1260)	ug/L				0.020 U	0.020 U	0.020 U	0.020 U
Total PCBs	ug/L	0.5	0.5	0.2	ND	ND	ND	ND
Field Parameters								
Conductivity	mS/cm	-	-	-	0.779	0.774	0.836	0.785
Dissolved oxygen (DO)	mg/L	-	-	-	5.21	4.36	1.92	2.53
Oxidation reduction potential (ORP)	millivolts	-	-	-	230	227	81	209
pH	s.u.	6.5 - 8.5	6.5 - 8.5	-	7.23	7.18	6.71	6.88
Temperature	Deg C	-	-	-	9.3	10.8	10.9	11.9
Turbidity	NTU	-	-	-	<0.80	<0.98		<0.63

Notes.

[1] Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 3/25/2011, pursuant to 1994 PA 451 as amended.

a Residential Drinking Water

b Non-Residential Drinking Water

c Groundwater Surface Water Interface

[2] Also known as Methyl isobutyl ketone (MIBK).

U Not present at or above the associated value.

J Laboratory qualifiers - estimated concentration.

TABLE 2

SUMMARY OF APRIL 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-103D*	*MW-104S*	*MW-104D*	*MW-104D*	*MW-105S*	*MW-105D*
Sample Identification:		*WG-56393-020712-JV-043*	*WG-56393-020712-JV-044*	*WG-56393-020712-JV-046*	*WG-56393-020712-JV-045*	*WG-56393-020712-JV-048*	*WG-56393-020712-JV-047*
Sample Date:		*4/25/2012*	*4/25/2012*	*4/25/2012*	*4/25/2012*	*4/25/2012*	*4/25/2012*
Sample Type:				*Duplicate*			
	Units						
Volatile Organic Compounds							
Acetone	µg/L	20 U	20 U	20 U	20 U	20 U	20 U
Benzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromodichloromethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromomethane (Methyl bromide)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	20 U	20 U	20 U	20 U	20 U	20 U
Carbon disulfide	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon tetrachloride	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform (Trichloromethane)	µg/L	0.13 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloromethane (Methyl chloride)	µg/L	0.50 U	0.10 J	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Dibromochloromethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Dichlorodifluoromethane (CFC-12)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloropropane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,3-Dichloropropene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Hexanone	µg/L	20 U	20 U	20 U	20 U	20 U	20 U
Isopropyl benzene	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert butyl ether (MTBE)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
4-Methyl-2-pentanone [2]	µg/L	20 U	20 U	20 U	20 U	20 U	20 U
Methylene chloride	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Tetrachloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	µg/L	0.50 U	0.060 J	0.50 U	0.17 J	0.060 J	0.18 J
1,2,4-Trichlorobenzene	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1,1-Trichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.080 J	0.090 J
1,1,2-Trichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichlorofluoromethane (CFC-11)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl chloride	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
m&p-Xylenes	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

TABLE 2

SUMMARY OF APRIL 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-103D*	*MW-104S*	*MW-104D*	*MW-104D*	*MW-105S*	*MW-105D*
Sample Identification:		*WG-56393-020712-JV-043*	*WG-56393-020712-JV-044*	*WG-56393-020712-JV-046*	*WG-56393-020712-JV-045*	*WG-56393-020712-JV-048*	*WG-56393-020712-JV-047*
Sample Date:		*4/25/2012*	*4/25/2012*	*4/25/2012*	*4/25/2012*	*4/25/2012*	*4/25/2012*
Sample Type:				*Duplicate*			
	Units						
Volatile Organic Compounds							
Metals							
Cyanide (amenable)	ug/L	10 U	4 J	10 U	10 U	10 U	10 U
Cyanide (total)	ug/L	10 U	4 J	10 U	10 U	10 U	10 U
Magnesium	ug/L	23200	23200	22600	23100	28600	25100
Mercury	ug/L	0.00075 J	0.00073 J	0.00061 J	0.00064 J	0.00047 J	0.00088 J
Sodium	ug/L	21700	22100	21000	21900	25600	23600
PCBs							
Aroclor-1016 (PCB-1016)	ug/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1221 (PCB-1221)	ug/L	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U
Aroclor-1232 (PCB-1232)	ug/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1242 (PCB-1242)	ug/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1248 (PCB-1248)	ug/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1254 (PCB-1254)	ug/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1260 (PCB-1260)	ug/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Total PCBs	ug/L	ND	ND	ND	ND	ND	ND
Field Parameters							
Conductivity	mS/cm	0.612	0.739	0.734	0.734	0.928	0.881
Dissolved oxygen (DO)	mg/L	1.95	2.67	2.74	2.74	.93	1.80
Oxidation reduction potential (ORP)	millivolts	230	229	233	233	81	96
pH	s.u.	5.76	7.07	7.06	7.06	6.75	6.77
Temperature	Deg C	13.35	13.3	13.1	13.1	12.8	13.2
Turbidity	NTU	<2.00	<1.0	<2.77	<2.77	<0.64	<4.58

Notes

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 3/25/2011, pursuant to 1994 PA 451 as amended.

a Residential Drinking Water

b Non-Residential Drinking Water

c Groundwater Surface Water Interface

(2) Also known as Methyl isobutyl ketone (MIBK).

