Five-Year Review Report

Second Five-Year Review Report

for

N. W. Mauthe Superfund Site

Appleton

Outagamie County, Wisconsin

April 2006

PREPARED BY:

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4/26/06

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Five-Year Review Report

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List of Acronyms

ACL	Alternative Concentration Limit
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EPA	United States Environmental Protection Agency
ES	Enforcement Standard
ESD	Explanation of Significant Difference
FSP	Field Sampling Plan
HI	Hazard Index
IC	Institutional Control
LTRA	Long Term Response Action
MCL	Maximum Contaminant Level
MCO	Midwest Contract Operations, Inc.
NCP	National Contingency Plan
NPL	National Priorities List
NR	Natural Resources (e.g. ch. NR 140, Wis. Adm. Code)
O&M	Operation and Maintenance
PAL	Preventive Action Limit
POTW	Publicly Owned Treatment Works
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance / Quality Control
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
VOC	Volatile Organic Compound
WDHFS	Wisconsin Department of Health and Family Services
WDNR	Wisconsin Department of Natural Resources
WDOJ	Wisconsin Department of Justice

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Executive Summary

The second five-year review of the N. W. Mauthe Superfund site at 725 South Outagamie Street in Appleton, Wisconsin revealed that the containment and treatment system installed by the Environmental Protection Agency (EPA) in 1995 and 1996 is operating as designed. The remedy at the N. W. Mauthe Superfund site is currently protective of human health and the environment based on completion of the following actions: demolition and removal of contaminated buildings; removal of containerized wastes; excavation of contaminated soils greater than 500 milligrams per kilogram (mg/kg) of chromium; installation of a clay cap over the soil remaining below 500 mg/kg of chromium; installation of a contaminated groundwater collection and treatment system; installation or improvement of foundation drain systems for those residents or businesses located within the groundwater contaminant plume; and cleaning, painting or sealing of affected basements to prevent future contaminated groundwater seepage into the residential buildings. As a result, the exposure pathways that could result in unacceptable risks in the short term are being controlled. However, institutional controls, such as deed restrictions or easements and site access controls that are intended to prevent access, excavation or disturbance of the constructed cap, access to remaining soil contamination, disturbance of the groundwater collection and treatment system and installation of drinking water wells need to be implemented to ensure long-term protectiveness. Additionally, on-going operation and maintenance (O&M) of the groundwater collection and treatment system as well as system evaluations to identify efficiencies need to continue.

Routine O&M revealed that corrosion to the concrete and associated piping and wiring within manhole no. 2 is evident due to the presence of hydrogen sulfide and sulfuric acid. This corrosion must be addressed to prevent further degradation and avoid impact to the overall collection system. This work is scheduled to be performed in 2006.

During the five-year review process, the Wisconsin Department of Natural Resources (WDNR) identified that several key wells installed during the Remedial Investigation (RI) that were abandoned to perform the Remedial Action (RA) should be replaced. These replacement wells, located in areas of historically high groundwater contaminant concentrations, will assist in the on-going monitoring of the contaminant plume and evaluation of the progress of the remedy. Installation of these wells is also scheduled to be performed in 2006.

The groundwater cleanup goals do not appear to be attainable in a reasonable amount of time with the existing collection system and clay cap. Modifications should be evaluated to increase the efficiency of the collection and treatment system to reduce the time necessary to meet the cleanup goals.

OMNNI Associates is working under contract with the WDNR to evaluate the collection and treatment systems and propose changes to increase the efficiency and reduce long-term costs for operation and maintenance. This evaluation includes installation of the additional monitoring wells discussed above that will be added to the long-term monitoring plan. Information obtained from these efforts will be used to identify options to increase the efficiency of the collection and treatment system and to reduce the time necessary to achieve the groundwater cleanup goals.

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Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: N. W. Mauthe Superfund Site		
EPA ID *(from WasteLAN)*: WID083290981		
Region: 5	**State:** WI	**City/County:** Appleton/Outagamie

SITE STATUS	
NPL status: ✓ **Final** Deleted Other (specify)	
Remediation status (choose all that apply): Under Construction; ✓ **Operating;** Complete	
Multiple OUs?* YES ✓ **NO**	**Construction completion date:** 03 / 27 / 1997
Has site been put into reuse? YES ✓ **NO**	

REVIEW STATUS	
Lead agency: EPA; ✓ **State** Tribe Other Federal Agency _____	
Author name: Jennifer Borski	
Author title: Hydrogeologist	**Author affiliation: WDNR**
Review period:** 11 / 14 / 2005 to 03 / 31 / 2006	
Date(s) of site inspection: 11 / 14 / 2005 and 02 / 27 / 2006	
Type of review: Post-SARA Pre-SARA NPL-Removal only Non-NPL Remedial Action Site ✓ **NPL State/Tribe-lead** Regional Discretion	
Review number: 1 (first) ✓ **2 (second)** 3 (third) Other (specify) _____	
Triggering action: Actual RA Onsite Construction at OU #____ Actual RA Start at OU#____ Construction Completion ✓ **Previous Five-Year Review Report** Other (specify)	
Triggering action date *(from WasteLAN)*: 04 / 26 / 2001	
Due date *(five years after triggering action date)*: 04 / 26 / 2006	

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form Continued

Issues:

- It is unclear if institutional controls (ICs) are in place to protect the clay cap, collection and treatment systems and prevent direct contact with or excavation of remaining soil contamination.
- The corrosion of concrete and associated piping and wiring within manhole no. 2 must be addressed to prevent further degradation and avoid impact to the overall collection system.
- There is no exit strategy in place to discontinue use of the residential sump laterals, groundwater collection trenches, manholes, groundwater treatment facility or associated piping when no longer needed.
- Alternative technologies may be available for a more cost-effective and efficient treatment process.
- It does not appear that the groundwater cleanup goals will be met within a reasonable amount of time utilizing the current design and operational procedures for the groundwater collection system.
- The existing monitoring network should be enhanced to assist in the on-going monitoring of the contaminant plume and evaluation of the progress of the remedy.
- Filtering procedures, analyzing laboratory and analytical methods have not been consistent. The Quality Assurance Project Plan (QAPP) has not been followed consistently.
- Wisconsin Department of Natural Resources (WDNR) Preventive Action Limit (PAL) standards changed in 2004 for several contaminants of concern.
- Influent/effluent sampling points are not labeled in the treatment building.

Recommendations and Follow-up Actions:

- Perform a title search to determine if ICs are in place. Determine appropriate means to adequately protect the existing clay cap and vegetative cover, collection and treatment systems and prevent direct contact with and excavation of remaining soil contamination.
- Investigate the source of the hydrogen sulfide. Identify and implement the most cost-effective option to address corrosion within manhole no. 2 from hydrogen sulfide and sulfuric acid.
- Develop an exit strategy that determines the appropriate disposition of the residential sump laterals, groundwater collection trenches, manholes, groundwater treatment facility and associated piping upon completion of the remedy.
- Complete the on-going System Evaluation with WDNR and OMNNI Associates to identify alternative technologies that may be available for a more cost-effective and efficient treatment process. Pursue long-term approval for direct discharge of influent to the City of Appleton Publicly Owned Treatment Works (POTW).
- Identify and implement potential modifications to the system to increase efficiency and reduce the amount of time necessary to achieve remedial action objectives. Evaluate whether alternative concentration limits (ACLs) may be appropriate for the site conditions.
- Install additional monitoring wells to assist in the on-going monitoring of the contaminant plume and evaluation of the progress of the remedy.
- WDNR will discuss appropriate lab selection and the existing QAPP with the Environmental Protection Agency (EPA).
- Changes to standards will be tracked over the next five years as operation and maintenance (O&M) and System Evaluation continues.
- WDNR will label influent and effluent sampling points in the treatment building.

Five-Year Review Summary Form Continued

Protectiveness Statement:
The remedy at the N. W. Mauthe Superfund Site is currently protective of human health and the environment based on completion of the following actions: demolition and removal of contaminated buildings; removal of containerized wastes; excavation of contaminated soils greater than 500 milligrams per kilogram (mg/kg) of chromium; installation of a clay cap over the soil remaining below 500 mg/kg of chromium; installation of a contaminated groundwater collection and treatment system; installation or improvement of foundation drain systems for those residents or businesses located within the groundwater contaminant plume; and cleaning, painting or sealing of affected basements to prevent future contaminated groundwater seepage into the residential buildings. As a result, the exposure pathways that could result in unacceptable risks in the short term are being controlled. However, institutional controls, such as deed restrictions or easements and site access controls that are intended to prevent access, excavation or disturbance of the constructed cap, access to remaining soil contamination, disturbance of the groundwater collection and treatment system and installation of drinking water wells need to be implemented to ensure long-term protectiveness. Additionally, on-going O&M of the groundwater collection and treatment system as well as system evaluations to identify efficiencies need to continue.

Five-Year Review Report

I. Introduction

The Purpose of the Review

The purpose of the five-year review is to determine whether the remedy at a site is expected to be 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.

The Wisconsin Department of Natural Resources (WDNR) is preparing this five-year review pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §121 and the National Contingency Plan (NCP). CERCLA §121 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.*

The Environmental Protection Agency (EPA) interpreted this requirement further in the NCP; 40 CFR §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.*

Who Conducted the Five-Year Review

The WDNR, Northeast Region has conducted a five-year review of the Remedial Actions (RA) implemented at the N. W. Mauthe Superfund site in Appleton, Wisconsin. This review was conducted from November 2005 through March 2006. This report documents the results of the review. This review was conducted with support from OMNNI Associates in Appleton, Wisconsin under contract with the WDNR for *Evaluation of the Collection and Treatment System and Proposal for Modifications at N.W. Mauthe, 725 S. Outagamie St., Appleton, Wisconsin*, scope of work dated August 31, 2005 (System Evaluation).

Other Review Characteristics

This is the second five-year review for the N. W. Mauthe Superfund site. The triggering action for this review is the date of the first five-year review, as shown in EPA's WasteLAN database:

April 26, 2001. Five-year reviews are required for the N. W. Mauthe Superfund site due to hazardous substances, pollutants, or contaminants left onsite above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
Wisconsin Chromium Corp, owned by Norbert W. Mauthe, operated hard chrome plating at site.	1960 – 1976
Norbert W. Mauthe owner of Wisconsin Chromium Corp	1946 – 1976
Plating facility operated electroplating of zinc and cadmium and possibly copper and silver at site	1978 – 1987
Complaint of environmental contamination received by WDNR	Mar 1982
Initial investigation by WDNR and temporary groundwater collection	Apr – May 1982
WDNR pursued Norbert W. Mauthe for remedial action at site	1982 – 1985
WDOJ initiated legal action against Norbert W. Mauthe	Oct 1982
WDNR site investigation of soil and groundwater	Nov 1982
Superfund Field Investigation Team performed site inspection	Oct 1984
Initial soil removal and liquid asphalt applied to site by WDNR	Oct 1984
Outagamie County Circuit Court ordered Norbert W. Mauthe to develop a cleanup plan for the site	1985
Norbert W. Mauthe's consultant proposed cleanup plan which was rejected by WDNR	1986
Norbert W. Mauthe's insurance carrier rejected claims for costs and remedial action	1986
Norbert W. Mauthe passed away	1986
Health reaction to exposure of contaminated soils by Sprint field worker	Aug 1987
WDOJ settled with Norbert W. Mauthe's estate	1988
EPA Technical Assistance Team conducted site assessment	June 1988
Cooperative agreement signed between EPA and WDNR for state-lead RI/FS	Sept 1988

Table 1: Chronology of Site Events

Event	Date
EPA Technical Assistance Team conducted second site assessment for immediate threats	Jan 4, 1989
Site listed on NPL	Mar 1989
WDNR begins RI/FS	Sept 1989
EPA installed fence around Mauthe property to prevent access and excavated highly contaminated soils as Time-Critical Removal Action	1991
WDNR installed groundwater diversion system in basement at 1414 W. Second St.	1991
RI initiated with public meeting	1991
RI complete	Feb 4, 1993
FS complete	May 1993
ROD selecting remedy signed	March 31, 1994
Site buildings removed by EPA	1995
Phase I RA started -Soil with chromium > 500 mg/kg removed and three groundwater collection trenches installed by EPA	1995
Phase II RA started- Groundwater treatment building and system constructed by EPA	1996
Phase I RA closure report	July 31, 1996
Groundwater treatment system start-up by CH2M Hill	Jan 14, 1997
Groundwater treatment operation by MCO	Feb 20, 1997
Preliminary CloseOut Report documenting RA construction completed	March 1997
Phase II RA closure report	July 29, 1997
Final O&M Manual	April 29, 1997
Plans for LTRA	Sept 5, 1997
WDNR assumes management of O&M of groundwater collection trenches and groundwater treatment system and building	1998
EPA approval of reduction in groundwater monitoring program	Jan 18, 2000
Signature of first five-year review performed by WDNR (lead) & EPA	April 26, 2001
EPA approval of reduction in groundwater monitoring program	April 17, 2003

Table 1: Chronology of Site Events

Event	Date
Start of WDNR contract with OMNNI Associates for *Evaluation of Collection and Treatment System and Proposal for Modifications at N. W. Mauthe Site*	Jan 26, 2005
Four deep piezometers installed by WDNR to delineate vertical extent of chromium and VOCs in groundwater	June 2005
Five-year review site inspection by WDNR and EPA	November 2005

III. Background

The N. W. Mauthe Superfund site is located at 725 South Outagamie Street in Appleton, Wisconsin. (See Figure 1 in Appendix A.) Appleton has a population of 72,085. Electroplating of chromium took place at the site from 1960 until 1976 by Norbert W. Mauthe. Mr. Mauthe then performed electroplating of zinc and cadmium and possibly copper and silver at the site from 1978 until 1987 when all operations at the site ceased. The property is currently owned by Carol Mauthe, widow of Mr. Mauthe.

Physical Characteristics and Land Use

The site is approximately a one-acre triangular shaped parcel. It is bound to the north by Melvin Street, to the west by a parking lot for Miller Electric and Manufacturing Company and to the southeast by Canadian National Railroad. Immediately adjacent to the railroad are three residences (801 South Outagamie Street, 1410 West Second Street and 1414 West Second Street), one business/residence (1428 West Second Street) and one business (1400 West Second Street). Land use in the surrounding area is a mix of residential, commercial and light industrial. Land use at the properties immediately surrounding the site is the same as land use prior to remedial action at the site.

The Fox River is located approximately ½ mile southeast of the site. The depth to groundwater at the site is approximately ten feet below ground surface. (See the time versus groundwater elevation graph in Appendix E.) The City of Appleton is served by a municipal water system, referred to as the Publicly Owned Treatment Works (POTW).

History of Contamination and Initial Response

The WDNR received a complaint of yellow-green surface water in a ditch along the railroad tracks adjacent to 725 South Outagamie Street in March 1982. The WDNR also received a complaint of yellow-green water being pumped from a residential foundation drain sump south of the site. The WDNR took immediate action in April and May 1982 by installing a shallow drain system to collect contaminated groundwater and surface water. The system operated until late 1984.

The WDNR initiated an investigation into groundwater in November 1982. The investigation confirmed that plating operations contributed metals, cyanide and Volatile Organic Compounds (VOCs) to the groundwater above WDNR standards and impacted soils above WDNR direct contact residual contaminant levels. The amount of contamination released to the environment is not known.

In October 1984, the WDNR installed a temporary asphalt cover to limit infiltration of surface water while continuing to pursue Mr. Mauthe for cleanup of the contamination. In 1985, Mr. Mauthe was ordered by the Outagamie County Circuit Court to develop a cleanup plan. The consultant for Mr. Mauthe proposed a cleanup plan in 1986, which was subsequently denied by the WDNR. Mr. Mauthe's insurance carrier rejected claims for costs associated with cleanup of the contamination. Mr. Mauthe passed away in 1986.

In May 1987, a contractor of AT&T installed a fiber optics cable along the railroad right-of-way adjacent to the site. In August 1987, a contractor of U.S. Sprint also installed a fiber optics cable in a trench between the railroad tracks. Several workers developed skin irritation and rashes, apparently caused by contact with the water and soil in the U.S. Sprint trench. In November 1987, AT&T and U.S. Sprint installed a joint conduit system for the fiber optics cables outside of the contaminated areas. They abandoned the two initial trenches and anti-seep plugs were installed.

In March 1989, the site was listed on the National Priorities List (NPL). WDNR initiated the Remedial Investigation / Feasibility Study (RI/FS) in September 1989. In November 1991, CH_2M Hill under contract with the WDNR, began the RI/FS. The RI/FS included the installation of monitoring wells, surface and subsurface soil sampling, test pit excavation, groundwater, residential sump pump and sewer water sampling, hydraulic conductivity testing, surface water sampling and videotaping of the sanitary and storm sewer lines.

In 1991, the EPA installed a fence around the site and excavated some of the highly contaminated soil adjacent to the chrome building and from a tank pit within the building. EPA also steam cleaned the walls, floors and ceilings of the office areas and the floors and uninsulated portions of the zinc and chromium buildings. Miscellaneous debris was decontaminated and disposed of or placed in containers stored in the buildings onsite.

In 1991, the WDNR installed a groundwater diversion system in the basement at 1414 West Second Street, called the Electro-Pulse Shield. Installation of the shield reduced seepage of contaminated water into the basement.

A final RI Report, dated February 4, 1993 and final FS Report, dated May 1993, were approved by the EPA and the WDNR in 1993. The RI found significant contamination of concern in soil and groundwater both on and off the site. The greatest concentrations of contamination were in the area around the zinc and chromium buildings. The contaminants most often detected include total and hexavalent chromium, zinc, cadmium, cyanide, trichloroethene, 1,1,1-trichloroethane, 1,1-dichloroethene and toluene.

Basis for Taking Action

Subsurface soil contamination at the site was detected to a maximum depth of 25 feet. Soil contamination extended across the entire site and south to the south side of the railroad tracks and onto property at 1414 West Second Street. Chromium was the most widely distributed contaminant.

Chromium, primarily hexavalent, was found in groundwater above WDNR standards at the site and adjacent properties. The groundwater impacts were limited to the north by Melvin Street, to the east by Outagamie Street, to the south by West Second Street and to the west by the parking lot for Miller Electric.

Public health was threatened by the contamination through direct contact with the buildings onsite, impacted surficial soils on and off-site and impacted surface water on and off-site. Public health was also threatened by contamination in groundwater off-site through seepage of water into basements and surficial discharge of water from foundation sumps. The Record of Decision (ROD) selecting a remedy was signed on March 31, 1994.

IV. Remedial Actions

Remedy Selection

Remedial Action Objectives (RAOs) and the selected remedy are outlined in the ROD, signed March 31, 1994. Details of the remedy are described in the Final Design Submittal, dated May 1995.

RAOs identified include:

- Prevent migration of contaminants in groundwater and in the long term, to remediate the groundwater to protect human health and the environment and to meet state and federal standards;
- Prevent human exposure to contaminated soils, groundwater or surface water that pose unacceptable risks.

The selected remedy includes the following activities:

- Demolition and removal of the buildings on the N. W. Mauthe property, with proper management and disposal of the building debris;
- Removal and proper disposal of the containerized waste stored onsite at the time of the ROD;
- Excavation of soils with a total chromium concentration greater than 500 milligrams per kilogram (mg/kg), removing approximately 80% of the chromium contaminant mass, including the removal of soils beneath the railroad tracks;
- Off-site treatment and proper disposal of excavated soils in excess of 50 mg/kg;
- Backfilling of the excavation with excavated soils less than 50 mg/kg and clean soils;
- Capping of the site with two feet of clay soil and topsoil with a vegetative cover;
- Installation of three groundwater collection trenches and construction and operation of a groundwater treatment facility with discharge to the sanitary sewer to contain and/or control groundwater contamination with ultimate compliance with groundwater Applicable or Relevant and Appropriate Requirements (ARARs) and defined by the State and Federal groundwater quality standards identified in Table 4 of the ROD.
- Improvement or installation of foundation drain systems and cleaning, painting or sealing basement walls and floors for homes or businesses in the area of the site, to prevent seepage of contaminated water into the buildings;

- ICs, such as deed restrictions or easements and site access controls that are intended to prevent access, excavation, disturbance of the newly constructed cap, future soil excavation in the railroad corridor for areas in the corridor where contaminated soils will remain and installation of drinking water wells;
- Monitoring of the effectiveness of the groundwater treatment system and groundwater quality; and
- Operation and maintenance (O&M) of all systems.

Remedy Implementation

Demolition of the site buildings and the removal and disposal of the containerized waste was accomplished in the fall of 1994 during remedial design (RD). The RD was split into two parts to allow a trench test to be completed on a portion of the groundwater collection system before design of the groundwater treatment facility. Excavation, trench installation and related activities took place in 1995 (Phase I). The treatment building and clay cap were constructed in 1996 (Phase II). The system began operation in January 1997 and has operated continuously since that time.

Phase I took place between March 1995 and November 1995. In July 1995, 25 monitoring wells were abandoned. MW-26R, located in the northwest corner of the Mauthe property could not be located and was assumed to have been previously abandoned.

The excavation of an area identified as a hot spot served to remove a majority of the source area and was excavated between July and October 1995. An area with soils greater than 500 mg/kg was identified as the hot spot. Additional soils were excavated on and off-site to access the soils identified for removal. Excavated soils greater than 50 mg/kg were transported off-site for proper disposal. Excavated soils less than 50 mg/kg were replaced onsite along with clean soils. Two feet of clay and a vegetative cover were installed in June 1996. The excavation area is shown on Figure 2 in Appendix A.

The groundwater collection trench system was designed with several purposes. The west trench, located on Miller Electric property, and the southeast trench, located along Outagamie Street and West Second Street, were designed to prevent further migration of contamination by surrounding the delineated plume. The central trench, located along the south side of the railroad corridor, was designed to prevent further migration of contamination from the Mauthe property and reverse the groundwater gradient between the site and residences to the south. In addition to the collection trenches, two 33-foot deep sumps (manholes) with pumps were constructed in June and August 1995. Associated piping was installed in October 1995 to transport the collected groundwater to the treatment building.

Residential foundation drains were installed at 1410 and 1414 West Second Street in October 1995. A sealant was applied to the exteriors of the foundations. The new residential foundation drains at 1410 and 1414 West Second Street along with the existing foundation drain at 801 South Outagamie Street were connected to the southeast collection trench. The interior floors and walls of the foundations at 1410 and 1414 West Second Street and 801 South Outagamie Street were seal coated in October and November 1995. A residential fence was installed throughout the properties at 801 South Outagamie, 1410 and 1414 West Second Street in November 1995.

The existing foundation drain at 1428 West Second Street was not connected to the collection trench as initially planned. This was discovered in May 2002 and the drain at 1428 West Second Street was connected to the southeast trench at that time.

Eight new monitoring wells were installed in October 1995 (MW-101 through MW-108). Four piezometers were installed within the filter material of the groundwater collection trenches to assist with evaluation of the groundwater collection (PZ-1 through PZ-4). These piezometers were scheduled to be abandoned after initial system evaluation. These piezometers were abandoned by WDNR in May 2004 due to the poor condition of the wells.

Phase I is documented in the report, *Phase I Remedial Action Closure Report*, dated July 31, 1996. Final as-builts were not submitted with the Phase I report. As-builts were received on November 6, 1996 but did not accurately reflect actual construction details. Specifically, the layout of the collection trench transfer pipe does not reflect discharge to the treatment building. Ms. Borski spoke with Ike Johnson with CH_2M Hill on January 20, 2005 and learned that final as-builts were not generated. Instead, post-construction notes were written on construction plans and submitted. This is confirmed in a letter from Cathy Barnett with CH_2M Hill dated November 1, 1996. Sheets # 3, 4, 5A, 5B, 5C (four different sheets), 5D, 7, 13, 9, 10, 11, 14 and 17 were submitted in November 1996 to document construction of Phase I. The estimated location of the existing collection system is shown on Figure 2 in Appendix A.

Phase II took place between August 1996 to February 1997 and April 1997 to May 1997 and included construction of the treatment building and treatment system. The final landscape work took place in April 1997. The perimeter fence at the Mauthe property was also installed in April 1997. The asphalt drive north of the treatment building was constructed in November 1996. Phase II is documented in the report, *Phase II Remedial Action Construction Documentation Report*, dated July 29, 1997.

Based on existing data, the groundwater collection trench is containing the groundwater contamination. (See Figure 3, Appendix A.) Although the influent contaminant concentrations are below the City of Appleton wastewater discharge limits, the collected water is treated with ferrous sulfate and sodium hydroxide prior to discharge to the sanitary sewer under permit. There are no known ICs in place to protect the clay cap, groundwater collection system, treatment system or prevent direct contact with and excavation of remaining contaminated soils.

<u>System Operations/Operation and Maintenance (O&M)</u>

Daily, weekly, monthly and annual O&M activities are performed at the treatment building and manholes. These activities are detailed in the *Final O&M Manual* dated April 29, 1997. In addition, existing wells are inspected quarterly. The current long-term groundwater monitoring plan is shown in Table 2 in Appendix B.

Table 3 below details O&M costs for each WDNR fiscal year (July 1st through June 30th) since July 1, 2000. These costs include payment to the O&M contractor and additional costs paid directly by WDNR (e.g. permit renewals, fourth quarter compliance sampling, utility invoices, repairs beyond the O&M contract, etc.) Table 3 does not include WDNR salaries for oversight of the site.

Table 3: System Operations/O&M Costs

Dates		Total Cost rounded to nearest $1,000
From	To	
7/1/00	6/30/01	$78,000
7/1/01	6/30/02	$84,000
7/1/02	6/30/03	$87,000
7/1/03	6/30/04	$53,000
7/1/04	6/30/05	$57,000
7/1/05	12/31/05	$31,000

Between July 1, 2000 and June 30, 2001, $2,500 of the $78,000 was for purchase of a backup pump, Quality Assurance / Quality Control (QA/QC) data package and piping modifications for connection of 1428 West Second Street to the southeast collection trench. Between July 1, 2002 and June 30, 2003, WDNR began paying utilities directly. The lump sum contract with Midwest Contract Operations, Inc. (MCO), the O&M contractor, included utility invoice payments and was not amended until 2004. In November 2003, WDNR rebid the O&M of the system. MCO provided the low bid of $35,649.84 for annual O&M. This lump sum bid did not include utility and permit costs or repairs above the O&M scope of work paid directly by WDNR. With the exception of the piping modifications and adjustment of the contract on utility payments, there were no unusually high O&M costs that would indicate an issue with the system.