U Not present at or above the associated value.

J Laboratory qualifiers - estimated concentration.

TABLE 2

SUMMARY OF APRIL 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-106S*	*MW-106D*	*MW-107S*	*MW-108S*	*MW-108D*	*MW-109D*
Sample Identification:		*WG-56393-020712-JV-050*	*WG-56393-020712-JV-049*	*WG-56393-020812-JV-051*	*WG-56393-020812-JV-053*	*WG-56393-020812-JV-052*	*WG-56393-020612-JV-041*
Sample Date:		*4/26/2012*	*4/26/2012*	*4/26/2012*	*4/26/2012*	*4/26/2012*	*4/26/2012*
Sample Type:							
	Units						
Volatile Organic Compounds							
Acetone	µg/L	20 U	20 U	20 U	20 U	20 U	20 U
Benzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromodichloromethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromomethane (Methyl bromide)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	20 U	20 U	20 U	20 U	20 U	20 U
Carbon disulfide	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon tetrachloride	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform (Trichloromethane)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloromethane (Methyl chloride)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Dibromochloromethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Dichlorodifluoromethane (CFC-12)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.11 J	0.50 U
1,2-Dichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloropropane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,3-Dichloropropene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Hexanone	µg/L	20 U	20 U	20 U	20 U	20 U	20 U
Isopropyl benzene	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Methyl tert butyl ether (MTBE)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
4-Methyl-2-pentanone [2]	µg/L	20 U	20 U	20 U	20 U	20 U	20 U
Methylene chloride	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Tetrachloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	µg/L	0.14 J	0.13 J	0.13 J	0.23 J	0.21 J	0.50 U
1,2,4-Trichlorobenzene	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1,1-Trichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.14 J	0.50 U
1,1,2-Trichloroethane	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Trichlorofluoromethane (CFC-11)	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl chloride	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
m&p-Xylenes	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

TABLE 2

SUMMARY OF APRIL 2012 GROUNDWATER ANALYTICAL RESULTS
12th STREET LANDFILL
OTSEGO TOWNSHIP, MICHIGAN

Sample Location:		*MW-106S*	*MW-106D*	*MW-107S*	*MW-108S*	*MW-108D*	*MW-109D*
Sample Identification:		*WG-56393-020712-JV-050*	*WG-56393-020712-JV-049*	*WG-56393-020812-JV-051*	*WG-56393-020812-JV-053*	*WG-56393-020812-JV-052*	*WG-56393-020612-JV-041*
Sample Date:		*4/26/2012*	*4/26/2012*	*4/26/2012*	*4/26/2012*	*4/26/2012*	*4/26/2012*
Sample Type:							
	Units						
Volatile Organic Compounds							
Metals							
Cyanide (amenable)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U
Cyanide (total)	ug/L	10 U	10 U	10 U	10 U	10 U	10 U
Magnesium	ug/L	33400	24600	28200	24300	25900	24700
Mercury	ug/L	0.00119	0.0012	0.00065 J	0.00141[c]	0.00079 J	0.00085 J
Sodium	ug/L	25000	26300	22100	23300	44400	22900
PCBs							
Aroclor-1016 (PCB-1016)	ug/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1221 (PCB-1221)	ug/L	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U
Aroclor-1232 (PCB-1232)	ug/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1242 (PCB-1242)	ug/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1248 (PCB-1248)	ug/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1254 (PCB-1254)	ug/L	0.020 U	0.0098 J	0.020 U	0.020 U	0.020 U	0.020 U
Aroclor-1260 (PCB-1260)	ug/L	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Total PCBs	ug/L	ND	0.0098 J	ND	ND	ND	ND
Field Parameters							
Conductivity	mS/cm	1.04	0.781	0.933	0.851	0.884	0.764
Dissolved oxygen (DO)	mg/L	.98	3.42	6.38	2.72	1.68	4.12
Oxidation reduction potential (ORP)	millivolts	-59	91	-24	-12	-33	193
pH	s.u.	6.63	7.17	6.84	7.05	7.18	7.17
Temperature	Deg C	11.3	12.5	11.9	11.9	12.3	11.7
Turbidity	NTU	<1.02	<2.98	<0.24	<0.5	<0.41	<0.35

Notes

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 3/25/2011, pursuant to 1994 PA 451 as amended.

a Residential Drinking Water

b Non-Residential Drinking Water

c Groundwater Surface Water Interface

(2) Also known as Methyl isobutyl ketone (MIBK).

U Not present at or above the associated value.

J Laboratory qualifiers - estimated concentration.

Photos

Attachment 3

Photos Documenting Site Conditions