V. Progress Since the Last Review

The first five-year review performed in 2001 concluded that the remedy is protective of human health and the environment. Several issues with the monitoring network, collection system and treatment system were identified with recommendations for follow-up. These recommendations are detailed in Table 4 below and include actions taken since the first five-year review report.

Table 4: Actions Taken 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
	Continue O&M of groundwater collection and treatment system.	WDNR	On-going	WDNR maintained O&M contract with MCO for continuous system operation.	MCO contract renewed Oct 2005 for one year. Contract renewal scheduled to be offered to MCO annually.

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Evaluate contaminant trends in groundwater and determine optimal monitoring well configuration and frequency of sampling for site remedy monitoring.	Prepare a trend analysis report and analysis of current monitoring network.	WDNR	None established.	1. WDNR evaluation of monitoring network and request for reduction in monitoring frequency/sampling parameters. 2. System Evaluation contract with OMNNI Associates for a proposal for modifications to increase system efficiency. 3. WDNR evaluation of monitoring network and installation of four piezometers (PZ-5 – PZ-8) to confirm vertical extent of chromium and VOCs in groundwater. 4. WDNR evaluation of monitoring network and plans for additional monitoring wells in 2006 to assist in the on-going monitoring of the contaminant plume and evaluation of the progress of the remedy.	Requested by WDNR March 2003, approved by EPA April 2003 Contract date: January 26, 2005. System Evaluation on-going June 2005 February 2006 - present
Evaluate alternative groundwater treatment options	Perform groundwater treatability study and share results with EPA. EPA to then determine if Explanation of Significant Differences (ESD) required for recommended changes.	WDNR	None established	Treatability study not performed. System Evaluation contract with OMNNI Associates for a proposal for modifications to increase system efficiency.	Contract date: January 26, 2005. System Evaluation on-going Recommendations will be shared with EPA to determine if ESD or administrative change to the ROD is necessary.

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
If alternative groundwater treatment options not recommended, pursue potential for direct discharge to Appleton POTW.	Confirm influent concentrations are below Appleton POTW discharge limitations and discuss possibility for direct discharge to Appleton POTW.	WDNR	None established	System Evaluation contract with OMNNI Associates for a proposal for modifications to increase system efficiency. OMNNI prepared a time vs. hexavalent chromium influent concentration graph to show 100% compliance with Appleton POTW discharge limit since the start of operation and a regression analysis to show no exceedance of the discharge limit is expected to discuss the potential for direct discharge.	Contract date: January 26, 2005. Evaluation on-going OMNNI, WDNR and City of Appleton met on April 5, 2006 and City granted approval for eight-week pilot test for direct discharge beginning April 18, 2006. Final approval for continuous direct discharge dependent upon compliance with discharge limitations during pilot test.

Additional construction activity took place in May 2002 when the WDNR received a complaint of yellow-green water ponding in the grass at 1428 West Second Street. The RD called for connection of residential drain sumps to the groundwater collection system for 801 South Outagamie Street, 1410, 1414 and 1428 West Second Street. While post-construction reports documented that all drain sumps for the residences listed were tied to the collection system, the drain sump at 1428 West Second Street was, in fact, not tied into the collection system. WDNR contacted the railroad for permission to excavate within the right-of-way to connect 1428 West Second Street to the central collection trench, however, this access was not granted. Therefore, a lateral from the drain sump at 1428 West Second Street to the southeast collection trench was constructed in May 2002. The updated collection system is shown on all current site figures.

VI. Five-Year Review Process

Administrative Components

Jennifer Borski of WDNR and David Seely, Remedial Project Manager (RPM), of EPA met on November 14 and 15, 2005 to discuss the status of the site and process and time schedule for the second five-year review. Ms. Borski and Mr. Seely visited the site on November 14, 2005. Ms. Borski and Mr. Seely also met with Brian Wayner, Environmental Engineer with OMNNI Associates, to discuss system issues on November 15, 2005.

Ms. Borski and Mr. Seely conferenced with Brianna Bill of EPA on November 22, 2005 to discuss the community involvement appropriate for the second five-year review. Ms. Borski also consulted with Kurt Eggebrecht and Tim Mirkes of the City of Appleton Health Department, Alderperson Peter Stueck and Chuck Warzecha of Wisconsin Department of Health and Family Services (WDHFS).

Community Notification and Involvement

Ms. Borski developed a fact sheet titled *N W Mauthe Superfund Site, 725 South Outagamie Street, Appleton, WI* in December 2005 for distribution to adjacent property owners and persons interested in the status of the site. On December 5, 2005, the fact sheet was sent along with a letter to owners of property on which the groundwater collection system is constructed to inform them of the start of the five-year review process. The fact sheet is included in Appendix C. The letter also included an invitation to a meeting at the treatment building on December 14, 2005 to discuss the status of the cleanup. On December 5, 2005, a separate letter and fact sheet were sent to property owners and occupants within a two block radius of both the site and an adjacent metal plating cleanup at 1315 West Fourth Street, known as Midwest Plating Corp. (former), to inform the immediate community of the start of the five-year review process. A press release was issued to the Appleton Post Crescent by WDNR on December 7, 2005. An article, written by Ed Culhane, was published on the front page of the Appleton Post Crescent on December 10, 2005.

No comments were submitted to WDNR as a result of the informational letters and article in the Appleton Post Crescent. The meeting scheduled for December 14, 2005 at the treatment building was cancelled due to weather. The meeting was not rescheduled due to lack of interest.

Document Review

Ms. Borski performed review of documents listed in Appendix D during January and February 2006 along with ch. NR 140, Wis. Adm. Code for current groundwater cleanup standards.

Access agreements were developed by WDNR and signed by property owners in 1991 for the following properties: 702 and 801 South Outagamie Street, 1418 West Melvin, 1354, 1400, 1410, 1414, 1417 and 1428 West Second Street. Those agreements expired ten years from signature date. Access agreements were developed by EPA and signed by property owners in 1995 with no expiration date. Access agreements were updated by WDNR in July 2004 with existing property owners at 1635 West Spencer Street, 715, 725 and 801 South Outagamie Street and 1400, 1410, 1414 and 1428 West Second Street. The signed access agreements are effective until December 31, 2014.

Data Review

The original groundwater monitoring plan is outlined in the Field Sampling Plan (FSP) within the *Site-Specific Plans for N. W. Mauthe Long Term Response Action*, (LTRA Plans) dated September 5, 1997. The LTRA Plans call for quarterly sampling at all wells and analysis of groundwater for cadmium, chromium, cyanide, copper, mercury, manganese, zinc and VOCs. The sample collection procedures called for VOCs to be unfiltered and metals filtered during collection of groundwater. Monitoring wells referenced in the LTRA Plans include W-2, W-8, W-15, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, MW-107 and MW-108.

Two reductions to the original monitoring plan have been requested since 1997. On December 3, 1999, Jennifer Huffman with the WDNR requested a reduction to the monitoring plan:

1. Elimination of quarterly sampling for copper, zinc, mercury and cyanide at all site wells;
2. Reduction in VOC sampling frequency from quarterly to annual;
3. Elimination of weekly testing for total suspended solids on the treated effluent.

EPA approved the 1999 request on January 18, 2000.

On March 24, 2003, Jennifer Borski with the WDNR requested a reduction to the monitoring plan:

4. Elimination of quarterly cadmium sampling at all site wells;
5. Reduction in the frequency from quarterly to annual sampling of manganese at all site wells. Manganese detections did not appear to be related to contamination from the plating operations;
6. Reduction in the frequency from quarterly to annual sampling of total dissolved chromium at W-2, W-8, W-15, MW-101, MW-102, MW-105, MW-106 and MW-108.
7. Elimination of annual VOC sampling at W-2, W-8, W-15, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106 and MW-108.

EPA approved the 2003 request on April 17, 2003.

With these approved monitoring reductions, the current monitoring plan consists of the following:

- Quarterly recording of water table elevations, pH, temperature, conductivity, dissolved oxygen, redox potential and ferrous iron at all wells;
- Annual analysis for total dissolved chromium, hexavalent chromium and manganese at all wells;
- Quarterly analysis for total dissolved chromium and hexavalent chromium at MW-103, MW-104 and MW-107;
- Annual analysis for VOCs at MW-107.

The current long-term groundwater monitoring plan is detailed in Table 2 in Appendix B.

Historical groundwater data from the RI was reviewed and compared with post remedy groundwater data from 1997 through 2005. March 2006 groundwater data was not yet collected at the time of data review. All wells included in the LTRA Plans for quarterly sampling are present and in good condition.

Cadmium, copper, cyanide, mercury and zinc are not present above 1992 standards in any well and sampling for these parameters was discontinued as detailed above. Manganese is consistently present above the Preventive Action Limit (PAL) at W-15 and MW-105 and intermittently at MW-101, MW-102, MW-103, MW-106 and MW-108. It does not appear that the presence of manganese is related to contamination from plating operations, however, it is monitored annually to assist in evaluation of the geochemistry of the site.

Chromium is sampled annually at W-2, W-8, W-15, MW-101, MW-102, MW-105, MW-106 and MW-108, where chromium has been below the 1992 PAL for more than five years. Chromium is sampled quarterly at MW-103, MW-104 and MW-107 where chromium is present above the 1992 PAL. Analysis of hexavalent chromium began in December 2003 to determine the percent of hexavalent chromium present. It appears that all chromium present in groundwater is in the hexavalent state.

It should be noted that Northern Lake was the analyzing lab of groundwater samples from 1997 through 2004, using analytical method SW846 6010. EnChem was used in March and June 2005, using analytical method SW846 6010B. Pace Analytical was used in September and December 2005, using analytical method SW846 6020. Total dissolved chrome samples have historically been filtered at the time of collection. Paul Much with MCO performs the groundwater sampling at the site since 2004. He stated in an interview that hexavalent chrome samples have also been filtered at the time of collection. Ms. Borski instructed Mr. Much on

March 2, 2006 to continue filtering total dissolved chrome samples at the time of collection, but to not filter hexavalent chrome samples.

Total dissolved chromium (chromium) in MW-103 ranged from 6 to 100 micrograms per liter (ug/L) in 1997 and increased to 350 ug/L in March 2003. Chromium then decreased to below the PAL and increased again to a range of 110 to 240 ug/L in 2005. Analyzing laboratories and analytical methods were changed in 2005. It is unclear if the increase in chromium at MW-103 in 2005 is due to actual chromium concentrations or a difference in lab analysis. A concentration verses time graph for chromium at MW-103 is included in Appendix E.

Chromium at MW-104 has generally increased over time with one outlier result of 1200 ug/L in September 2003. Concentrations ranged from 680 ug/L in June 2001 to 17 ug/L in September 2005. A concentration verses time graph for chromium at MW-104 is included in Appendix E.

Chromium at MW-107 has generally been stable over the past five years and since 1997 with the exception of a spike in concentration in 2000. Over the past five years, chromium ranged from 8,200 ug/L in June 2001 to 2,400 ug/L in December 2005. A concentration verses time graph for chromium at MW-107 is included in Appendix E. A chromium iso-concentration map for December 2005 is shown on Figure 4 in Appendix A.

VOCs remain in groundwater at only MW-107 and are no longer sampled at other existing wells. Total VOCs are relatively stable from 1997 through 2004 and decrease in 2005 for 1,1-dichroloethene, 1,1,1-trichloroethane and trichloroethene. A concentration verses time graph for VOCs at MW-107 is included in Appendix E.

Evaluation of the historical groundwater data provided in the RI report reveals the existing network should be enhanced to assist in the on-going monitoring of the contaminant plume and evaluation of the progress of the remedy. Of special note is that there is currently no monitoring well in the location of the former MW-15, abandoned during the excavation. This is the location of the suspected main source area for chromium and the area where the highest chromium concentration in groundwater was present at 860,000 ug/L in February 1992. MW-107 is located in an area west of former MW-15 where groundwater concentrations prior to cleanup action are unknown. The relation of MW-107 to former MW-15 is important to understand as it reveals the existing monitoring network can be enhanced to better evaluate the concentrations in groundwater at the former source area. MW-15 is shown on historic Figure 1 from the RI/FS reports in Appendix A. Current well locations are shown on Figure 2 in Appendix A. Groundwater data from 1997 through 2005 for metals and VOCs is shown in Tables 5 and 6 in Appendix B.

The WDNR is currently evaluating the existing monitoring well network and plans to install additional wells at the following locations in 2006:

- Between former MW-26R in the northwest corner of the Mauthe property where chromium was present at 150,000 ug/L and former MW-25R on the west side of the Mauthe property where chromium was present at 124,000 ug/L in May 1992;
- Former MW-15 at the southeast corner of the former chrome plating building where chromium was present at 860,000 ug/L in February 1992 and 789,000 ug/L in May 1992;
- Former MW-17 north of the former chrome plating building where chromium was present at 73,300 ug/L in May 1992;
- Former SB3A located within the former zinc plating building in the location of the

collection pit where chrome was present in soil at 15,000 mg/kg, zinc at 14,900 mg/kg, cadmium at 3,660 mg/kg and cyanide at 2,960 mg/kg in January 1992;

- The northeast corner of the Mauthe property, west of former MW-13R, where chromium was present at 18,600 ug/L in May 1992.

Historic Figure 1 from the RI/FS reports is included in Appendix A for reference to former well locations.

Table 7 compares maximum historic concentrations prior to cleanup action, concentrations following the remedy in May 1997, concentrations in December 2005 after eight years of system operation and the current cleanup goals. The groundwater cleanup goals are identified in Table 4 of the ROD. Only those contaminants remaining above current cleanup goals are included in Table 7 below. Based on the data provided in the table, it appears the excavation significantly reduced contaminant concentrations in groundwater. However, continued operation of the system does not appear to have substantially continued reduction of contaminant concentrations.

Table 7: Maximum Contaminant Concentrations in Groundwater and Groundwater Cleanup Goals (units in ug/L)

Contaminant	Maximum concentration according to FS report, May 1993	Maximum concentration in May 1997	Maximum concentration in Dec 2005	EPA Maximum Contaminant Level, Sept 1992	WDNR Enforcement Standard, Jan 1992	WDNR Preventive Action Limit, Jan 1992 (Current Cleanup Goal)
Chromium[1]	860,000	3,600	2,400	100	50	5
1,1-dichloroethene	190	40	26	7	7	0.024
1,1,1-trichloroethane	2,100	390	250	200	200	40
Trichloroethene	1,800	420	490	5	5	0.18

[1]FS report chromium data is from MW-15. May 1997 and Dec 2005 chromium data is from MW-107. No well is currently located at former MW-15.

Site Inspection

Ms. Borski and Mr. Seely performed a site inspection on November 14, 2006. They walked along the sidewalk in front of the following properties to observe the scale and condition of each property: 725 and 801 South Outagamie Street, 1400, 1410, 1414 and 1428 West Second Street. They observed the condition of the cover for manhole no. 1, which is protective. They observed the condition of the fence around the site to verify it provides security for the treatment building and clay cap at the site.

Mr. Brian Wayner, Engineer with OMNNI Associates, accompanied Ms. Borski and Mr. Seely during inspection of manhole no. 2 at 801 South Outagamie Street during their site visit on November 14, 2005. Ms. Borski is working with Mr. Wayner to evaluate options to address unpleasant odor from hydrogen sulfide in the manhole and the corrosion to concrete and associated piping and wiring within the manhole from the sulfuric acid. Manhole no. 2 is anticipated to be addressed in 2006. While hydrogen sulfide is present in manhole no. 1, there are no corrosion issues at manhole no.1.

Ms. Borski and Mr. Seely inspected the treatment building to follow the flow from influent to effluent. A second, more detailed, inspection of the treatment building took place with Ms. Borski and Jim Peichl with MCO, O&M operator, on February 27, 2006 and is detailed below.

While the condition of the vegetative cover at the site was not visible on November 14, 2005 due to snow cover, Ms. Borski observed in multiple site visits in the summer of 2005 that the vegetative cap is in good condition and being maintained by the O&M contractor. Two trees at the site died in 2005, possibly due to inadequate precipitation and/or the two-foot compacted clay cap. The trees were cut off at the base by Lied's Nursery in Neenah, Wisconsin and chipped in September 2005. The chips generated were minimal and taken to Lied's Nursery property to be used as mulch.

Ms. Borski observed on June 28, 2005 that all the trees at the site have damage at the base of the trunks. Tom Vanden Elzen, a forester with the WDNR, observed photos of the tree damage and informed Ms. Borski that the damage took place a couple years prior and the trees appear to be healing on their own. Mr. Vanden Elzen recommended a one-foot radius of mulch be placed around the base of each trunk to protect the trees from further damage or to spray the grass around the base of each tree, taking care not to spray young shoots at the base. A one-foot radius of mulch is anticipated to be performed in 2006.

Ms. Borski met with the O&M operator, Mr. Peichl of MCO, on February 27, 2006. Ms. Borski and Mr. Peichl discussed all items on the site inspection checklist and performed a walk through of the treatment system and building. The Site Inspection Checklist is included in Appendix F. Generally, the treatment system and building are in good condition and no major repairs are necessary. The treatment building is locked when the systems operator is not onsite. Mr. Peichl, Mr. Wayner and Ms. Borski have keys to the treatment building. Walk through of the system revealed that the influent and effluent sampling points are not labeled.

Interviews

The following people were interviewed during the five-year review process:
Jim Peichl, MCO – O&M Operator
Kurt Eggebrecht, City of Appleton – Appleton Health Officer
Brian Wayner, OMNNI Associates – System Evaluation Consultant
Stuart Boerst, McMahon – Quarterly and Semi-Annual Report Writer
Robert Ludwig – Private Resident at 801 South Outagamie Street
Paul Much, MCO – Groundwater Sampler and Monthly Report Writer
Interview records are included in Appendix G.

On February 27, 2006, Ms. Borski interviewed Jim Peichl with MCO, O&M operator from 2001 to the present. The interview took place in the treatment building onsite. Mr. Peichl took over operation from John Stoeger, formerly with MCO, who operated the system from 1997 to 2001. Mr. Peichl communicated that the system is being effectively operated and maintained, however, MCO has two concerns. The existing treatment process of treating all influent, regardless of contaminant concentration, and performing zero to four manual batch discharges daily to the Appleton POTW is labor intensive. MCO recommends a less labor-intensive treatment option be considered, specifically, ion exchange. The second concern by MCO is drainage of the residential sumps to the collection system. Although laterals from residential drains to the collection trench are equipped with check valves, the potential for backup of collected water into residential basements drives MCO to perform manual batch discharges

seven days a week, 365 days a year to assure the water levels in the collection trenches allow for continuous drainage of the residential sumps.

On February 27, 2006, Ms. Borski interviewed Kurt Eggebrecht, City Health Officer with the City of Appleton, at Mr. Eggebrecht's office. Mr. Eggebrecht is not aware of any complaints to his office in regard to this site in the past five years. Mr. Eggebrecht believes that his office is well informed as to the activities at this site and is glad that action was taken to address the danger to the community from this site.

On February 27, 2006, Ms. Borski interviewed Brian Wayner, Engineer with OMNNI Associates, at Mr. Wayner's office. Mr. Wayner is the lead consultant on the existing contract between WDNR and OMNNI Associates for an evaluation of the collection and treatment system. Mr. Wayner and Ms. Borski have spoken in great detail about the ROD, RD, current groundwater collection and treatment system, current groundwater concentrations and other details of this site during execution of the scope of work outlined for the System Evaluation contract. During the interview, Mr. Wayner raised several concerns previously discussed with Ms. Borski and the basis for the System Evaluation contract. Specifically, the existing containment and treatment system, while performing as expected, does not appear to be cost-effective or reasonable (in time or costs) to address the remaining contamination.

Mr. Wayner explained that the excavation performed in 1995 appears to have significantly reduced contaminant concentrations in groundwater. However, installation of a two-foot compacted clay cap, building and pavement over the remaining contamination served to significantly slow down migration of the remaining contamination. This will likely increase the number of years necessary for the remaining contamination to reach the central collection trench, where the contamination will eventually be collected and treated. Another concern is that there is no exit strategy in place to eventually disconnect the residential sump laterals currently connected to the collection system. There is also no means to manually shut down one or more legs of the collection trench system when justified to reduce the volume of flow into the treatment system and/or monitor the groundwater under steady-state conditions. An immediate concern is the condition of manhole no. 2 and associated wiring and piping. Manhole no. 2 is in poor condition as a result of corrosion from hydrogen sulfide and sulfuric acid, the exact cause of which has not been identified. Manhole no. 2 must be addressed to prevent further degredation and avoid impact to the overall collection system.

Mr. Wayner explained that the existing treatment system is set up to require all influent be treated, regardless of the contaminant concentration, under the current permit from the City of Appleton for discharge to the Appleton POTW. Alternative technologies and options exist that could serve to minimize the amount of labor necessary to operate the treatment system, increase efficiency and reduce operation costs.

Recommendations for changes to the groundwater collection and treatment system will be provided by OMNNI Associates to WDNR and EPA for consideration as a result of the System Evaluation. The goal of the System Evaluation is to identify the best options available to reduce operation costs and the time necessary to reach the groundwater cleanup goals.

On March 1, 2006, Ms. Borski interviewed Stuart Boerst, hydrogeologist with McMahon Associates, Inc., on the telephone. Mr. Boerst writes the quarterly status updates and semi-annual O&M reports. Boerst commented that the perimeter wells have decreased for chromium

in the first couple years after the excavation which shows the plume is being contained by the groundwater collection trenches but the monitoring network is not adequate to evaluate the status of the remaining contamination. Mr. Boerst recommended WDNR pursue a permit for direct discharge to the Appleton POTW since influent concentrations are below discharge limitations.

On March 1, 2006, Ms. Borski interviewed Robert Ludwig, property owner at 801 South Outagamie Street, Appleton, Wisconsin. Mr. and Mrs. Ludwig have resided at this address through the investigation and EPA removal action to present. Manhole no. 2 and MW-102 are located on their property along with both the central and southeast collection trenches. Their foundation drain is tied directly into the southeast collection trench.

Mr. Ludwig stated that he is very familiar with the remedy and the goals and understands this project is anticipated to last more than 100 years. Mr. Ludwig is not aware of any restrictions filed to the deed for the property. Ms. Borski asked Mr. Ludwig if he recalls the purpose of the wooden residential fence located throughout properties at 801 South Outagamie Street, 1410 and 1414 West Second Street. According to historical photos reviewed by Ms. Borski, the fence was not present prior to removal action in 1995. Mr. Ludwig stated that EPA offered the fence to appease the residents due to the significant construction activity at the site in 1995 and 1996.

Mr. Ludwig is concerned with the unpleasant odor from manhole no. 2. Ms. Borski explained that the corrosion to the concrete, piping and wiring from the hydrogen sulfide and sulfuric acid is scheduled to be addressed in 2006. The odors will be addressed at the same time by vapor sealing the cover.

Mr. Ludwig expressed concern regarding the possibility for his foundation drain to be disconnected from the collection trench. Current regulations in the City of Appleton apparently require an underground connection to the storm sewer which would be a cost for Mr. Ludwig to amend the connection. Ms. Borski clarified that when the residential foundation drains are eventually disconnected from the collection trenches, WDNR will fund construction of proper discharge systems since the residential connections to the collection system were a requirement by EPA as part of the remedy.

Mr. Ludwig also expressed concern that the chain link fence at the Mauthe site is not necessary and is a blight on the beautiful landscaping done by EPA in 1996 and 1997. Mr. Ludwig also believes the area could be used by Miller Electric employees at lunch. Ms. Borski explained that the purpose of the fence is to protect the clay cap but the actual need for this fence can be reviewed jointly by EPA and WDNR. Also, Mrs. Mauthe is the current owner for the property at 725 South Outagamie Street and use of the space is at her discretion. Mr. Ludwig was under the impression that the property was obtained by EPA or WDNR at the time of the removal.

On March 2, 2006, Ms. Borski interviewed Paul Much, Environmental Scientist with MCO. Mr. Much performs the quarterly sampling and monthly reporting for the site and has done this since 2004. Prior to 2004, the sampling and monthly reporting was performed by John Stoeger, formerly with MCO. According to Mr. Much, the monitoring wells are in good condition, sampling protocols developed for the site are followed and there have been no issues with sampling since he began in 2004. He has received complaints from the Ludwig residents in regard to unpleasant odors from manhole no. 2.

Mr. Much noted that the sample from MW-104 during December 2005 was very turbid and silt and sand were present in the well. This may be due to installation of PZ-7 in June 2005. Mr. Much will note the turbidity of the sample in March 2006 and discuss with Ms. Borski.

Mr. Much stated that he filters samples collected for total dissolved chromium and hexavalent chromium. Ms. Borski instructed Mr. Much to not filter the hexavalent chromium sample in the future. Ms. Borski also asked Mr. Much about the reason for the change of analyzing laboratories in March 2005 from Northern Lake to EnChem and from EnChem to Pace Analytical in September 2005. Mr. Much stated that sample results are received from EnChem much more quickly than Northern Lake which allows for timely reporting. Mr. Much also stated that Pace Analytical purchased EnChem in 2005. Ms. Borski pointed out that analytical methods changed from SW846 6010, performed at Northern Lake, to SW846 6010B, performed at EnChem, to SW846 6020, performed at Pace. This inconsistent lab procedures and analytical methods may affect the trend analysis of groundwater data. Mr. Much will contact Pace Analytical to verify SW846 6010 can be performed on future samples. Ms. Borski will follow up with EPA to determine the appropriate lab selection for future analysis.

Conclusions

The site inspections reveal that the fence and vegetative cover are currently adequately protecting the clay cap at the site. Institutional controls required by the ROD may still be necessary to protect the clay cap and prevent exposures to the contaminated soils below the cap in the future. The covers to manhole nos. 1 and 2 are secure. The corrosion to concrete, piping and wiring in manhole no. 2 from hydrogen sulfide and sulfuric acid must be addressed to prevent further degradation and avoid impact to the overall collection system. The treatment building is secure and in good condition. The treatment system is operating as designed, however, influent concentrations have been below Appleton Wastewater discharge limitations since 1997. WDNR and OMNNI Associates should continue to pursue options to increase the efficiency of the collection and treatment system. The monitoring well network should be enhanced to assist in the monitoring of the contaminant plume and evaluation of the progress of the remedy. Additional monitoring wells are scheduled to be installed in 2006. Based on the available data, the plume is being contained.

VII. Technical Assessment

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

Based on the existing data, the remedy is functioning as intended by the decision documents.

Remedial Action Performance

The collection trenches appear to be containing the plume. The residential foundation drain laterals are effectively keeping contaminated water from seeping into the basements. The treatment system is effectively preparing the water for discharge to the Appleton POTW in compliance with the wastewater discharge permit. A clay cap is in place to prevent direct contact with remaining soil contamination and a fence is in place to protect the cap. However, it is unclear if ICs are in place. It does not appear that groundwater cleanup levels will be achieved in a reasonable amount of time. System evaluation is taking place by WDNR and OMNNI Associates to propose modifications to the collection and treatment systems for a more efficient and timely cleanup. Cleanup goals are discussed under Question B below.

System Operations/O&M

The existing collection and treatment system is being effectively operated and maintained. Continuous operation of the system will effectively contain the contamination. However, WDNR has concerns regarding the existing design. Alternative options for a more cost effective and timely cleanup of remaining contamination are being evaluated under a System Evaluation contract with OMNNI Associates.

Opportunities for Optimization

Opportunities exist to enhance the system performance and reduce long term costs for monitoring, sampling and operation of the treatment system. Alternative options for a more cost effective and timely cleanup of remaining contamination are being evaluated under a System Evaluation contract with OMNNI Associates.

Early Indicators of Potential Problems

Corrosion to concrete, piping and wiring within manhole no. 2 from hydrogen sulfide and sulfuric acid must be addressed to prevent further degradation and avoid impact to the overall collection system.

Implementation of Institutional Controls and Other Measures

The Mauthe property has a chain link fence around the perimeter that is locked. It is suspected that the purpose of the fence is to protect the clay cap, however, this is not clear from documentation in the WDNR file. Since the Mauthe property is privately owned and the O&M operator maintains a vegetative cover over the clay cap, it does not appear that the fence is necessary to protect the clay cap. No warning or identification signs are present on the treatment building or fence as there are no immediate hazards to the general public. Appropriate signage is posted within the treatment building. It is unclear if institutional controls are in place to further protect the clay cap or to prevent adverse impacts to the collection trenches.

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

Exposure Assumptions

Land use at and near the site is a mix of residential, commercial and light industrial. Land use and site conditions at and near the site is not expected to change. No new human health or ecological routes of exposure or receptors have been identified since the ROD. There are no new contaminants or unanticipated toxic byproducts identified since the ROD.

Toxicity Data

The ROD identified chromium concentrations in soil exceeded concentrations that correspond to a hazard index (HI) of one for both the dermal contact (570 mg/kg) and ingestion (780 mg/kg) exposure routes for the current land use. EPA addressed soils that exceeded the HI of one by removing soils with chromium greater than 500 mg/kg.

The ROD identified chromium concentrations in groundwater that exceeded the criteria (5000ug/l) of a HI of one for occupational dermal exposure. In the past five years, chromium

has exceeded the concentration that represents a HI of one at MW-107. It should be noted that higher levels of chromium may be present at the Mauthe property and will be evaluated with installation of additional wells in former source areas.

Cleanup Levels

The long term RAO for the N. W. Mauthe Superfund site is to reduce the contaminant concentrations in groundwater to meet state and/or federal groundwater quality standards, whichever are more stringent. The groundwater cleanup goals specified by the ROD are shown in Table 7. In all cases, the WDNR PALs outlined in ch. NR 140, Wis. Adm. Code are the more stringent standard for each contaminant of concern. PAL standards for ten of the eighteen initial contaminants of concern were updated in February 2004 and are outlined in Table 8.

Table 8: Changes in Chemical-Specific Groundwater Standards (units in ug/L)

Contaminant	Cleanup Level	WDNR PAL		WDNR ES		EPA MCL	
Cadmium[3]	1	Previous[1]	1	Previous[1]	10	Previous[6]	5
		New[2]	0.5	New[2]	5	New[7]	No change
Chromium	5	Previous[1]	5	Previous[1]	50	Previous[6]	100
		New[2]	10	New[2]	100	New[7]	No change
Copper[4]	500	Previous[1]	500	Previous[1]	1,000	Previous	None established
		New[2]	130	New[2]	1,300	New[7, 8]	1,300
Manganese	25	Previous[1]	25	Previous[1]	50	Previous[6]	None established
		New[2]	25	New[2]	50	New[7, 8]	50
Benzene[5]	0.067	Previous[1]	0.067	Previous[1]	5	Previous[6]	5
		New[2]	0.5	New[2]	No change	New[7]	No change
1,1-Dichloroethene	0.024	Previous[1]	0.024	Previous[1]	7	Previous[6]	7
		New[2]	0.7	New[2]	No change	New[7]	No change
Cis-1,2-Dichloroethene[5]	10	Previous[1]	10	Previous[1]	100	Previous[6]	70
		New[2]	7	New[2]	70	New[7]	No change
Toluene[5]	68.6	Previous[1]	68.6	Previous[1]	343	Previous[6]	1,000
		New[2]	200	New[2]	1,000	New[7]	No change
Trichloroethene	0.18	Previous[1]	0.18	Previous[1]	5	Previous[6]	5
		New[2]	0.5	New[2]	No change	New[7]	No change
1,1,2-Trichloroethane	0.06	Previous[1]	0.06	Previous[1]	0.6	Previous[6]	5
		New[2]	0.5	New[2]	5	New[7]	No change
Xylene[5]	124	Previous[1]	124	Previous[1]	620	Previous[6]	10,000
		New[2]	1,000	New[2]	10,000	New[7]	No change

[1] Ch. NR 140.10, Wis. Adm. Code, Jan 1992
[2] Ch. NR 140, Wis. Adm. Code, Feb 2004
[3] Removed from sampling schedule by approval from EPA on April 17, 2003
[4] Removed from sampling schedule by approval from EPA on Jan 18, 2000

[5] Not detected during five-year review period.
[6] 40 CFR 141.61 & 141.62, Sept 1992
[7] 40 CFR 141.61 & 141.62, July 2002
[8] EPA Secondary Public Health Goal

WDNR PALs for three contaminants decreased in 2004 from the standards in 1992: cadmium, copper and cis-1,2-dichloroethene. Cadmium was removed from the monitoring schedule with approval from EPA on April 17, 2003 due to detects of cadmium below the PAL at all monitoring points. While the PAL for cadmium decreased from 1 ug/L in 1992 to 0.5 ug/L in 2004, historic detects of cadmium were not above the 2004 PAL. Therefore, sampling for cadmium does not need to be resumed.

Copper was removed from the monitoring schedule with approval from EPA on January 18, 2000 due to detects of copper below the PAL at all monitoring points. While the PAL for copper decreased from 500 ug/L in 1992 to 130 ug/L in 2004, historic detects of copper were not above the 2004 PAL. Therefore, sampling for copper does not need to be resumed.

Cis-1,2-dichloroethene was reduced in the monitoring schedule with approval from EPA on April 17, 2003 due to detects of cis-1,2-dichloroethene below the PAL at all monitoring points except MW-107. While the PAL for cis-1,2-dichloroethene decreased from 10 ug/L in 1992 to 7 ug/L in 2004, historic detects of cis-1,2-dichloroethene were not above the 2004 PAL at all wells with the exception of MW-107. Therefore, sampling for cis-1,2-dichloroethene does not need to be increased.

Manganese and copper had no EPA Maximum Contaminant Level (MCL) identified in the ROD in 1994. Since that time, secondary public health goals have been established. These values are above the PALs and consideration of the changes is not necessary at this time.

Benzene, toluene and xylene are no longer detected in monitoring wells for the site. Consideration of increases in the PALs from 1992 to 2004 is not necessary at this time.

Chromium, 1,1-dichloroethene, trichloroethene and 1,1,2-trichloroethane PALs increased from 1992 to 2004. Since a minimal reduction to post-excavation groundwater concentrations has been observed since 1997, consideration of the changes in standards does not need to be evaluated at this time. More importantly is an evaluation as to whether the PALs will be met within a reasonable amount of time under the existing remedy design or if alternative groundwater cleanup goals should be considered.

It should be noted that installation of additional wells on the Mauthe property may reveal higher concentrations of contaminants of concern. Specifically, cadmium, copper, benzene, toluene and xylene may again be detected. If this is the case, evaluation of the changes in standards should be pursued. More importantly, however, is the evaluation of the remedy design and whether PALs will be obtained within a reasonable amount of time. This is discussed further below.

Remedial Action Objectives

RAOs in the ROD are “to prevent direct contact or ingestion of ponded water, groundwater or soils or debris with contaminants producing a total excess cancer risk greater than 1×10^{-6}, or a HI level that exceeds one and to prevent the discharge of water that exceeds state or federal

surface water criteria to local storm sewers which would ultimately discharge to the Fox River." This RAO is still valid.

Another objective for groundwater "is to protect the underlying bedrock aquifer and contain and/or control the further migration of contaminants. The long term remedial objective for the N. W. Mauthe site is to reduce the contaminant concentration in groundwater to meet state and/or federal groundwater quality standards, whichever are more stringent." The ROD goes on to state that if it is determined that "it is not possible… to achieve the groundwater standards or to achieve further reductions, then" alternative options exist. Those options include "establishing Alternative Concentration Limits (ACL) under the substantive requirements of s. NR 140.28, Wis. Adm. Code which can be no higher than the enforcement standard (ES)" or pursuit of a "technical impractibility waiver under Section 121(d) of CERCLA, which may be used to set an alternative groundwater goal higher than the ES or establish other approaches to groundwater containment or remediation that are protective of human health and the environment." The objective to protect the underlying bedrock aquifer and contain further migration is still valid. However, it appears that it is not possible to achieve the most stringent groundwater standards, which are the ch. NR 140, Wis. Adm. Code PALs for each contaminant of concern, within a reasonable amount of time with the existing collection trench design. As a result, the alternative options presented should be pursued. These options will be evaluated by WDNR and OMNNI Associates during the System Evaluation. Any recommendations will be discussed with EPA to determine if ESDs or amendments to the ROD are appropriate to proceed with expediting the cleanup.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy? No.

Technical Assessment Summary

According to the data reviewed, the site inspection, and the interviews, the remedy is functioning as intended by the ROD. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. Changes to the 1992 NR 140, Wis. Adm. Code PALs took place in 2004 for cadmium, chromium, copper, benzene, 1,1-dichloroethene, cis-1,2-dichloroethene, toluene, trichloroethene, 1,1,2-trichloroethane and xylene. Cadmium and copper are no longer monitored at the site. Benzene, toluene and xylene are no longer detected at the site. The 1992 PALs for chromium, 1,1-dichloroethene, trichloroethene and 1,1,2-trichloroethane increased in 2004, however, the changes in standards do not need to be evaluated at this time. ACLs under the substantive requirements of s. NR 140.28, Wis. Adm. Code or a technical impractibility waiver under Section 121(d) of CERCLA should be evaluated as it does not appear PALs will be obtained within a reasonable amount of time with the existing remedy design. All other RAOs are still valid. There is no additional information that calls into question the protectiveness of the remedy.

VIII. Issues

Nine issues were identified during the second five-year review and are detailed below:

1. It is unclear if ICs are in place to protect the direct contact clay cap and vegetative cover onsite and at 1414 West Second Street and in the railroad right-of-way. Without ICs in

place, it is possible the clay cap will be disturbed and potentially result in exposure to human health. It is also unclear if ICs are in place to prevent excavation of remaining contaminated soil and protect the collection trenches at 801 South Outagamie Street, 1400, 1410, 1414 and 1428 West Second Street and at Miller Electric parking lot on Melvin Street.

2. The corrosion of concrete and associated piping and wiring within manhole no. 2 must be addressed to prevent further degradation and avoid impact to the overall collection system. Specifically, the presence of hydrogen sulfide and sulfuric acid have degraded the quality of the cement manhole structure and corroded wires and piping and placed the pump at risk. Unpleasant odors are also present outside of the manhole at the immediate vicinity of the opening. The source of the hydrogen sulfide is unknown.

3. There is no exit strategy in place to discontinue use of the residential sump laterals, groundwater collection trenches, manholes, groundwater treatment facility or associated piping when no longer needed. While this does not affect the current protectiveness, the final disposition of these items has not been determined.

4. Alternative technologies may be available for a more cost-effective and efficient treatment process. Historic influent concentrations are shown on Table 9 and current Appleton POTW discharge limits are shown on Table 10 in Appendix B. Comparison of the two reveals that influent concentrations of hexavalent chromium have been below the Appleton POTW discharge limits since the system began in 1997.

5. It does not appear the groundwater cleanup goals will be met within a reasonable amount of time utilizing the current design and operational procedures for the groundwater collection system.

6. The existing monitoring network should be enhanced to assist in the on-going monitoring of the contaminant plume and evaluation of the progress of the remedy. Monitoring wells in locations of former source areas were abandoned to perform the excavation and not replaced.

7. Filtering procedures, analyzing laboratory and analytical methods have not been consistent. The QAPP has not been followed consistently since elimination of the WDNR chemist position in the Remediation and Redevelopment Program.

8. WDNR PALs changed in 2004 for several contaminants of concern. Specifically, cadmium, chromium, copper, benzene, 1,1-dichloroethene, cis-1,2-dichloroethene, toluene, trichloroethene, 1,1,2-trichloroethane and xylene.

9. Influent/effluent sampling points are not labeled in the treatment building.

IX. Recommendations and Follow-up Actions

The following section outlines recommendations and follow-up actions to issues identified during the five-year review.

Institutional Controls

It is unclear what ICs are in place for the site. EPA is contracting with an outside consultant to perform title searches of properties associated with the clay cap and collection trenches to determine if any deed restrictions are in place. This information was requested February 28, 2006 and is expected to be received by July 2006. If appropriate deed restrictions are found, EPA and WDNR will evaluate whether these controls are enforceable against subsequent owners of the properties in question. EPA and WDNR will jointly evaluate the ICs identified in the ROD to determine the appropriate means to adequately protect the remedy and develop an IC implementation plan by October 2006.

Hydrogen Sulfide and Sulfuric Acid within Manhole No. 2.

WDNR will work with OMNNI Associates to investigate the source of the hydrogen sulfide and identify and implement the most cost-effective option to address corrosion within manhole no. 2 from hydrogen sulfide and sulfuric acid. Specifically, WDNR and OMNNI intend to seal coat the existing cement structure, install corrosion-resistant wire and pump housing and piping for future protection of these necessary components, and vapor seal manhole no. 2. WDNR anticipates addressing manhole no. 2 by October 2006.

Exit Strategy for Collection and Treatment System

Develop an exit strategy that determines the appropriate disposition of the residential sump laterals, groundwater collection trenches, manholes, groundwater treatment facility and associated piping upon completion of the remedy. The strategy will need to be developed as information is obtained from evaluation of the remaining groundwater contaminant plume and evaluation of the progress of the remedy. Development of the strategy is dependent upon the ability to manipulate the collection system and will therefore likely not be completed in the near future. This action should be evaluated during each five-year review.

System Evaluation and Groundwater Cleanup Goals

WDNR will continue to work with OMNNI Associates to complete the System Evaluation and proposal for modifications to the system to increase efficiency and reduce the amount of time necessary to achieve the remedial action objectives. Modifications could include reducing the volume of flow into the system, obtaining long-term approval from the City of Appleton for direct discharge of influent water, implementation of an ion exchange treatment system and/or amend the collection system to directly reach the highest concentrations of groundwater contamination, among other options. It is anticipated that approval for long-term direct discharge will be obtained by June 2006.

This System Evaluation will include an evaluation of the residential drain sump connections. OMNNI Associates will monitor the residential sumps seasonally in 2006 to establish current contaminant concentrations. WDNR and OMNNI Associates will work to develop an exit strategy to disconnect the sumps from the collection system when appropriate and to assure protection of the basements and compliance with the sump water discharge requirements by the City of Appleton. It is anticipated that the System Evaluation and proposal for modifications will be completed by March 2007. At that time, WDNR will consult with EPA to determine if ESDs or amendments to the ROD are necessary to proceed. Amendments to the collection or treatment system may be implemented by October 2008.

The System Evaluation will also consider options to modify the manholes and the connections to the collection trenches for on-going evaluation of the collection, contaminant plume and compliance with ARARs.

Enhance Monitoring Network

WDNR and OMNNI Associates evaluated the existing monitoring network and found that additional wells located in former source areas will assist in the on-going monitoring of the contaminant plume and evaluation of the progress of the remedy. An additional five wells are proposed for installation by June 2006. Metals and VOCs data collected from the soil borings and monitoring wells will be used during the System Evaluation.

Filtering, Analytical Laboratory and Method and QAPP

Total dissolved chromium samples are to be filtered and hexavalent chromium samples not filtered at collection. Analytical method SW846 6010 should be used for analysis of total dissolved chromium and analytical method SM3500 should be used for analysis of hexavalent chromium in future samples. Ms. Borski will discuss proper laboratory selection with EPA for resolution in 2006. WDNR and EPA should discuss the QAPP and proper follow up for continued quality control/quality assurance of site data.

PAL Standard Changes

Changes to standards will be tracked over the next five years as O&M and system evaluation continues. This should be re-evaluated during the next five-year review process.

Influent/Effluent Sampling Points

WDNR will label the influent and effluent sampling points within the treatment building.

Table 11: Recommendations/Follow-up Actions and Projected Milestone Dates for Issues Identified During the Second Five-Year Review

Issue Identified During Second Five-Year Review	Recommendations / Follow-up Actions	Party Responsible	Projected Milestone Date
1. It is unclear if ICs are in place.	Perform a title search to determine what ICs are currently in place. Evaluate ICs identified in the ROD to determine appropriate means to adequately protect the remedy.	EPA EPA and WDNR	July 2006 October 2006
2. Corrosion within manhole no. 2. Presence of hydrogen sulfide.	Investigate the source of the hydrogen sulfide. Identify and implement the most cost-effective option to address the corrosion within manhole no. 2 and odor issues.	WDNR	October 2006
3. No exit strategy exists for collection and treatment system components.	Develop an exit strategy that determines the appropriate disposition of the residential sump laterals, groundwater collection trenches, manholes, groundwater treatment facility and associated piping upon completion of the remedy.	WDNR	TBD. This should be evaluated during each five-year review.

Issue Identified During Second Five-Year Review	Recommendations / Follow-up Actions	Party Responsible	Projected Milestone Date
4. Alternative technologies may be available for a more cost-effective and efficient treatment process.	Achieve long-term approval for direct discharge to the City of Appleton POTW.	WDNR	June 2006
	Complete the System Evaluation.	WDNR	March 2007
	Review System Evaluation proposals for a more cost-effective and efficient treatment process.	EPA and WDNR	June 2007
	Implement amendments to the system for a more cost-effective and efficient treatment process.	WDNR	October 2008
5. Groundwater cleanup goals likely unable to be met in reasonable amount of time.	Identify and implement modifications to the system to increase efficiency and reduce the amount of time necessary to achieve remedial action objectives.	WDNR	October 2008
	Evaluation whether ACLs may be appropriate for the site conditions.	EPA and WDNR	October 2008
6. Monitoring network should be enhanced.	Install additional monitoring wells in former source areas to enhance the network and assist in the on-going monitoring of the contaminant plume and evaluation of the progress of the remedy.	WDNR	June 2006
7. Filtering procedures, analyzing laboratory, analytical methods and QAPP need to be clarified for consistency.	Identify filtering procedures with O&M contractor.	WDNR	May 2006
	Identify appropriate analyzing laboratory for soil and groundwater analysis	EPA and WDNR	June 2006
	Identify appropriate analytical methods for soil and groundwater analysis.	EPA and WDNR	June 2006
	Identify and implement necessary items in the QAPP critical for the on-going evaluation of the progress of the remedy.	EPA and WDNR	October 2006
8. Changes to WDNR PALs in 2004.	Track changes to PAL standards as O&M and System Evaluation continues.	WDNR	On-going
	Re-evaluate changes to PAL standards during the next five-year review.	WDNR	April 2011
9.Influent/effluent sampling points not labeled.	Label influent and effluent sampling points in the treatment building.	WDNR	June 2006

X. Protectiveness Statement

The remedy at the N. W. Mauthe Superfund Site is currently protective of human health and the environment based on completion of the following actions: demolition and removal of contaminated buildings; removal of containerized wastes; excavation of contaminated soils greater than 500 milligrams per kilogram (mg/kg) of chromium; installation of a clay cap over the soil remaining below 500 mg/kg of chromium; installation of a contaminated groundwater collection and treatment system; installation or improvement of foundation drain systems for those residents or businesses located within the groundwater contaminant plume; and cleaning, painting or sealing of affected basements to prevent future contaminated groundwater seepage into the residential buildings. As a result, the exposure pathways that could result in unacceptable risks in the short term are being controlled. However, institutional controls, such as deed restrictions or easements and site access controls that are intended to prevent access, excavation or disturbance of the constructed cap, access to remaining soil contamination, disturbance of the groundwater collection and treatment system and installation of drinking

water wells need to be implemented to ensure long-term protectiveness. Additionally, on-going O&M of the groundwater collection and treatment system as well as system evaluations to identify efficiencies need to continue.

XI. Next Review

The next five-year review is due April 26, 2011.

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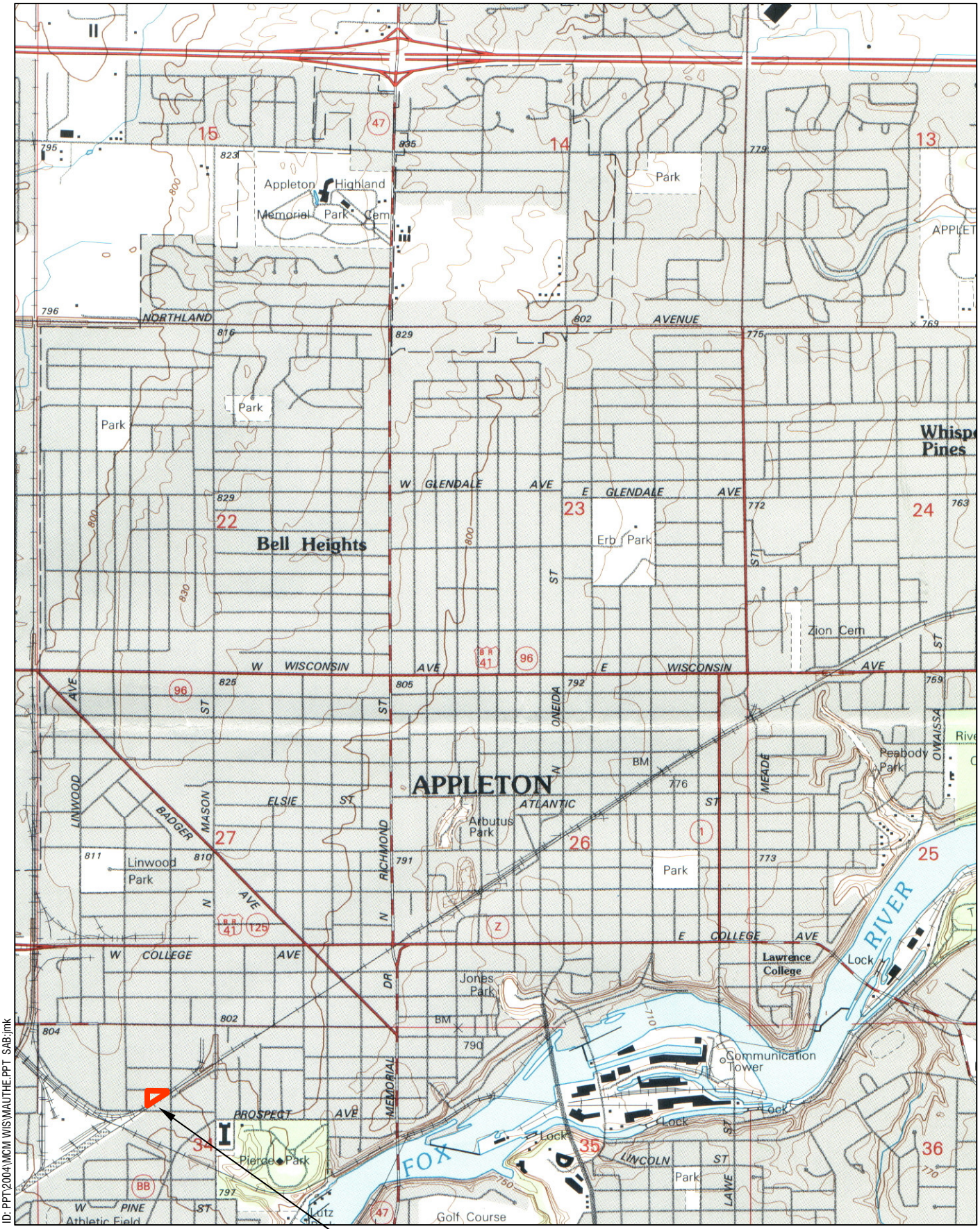
Appendix A – Site Maps

Figure 1 – Site Location
Figure 2 – Site Detail
Figure 3 – Groundwater Contours, December 14, 2005
Figure 4 – Iso-concentration Map, Chromium in Groundwater, Dec 14, 2005
Historic Figure 1 – Site Detail from RI/FS Report

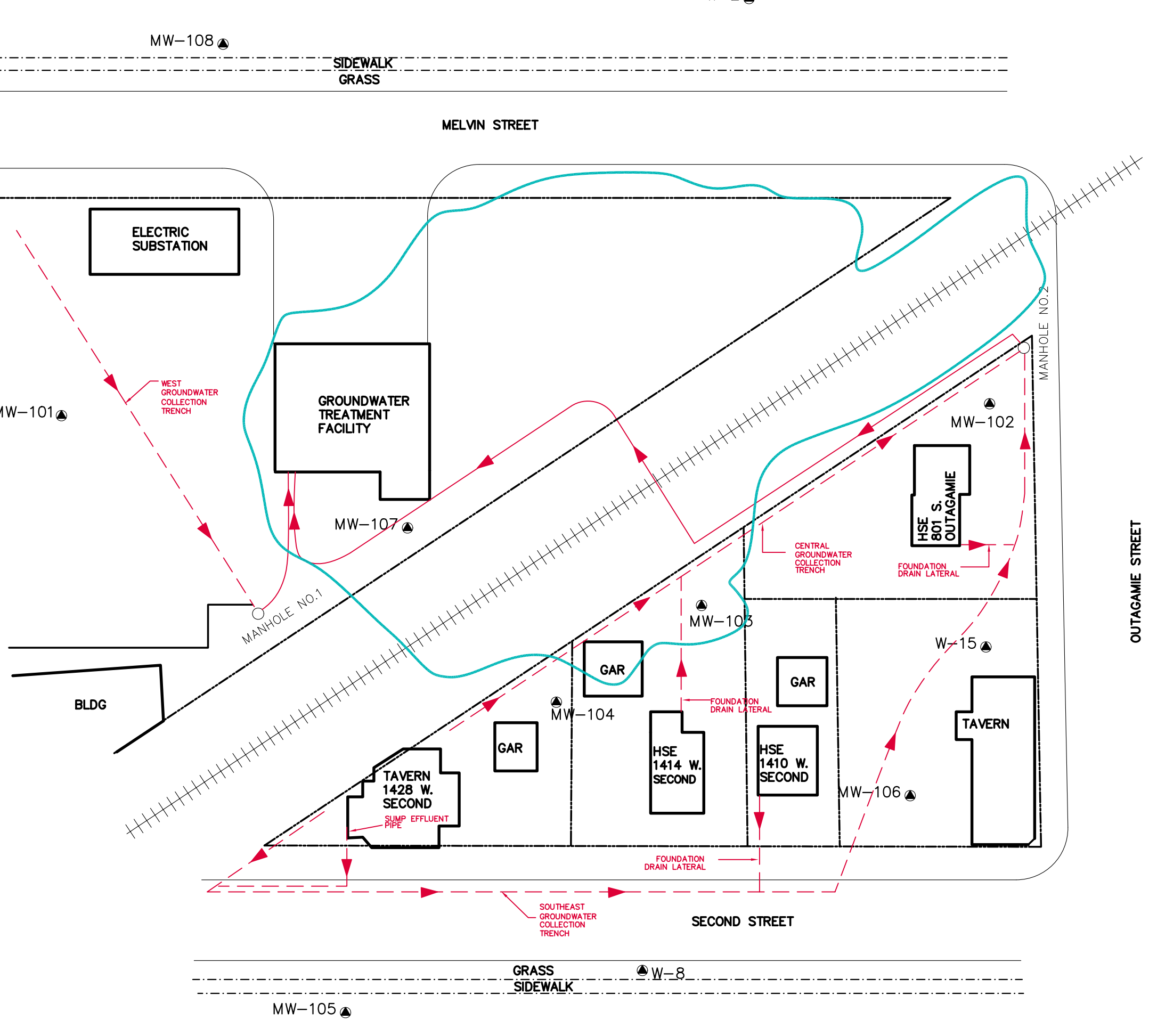


ID: PPT\2004\MCM WIS\MAUTHE.PPT SAB:jmk

McMAHON ASSOCIATES, INC.
ENGINEERS ■ ARCHITECTS
PROJ. MGRS. ■ SURVEYORS

NORTH
SCALE: 1" = 2000'

Figure 1
SITE LOCATION MAP
N.W. MAUTHE SUPERFUND SITE - APPLETON, WI
McM #M0050-930746.14 8/11/04



0' 10' 25' 50'

SCALE: 1" = 50'

LOCAL GRID NORTH

N

LEGEND:

MW-108 Well Location and I.D. No.

Rail Road Tracks

Building Face

Property Line

Edge of Concrete Pavement

Collection System

Pump Discharge

Approximate Soil Remediation Limits
Jul 11 – October 27, 1995
(10,834 Tons)

FIGURE 2
SITE DETAIL MAP

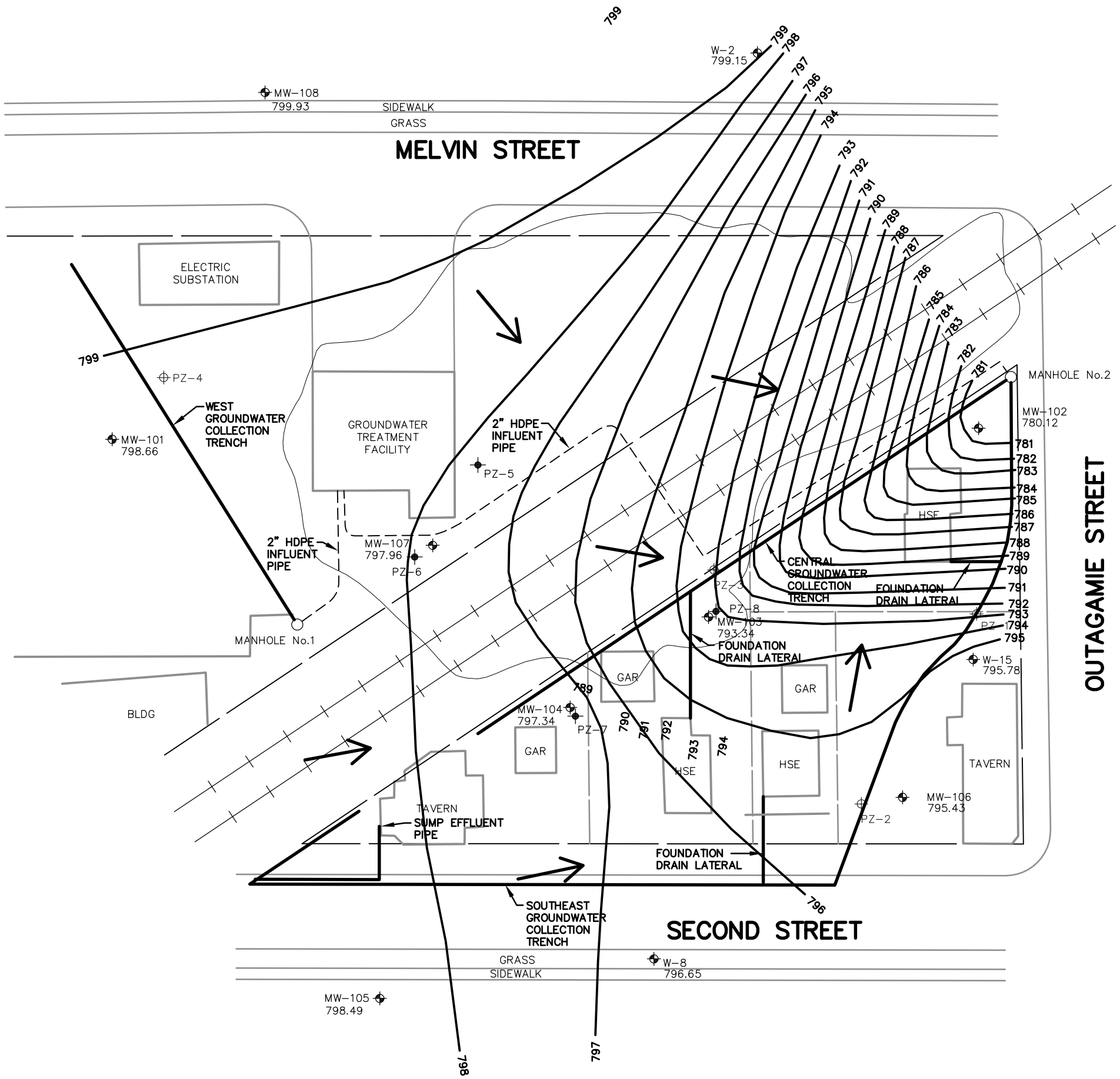
N.W. MAUTHE
725 SOUTH OUTAGAMIE STREET
APPLETON, WISCONSIN

OMNI ASSOCIATES

ONE SYSTEMS DRIVE
APPLETON, WI 54914

PHONE (920) 735-6900
FAX (920) 830-6100

PROJECT MANAGER:	BDW	PROJECT NO:	
PROJECT ENGINEER:	BDW	CAD FILE NO:	SITE
DRAWN BY:	DLD	SCALE:	1" = 50'
REVIEWED BY:	BDW	DATE:	2/27/2006



NORTH

50 25 0 50

SCALE – FEET

LEGEND

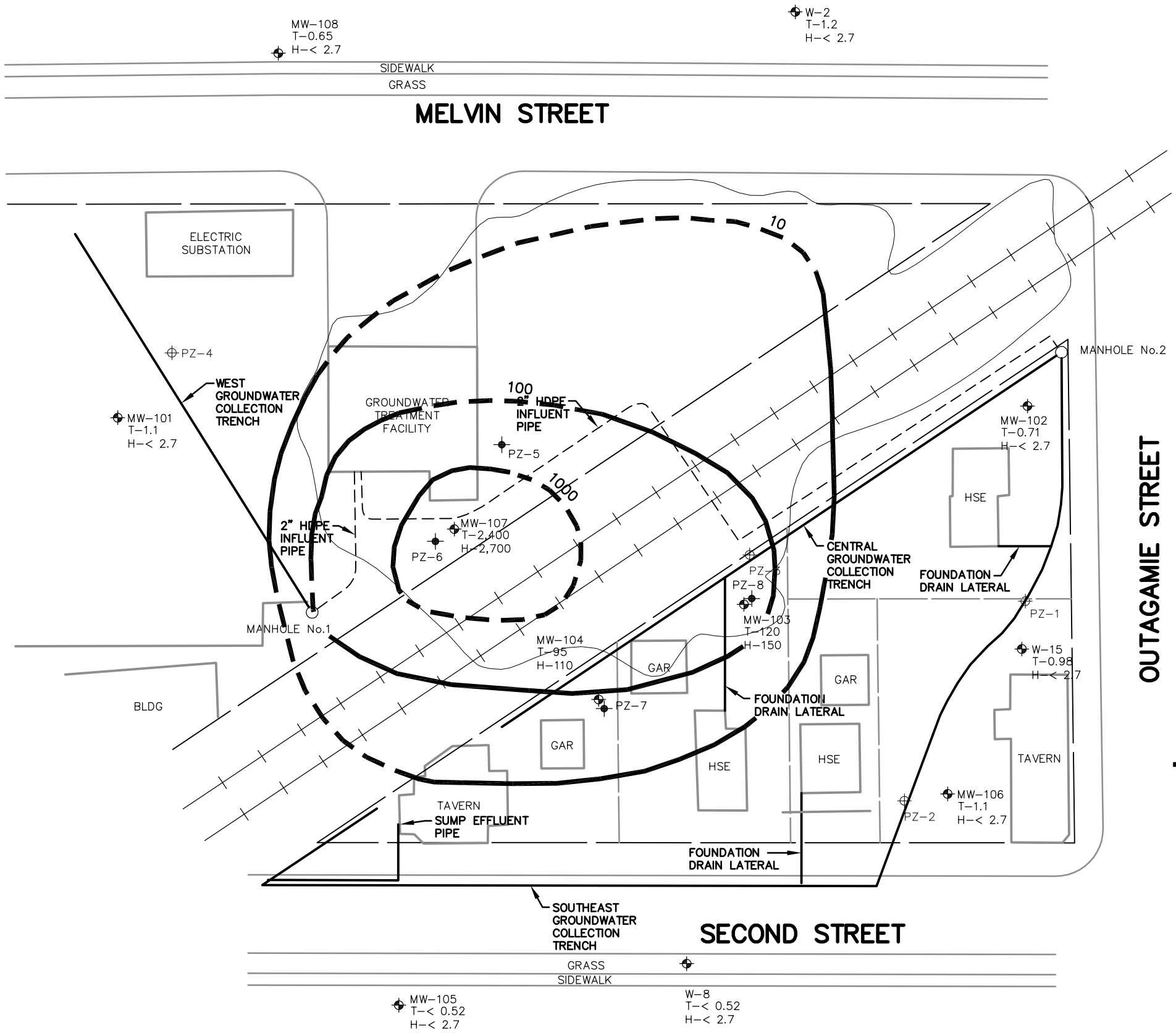
- MW-101 MONITORING WELL
- PZ-8 PIEZOMETER
- PZ-1 ABANDONED PIEZOMETER
- APPROXIMATE SOIL REMEDIATION EXCAVATION LIMITS JULY 11 – OCTOBER 27, 1995 (10,834 TONS)
- W-2 801.22 MONITORING WELL & GROUNDWATER ELEVATION
- GROUNDWATER FLOW DIRECTION
- 797 GROUNDWATER CONTOUR

NOTE:
THE GROUNDWATER CONTOURS WERE DRAWN ASSUMING NO INFLUENCE BY THE GROUNDWATER COLLECTION SYSTEM, WHICH IS NOT THE CASE.

FIGURE 3

GROUNDWATER CONTOURS
DECEMBER 14, 2005
N.W. MAUTHE SUPERFUND SITE

APPLETON, WISCONSIN
McM# M0050–930746.22



LEGEND

- MW-101 MONITORING WELL
- PZ-8 PIEZOMETER
- PZ-1 ABANDONED PIEZOMETER
- APPROXIMATE SOIL REMEDIATION EXCAVATION LIMITS JULY 11 – OCTOBER 27, 1995 (10,834 TONS)
- 10 ISOCONCENTRATION OF TOTAL CHROMIUM (ESTIMATED) (dashed where inferred)
- < LESS THAN THE DETECTION LIMIT
- ug/L MICROGRAM.LITER
- T TOTAL CHROMIUM CONCENTRATION (ug/L) IN THE GROUNDWATER
- H HEXAVALENT CHROMIUM CONCENTRATION (ug/L) IN THE GROUNDWATER
- * ANALYTE DETECTED IN THE AREA OF LESS CERTAIN QUANTITATION

NOTE:
DATA SHOWN FROM MONITORING WELLS W-2, W-8, W-15, MW-101, MW-102, MW-105, MW-106 AND MW-108 ARE FROM THE MOST RECENT ANNUAL SAMPLING EVENT. SEE TABLE 6 FOR DATE.

FIGURE 4

ISOCONCENTRATION MAP
TOTAL CHROMIUM ug/L In Groundwater
DECEMBER, 2005
N.W. MAUTHE SUPERFUND SITE

APPLETON, WISCONSIN
McM# M0050-930746.22

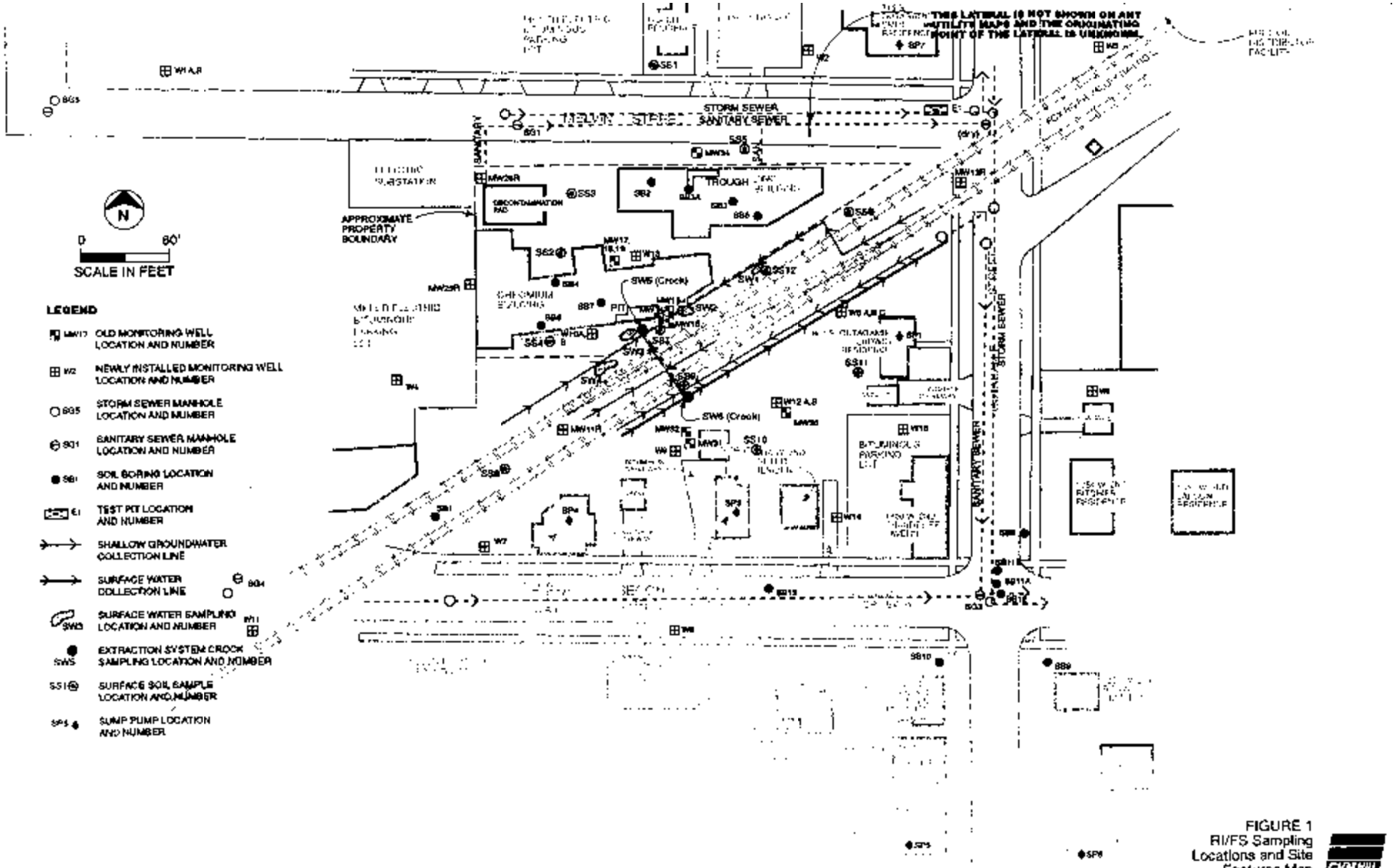


FIGURE 1
RI/FS Sampling Locations and Site Features Map
N.W. Mauthe Site RI Report

Appendix B – Tables

Table 2 – Long Term Groundwater Monitoring Plan
Table 5 – Groundwater Results – Metals
Table 6 – Groundwater Results – VOCs
Table 9 – Influent Chromium Concentrations
Table 10 – Appleton POTW Discharge Limits

Table 2
Long-Term Groundwater Monitoring Plan for
N. W. Mauthe Superfund Site, Appleton, Wisconsin

Well ID	Water Level	pH	Temp	Specific Conductivity	DO	Chromium (total)	Cadmium REMOVED	Copper REMOVED	Cyanide REMOVED	Mercury REMOVED	Manganese	Zinc REMOVED	VOCs
W-2	Q	A	A	A	A	A	Q	Q	Q	Q	A	Q	
W-8	Q	A	A	A	A	A	Q	Q	Q	Q	A	Q	
W-15	Q	A	A	A	A	A	Q	Q	Q	Q	A	Q	
MW-101	Q	A	A	A	A	A	Q	Q	Q	Q	A	Q	
MW-102	Q	A	A	A	A	A	Q	Q	Q	Q	A	Q	
MW-103	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	A	Q	
MW-104	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	A	Q	
MW-105	Q	A	A	A	A	A	Q	Q	Q	Q	A	Q	
MW-106	Q	A	A	A	A	A	Q	Q	Q	Q	A	Q	
MW-107	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	A	Q	Q
MW-108	Q	A	A	A	A	A	Q	Q	Q	Q	A	Q	
PZ-1	Q												
PZ-2	Q												
PZ-3	Q												
PZ-4	Q												
PZ-5 PZ-6 PZ-7 PZ-8													

Note:

Q = Quarterly, A = Annual

EPA approved change 4/17/03

EPA approved change 1/18/00

Changed 4/22/03

No Longer Sampled

VOCs were reduced from quarterly to annually at all wells except MW-107 on 1/18/00

PZ-1 through PZ-4 were abandoned DATE

PZ-5 through PZ-6 were installed June 2005 by OMNNI Associates for System Evaluation and are not currently included in the long-term monitoring plan.

Table #5

GROUNDWATER ANALYTICAL RESULTS / Selected Metals
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO No. M0050-930746.22

Well Name	Sample Date	Cadmium (ug/l)	Chromium (ug/l)	Hexavalent Chromium (ug/l)	Copper (ug/l)	Cyanide (ug/l)	Manganese (ug/l)	Mercury (ug/l)	Zinc (ug/l)
W-2	02/20/97	NA	**15**	NA	26	NA	**460.0**	NA	49
	05/27/97	0.43	8.5	NA	<10	NA	**170.0**	<.2	30
	09/18/97	0.27	4.5**	NA	9.5**	3**	**116.0**	<.03	16.9
	12/12/97	.13*	6.2	NA	<9.7	<.8	**133.0**	.06*	20.4
	03/25/98	0.08	<3.9	NA	<9.5	<1.7	**83.8**	.007*	18.6
	06/10/98	.31*	**16.4**	NA	18.6**	<1.7	**466.0**	.027*	40.8
	10/27/98	**.51***	3.60	NA	4.7*	<.0032	**69.0**	<.05	170
	02/09/99	.46*	<.62	NA	4.0	<.0032	**240.0**	<0.05	23
	06/08/99	<.31	<.62	NA	1.8*	<.0032	**290.0**	<0.05	<12
	09/13/99	<.31	2.00	NA	3.2	<.0032	**240.0**	<.05	<12
	12/15/99	<.31	.72 *	NA	NA	NA	2.8	NA	NA
	03/13/00	<.31	.79 *	NA	NA	NA	7.8	NA	NA
	06/22/00	<.31	<.62	NA	NA	NA	<.42	NA	NA
	09/27/00	**2.70**	1.1*	NA	NA	NA	17.0	NA	NA
	12/19/00	.24*	.91*	NA	NA	NA	8.0	NA	NA
	03/01/01	<.23	<.57	NA	NA	NA	<2.0	NA	NA
	06/19/01	<.17	.55 *	NA	NA	NA	**48.0**	NA	NA
	09/24/01	<.17	<.34	NA	NA	NA	**52**	NA	NA
	12/05/01	<.23	<.57	NA	NA	NA	<2.0	NA	NA
	03/19/02	.27*	<.57	NA	NA	NA	<2.0	NA	NA
	06/20/02	<.23	<.44	NA	NA	NA	**61.0**	NA	NA
	09/18/02	<.23	<.44	NA	NA	NA	**110.0**	NA	NA
	12/17/02	<.23	<.44	NA	NA	NA	**150.0**	NA	NA
	03/24/03	<0.17	<0.43	NA	NA	NA	8.5	NA	NA
	03/24/04	NA	<0.45	5.0	NA	NA	<1.0	NA	NA
	03/29/05	NA	1.2	<2.7	NA	NA	1.3	NA	NA
W-8	02/20/97	NA	**17**	NA	22	NA	**320.0**	NA	34
	05/27/97	**1.6**	**37**	NA	27	NA	**670.0**	<.2	54
	09/18/97	0.45	**14.4**	NA	14.6**	1**	**338.0**	.11**	31.8
	12/12/97	**0.5***	5.7	NA	<9.7	<.8	**147.0**	.07*	17.1
	03/25/98	0.43	**10.1**	NA	15**	<1.7	**205.0**	.007*	21
	06/10/98	**0.54**	9.9	NA	12.6**	<1.7	**264.0**	.016*	21.6
	10/27/98	**0.80**	3.90	NA	4.8*	<.0032	**64.0**	<.05	85
	02/09/99	<.31	<.62	NA	<60	<.0032	**850.0**	<.05	12
	06/08/99	<.31	<.62	NA	2.6	<.0032	**50.0**	<.05	<12
	09/13/99	<.31	1.90	NA	2.7	<.0032	**98.0**	<.05	29
	12/15/99	<.31	2.80	NA	NA	NA	**180.0**	NA	NA
	03/13/00	<.31	1.4 *	NA	NA	NA	**65.0**	NA	NA
	06/22/00	<.31	3.10	NA	NA	NA	**74.0**	NA	NA
	09/27/00	.27*	.75*	NA	NA	NA	**26.0**	NA	NA
	12/19/00	<.23	.66*	NA	NA	NA	**40.0**	NA	NA
	03/01/01	<.23	<.57	NA	NA	NA	23.0	NA	NA
	06/19/01	<.17	1*	NA	NA	NA	**100.0**	NA	NA
	09/24/01	<.17	<.34	NA	NA	NA	**380.0**	NA	NA
	12/25/01	<.23	<.57	NA	NA	NA	<2.0	NA	NA
	03/19/02	<.23	<.57	NA	NA	NA	21.0	NA	NA
	06/20/02	<.23	.47*	NA	NA	NA	**1400.0**	NA	NA
	09/18/02	<.23	<.44	NA	NA	NA	**620.0**	NA	NA
	12/17/02	<.23	<.44	NA	NA	NA	**34.0**	NA	NA
	03/24/03	<.17	<.43	NA	NA	NA	**27.0**	NA	NA
	03/24/04	NA	0.76*	3.8	NA	NA	1.7*	NA	NA
	03/29/05	NA	<0.52	<2.7	NA	NA	9.7	NA	NA

Table #5

GROUNDWATER ANALYTICAL RESULTS / Selected Metals
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO No. M0050-930746.22

Well Name	Sample Date	Cadmium (ug/l)	Chromium (ug/l)	Hexavalent Chromium (ug/l)	Copper (ug/l)	Cyanide (ug/l)	Manganese (ug/l)	Mercury (ug/l)	Zinc (ug/l)
W-15	02/20/97	NA	**32**	NA	52	NA	**430.0**	NA	88
	05/27/97	0.27	5.9	NA	15	NA	**97.0**	<.2	39
	09/18/97	0.31	**13.9**	NA	18.8**	<.78	**325.0**	<.03	35.5
	12/12/97	.12*	5.7	NA	9.7**	<.8	**80.9**	.03*	18.5
	03/25/98	.04*	<3.9	NA	<9.5	<1.7	**85.7**	.038*	13.7
	06/10/98	.11*	10	NA	13.2**	<1.7	**147.0**	.016*	18.8
	10/27/98	.41*	6.80	NA	7.40	<.0032	**110.0**	<.05	100
	02/09/99	<.31	<.62	NA	<.60	<.0032	**320.0**	<.05	<12
	06/08/99	<.31	2.40	NA	14.00	<.0032	**130.0**	<.05	66
	09/13/99	<.31	5.30	NA	6.40	<.0032	**130.0**	<.05	16
	12/15/99	<.31	5.00	NA	NA	NA	**90.0**	NA	NA
	03/13/00	<.31	7.00	NA	NA	NA	**130.0**	NA	NA
	06/22/00	<.31	1.80	NA	NA	NA	11.0	NA	NA
	09/27/00	<.23	4.20	NA	NA	NA	24.0	NA	NA
	12/19/00	<.23	1.4*	NA	NA	NA	**930.0**	NA	NA
	03/01/01	<.23	<.57	NA	NA	NA	<2.0	NA	NA
	06/19/01	<.17	<.34	NA	NA	NA	<2	NA	NA
	09/24/01	<.17	<.34	NA	NA	NA	**290.0**	NA	NA
	12/05/01	<.23	<.57	NA	NA	NA	2.5	NA	NA
	03/19/02	<.23	<.57	NA	NA	NA	22.0	NA	NA
	06/20/02	.36*	.47*	NA	NA	NA	3.1	NA	NA
	09/18/02	<.23	<.44	NA	NA	NA	**110.0**	NA	NA
	12/17/02	<.23	<.44	NA	NA	NA	**31.0**	NA	NA
	03/24/03	<0.17	0.47*	NA	NA	NA	**27.0**	NA	NA
	03/24/04	NA	1.80	3.8	NA	NA	1.1*	NA	NA
	03/29/05	NA	0.98	<2.7	NA	NA	24.0	NA	NA
MW-101	02/20/97	NA	**36**	NA	41	NA	**820.0**	NA	49
	05/27/97	<.2	**10**	NA	11	NA	**170.0**	<.03	18
	09/18/97	.06**	**11.9**	NA	10.7**	1**	**145.0**	<.05	18.2
	12/12/97	.06*	**12.8**	NA	<9.7	<.8	**176.0**	.05*	20.7
	03/25/98	.04*	**20.9**	NA	21.6**	<1.7	**239.0**	.007*	32.7
	06/10/98	.27*	**48.2**	NA	46.8	<1.7	**604.0**	.044*	75.9
	10/27/98	<.16	3.20	NA	4.2*	<.0032	24.0	<.05	54
	02/09/99	<.31	<.62	NA	<.60	<.0032	**1900.0**	<.05	14
	06/08/99	<.31	1.80	NA	8.2	<.0032	**380.0**	<.05	39
	09/13/99	<.31	2.90	NA	5.1	<.0032	**31.0**	<.05	<12
	12/15/99	<.31	2.50	NA	NA	NA	9.1	NA	NA
	03/13/00	<.31	2.30	NA	NA	NA	**100.0**	NA	NA
	06/22/00	<.31	1.4 *	NA	NA	NA	<4.2	NA	NA
	09/27/00	<.23	**19.00**	NA	NA	NA	**37.0**	NA	NA
	12/19/00	<.23	7.20	NA	NA	NA	18.0	NA	NA
	03/01/01	<.23	<.57	NA	NA	NA	13.0	NA	NA
	06/19/01	<.17	8.50	NA	NA	NA	9.1	NA	NA
	09/24/01	<.17	.55 *	NA	NA	NA	<2.0	NA	NA
	12/05/01	<.23	.90*	NA	NA	NA	<2.0	NA	NA
	03/19/02	<.23	.66*	NA	NA	NA	<2.0	NA	NA
	06/20/02	<.23	.58*	NA	NA	NA	2.2	NA	NA
	09/18/02	<.23	<.44	NA	NA	NA	13.0	NA	NA
	12/17/02	<.23	<.44	NA	NA	NA	**33.0**	NA	NA
	03/24/03	<.17	.50*	NA	NA	NA	8.3	NA	NA
	03/24/04	NA	0.79*	<3.6	NA	NA	<1.0	NA	NA
	03/29/05	NA	1.10	<2.7	NA	NA	16.0	NA	NA

Table #5

GROUNDWATER ANALYTICAL RESULTS / Selected Metals
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO No. M0050-930746.22

Well Name	Sample Date	Cadmium (ug/l)	Chromium (ug/l)	Hexavalent Chromium (ug/l)	Copper (ug/l)	Cyanide (ug/l)	Manganese (ug/l)	Mercury (ug/l)	Zinc (ug/l)
MW-102	02/20/97	NA	**26**	NA	38	NA	**570.0**	NA	34
	05/27/97	0.21	**48**	NA	77	NA	**920.0**	<.2	73
	09/18/97	.08**	<3.92	NA	6.9**	2**	**302.0**	<.03	8.7
	12/12/97	.04*	<3.9	NA	<9.7	<.8	**387.0**	.04*	10.9
	03/25/98	.11*	<3.9	NA	9.5**	<1.7	**302.0**	.007*	7.4*
	06/10/98	.04*	<3.9	NA	<9.8	<1.7	**318.0**	.018*	9.5
	10/27/98	.27*	.98*	NA	3.2*	<.0032	**340.0**	<.05	24
	02/09/99	<.31	.73*	NA	<.60	<.0032	**670.0**	<.05	20
	06/08/99	<.31	1.2*	NA	5.8	<.0032	**140.0**	<.05	36
	09/13/99	<.31	4.00	NA	15.0	<.0032	**160.0**	<.05	73
	12/15/99	<.31	1.2 *	NA	NA	NA	**550.0**	NA	NA
	03/13/00	<.31	1.70	NA	NA	NA	**580.0**	NA	NA
	06/22/00	<.31	<.62	NA	NA	NA	**310.0**	NA	NA
	09/27/00	<.23	2.10	NA	NA	NA	**130.0**	NA	NA
	12/19/00	.33*	2.90	NA	NA	NA	**110.0**	NA	NA
	03/01/01	<.23	<.57	NA	NA	NA	<2.0	NA	NA
	06/19/01	<.17	<.34	NA	NA	NA	<2	NA	NA
	09/24/01	.48 *	1.40	NA	NA	NA	**46.0**	NA	NA
	12/05/01	<.23	<.57	NA	NA	NA	**100.0**	NA	NA
	03/19/02	<.23	<.57	NA	NA	NA	**87.0**	NA	NA
	06/20/02	<.17	1.80	NA	NA	NA	**44.0**	NA	NA
	09/18/02	<.23	1.4*	NA	NA	NA	<2.0	NA	NA
	12/17/02	<.23	<.44	NA	NA	NA	**38.0**	NA	NA
	03/24/03	0.21*	<0.43	NA	NA	NA	3.5	NA	NA
	03/24/04	NA	<0.45	<3.6	NA	NA	**65.0**	NA	NA
	03/29/05	NA	0.71	<2.7	NA	NA	**190.0**	NA	NA
MW-103	02/20/97	NA	**1,300**	NA	47	NA	**800.0**	NA	27
	05/27/97	<.2	**160.0**	NA	31	NA	**900.0**	<.2	29
	09/18/97	.06**	**35.2**	NA	13.5**	3**	**287.0**	<.03	13.7
	12/12/97	.04*	**16.3**	NA	<9.7	<.8	**84.3**	.09*	21.4
	03/25/98	.04*	**15.5**	NA	<9.5	<1.7	**83.0**	.007*	7.5*
	06/10/98	.15*	**57.6**	NA	27.5	<1.7	**417.0**	.02*	33.7
	10/27/98	<.16	6.30	NA	2.3*	<.0032	**27.0**	<.05	30.0
	06/08/99	<.31	**87.00**	NA	3.5	<.0032	**810.0**	<.05	30
	09/13/99	<.31	**720.0**	NA	5.9	<.0032	**83.0**	<.05	15
	12/15/99	<.31	**260.0**	NA	NA	NA	**160.0**	NA	NA
	03/13/00	<.31	**600.0**	NA	NA	NA	**79.0**	NA	NA
	06/22/00	<.31	**130.0**	NA	NA	NA	**180.0**	NA	NA
	09/27/00	<.23	**280.0**	NA	NA	NA	**230.0**	NA	NA
	12/19/00	<.23	**180.0**	NA	NA	NA	**170.0**	NA	NA
	03/01/01	<.23	**49.0**	NA	NA	NA	**240.0**	NA	NA
	06/19/01	<.17	**11.0**	NA	NA	NA	**350.0**	NA	NA
	09/24/01	<.17	**12.0**	NA	NA	NA	**280.0**	NA	NA
	12/05/01	<.23	2.9	NA	NA	NA	**230.0**	NA	NA
	03/19/02	<.23	**73.0**	NA	NA	NA	7.9	NA	NA
	06/20/02	<.23	**14.0**	NA	NA	NA	**630.0**	NA	NA
	09/18/02	<.23	6.5	NA	NA	NA	**560.0**	NA	NA
	12/17/02	<.23	6.2	NA	NA	NA	3.7	NA	NA
	03/24/03	.26*	**350.0**	NA	NA	NA	**48.0**	NA	NA
	06/10/03	NA	**150.0**	NA	NA	NA	NA	NA	NA
	09/10/03	NA	9.10	NA	NA	NA	NA	NA	NA
	12/10/03	NA	7.70	NA	NA	NA	NA	NA	NA
	12/15/03	NA	NA	<3.6	NA	NA	NA	NA	NA
	03/24/04	NA	5.60	6.3	NA	NA	7.6	NA	NA
	07/09/04	NA	**11.00**	16.0	NA	NA	NA	NA	NA
	12/09/04	NA	1.20	<3.6	NA	NA	NA	NA	NA
	03/29/05	NA	**220.0**	350.0	NA	NA	**82.0**	NA	NA
	06/22/05	NA	**240.0**	250.0	NA	NA	NA	NA	NA
	09/21/05	NA	**110.0**	69.0	NA	NA	NA	NA	NA
	12/15/05	NA	**120.0**	150.0	NA	NA	NA	NA	NA

Table #5

GROUNDWATER ANALYTICAL RESULTS / Selected Metals
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO No. M0050-930746.22

Well Name	Sample Date	Cadmium (ug/l)	Chromium (ug/l)	Hexavalent Chromium (ug/l)	Copper (ug/l)	Cyanide (ug/l)	Manganese (ug/l)	Mercury (ug/l)	Zinc (ug/l)
MW-104	02/20/97	NA	5.9	NA	15	NA	**550.0**	NA	6.9
	05/27/97	<.02	6.9	NA	11	NA	**470.0**	<.2	5.2
	09/18/97	<.04	**35.6**	NA	5**	3**	**235.0**	<.03	4.74
	12/12/97	.04*	**61.8**	NA	9.8**	<.8	**279.0**	.05*	14
	03/25/98	.04*	**66.8**	NA	<9.5	<1.7	**73.6**	.008*	7.4*
	06/10/98	.04*	**219.0**	NA	<9.8	<1.7	**107.0**	.016*	12.8
	10/27/98	.29*	**150.0**	NA	2.3*	<.0032	**25.0**	<.05	30
	02/09/99	<.31	**94.0**	NA	1.4*	<.0032	**1000.0**	<.05	<12
	06/08/99	1*	**62.0**	NA	12.0	<.0032	**620.0**	<.05	17
	09/13/99	<.31	**80.0**	NA	3.2	<.0032	9.2	<.05	<12
	12/15/99	<.31	**170.0**	NA	NA	NA	1.6	NA	NA
	03/13/00	<.31	**300.0**	NA	NA	NA	13.0	NA	NA
	06/22/00	<.31	**210.0**	NA	NA	NA	**41.0**	NA	NA
	09/27/00	<.23	**510.0**	NA	NA	NA	3.9	NA	NA
	12/19/00	<.23	**790.0**	NA	NA	NA	<2	NA	NA
	03/01/01	<.23	**840.0**	NA	NA	NA	<2	NA	NA
	06/19/01	<.17	**680.0**	NA	NA	NA	2.3	NA	NA
	09/24/01	<.17	**310.0**	NA	NA	NA	17.0	NA	NA
	12/05/02	<.23	**390.0**	NA	NA	NA	2.2	NA	NA
	03/19/02	<.23	**430.0**	NA	NA	NA	<2.0	NA	NA
	06/20/02	<.23	**490.0**	NA	NA	NA	14.0	NA	NA
	09/18/02	<.23	**410.0**	NA	NA	NA	**27.0**	NA	NA
	12/17/02	<.23	**240.0**	NA	NA	NA	8.9	NA	NA
	03/24/03	<.17	**180.0**	NA	NA	NA	4.2	NA	NA
	06/10/03	NA	**420.0**	NA	NA	NA	NA	NA	NA
	09/10/03	NA	**1200.0**	NA	NA	NA	NA	NA	NA
	12/10/03	NA	**790.0**	NA	NA	NA	NA	NA	NA
	12/15/03	NA	NA	700.0	NA	NA	NA	NA	NA
	03/24/04	NA	**550.0**	580.0	NA	NA	<1.0	NA	NA
	07/09/04	NA	**370.0**	380.0	NA	NA	NA	NA	NA
	09/22/04	NA	**87.0**	33.0	NA	NA	NA	NA	NA
	12/09/04	NA	**56.0**	57.0	NA	NA	NA	NA	NA
	03/29/05	NA	**260.0**	260.0	NA	NA	1.0	NA	NA
	06/22/05	NA	**280.0**	230.0	NA	NA	NA	NA	NA
	09/21/05	NA	**17.0**	25.0	NA	NA	NA	NA	NA
	12/15/05	NA	**95.0**	110.0	NA	NA	NA	NA	NA
MW-105	02/20/97	NA	**21**	NA	22	NA	**1100.0**	NA	23
	05/27/97	<.2	5	NA	<10	NA	**120.0**	<.2	12
	09/18/97	.14**	**29.5**	NA	28.3	1**	**532.0**	<.03	46
	12/12/97	.36*	**15.8**	NA	12.5**	<.8	**297.0**	.03*	27.1
	03/25/98	.04*	**30.8**	NA	27.6	<1.7	**518.0**	.064*	44
	06/10/98	.048*	**13.7**	NA	15.3**	<1.7	**217.0**	.016*	22.1
	10/27/98	.29*	8.80	NA	8.20	<.0032	**150.0**	<.05	70
	02/09/99	<.31	1.3*	NA	4.30	<.0032	**2000.0**	<.05	19
	06/08/99	<.31	1*	NA	18.00	<.0032	**1300.0**	<.05	66
	09/13/99	<.31	.64*	NA	24.00	<.0032	**1700.0**	<.05	30
	12/15/99	<.31	<.62	NA	NA	NA	**860.0**	NA	NA
	03/13/00	<.31	4.80	NA	NA	NA	**660.0**	NA	NA
	06/22/00	<.31	1.0 *	NA	NA	NA	**600.0**	NA	NA
	09/27/00	<.23	1.2*	NA	NA	NA	**700.0**	NA	NA
	12/19/00	<.23	<.4	NA	NA	NA	**230.0**	NA	NA
	03/01/01	<.23	<.57	NA	NA	NA	**43.0**	NA	NA
	06/19/01	<.17	.75*	NA	NA	NA	**230.0**	NA	NA
	09/24/01	<.17	.73*	NA	NA	NA	**530.0**	NA	NA
	12/05/01	<.23	<.57	NA	NA	NA	<2.0	NA	NA
	03/19/02	<.23	<.57	NA	NA	NA	22.0	NA	NA
	06/20/02	<.23	.60*	NA	NA	NA	**1400.0**	NA	NA
	09/18/02	<.23	<.44	NA	NA	NA	**600.0**	NA	NA
	12/17/02	<.23	<.44	NA	NA	NA	**58.0**	NA	NA
	03/24/03	.21*	<.43	NA	NA	NA	**86.0**	NA	NA
	03/24/04	NA	3.80	6.3	NA	NA	**89.0**	NA	NA
	03/29/05	NA	<0.52	<2.7	NA	NA	**82.0**	NA	NA

Table #5

GROUNDWATER ANALYTICAL RESULTS / Selected Metals
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO No. M0050-930746.22

Well Name	Sample Date	Cadmium (ug/l)	Chromium (ug/l)	Hexavalent Chromium (ug/l)	Copper (ug/l)	Cyanide (ug/l)	Manganese (ug/l)	Mercury (ug/l)	Zinc (ug/l)
MW-106	02/20/97	NA	**21**	NA	24	NA	**320.0**	NA	26
	05/27/97	<.02	**40**	NA	35	NA	**590.0**	<.2	68
	09/18/97	.05**	5.5	NA	6.2**	1**	**56.9**	<.03	35.6
	12/12/97	.04*	9.2	NA	9.7**	<.08	**155.0**	.03*	18.4
	03/25/98	NA	**13.40**	NA	14.4**	<1.7	**150.0**	.007*	18.5
	06/10/98	.04*	<3.9	NA	10.2**	<1.7	10.0	.016*	10.9
	10/27/98	.27*	3.20	NA	4.3*	<.0032	**38.0**	<.05	88
	02/09/99	<.31	<.62	NA	1.1*	<.0032	**760.0**	<.05	22
	06/08/99	<.31	.79*	NA	2.3	<.0032	**900.0**	<.05	<12
	09/13/99	<.31	1.80	NA	4.7	<.0032	**1100.0**	<.05	30
	12/15/99	<.31	1.3 *	NA	NA	NA	**130.0**	NA	NA
	03/31/00	<.31	2.30	NA	NA	NA	**270.0**	NA	NA
	06/22/00	<.31	.73 *	NA	NA	NA	<4.2	NA	NA
	09/27/00	<.23	.88*	NA	NA	NA	**50.0**	NA	NA
	12/19/00	<.23	.77*	NA	NA	NA	22.0	NA	NA
	03/01/01	<.23	<.57	NA	NA	NA	**45.0**	NA	NA
	06/19/01	.21*	.39*	NA	NA	NA	**57.0**	NA	NA
	09/24/01	<.17	<.34	NA	NA	NA	**950.0**	NA	NA
	12/05/01	<.23	<.57	NA	NA	NA	**310.0**	NA	NA
	03/19/02	<.23	<.57	NA	NA	NA	**92.0**	NA	NA
	06/20/02	<.23	<.44	NA	NA	NA	**270.0**	NA	NA
	09/18/02	<.23	<.44	NA	NA	NA	**420.0**	NA	NA
	12/17/02	<.23	<.44	NA	NA	NA	**41.0**	NA	NA
	03/24/03	<0.17	<.43	NA	NA	NA	2.1	NA	NA
	03/24/04	NA	<0.45	3.8	NA	NA	**190.0**	NA	NA
	03/29/05	NA	1.10	<2.7	NA	NA	15.0	NA	NA
MW-107	02/20/97	NA	**2,000**	NA	13	NA	**190.0**	NA	6.9
	05/27/97	<.2	**3,600**	NA	<10	NA	**91.0**	<.2	10
	09/18/97	<.04	**2,670**	NA	<8.1	1**	**59.3**	<.03	33.5
	12/12/97	.04*	**2,310**	NA	<9.7	<.8	**48.4**	.1*	6.7
	03/25/98	.04*	**11,200***	NA	12.1**	<1.7	**68.2**	.041*	9.3*
	06/10/98	.11*	**6,240**	NA	13.8**	<1.7	**161.0**	.027*	17.3*
	10/27/98	<.16	**7,100**	NA	1.2*	<.0032	**28.0**	<.05	94
	02/09/99	<.31	**3,200**	NA	1.9*	<.0032	**49.0**	<.05	<12
	06/08/99	<.31	**5,800**	NA	3.0	<.0032	**25.0**	<.05	<12
	09/13/99	<.31	**4,000**	NA	1.9*	<.0032	18.0	<.05	<12
	12/15/99	<.31	**14,000**	NA	NA	NA	.83 *	NA	NA
	03/13/00	<.31	**8,100**	NA	NA	NA	22.0	NA	NA
	06/22/00	<.31	**14,000**	NA	NA	NA	<42	NA	NA
	09/27/00	<.23	**11,000**	NA	NA	NA	4.9	NA	NA
	12/19/00	<.23	**10,000**	NA	NA	NA	2.4	NA	NA
	03/01/01	<.23	**5,000**	NA	NA	NA	2.2	NA	NA
	06/19/01	<.17	**8,200**	NA	NA	NA	<2	NA	NA
	09/24/01	<17	**5,300**	NA	NA	NA	**270.0**	NA	NA
	12/05/01	<.23	**6,200**	NA	NA	NA	10.0	NA	NA
	03/19/02	<.23	**7,000**	NA	NA	NA	<20	NA	NA
	06/20/02	<2.3	**7,000**	NA	NA	NA	<20	NA	NA
	09/18/02	<.17	**4,300**	NA	NA	NA	24.0	NA	NA
	12/17/02	<.17	**3,700**	NA	NA	NA	15.0	NA	NA
	03/24/03	<10	**3,800**	NA	NA	NA	7.7	NA	NA
	06/10/03	NA	**5,900**	NA	NA	NA	NA	NA	NA
	09/10/03	NA	**5,200**	NA	NA	NA	NA	NA	NA
	12/10/03	NA	**5,200**	NA	NA	NA	NA	NA	NA
	12/15/03	NA	NA	5,500	NA	NA	NA	NA	NA
	03/24/04	NA	**3,900**	4,100	NA	NA	1.2*	NA	NA
	07/09/04	NA	**3,400**	5,000	NA	NA	NA	NA	NA
	09/22/04	NA	**4,100**	4,400	NA	NA	NA	NA	NA
	12/14/04	NA	**6,300**	5,800	NA	NA	NA	NA	NA
	03/29/05	NA	**3,600**	4,100	NA	NA	1.9	NA	NA
	06/22/05	NA	**3,300**	2,900	NA	NA	NA	NA	NA
	09/21/05	NA	**2,500**	2,500	NA	NA	NA	NA	NA
	12/15/05	NA	**2,400**	2,700	NA	NA	NA	NA	NA

Table #5

GROUNDWATER ANALYTICAL RESULTS / Selected Metals
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO No. M0050-930746.22

Well Name	Sample Date	Cadmium (ug/l)	Chromium (ug/l)	Hexavalent Chromium (ug/l)	Copper (ug/l)	Cyanide (ug/l)	Manganese (ug/l)	Mercury (ug/l)	Zinc (ug/l)
MW-108	02/20/97	NA	**25**	NA	23	NA	**490.0**	NA	31
	05/27/97	<.2	**11**	NA	13	NA	**210.0**	<.2	15
	09/18/97	.14**	**27.4**	NA	22.4**	1**	**462.0**	<.03	36.6
	12/12/97	.04*	5.6	NA	<9.7	<.8	**74.8**	.03*	27.9
	03/25/98	.04*	9.4	NA	10.4**	<1.7	**142.0**	.007*	13.8
	06/10/98	.14*	**28.4**	NA	25.5	<1.7	**478.0**	.021*	40.5
	10/27/98	.26*	8.90	NA	7.40	<.0032	**88.0**	<0.5	44
	02/09/99	<.31	1.70	NA	3.90	<.0032	**560.0**	<.05	30
	06/08/99	<.31	3.10	NA	1.4*	<.0032	**450.0**	<.05	54
	09/13/99	<.31	4.50	NA	5.30	<.0032	**100.0**	<.05	<12
	12/15/99	<.31	6.10	NA	NA	NA	**79.0**	NA	NA
	03/13/00	<.31	3.6	NA	NA	NA	**41.0**	NA	NA
	06/22/00	<.31	6.5	NA	NA	NA	<4.2	NA	NA
	09/27/00	<.23	2.9	NA	NA	NA	**29.0**	NA	NA
	12/19/00	<.23	3.0	NA	NA	NA	22.0	NA	NA
	03/01/01	<.23	<.57	NA	NA	NA	<2.0	NA	NA
	06/19/01	<.17	2.40	NA	NA	NA	**110.0**	NA	NA
	09/24/01	<.17	<.34	NA	NA	NA	**40.0**	NA	NA
	12/05/01	<.23	<.57	NA	NA	NA	7.4	NA	NA
	03/19/02	<.23	<.57	NA	NA	NA	3.4	NA	NA
	06/20/02	<.23	.85*	NA	NA	NA	**39.0**	NA	NA
	09/18/02	<.23	<.44	NA	NA	NA	**150.0**	NA	NA
	12/17/02	<.23	.67*	NA	NA	NA	**34.0**	NA	NA
	03/24/03	<.17	.67*	NA	NA	NA	3.3	NA	NA
	03/24/04	NA	0.79*	<36	NA	NA	**83.0**	NA	NA
	03/29/05	NA	0.65	<2.7	NA	NA	2.6	NA	NA
Maximum Contaminant Lev		5	100		100	200	50.0	2	5,000
Preventive Action Limit Cha		0.5	10		130	40	25.0	0.2	2,500

EXPLANATION:

Samples collected prior to 10/27/98 were collected by CH2M Hill.
* = Detection of compound in area of less certain quantitation.
** = Compound was found in sample and blank.

ND = Not detected above the analytical laboratories method detection limit
NA = Not Analyzed
MW-104 = Was tested for Aluminum, Nickel, Arsenic & Lead. No quantifiable detections were noted for any of the analytes.
ug/L = Microgram/Liter
mg/L = Milligram / Liter

BOLD Indicates Exceedance of the NR 140 Groundwater Preventive Action Limit (PAL)

Table #6

GROUNDWATER ANALYTICAL RESULTS
Volatile Organic Compounds (VOC's)
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO No. M0050-930746.22

Well Name	Sample Date	Benzene (ug/l)	Chloroform (ug/l)	1,1-Dichloroethane (ug/l)	1,1-Dichloroethene (ug/l)	cis-1,2,-Dichloroethene (ug/l)	Trans-1,2,-Dichloroethene (ug/l)	Ortho-Xylene (ug/l)	Toluene (ug/l)	1,1,1-Trichloroethane (ug/l)	1,1,2-Trichloroethane (ug/l)	Trichloroethene (ug/l)	Meta, para Xylene (ug/l)	Total Xylenes (ug/l)
W-2	02/20/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	05/27/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	09/18/97	<.5	<.6	<85	<.7	<7	<7	<124	<68	<40	<.5	<.5	<124	-
	12/12/97	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	03/25/98	<.5	<.6	<85	<.7	<7	<7	<.4	<68	<40	<.5	<.5	.4**	-
	06/10/98	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	10/27/98	<.24	<.23	<.27	<.28	<.27	<.26	<.17	<.21	<.26	<.23	<.29	<.36	-
	02/09/99	.15*	<.15	<.14	<.15	<.16	<.17	***	<.13	<.14	<.15	<.14	***	<.37
	06/08/99	<.13	<.15	<.14	<.15	<.16	<.17	***	<.13	<.14	<.15	<.14	***	<.37
	09/13/99	<.13	<.15	<.14	<.15	<.16	<.17	***	.13*	<.14	<.15	<.14	***	<37
	03/13/00	<.32	<.28	<.36	<.35	<.15	<.39	***	<.37	<.33	<.11	<.34	***	<.71
	03/01/01	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/19/02	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/24/03	<.35	<.35	<.35	<.39	<.39	<.37	***	<.37	<.42	<.32	<.42	***	<.43
W-8	02/20/97	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-
	05/27/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	09/18/97	<.5	<.6	<85	<40	<7	<7	<124	<68	<40	<.5	<.5	<124	-
	12/12/97	<.5	<.6	<85	<40	<7	<7	<.4	<68	<40	<.5	<.5	.4**	-
	03/25/98	<.5	<.6	<85	<40	<7	<7	<.3	<68	<40	<.5	<.5	.3**	-
	06/10/98	<.5	<.6	<85	<40	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	10/27/98	<.24	<.23	<.27	<.28	<.27	<.26	<.17	<.21	<.26	<.23	<.29	<.36	-
	02/09/99	.19*	<.15	<.15	<.15	<.16	<.17	***	.15*	<.14	<.15	<.15	***	<.37
	06/08/99	<.13	<.15	<.14	<.15	<.16	<.17	***	0.13	<.14	<.15	<.14	***	<.37
	09/13/99	<.13	<.15	<.14	<.15	<.16	<.17	***	<.13	<.14	<.15	<.14	***	<.37
	03/13/00	<.32	<.28	<.36	<.35	<.15	<.39	***	<.37	<.33	<.11	<.34	***	<.71
	03/01/01	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/19/02	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/24/03	<.35	<.35	<.35	<.39	<.39	<.37	***	<.37	<.42	<.32	<.42	***	<.43

Table #6

GROUNDWATER ANALYTICAL RESULTS
Volatile Organic Compounds (VOC's)
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO No. M0050-930746.22

Well Name	Sample Date	Benzene (ug/l)	Chloroform (ug/l)	1,1-Dichloroethane (ug/l)	1,1-Dichloroethene (ug/l)	cis-1,2,-Dichloroethene (ug/l)	Trans-1,2,-Dichloroethene (ug/l)	Ortho-Xylene (ug/l)	Toluene (ug/l)	1,1,1-Trichloroethane (ug/l)	1,1,2-Trichloroethane (ug/l)	Trichloroethene (ug/l)	Meta, para Xylene (ug/l)	Total Xylenes (ug/l)
W-15	02/20/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	05/27/97	<.5	0.22	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	09/18/97	<.5	<.6	<85	<.7	<7	<7	<124	<68	<40	<.5	<.5	<124	-
	12/12/97	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	03/25/98	<.5	<.6	<85	<.7	<7	<7	<.4	<68	<40	<.5	<.5	.4**	-
	06/10/98	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	10/27/98	<.24	<.23	<.27	<.28	<.27	<.26	<.17	<.21	<.26	<.23	<.29	<.36	-
	02/09/99	<.13	<.15	<.14	<.15	<.16	<.17	***	<.13	<.14	<.15	<.14	***	<.37
	06/08/99	.16*	<.15	<.14	<.15	<.16	<.17	***	<.13	<.14	<.15	<.14	***	<.37
	09/13/99	<.13	<.15	<.14	<.15	<.16	<.17	***	<.13	<.14	<.15	<.14	***	<.37
	03/13/00	<.32	<.28	<.36	<.35	<.15	<.39	***	<.37	<.33	<.11	<.34	***	<.71
	03/01/01	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/19/02	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/24/03	<.35	<.35	<.35	<.39	<.39	<.37	***	<.50*	<.42	<.32	<.42	***	<.43
MW-101	02/20/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	05/27/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	09/18/97	<.5	<.6	.491*	.353*	<7	<7	<124	<68	3.03	<.5	3.31	<124	-
	12/12/97	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	03/25/98	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	06/10/98	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	10/27/98	<.24	<.23	<.27	<.28	<.27	<.26	<.17	<.21	<.26	<.23	<.29	<.36	-
	02/09/99	<.13	<.15	<.14	<.15	<.16	<.17	***	0.91	<.14	<.15	<.14	***	<.37
	06/08/99	<.13	<.15	<.14	<.15	<.16	<.17	***	<.13	<.14	<.15	<.14	***	<.37
	03/13/00	<.32	<.28	<.36	<.35	<.15	<.39	***	<.37	<.33	<.11	<.34	***	<.71
	03/01/01	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/19/02	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/24/03	<.35	<.35	<.35	<.39	<.39	<.37	***	<.40*	<.42	<.32	<.42	***	<.43

Table #6

GROUNDWATER ANALYTICAL RESULTS
Volatile Organic Compounds (VOC's)
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO No. M0050-930746.22

Well Name	Sample Date	Benzene (ug/l)	Chloroform (ug/l)	1,1-Dichloroethane (ug/l)	1,1-Dichloroethene (ug/l)	cis-1,2,-Dichloroethene (ug/l)	Trans-1,2,-Dichloroethene (ug/l)	Ortho-Xylene (ug/l)	Toluene (ug/l)	1,1,1-Trichloroethane (ug/l)	1,1,2-Trichloroethane (ug/l)	Trichloroethene (ug/l)	Meta, para Xylene (ug/l)	Total Xylenes (ug/l)
MW-102	02/20/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	05/27/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	09/18/97	<.5	<.6	<.85	<85	<7	<7	<124	<68	<40	<.5	<.5	<124	-
	12/12/97	<.5	<.6	<85	<85	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	03/25/98	<.5	<.6	<85	<85	<7	<7	<.4	<68	<40	<.5	<.5	.4*	-
	06/10/98	<.5	<.6	<85	<85	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	10/27/98	<.24	<.23	<.27	<.28	<.27	<.26	<.17	<.21	<.26	<.23	<.29	<.36	-
	02/09/99	<.13	<.15	<.14	<.15	<.16	<.17	***	0.65	<.14	<.15	<.14	***	<.37
	06/08/99	<.13	<.15	<.14	<.15	<.16	<.17	***	.21*	<.14	<.15	<.14	***	<.37
	09/13/99	<.13	<.15	<.14	<.15	<.16	<.17	***	<.13	<.14	<.15	<.14	***	<.37
	03/13/00	<.32	<.28	<.36	<.35	<.15	<.39	***	<.37	<.33	<.11	<.34	***	<.71
	03/01/01	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/19/02	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/24/03	<.35	<.35	<.35	<.39	<.39	<.37	***	<.37	<.42	<.32	<.42	***	<.43
MW-103	02/20/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	05/27/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	09/18/97	<.5	<.6	<85	<.7	<7	<7	<124	<68	<40	<.5	<.5	<124	-
	12/12/97	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	03/25/98	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	06/10/98	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	10/27/98	<.24	<.23	<.27	<.28	<.27	<.26	<.17	<.21	<.26	<.23	<.29	<.36	-
	02/09/99	<.13	<.15	<.14	<.15	<.16	<.17	***	.15*	<.14	<.15	<.14	***	<.37
	06/08/99	<.13	<.15	<.14	<.15	<.16	<.17	***	<.13	<.14	<.15	<.14	***	<.37
	09/13/99	<.13	<.15	<.14	<.15	<.16	<.17	***	<.13	<.14	<.15	<.14	***	<.37
	03/13/00	<.32	<.28	<.36	<.35	<.15	<.39	***	<.37	<.33	<.11	<.34	***	<.71
	03/01/01	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/19/02	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	.23*	***	<.56
	03/24/03	<.35	<.35	<.35	<.39	<.39	<.39	***	<.37	<.42	<.32	<.42	***	<.42

Table #6

GROUNDWATER ANALYTICAL RESULTS
Volatile Organic Compounds (VOC's)
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO No. M0050-930746.22

Well Name	Sample Date	Benzene (ug/l)	Chloroform (ug/l)	1,1-Dichloroethane (ug/l)	1,1-Dichloroethene (ug/l)	cis-1,2,-Dichloroethene (ug/l)	Trans-1,2,-Dichloroethene (ug/l)	Ortho-Xylene (ug/l)	Toluene (ug/l)	1,1,1-Trichloroethane (ug/l)	1,1,2-Trichloroethane (ug/l)	Trichloroethene (ug/l)	Meta, para Xylene (ug/l)	Total Xylenes (ug/l)
MW-104	02/20/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	05/27/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	09/18/97	<.5	<.6	<85	<.7	<7	<7	<124	<68	.324*	<.5	<.5	<124	-
	12/12/97	<.5	<.6	0.4	<.7	<7	<7	<120	<68	1*	<.5	0.9	<120	-
	03/25/98	<.5	<.6	<85	<.7	<7	<7	<120	<68	.8*	<.5	<.5	<120	-
	06/10/98	<.5	<.6	<85	<.7	<7	<7	<120	<68	2*	<.5	<.5	<120	-
	10/27/98	<.24	<.23	.35*	<.28	<.27	<.26	<.17	<.21	1.8	<.23	<.29	<.36	-
	02/09/99	<.13	<.15	.38*	<.15	<.16	<.17	***	.17*	1.5	<.15	<.14	***	<.37
	06/08/99	<.13	<.15	.34*	<.15	<.16	<.17	***	.14*	1.4	<.15	<.14	***	<.37
	09/13/99	<.13	<.15	.38*	<.15	<.16	<.17	***	.27*	1.6	<.15	<.14	***	<.37
	03/13/00	<.32	<.28	.38 *	<.35	<.15	<.39	***	<.37	1.6	<.11	<.34	***	<.71
	03/01/01	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	2.8	<.25	<.13	***	<.56
	03/19/02	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	2.4	<.25	<.23 *	***	<.56
	03/24/03	<.35	<.35	<.35	<.39	<.39	<.37	***	<.37	1.3*	<.32	<.42	***	<.43
MW-105	02/20/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	05/27/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	09/18/97	<.5	<.6	<85	<.7	<7	<7	<124	<68	<40	<.5	<.5	<124	-
	12/12/97	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	03/25/98	<.5	<.6	<85	<.7	<7	<7	<.4	<68	<40	<.5	<.5	.4*	-
	06/10/98	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	10/27/98	<.24	<.23	<.27	<.28	<.27	<.26	<.17	<.21	<.26	<.23	<.29	<.36	-
	02/09/99	.16*	<.15	<.14	<.15	<.16	<.17	***	.3*	<.14	<.15	<.14	***	<.37
	06/08/99	<.13	<.15	<.14	<.15	<.16	<.17	***	<.13*	<.14	<.15	<.14	***	<.37
	09/13/99	<.13	<.15	<.14	<.15	<.16	<.17	***	<.13	<.14	<.15	<.14	***	<.37
	03/13/00	<.32	<.28	<.36	<.35	<.15	<.39	***	<.37	<.33	<.11	<.34	***	<.71
	03/01/01	<.12	<.15	<.64	<.13	<.28	<.13	****	<.17	<.17	<.25	<.13	***	<.56
	03/19/02	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/24/03	<.35	<.35	<.35	<.39	<.39	<.37	***	0.64*	<.42	<.32	<.42	***	<.43

Table #6

GROUNDWATER ANALYTICAL RESULTS
Volatile Organic Compounds (VOC's)
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO No. M0050-930746.22

Well Name	Sample Date	Benzene (ug/l)	Chloroform (ug/l)	1,1-Dichloroethane (ug/l)	1,1-Dichloroethene (ug/l)	cis-1,2,-Dichloroethene (ug/l)	Trans-1,2,-Dichloroethene (ug/l)	Ortho-Xylene (ug/l)	Toluene (ug/l)	1,1,1-Trichloroethane (ug/l)	1,1,2-Trichloroethane (ug/l)	Trichloroethene (ug/l)	Meta, para Xylene (ug/l)	Total Xylenes (ug/l)
MW-106	02/20/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	05/27/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	09/18/97	<.5	<.6	<85	<.7	<7	<7	<124	<68	2.73*	<.5	<.5	<124	-
	12/12/97	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	03/25/98	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	06/10/98	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	10/27/98	<.24	<.23	<.27	<.28	<.27	<.26	<.17	<.21	<.26	<.23	<.29	<.36	-
	02/09/99	.18*	<.15	<.14	<.15	<.16	<.17	***	<.17	<.14	<.15	<.14	***	<.37
	06/08/99	<.13	<.15	<.14	<.15	<.16	<.17	***	<.13	<.14	<.15	<.14	***	<.37
	09/13/99	<.13	<.15	<.14	<.15	<.16	<.17	***	<.13	<.14	<.15	<.14	***	<.37
	03/13/00	<.32	<.28	<.36	<.35	<.15	0.39	***	<.37	<.33	<.11	<.34	***	<.71
	03/01/01	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/19/02	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/24/03	<.35	<.35	<.35	<.39	<.39	<.37	***	5.7	<.42	<.32	<.42	***	<.43

Table #6

GROUNDWATER ANALYTICAL RESULTS
Volatile Organic Compounds (VOC's)
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO No. M0050-930746.22

Well Name	Sample Date	Benzene (ug/l)	Chloroform (ug/l)	1,1-Dichloroethane (ug/l)	1,1-Dichloroethene (ug/l)	cis-1,2,-Dichloroethene (ug/l)	Trans-1,2,-Dichloroethene (ug/l)	Ortho-Xylene (ug/l)	Toluene (ug/l)	1,1,1-Trichloroethane (ug/l)	1,1,2-Trichloroethane (ug/l)	Trichloroethene (ug/l)	Meta, para Xylene (ug/l)	Total Xylenes (ug/l)
MW-107	02/20/97	<.5	0.3	11	**8.4**	0.7	<.7	<.5	<.5	**81**	0.6	**50**	<.5	-
	05/27/97	0.09	1.10	36	**40**	3.1	<3.1	<.5	0.34	**390**	3.5	**420**	<.5	-
	09/18/97	<10	<12	47.6*	**22.1**	2.61*	<2.61	<2480	<68	**265***	2.83	**295**	<2480	-
	12/12/97	<10	<12	56*	**23**	3*	<3	<2500	<68	**280**	3	**290**	<2500	-
	03/25/98	<25	<30	61*	**69**	5*	<5	<17	<68	**720**	**5**	**620**	17*	-
	06/10/98	<12	<15	59*	**58**	<3	<3	<3100	63*	**340***	4*	**390**	<3100	-
	10/27/98	<.24	1.4	62	**46***	3.6	.51*	<.17	<.21	**550**	4.9	**640**	<.36	-
	02/09/99	<3.2	<3.8	48	**24**	<4.0	<4.2	***	<3.2	**220**	<.38	**250**	***	<9.2
	06/08/99	<2.6	<3.0	42	**20**	<3.2	<3.4	***	<2.6	**200**	<3.0	**310**	***	<7.4
	09/13/99	<.26	<3.0	34	**19**	<.32	<3.4	***	<2.6	**180**	<.3.0	**320**	***	<.7.4
	12/15/99	<3.2	<3.8	37	**56**	4.6 *	<4.2	***	<3.2	**570**	4.5 *	**880**	***	<9.2
	03/13/00	<26	<23	50 *	**32 ***	<12	<31	***	<30	**340**	<.90	**630**	***	<57
	06/22/00	<26	<23	<29	**50 ***	<12	<31	***	<30	**540**	<9	**850**	***	<57
	09/27/00	<26	<23	35*	**54***	<12	<31	***	<30	**560**	<9	**870**	***	<57
	12/19/00	<6.4	<5.6	36	**53**	4.5*	<7.8	***	<7.5	**480**	4.1*	**790**	***	<20
	03/01/01	<6.0	<7.4	<32	<6.7	<14	<6.5	***	<8.7	**420**	<13	**760**	***	<28
	06/25/01	<6.5	<15	26	**35**	<9	<6.1	***	<6.2	**360**	<6.5	**620**	***	<32
	09/24/01	<6.5	<15	36	**50**	<9	<6.1	***	<6.2	**480**	<6.5	**760**	***	<32
	12/05/01	<6.5	<15	40	**50**	<9	<6.1	***	<6.2	**500**	<6.5	**810**	***	<32
	03/19/02	<6.0	<7.5	37*	**43**	<14	<6.5	***	<8.7	**440**	<13	**740**	***	<28
	06/20/02	<7.9	<11	31	**39**	<7.2	<8.9	***	<7.6	**410**	<6.8	**690**	***	<14
	09/18/02	<7.9	<11	34	**39**	<7.2	<8.9	***	<7.6	**430**	<6.8	**710**	***	<14
	12/17/02	<7.9	<11	40	**43**	<7.2	<8.9	***	<7.6	**470**	<6.8	**850**	***	<14
	03/24/03	<.17	<.18	33*	**37***	<19	<19	***	<19	**390**	<16	**640**	***	<22
	06/10/03	<5.7	<8.0	<5.3	**39**	<11	<8.2	***	<7.2	**400**	<9.0	**680**	***	<17
	09/10/03	<17	<18	36*	**41***	<19	<19	***	<19	**430**	<16	**730**	***	<22
	12/10/03	<17	<18	25*	**31***	<19	<19	***	<19	**380**	<16	**740**	***	<22
	03/24/04	<7.5	<7.0	<7.1	**22**	<6.8	<6.0	***	<7.6	**220**	<8.1	**370**	***	<19
	07/29/04	<2.0	<1.8	29	**25**	<4.1	<4.4	***	<3.4	**310**	**3.4**	**510**	***	<13.1
	09/22/04	<7.5	<7.0	28	**34**	<6.8	<6.0	***	<7.6	**270**	<8.1	**570**	***	<19
	12/14/04	<7.5	<7.0	33	**40**	<6.8	<6.0	***	<7.6	**410**	<8.1	**800**	***	<19
	03/29/05	<2.0	<1.8	39	**20**	<4.1	<4.4	***	<3.4	**200**	0.21	**330**	***	<13.1
	06/22/05	<1.0	<0.92	18	**8.2**	<2.1	<2.2	***	<1.7	**82**	<1.0	**160**	***	<6.6
	09/21/05	<2.0	<1.8	39	**18.0**	<4.1	<4.4	***	<3.4	**220**	<2.1	**470**	***	<13.1
	12/15/05	<2.0	<1.8	42	**26.0**	<4.1	<4.4	***	<3.4	**250**	<2.1	**490**	***	<13.1

Table #6

GROUNDWATER ANALYTICAL RESULTS
Volatile Organic Compounds (VOC's)
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO No. M0050-930746.22

Well Name	Sample Date	Benzene (ug/l)	Chloroform (ug/l)	1,1-Dichloroethane (ug/l)	1,1-Dichloroethene (ug/l)	cis-1,2,-Dichloroethene (ug/l)	Trans-1,2,-Dichloroethene (ug/l)	Ortho-Xylene (ug/l)	Toluene (ug/l)	1,1,1-Trichloroethane (ug/l)	1,1,2-Trichloroethane (ug/l)	Trichloroethene (ug/l)	Meta, para Xylene (ug/l)	Total Xylenes (ug/l)
MW-108	02/20/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	05/27/97	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	<.5	-
	09/18/97	<.5	<.6	<85	<.7	<7	<7	<124	<68	<40	<.5	<.5	<124	-
	12/12/97	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	03/25/98	<.5	<.6	<85	<.7	<7	<7	<120	<68	<40	<.5	<.5	<120	-
	06/10/98	<.5	<.6	<85	<.7	<7	<7	<120	<68	<44	<.5	<.5	<120	-
	10/27/98	<.24	<.23	<.22	<.28	<.27	<.26	<.17	<.21	<.26	<.23	<.29	<.36	-
	02/09/99	<.13	<.15	<.14	<.15	<.16	<.17	***	0.83	<.14	<.15	<.14	***	<.37
	06/08/99	<.13	<.15	<.14	<.15	<.16	<.17	***	.15*	<.14	<.15	<.14	***	<.37
	09/13/99	<.13	<.15	<.14	<.15	<.16	<.17	***	0.84	<.14	<.15	<.14	***	<.32
	03/13/00	<.32	<.28	<.36	<.35	<.15	<.39	***	<.37	<.33	<.11	<.36	***	<.71
	03/31/01	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<56
	03/19/02	<.12	<.15	<.64	<.13	<.28	<.13	***	<.17	<.17	<.25	<.13	***	<.56
	03/24/03	<.35	<.35	<.35	<.39	<.39	<.37	***	<.37	<.42	<.32	<.42	***	<.43
MCL NR 149.21 (9)		5.0	-	-	7.0	70	100	-	1,000	200	5.0	5.0	-	-
Preventive Action Plan (PAL) 140		0.5	0.6	85	0.7	7	20	124**	686	40	0.5	0.5	124**	124

EXPLANATION:

Results prior to 10/27/98 for cis-1,2,-Dichloroethene and Trans-1,2 Dichloroethene were listed as Total Dichloroethene and were placed in this table under the heading cis-1,2,-Dichloroethene.
Results prior to 10/27/98 for Ortho Xylene and Meta, para Xylene were listed as Total Xylenes and were placed in this table under the heading Meta, para Xylene.

* = Detection of compound in area of less certain quantification
** = Standard includes Ortho-, Meta, para-Xylenes
*** = As of 02/09/99 Xylene results are listed as "Total Xylenes".
WM Equipment Malfunction, no accurate measurement.
ND = Not Detected
NA = Not Analyzed
MCL = Maximum Contaminant Levels
ug/l = Microgram/Liter
BOLD = Indicates an exceedance of the NR 140, Wis. Adm. Code PAL

Table #9

WEEKLY INFLUENT HEXAVALENT CHROMIUM RESULTS
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO. No. M0050-930746.22

DATE	INFLUENT HEXAVALENT CHROMIUM* (ppm)
02/26/97	1.0
03/03/97	.8
03/06/97	1.0
03/10/97	1.5
03/23/97	.9
03/29/97	1.2
04/06/97	1.1
04/09/97	1.2
04/16/97	1.0
04/25/97	1.0
04/27/97	1.1
05/02/97	1.1
05/08/97	1.1
05/13/97	1.2
05/21/97	1.1
05/29/97	1.1
06/06/97	1.2
06/13/97	1.2
06/17/97	1.3
06/23/97	1.2
07/02/97	1.2
07/08/97	1.2
07/14/97	1.2
07/21/97	1.2
07/28/97	1.4
08/04/97	1.4
08/13/97	1.3
08/18/97	1.3
08/25/97	1.3
09/04/97	1.3
09/08/97	1.5
09/15/97	1.4
09/24/97	1.3
10/01/97	1.3
10/08/97	1.4
10/15/97	1.3
10/22/97	1.4
10/29/97	1.4
11/05/97	1.3
11/11/97	1.2
11/22/97	1.0
11/24/97	1.0
12/03/97	1.0
12/10/97	1.0
12/17/97	1.1
01/07/98	1.0
01/14/98	1.0
01/21/98	1.0
01/28/98	1.0
02/04/98	1.4
02/11/98	1.4
02/18/98	1.4
02/25/98	0.8
03/04/98	1.3
03/11/98	1.3
03/18/98	1.3
03/26/98	1.3
04/01/98	0.8
04/08/98	1.0
04/15/98	1.3
04/23/98	1.3
04/29/98	1.3
05/06/98	1.3
05/13/98	1.3
05/20/98	1.3
05/27/98	1.4
06/03/98	1.3
06/10/98	1.4
06/17/98	1.2
06/24/98	1.2
07/01/98	1.1
07/08/98	1.1
07/15/98	1.1
07/23/98	1.3
07/29/98	1.3
08/06/98	1.2
08/12/98	1.2
08/19/98	1.2
08/26/98	1.2
09/02/98	1.2
09/09/98	1.2
09/16/98	1.2
09/23/98	1.2
09/30/98	1.2
10/07/98	1.0
10/15/98	1.1
10/21/98	1.3
10/28/98	1.3
11/04/98	1.1
11/11/98	1.1
11/18/98	1.2
11/25/98	1.2
12/02/98	1.2
12/09/98	1.5
12/16/98	1.3
12/23/98	1.3
12/30/98	1.3
01/06/99	1.3
01/12/99	1.1
01/20/99	1.2
01/28/99	1.3
02/03/99	1.3
02/10/99	1.4
02/17/99	1.4
02/24/99	1.4
03/03/99	1.3
03/10/99	1.3
03/17/99	1.3
03/24/99	1.3
03/31/99	1.3
04/07/99	1.2
04/14/99	1.2
04/21/99	1.1
04/28/99	1.2
05/05/99	1.2
05/12/99	1.2
05/19/99	1.1
05/26/99	1.2
06/02/99	1.1
06/10/99	1.4
06/16/99	1.5
06/23/99	2.2
06/30/99	2.2
07/07/99	2.4
07/14/99	2.0
07/21/99	1.8
07/28/99	1.2
08/04/99	1.5
08/11/99	1.4
08/18/99	1.3
08/25/99	1.3
09/01/99	1.3
09/08/99	1.4
09/15/99	1.5
09/21/99	1.3
09/29/99	1.2
10/06/99	1.4
10/13/99	1.5
10/20/99	1.4
10/27/99	1.4
11/04/99	1.3
11/10/99	1.2
11/18/99	1.3
11/24/99	1.2
11/30/99	1.3
12/08/99	1.3
12/15/99	1.2
12/22/99	1.3
12/29/99	1.2
01/06/00	1.3
01/12/00	1.3
01/19/00	1.2
01/26/00	1.2
02/02/00	1.1
02/09/00	1.1
02/16/00	1.2
02/23/00	1.3
03/01/00	1.2
03/08/00	1.3
03/14/00	1.2
03/22/00	1.2
03/29/00	1.1
04/05/00	1.4
04/11/00	1.1
04/19/00	1.1
04/26/00	1.1
05/03/00	1.3
05/10/00	1.1
05/17/00	1.2
05/24/00	1.1
05/31/00	1.1
06/07/00	1.4
06/14/00	0.5
06/21/00	1.0
06/28/00	1.1
07/05/00	1.3
07/12/00	1.2
07/19/00	1.3
07/26/00	1.3
08/02/00	1.3
08/09/00	1.4
08/16/00	1.2
08/23/00	1.4
08/30/00	1.3
09/06/00	1.4
09/13/00	1.2
09/20/00	1.2
09/27/00	1.4
10/03/00	1.3
10/11/00	1.3
10/18/00	2.5
10/25/00	2.2
11/01/00	1.8
11/08/00	1.4
11/15/00	1.8
11/22/00	1.8
11/29/00	1.4
12/06/00	1.6
12/13/00	1.4
12/20/00	1.2
12/27/00	1.3
01/03/01	1.2
01/10/01	1.4
01/17/01	1.8
01/24/01	1.4
01/31/01	1.3
02/07/01	1.2
02/13/01	2.0
02/21/01	1.5
02/28/01	1.4
03/17/01	1.3
03/14/01	1.2
03/21/01	1.3
03/28/01	1.2
04/04/01	1.4
04/11/01	1.2
04/18/01	1.2
04/25/01	1.4
05/02/01	1.3
05/09/01	1.3
05/16/01	1.2
05/23/01	1.3
05/30/01	1.1
06/06/01	1.2
06/13/01	1.4
06/20/01	1.2
06/27/01	1.3
07/04/01	1.3
07/11/01	1.2
07/18/01	1.4
07/25/01	1.3
08/01/01	1.6
08/08/01	1.3
08/15/01	1.2
08/22/01	1.1
08/29/01	1.3
09/05/01	1.4
09/12/01	1.4
09/19/01	3.0
09/25/01	2.4
10/01/01	1.5
10/09/01	2.5
10/18/01	2.0
10/24/01	2.3
10/31/01	2.5
11/09/01	1.4
11/17/01	1.2
11/21/01	1.3
11/29/01	1.4
12/06/01	1.5
12/14/01	2.0
12/20/01	2.0
12/27/01	2.5
01/03/02	2.5
01/10/02	2.0
01/17/02	2.5
01/24/02	2.0
01/31/02	1.5
02/07/02	2.5
02/13/02	2.5
02/21/02	3.0
02/28/02	2.5
03/07/02	2.0
03/14/02	1.5
03/21/02	2.5
03/28/02	1.5
04/04/02	1.5
04/11/02	1.5
04/18/02	2.0
04/25/02	2.5
05/02/02	3.0
05/09/02	1.5
05/16/02	1.5
05/23/02	1.5
05/30/02	2.0
06/06/02	1.5
06/13/02	2.0
06/20/02	3.0
06/27/02	2.0
07/03/02	2.0
07/11/02	1.5
07/18/02	1.0
07/25/02	0.1
08/01/02	0.0
08/08/02	0.0
08/15/02	0.0
08/22/02	0.0
08/29/02	0.0
09/09/02	0.0
09/12/02	0.4
09/19/02	0.1
09/26/02	0.0
10/03/02	0.0
10/10/02	1.5
10/17/02	1.5
10/24/02	1.5
10/31/02	1.5
11/07/02	1.5
11/14/02	1.5
11/21/02	1.0
11/27/02	1.5
12/05/02	0.0
12/12/02	0.0
12/19/02	0.2
12/26/02	0.2
01/02/03	0.4
01/09/03	0.4
01/16/03	0.0
01/23/03	0.1
01/30/03	0.3
02/06/03	0.0
02/14/03	0.0
02/20/03	0.0
02/27/03	0.3
03/06/03	0.3
03/13/03	0.3
03/22/03	0.4
03/27/03	0.4
04/03/03	1.2
04/11/03	1.4
04/18/03	0.9
04/25/03	1.1
05/01/03	1.2
05/08/03	0.8
05/15/03	0.4
05/22/03	1.2
06/01/03	1.1
06/11/03	1.1
06/19/03	1.4
06/26/03	0.9
07/03/03	0.9
07/10/03	1.0
07/17/03	1.0
07/24/03	1.0
07/31/03	1.0
08/07/03	1.4
08/14/03	1.2
08/21/03	1.0
08/28/03	1.0
09/04/03	0.1
09/11/03	0.1
09/20/03	0.0
09/25/03	0.0
10/02/03	0.0
10/09/03	0.3
10/16/03	0.3
10/23/03	0.7
10/30/03	1.1
11/06/03	1.0
11/13/03	1.4
11/20/03	1.4
11/27/03	1.2
12/04/03	1.1
12/11/03	1.5
12/18/03	1.3
12/25/03	0.5
01/02/04	0.8
01/08/04	0.8
01/15/04	0.6
01/22/04	0.6
01/29/04	0.6
02/05/04	0.5
02/12/04	0.0
02/19/04	0.0
02/26/04	0.9
03/04/04	1.3
03/11/04	0.8
03/18/04	0.6
03/25/04	0.8
04/01/04	0.6
04/08/04	0.5
04/15/04	0.2
04/22/04	0.2
04/29/04	0.7
05/06/04	0.5
05/13/04	1.2
05/22/04	1.3
05/27/04	0.5
06/03/04	0.5
06/10/04	0.5
06/17/04	0.7
06/24/04	0.7
07/01/04	0.7
07/08/04	1.1
07/15/04	1.0
07/22/04	1.1
07/29/04	0.5
08/05/04	0.7
08/12/04	1.2
08/19/04	1.1
08/26/04	1.1
09/02/04	1.6
09/09/04	1.5
09/16/04	1.3
09/23/04	1.1
09/30/04	1.1
10/07/04	0.6
10/14/04	0.6
10/21/04	0.4
10/28/04	0.4
11/04/04	0.7
11/11/04	0.7
11/18/04	0.7
11/26/04	0.7
12/02/04	0.7
12/09/04	0.7
12/16/04	0.8
12/23/04	0.8
12/30/04	1.3
01/06/05	1.3
01/13/05	1.3
01/20/05	1.0
01/27/05	0.9
02/03/05	1.2
02/10/05	1.0
02/17/05	1.0
02/24/05	1.0
03/03/05	1.0
03/10/05	0.9
03/17/05	0.9
03/24/05	0.8
03/31/05	0.7
04/07/05	1.2
04/14/05	1.1
04/21/05	1.8
04/28/05	1.8
05/05/05	1.2
05/12/05	1.2
05/19/05	0.9
05/26/05	1.5
06/02/05	1.5
06/09/05	1.5
06/16/05	1.3
06/23/05	1.3
06/30/05	1.3
07/07/05	0.4
07/14/05	0.4
07/22/05	0.4
07/28/05	1.2
08/04/05	1.2
08/11/05	1.2
08/18/05	1.1
08/25/05	1.5
09/01/05	1.5
09/08/05	1.5
09/15/05	1.4
09/22/05	1.4
09/29/05	1.3
10/06/05	1.3
10/13/05	1.5
10/20/05	1.7
10/27/05	1.7
11/03/05	1.7
11/10/05	1.5
11/17/05	2.5
12/01/05	1.2
12/08/05	1.2
12/22/05	1.2
12/29/05	1.2

Table #10

CITY OF APPLETON POTW EFFLUENT COMPLIANCE LIMITS
Effluent Point 001
N.W. Mauthe Superfund Site - Appleton, Wisconsin
MCO No. M0050-930746.22

	Aluminum (mg/l)	Arsenic (mg/l)	Cadmium (mg/l)	Chromium Total (mg/l)	Copper (mg/l)	Cyanide (mg/l)	Lead (mg/l)	Mercury (mg/l)	Nickel (mg/l)	Zinc (mg/l)	Hexavalent Chromium (mg/L)
Effluent Limits Permit #00-21	70	1.0	0.3	7.0	3.5	1.0	2.0	0.002	2.0	10.0	4.5

mg/l = milligram / liter
ug/l = microgram / liter

Appendix C – Fact Sheet

N W Mauthe Superfund Site, 725 South Outagamie Street, Appleton, Wisconsin,
December 2005

N W Mauthe Superfund Site
725 South Outagamie Street
Appleton, WI

December 2005

History

The property at 725 South Outagamie Street in Appleton was a metal plating facility from 1960 to 1987. The Wisconsin Chromium Corporation conducted chrome electroplating until 1976. Norbert W. Mauthe purchased the property and performed other types of electroplating from 1978 to 1987. Plating operations at the property ended in 1987.

In 1982 DNR received a complaint about environmental contamination and investigated the property. DNR found contamination from plating solutions in both the soil and the groundwater. These contaminants included chromium, cadmium, cyanide, zinc and volatile organic compounds. This contamination had also spread to neighboring properties where it was in the soil, the groundwater and some basements.

State and Federal Responses

N. W. Mauthe did not take the legally required environmental response. The DNR installed a temporary groundwater collection system to reduce the movement of contaminated groundwater and investigated the spread of the contamination. In addition, DNR asked the Wisconsin Department of Justice (DOJ) to take legal action against N. W. Mauthe, which DOJ did in 1982.

In 1984 DNR removed the most contaminated soils and paved the property with asphalt. The asphalt prevented people and animals from coming into contact with any remaining contaminated soil, and also prevented rainwater from flushing more contamination into the groundwater, where it could further affect local residents. In 1986 N. W. Mauthe passed away, and in 1988 the state settled the legal action with his estate.

DNR requested that the Environmental Protection Agency (EPA) add the N.W. Mauthe property to the Superfund National Priorities List (NPL), which would make the property eligible for Superfund funding and response actions. EPA acted on DNR's request in March of 1989. This allowed DNR to begin a Remedial Investigation/Feasibility Study (RI/FS) in September of 1989. The RI/FS is a federal requirement to fully understand the extent of the contamination so that the best options can be selected for cleanup.

More Contaminant Removal

EPA began contaminant removal in 1995 with a "removal action". A removal action is a short-term strategy to remove or contain hazards. EPA removed the buildings and excavated all soil with more than 500 milligrams per kilogram (mg/kg) of chromium. Next, EPA constructed a groundwater collection system with three trenches to pull contaminated groundwater back to a central location. In 1996 EPA constructed a system to treat the collected groundwater. After treatment, the water is discharged to the sanitary sewer, as permitted by the City of Appleton. This groundwater collection and treatment system started operation in 1997 and is still operating.

Current Operation of the Groundwater System

In 1998 EPA turned over operation of the groundwater collection and treatment system to DNR. DNR now supervises a local contractor that operates and maintains the system. The contractor provides reports on groundwater contamination and system operations to DNR's Oshkosh office four times a year. This includes testing the groundwater at monitoring points throughout the neighborhood. In June of 2005 DNR added four additional deep wells to determine the depth of the groundwater contamination and to better evaluate the efficiency of the collection system.

Five-Year Reviews

Federal law requires a review of operations every five years at Superfund sites with continuing cleanups. The first five-year review for the N. W. Mauthe site was completed in April 2001 and concluded that the groundwater collection and treatment system was operating as designed. The second review has now begun and this is another opportunity for residents to ask questions and learn more about the status of the cleanup. The second review is scheduled to be completed in April of 2006. Residents may contact DNR's project manager, Jennifer Borski, to discuss this cleanup or to view information in the N. W. Mauthe file.

For More Information

You may direct questions about the N. W. Mauthe Superfund site to DNR project manager:

Jennifer Borski, DNR
625 E. Cty Rd Y, STE. 700
Oshkosh, WI 54901-9731
Phone: (920) 424-7887
Fax: (920) 424-4404
E-mail: jennifer.borski@dnr.state.wi.us

You may also view information about this cleanup in the DNR tracking system on the internet at http://botw.dnr.state.wi.us/botw/Welcome.do. Enter 0245000127 in the activity number box.

Appendix D – Documents Reviewed

DOCUMENTS REVIEWED

Remedial Investigation Report, N. W. Mauthe Site, Appleton, Wisconsin, CH_2M Hill, February 4, 1993.

Feasibility Study Report, N. W. Mauthe Site, Appleton, Wisconsin, CH_2M Hill, May 1993.

Declaration for the Record of Decision, March 31, 1994.

Record of Decision Summary, N. W. Mauthe Site, City of Appleton, Outagamie County, Wisconsin, March 1994.

Final Design Submittal, N. W. Mauthe Site, Appleton, Wisconsin, CH_2M Hill, May 1995.

Phase I Remedial Action Closure Report, N. W. Mauthe Site, Appleton, Wisconsin, CH_2M Hill, July 31, 1996.

Phase II Remedial Action Construction Documentation Report, N. W. Mauthe Site, Appleton, Wisconsin, CH_2M Hill, July 29, 1997.

Final O&M Manual, Groundwater Treatment System, N. W. Mauthe Site, Appleton, Wisconsin, CH_2M Hill, April 29, 1997.

Site Specific Plans for the N. W. Mauthe Long Term Response Action, CH_2M Hill, September 5, 1997.

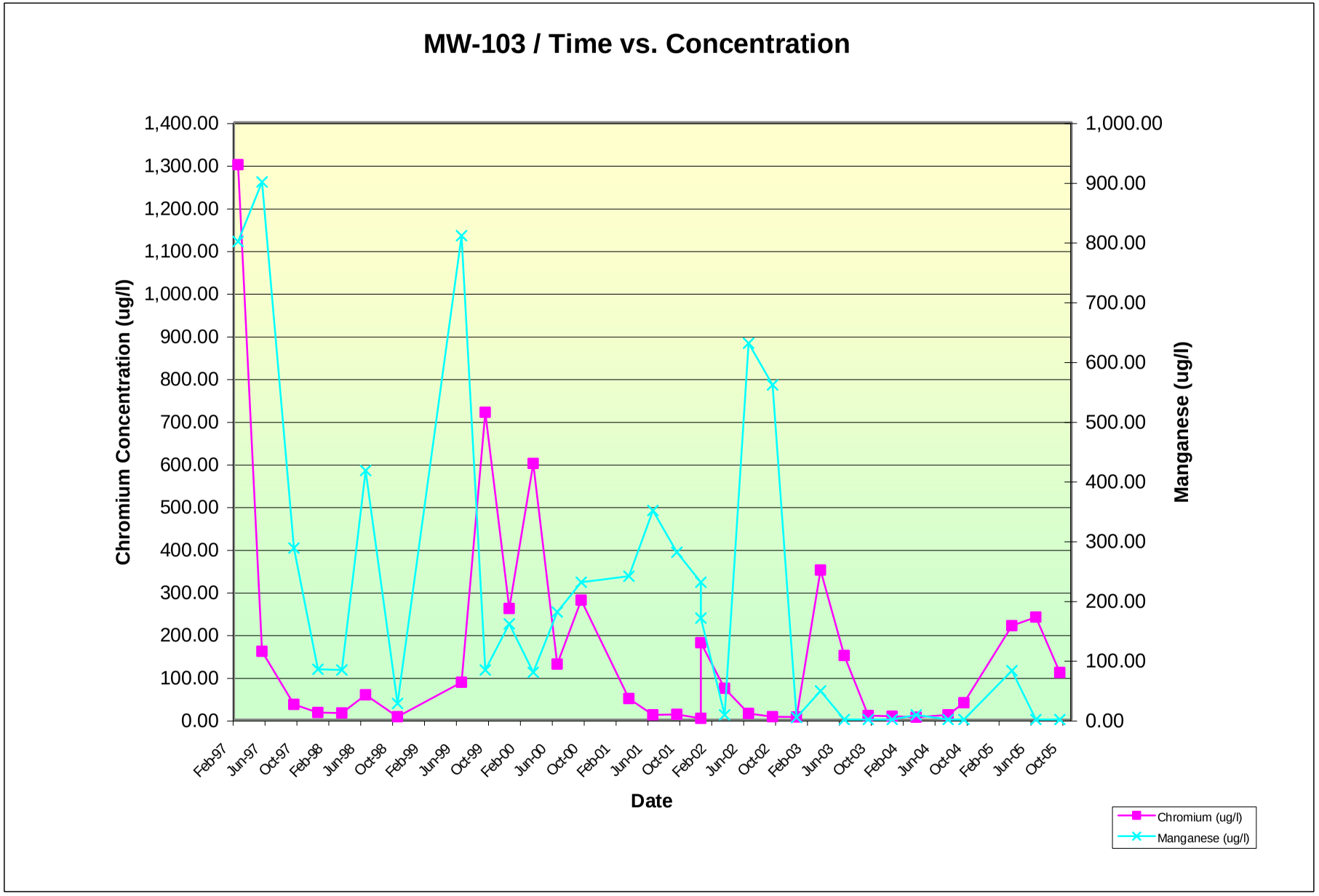
Long-Term Remedial Action Report, N. W. Mauthe Long-Term Response Action, CH_2M Hill, November 1998.

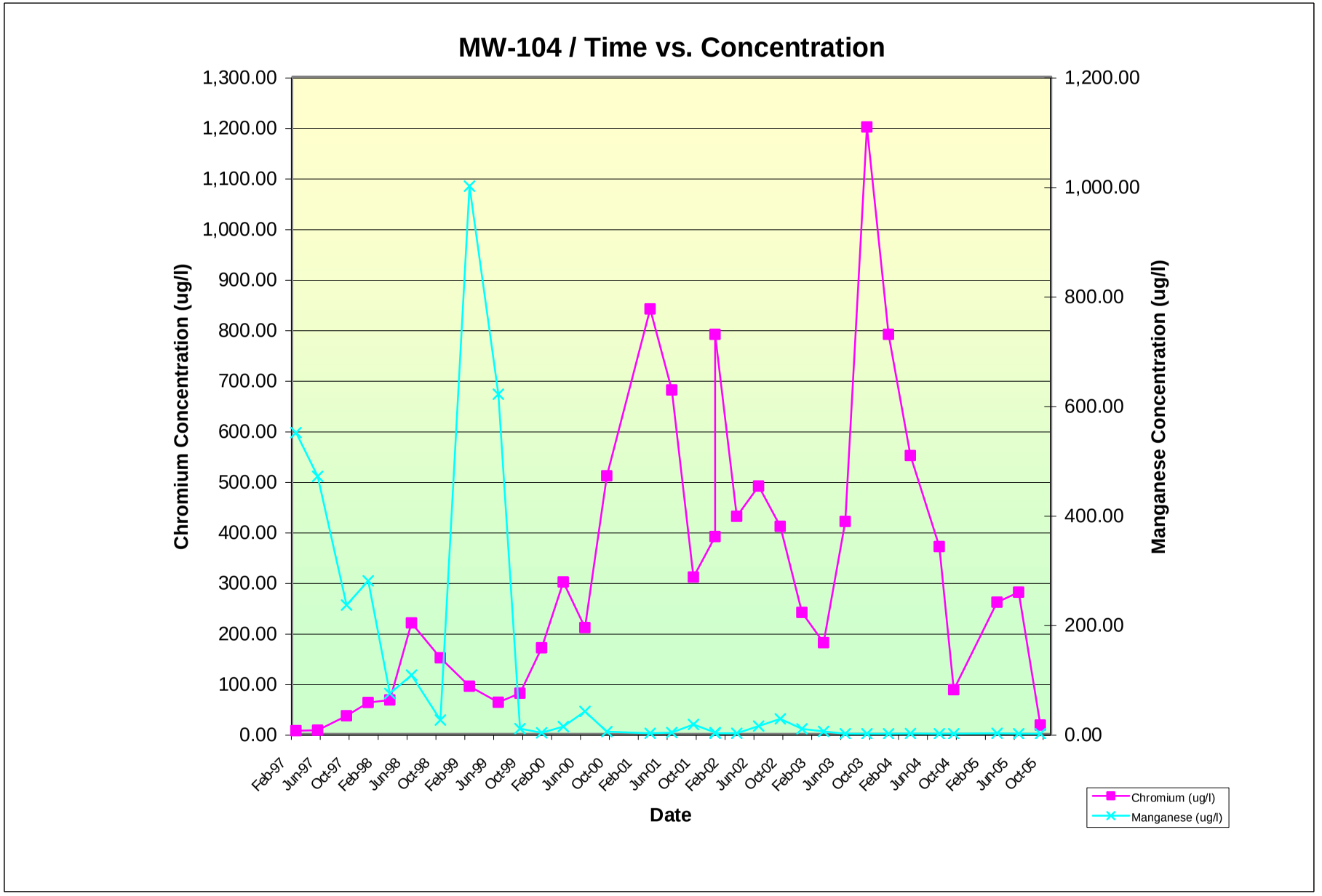
Quarterly Progress Report #28, July, August, September 2005 & Semi-Annual Operation & Maintenance Report, April 2005 through September 2005, N. W. Mauthe Groundwater Treatment System, BRRTS ID #02-45-000127, Appleton, Wisconsin, McMahon Associates, November 16, 2005.

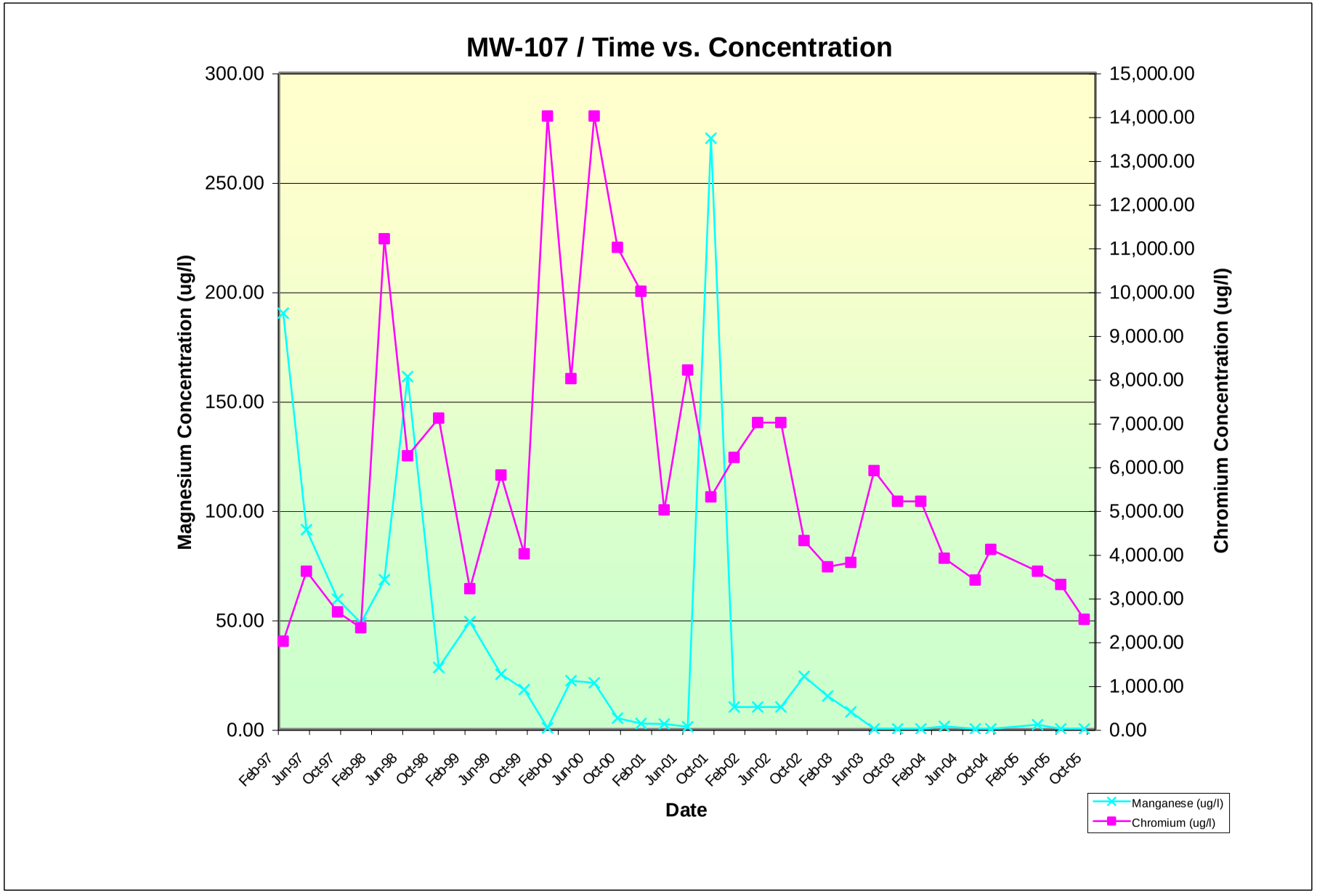
Quarterly Progress Report #29, October, November, December 2005, N. W. Mauthe Groundwater Treatment System, BRRTS ID #02-45-000127, Appleton, Wisconsin, McMahon Associates, January 24, 2006.

Appendix E – Time vs. Concentration Graphs & Supporting Data

MW-103 T vs. C for chromium and manganese
MW-104 T vs. C for chromium and manganese
MW-107 T vs. C for chromium and manganese
MW-107 T vs. C for VOCs
All wells – Time vs. Groundwater Elevation


MW-103 / Time vs. Concentration
Chromium Concentration (ug/l)
Manganese (ug/l)
1,400.00
1,300.00
1,200.00
1,100.00
1,000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
1,000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
Feb-97
Jun-97
Oct-97
Feb-98
Jun-98
Oct-98
Feb-99
Jun-99
Oct-99
Feb-00
Jun-00
Oct-00
Feb-01
Jun-01
Oct-01
Feb-02
Jun-02
Oct-02
Feb-03
Jun-03
Oct-03
Feb-04
Jun-04
Oct-04
Feb-05
Jun-05
Oct-05
Date
Chromium (ug/l)
Manganese (ug/l)


MW-104 / Time vs. Concentration
Chromium Concentration (ug/l)
Manganese Concentration (ug/l)
1,300.00
1,200.00
1,100.00
1,000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
1,200.00
1,000.00
800.00
600.00
400.00
200.00
0.00
Feb-97
Jun-97
Oct-97
Feb-98
Jun-98
Oct-98
Feb-99
Jun-99
Oct-99
Feb-00
Jun-00
Oct-00
Feb-01
Jun-01
Oct-01
Feb-02
Jun-02
Oct-02
Feb-03
Jun-03
Oct-03
Feb-04
Jun-04
Oct-04
Feb-05
Jun-05
Oct-05
Date
Chromium (ug/l)
Manganese (ug/l)


MW-107 / Time vs. Concentration
Magnesium Concentration (ug/l)
Chromium Concentration (ug/l)
Date
300.00
250.00
200.00
150.00
100.00
50.00
0.00
15,000.00
14,000.00
13,000.00
12,000.00
11,000.00
10,000.00
9,000.00
8,000.00
7,000.00
6,000.00
5,000.00
4,000.00
3,000.00
2,000.00
1,000.00
0.00
Feb-97
Jun-97
Oct-97
Feb-98
Jun-98
Oct-98
Feb-99
Jun-99
Oct-99
Feb-00
Jun-00
Oct-00
Feb-01
Jun-01
Oct-01
Feb-02
Jun-02
Oct-02
Feb-03
Jun-03
Oct-03
Feb-04
Jun-04
Oct-04
Feb-05
Jun-05
Oct-05
Manganese (ug/l)
Chromium (ug/l)

APPENDIX E

CHROMIUM & MANGANESE VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Sample Date	Chromium (ug/l)	Manganese (ug/L)
W-2	02/20/97	15.00	460.00
	05/27/97	8.50	170.00
	09/18/97	2.30	116.00
	12/12/97	6.20	133.00
	03/25/98	1.90	83.80
	06/10/98	16.40	466.00
	10/27/98	3.60	69.00
	02/09/99	0.31	240.00
	06/08/99	0.31	290.00
	09/13/99	2.00	240.00
	12/15/99	0.36	2.80
	03/13/00	0.39	7.80
	06/22/00	0.31	0.21
	09/27/00	0.55	17.00
	12/19/01	0.45	4.00
	03/01/01	0.28	1.00
	06/19/01	0.26	24.00
	09/24/01	0.17	52.00
	12/05/01	0.28	1.00
	03/19/02	0.28	1.00
	06/20/02	0.22	61.00
	09/18/02	0.22	110.00
	12/17/02	0.22	150.00
	03/24/03	0.21	8.50
	03/24/04	0.22	0.50
	03/29/05	1.20	1.30

APPENDIX E

CHROMIUM & MANGANESE VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Sample Date	Chromium (ug/l)	Manganese (ug/L)
W-8	02/20/97	17.00	320.00
	05/27/97	37.00	670.00
	09/18/97	14.40	338.00
	12/12/97	5.70	147.00
	03/25/98	10.10	205.00
	06/10/98	9.90	264.00
	10/27/98	3.90	64.00
	02/09/99	0.31	850.00
	06/08/99	0.31	50.00
	09/13/99	1.90	98.00
	12/15/99	2.80	180.00
	03/13/00	0.70	65.00
	06/22/00	3.10	74.00
	09/27/00	0.37	26.00
	12/19/01	0.33	40.00
	03/01/01	0.28	23.00
	06/19/01	0.50	100.00
	09/24/01	0.17	380.00
	12/05/01	0.28	1.00
	03/19/02	0.28	21.00
	06/20/02	0.23	1,400.00
	09/18/02	0.22	620.00
	12/17/02	0.22	34.00
	03/24/03	0.21	27.00
	03/24/04	0.76	1.70
	03/29/05	0.26	9.70

APPENDIX E

CHROMIUM & MANGANESE VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Sample Date	Chromium (ug/l)	Manganese (ug/L)
W-15	02/20/97	32.00	430.00
	05/27/97	5.90	97.00
	09/18/97	13.90	325.00
	12/12/97	5.70	80.90
	03/25/98	1.90	85.70
	06/10/98	10.00	147.00
	10/27/98	6.80	110.00
	02/09/99	0.31	320.00
	06/08/99	2.40	130.00
	09/13/99	5.30	130.00
	12/15/99	5.00	90.00
	03/13/00	7.00	130.00
	06/22/00	1.80	11.00
	09/27/00	4.20	24.00
	12/19/00	0.70	930.00
	03/01/01	0.28	1.00
	06/19/01	0.17	1.00
	09/24/01	0.17	290.00
	12/05/01	0.28	2.50
	03/19/02	0.28	22.00
	06/20/02	0.23	3.10
	09/18/02	0.22	110.00
	12/17/02	0.22	31.00
	03/24/03	0.23	27.00
	03/24/04	1.80	1.10
	03/29/05	0.98	24.00

APPENDIX E

CHROMIUM & MANGANESE VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Sample Date	Chromium (ug/l)	Manganese (ug/L)
MW-101	02/20/97	36.00	820.00
	05/27/97	10.00	170.00
	09/18/97	11.90	145.00
	12/12/97	12.80	176.00
	03/25/98	20.90	239.00
	06/10/98	48.20	604.00
	10/27/98	3.20	24.00
	02/09/99	0.31	1,900.00
	06/08/99	1.80	380.00
	09/13/99	2.90	31.00
	12/15/99	2.50	9.10
	03/13/00	2.30	100.00
	06/22/00	0.70	2.10
	09/27/00	19.00	3.70
	12/19/01	7.20	18.00
	03/01/01	0.28	13.00
	06/19/01	8.50	9.10
	09/24/01	0.27	1.00
	12/05/01	0.45	1.00
	03/19/02	0.33	1.00
	06/20/02	0.29	2.20
	09/18/02	0.22	13.00
	12/17/02	0.22	33.00
	03/24/03	0.25	8.30
	03/24/04	0.79	0.50
	03/29/05	1.10	16.00

APPENDIX E

CHROMIUM & MANGANESE VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Sample Date	Chromium (ug/l)	Manganese (ug/L)
MW-102	02/20/97	26.00	570.00
	05/27/97	48.00	920.00
	09/18/97	1.96	302.00
	12/12/97	1.85	387.00
	03/25/98	1.95	302.00
	06/10/98	1.95	318.00
	10/27/98	0.49	340.00
	02/09/99	0.37	670.00
	06/08/99	0.60	140.00
	09/13/99	4.00	160.00
	12/15/99	0.60	550.00
	03/13/00	1.70	580.00
	06/22/00	0.31	310.00
	09/27/00	2.10	130.00
	12/19/01	2.90	110.00
	03/01/01	0.28	1.00
	06/19/01	0.17	1.00
	09/24/01	1.40	46.00
	12/05/01	0.28	100.00
	03/19/02	0.28	87.00
	06/20/02	1.80	44.00
	09/18/02	0.70	1.00
	12/17/02	0.22	38.00
	03/24/03	0.21	3.50
	03/24/04	0.22	65.00
	03/29/05	0.71	190.00

APPENDIX E

CHROMIUM & MANGANESE VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Sample Date	Chromium (ug/l)	Manganese (ug/L)
MW-103	02/20/97	1,300.00	800.00
	05/27/97	160.00	900.00
	09/18/97	35.20	287.00
	12/12/97	16.30	84.30
	03/25/98	15.50	83.00
	06/10/98	57.60	417.00
	10/27/98	6.30	27.00
	06/08/99	87.00	810.00
	09/13/99	720.00	83.00
	12/15/99	260.00	160.00
	03/13/00	600.00	79.00
	06/22/00	130.00	180.00
	09/27/00	280.00	230.00
	12/19/01	180.00	170.00
	03/01/01	49.00	240.00
	06/19/01	11.00	350.00
	09/24/01	12.00	280.00
	12/05/01	2.90	230.00
	03/19/02	73.00	7.90
	06/20/02	14.00	630.00
	09/18/02	6.50	560.00
	12/17/02	6.20	3.70
	03/24/03	350.00	48.00
	06/10/03	150.00	0.00
	09/10/03	9.10	0.00
	12/10/03	7.70	0.00
	03/24/04	5.60	7.60
	07/09/04	11.00	0.00
	09/22/04	39.00	0.00
	03/29/05	220.00	82.00
	06/22/05	240.00	0.00
	09/21/05	110.00	0.00

APPENDIX E

CHROMIUM & MANGANESE VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Sample Date	Chromium (ug/l)	Manganese (ug/L)
MW-104	02/20/97	5.90	550.00
	05/27/97	6.90	470.00
	09/18/97	35.60	235.00
	12/12/97	61.80	279.00
	03/25/98	66.80	73.60
	06/10/98	219.00	107.00
	10/27/98	150.00	25.00
	02/09/99	94.00	1,000.00
	06/08/99	62.00	620.00
	09/13/99	80.00	9.20
	12/15/99	170.00	1.60
	03/13/00	300.00	13.00
	06/22/00	210.00	41.00
	09/27/00	510.00	3.90
	12/19/01	790.00	1.00
	03/01/01	840.00	1.00
	06/19/01	680.00	2.30
	09/24/01	310.00	17.00
	12/05/01	390.00	2.20
	03/19/02	430.00	1.00
	06/20/02	490.00	14.00
	09/18/02	410.00	27.00
	12/17/02	240.00	8.90
	03/24/03	180.00	4.20
	06/10/03	420.00	0.00
	09/10/03	1,200.00	0.00
	12/10/03	790.00	0.00
	03/24/04	550.00	0.50
	07/09/04	370.00	0.00
	09/22/04	87.00	0.00
	03/29/05	260.00	1.00
	06/22/05	280.00	0.00
	09/21/05	17.00	0.00

APPENDIX E

CHROMIUM & MANGANESE VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Sample Date	Chromium (ug/l)	Manganese (ug/L)
MW-105	02/20/97	21.00	1,100.00
	05/27/97	5.00	120.00
	09/18/97	29.50	532.00
	12/12/97	15.80	297.00
	03/25/98	30.80	518.00
	06/10/98	13.70	217.00
	10/27/98	8.80	150.00
	02/09/99	0.60	2,000.00
	06/08/99	0.50	1,300.00
	09/13/99	0.32	1,700.00
	12/15/99	0.31	860.00
	03/13/00	4.80	660.00
	06/22/00	0.50	600.00
	09/27/00	0.60	700.00
	12/19/01	0.20	230.00
	03/01/01	0.28	43.00
	06/19/01	0.37	230.00
	09/24/01	0.36	530.00
	12/05/01	0.28	1.00
	03/19/02	0.28	22.00
	06/20/02	0.30	1,400.00
	09/18/02	0.22	600.00
	12/17/02	0.22	58.00
	03/24/03	0.21	86.00
	03/24/04	3.80	89.00
	03/29/05	0.26	82.00

APPENDIX E

CHROMIUM & MANGANESE VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Sample Date	Chromium (ug/l)	Manganese (ug/L)
MW-106	02/20/97	21.00	320.00
	05/27/97	40.00	590.00
	09/18/97	5.50	56.90
	12/12/97	9.20	155.00
	03/25/98	13.40	150.00
	06/10/98	1.90	10.00
	10/27/98	3.20	38.00
	02/09/99	0.31	760.00
	06/08/99	0.39	900.00
	09/13/99	1.80	1,100.00
	12/15/99	0.60	130.00
	03/13/00	2.30	270.00
	06/22/00	0.36	2.10
	09/27/00	0.44	50.00
	12/19/00	0.38	22.00
	03/01/01	0.28	45.00
	06/19/01	0.19	57.00
	09/24/01	0.17	950.00
	12/05/01	0.28	310.00
	03/19/02	0.28	92.00
	06/20/02	0.22	270.00
	09/18/02	0.22	420.00
	12/17/02	0.22	41.00
	03/24/03	0.21	2.10
	03/24/04	0.22	190.00
	03/29/05	1.10	15.00

APPENDIX E

CHROMIUM & MANGANESE VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

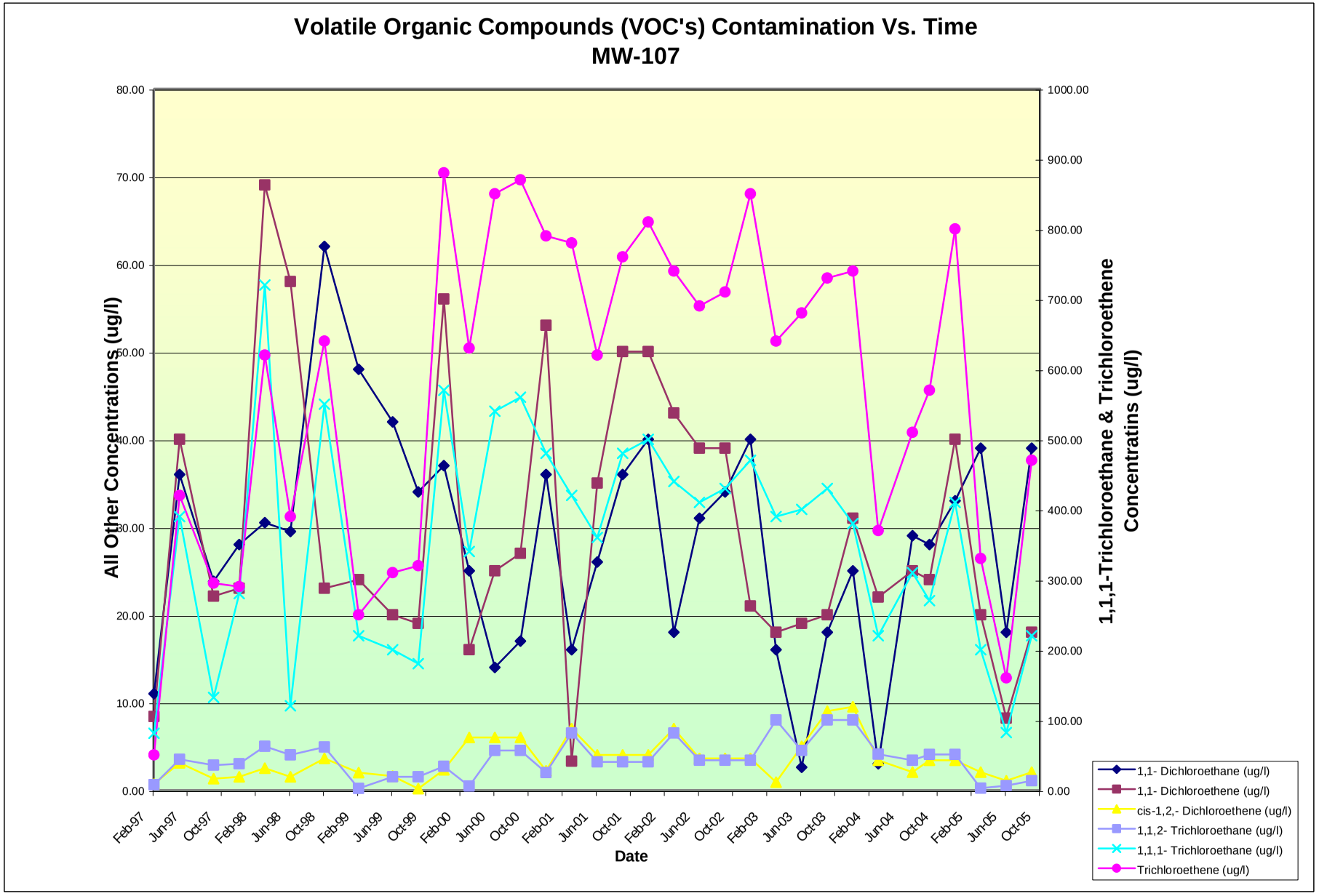
Well Name	Sample Date	Chromium (ug/l)	Manganese (ug/L)
MW-107	02/20/97	2,000.00	190.00
	05/27/97	3,600.00	91.00
	09/18/97	2,670.00	59.30
	12/12/97	2,310.00	48.40
	03/25/98	11,200.00	68.20
	06/10/98	6,240.00	161.00
	10/27/98	7,100.00	28.00
	02/09/99	3,200.00	49.00
	06/08/99	5,800.00	25.00
	09/13/99	4,000.00	18.00
	12/15/99	14,000.00	0.41
	03/13/00	8,000.00	22.00
	06/30/00	14,000.00	21.00
	09/27/00	11,000.00	4.90
	12/19/00	10,000.00	2.40
	03/01/01	5,000.00	2.20
	06/19/01	8,200.00	1.00
	09/24/01	5,300.00	270.00
	12/05/01	6,200.00	10.00
	03/19/02	7,000.00	10.00
	06/20/02	7,000.00	10.00
	09/18/02	4,300.00	24.00
	12/17/02	3,700.00	15.00
	03/24/03	3,800.00	7.70
	06/10/03	5,900.00	0.00
	09/10/03	5,200.00	0.00
	12/10/03	5,200.00	0.00
	03/24/04	3,900.00	1.20
	07/09/04	3,400.00	0.00
	09/22/04	4,100.00	0.00
	03/29/05	3,600.00	1.90
	06/22/05	3,300.00	0.00
	09/21/05	2,500.00	0.00

APPENDIX E

CHROMIUM & MANGANESE VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Sample Date	Chromium (ug/l)	Manganese (ug/L)
MW-108	02/20/97	25.00	490.00
	05/27/97	11.00	210.00
	09/18/97	27.40	462.00
	12/12/97	5.60	74.80
	03/25/98	9.40	142.00
	06/10/98	28.40	478.00
	10/27/98	8.90	88.00
	02/09/99	1.70	560.00
	06/08/99	3.10	450.00
	09/13/99	4.50	100.00
	12/15/99	6.10	79.00
	03/13/00	36.00	41.00
	06/22/00	6.50	2.10
	09/27/00	2.90	29.00
	12/19/00	3	22.00
	03/01/01	0.28	1.00
	06/19/01	2.4	110.00
	09/24/01	0.17	40.00
	12/05/01	0.28	7.40
	03/19/02	0.28	3.40
	06/20/02	0.42	39.00
	09/18/02	0.22	150.00
	12/17/02	0.33	34.00
	03/24/03	0.33	3.30
	03/24/04	0.79	83.00
	03/29/04	0.65	2.60
Maximum Contaminant Level (MCL)		100.00	50.00
Enforcement Standard Chapter NR 140.10		100.00	50.00
Preventive Action Limit Chapter NR 140.10		10.00	25.00

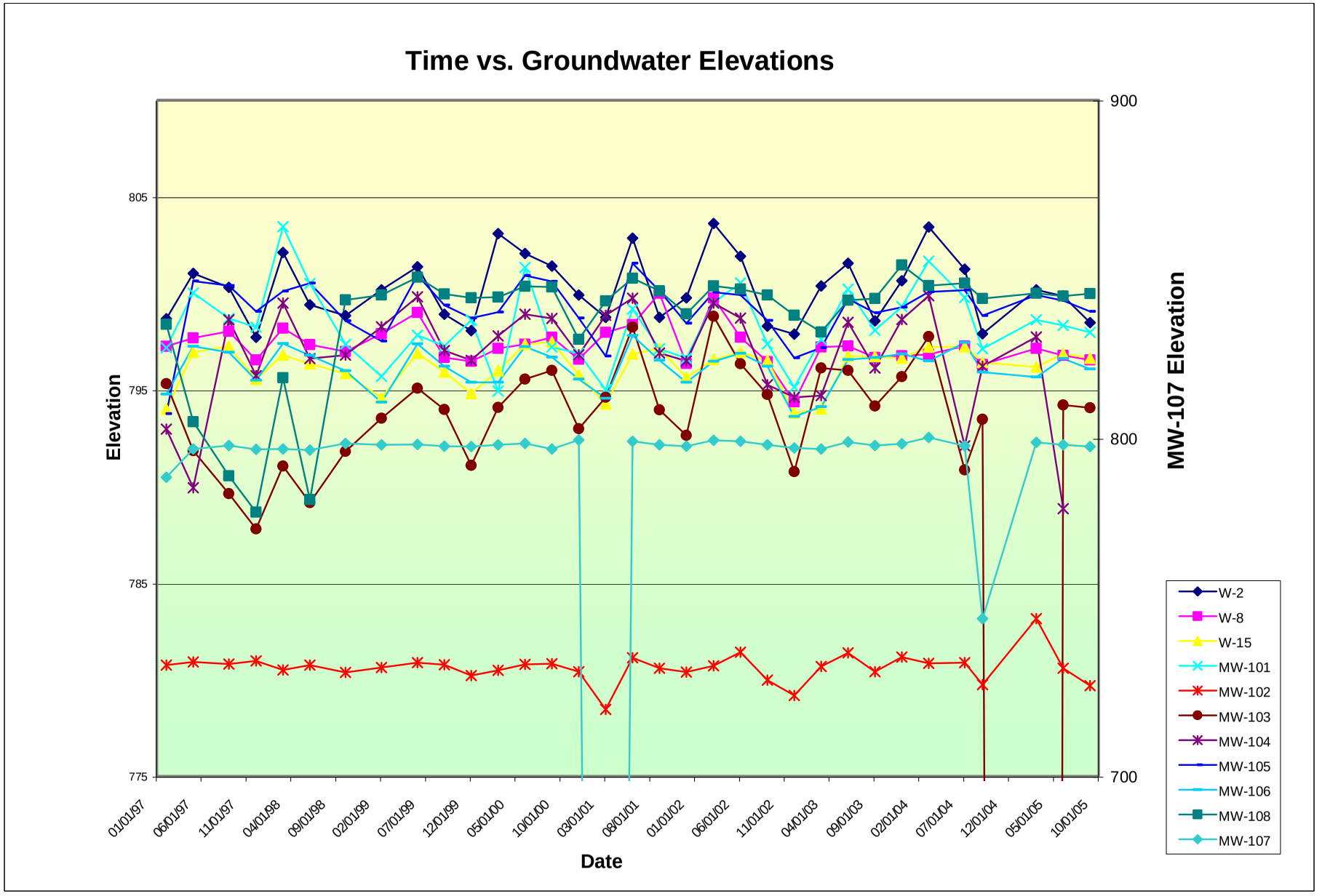

Volatile Organic Compounds (VOC's) Contamination Vs. Time
MW-107
All Other Concentrations (ug/l)
1,1,1-Trichloroethane & Trichloroethene Concentratins (ug/l)
Date
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
Feb-97
Jun-97
Oct-97
Feb-98
Jun-98
Oct-98
Feb-99
Jun-99
Oct-99
Feb-00
Jun-00
Oct-00
Feb-01
Jun-01
Oct-01
Feb-02
Jun-02
Oct-02
Feb-03
Jun-03
Oct-03
Feb-04
Jun-04
Oct-04
Feb-05
Jun-05
Oct-05
1,1- Dichloroethane (ug/l)
1,1- Dichloroethene (ug/l)
cis-1,2,- Dichloroethene (ug/l)
1,1,2- Trichloroethane (ug/l)
1,1,1- Trichloroethane (ug/l)
Trichloroethene (ug/l)

APPENDIX E

VOLATILE ORGANIC COMPOUNDS (VOC's) CONTAMINATION VERSUS TIME / MW-107

N.W. Mauthe Groundwater Treatment System

Well Name	Sample Date	1,1-Dichloroethane (ug/l)	1,1-Dichloroethene (ug/l)	cis-1,2,-Dichloroethene (ug/l)	1,1,1-Trichloroethane (ug/l)	1,1,2-Trichloroethane (ug/l)	Trichloroethene (ug/l)
MW-107	02/20/97	11.00	8.40	0.70	81.00	0.60	50.00
	05/27/97	36.00	40.00	3.10	390.00	3.50	420.00
	09/18/97	23.80	22.10	1.30	132.00	2.83	295.00
	12/12/97	28.00	23.00	1.50	280.00	3.00	290.00
	03/25/98	30.50	69.00	2.50	720.00	5.00	620.00
	06/10/98	29.50	58.00	1.50	120.00	4.00	390.00
	10/27/98	62.00	23.00	3.60	550.00	4.90	640.00
	02/09/99	48.00	24.00	2.00	220.00	0.19	250.00
	06/08/99	42.00	20.00	1.60	200.00	1.50	310.00
	09/13/99	34.00	19.00	0.16	180.00	1.50	320.00
	12/15/99	37.00	56.00	2.30	570.00	2.70	880.00
	03/13/00	25.00	16.00	6.00	340.00	0.45	630.00
	06/22/00	14.00	25.00	6.00	540.00	4.50	850.00
	09/27/00	17.00	27.00	6.00	560.00	4.50	870.00
	12/19/00	36.00	53.00	2.20	480.00	2.00	790.00
	03/01/01	16.00	3.30	7.00	420.00	6.50	780.00
	06/25/01	26.00	35.00	4.00	360.00	3.20	620.00
	09/24/01	36.00	50.00	4.00	480.00	3.20	760.00
	12/05/01	40.00	50.00	4.00	500.00	3.20	810.00
	03/19/02	18.00	43.00	7.00	440.00	6.50	740.00
	06/20/02	31.00	39.00	3.60	410.00	3.40	690.00
	09/18/02	34.00	39.00	3.60	430.00	3.40	710.00
	12/17/02	40.00	21.00	3.60	470.00	3.40	850.00
	03/24/03	16.00	18.00	0.90	390.00	8.00	640.00
	06/10/03	2.60	19.00	5.00	400.00	4.50	680.00
	09/10/03	18.00	20.00	9.00	430.00	8.00	730.00
	12/10/03	25.00	31.00	9.50	380.00	8.00	740.00
	03/24/04	3.00	22.00	3.40	220.00	4.10	370.00
	07/29/04	29.00	25.00	2.05	310.00	3.40	510.00
	09/22/04	28.00	24.00	3.40	270.00	4.05	570.00
	12/14/04	33.00	40.00	3.40	410.00	4.05	800.00
	03/29/05	39.00	20.00	2.05	200.00	0.21	330.00
	06/22/05	18.00	8.20	1.05	82.00	0.50	160.00
	09/21/05	39.00	18.00	2.05	220.00	1.05	470.00


Time vs. Groundwater Elevations
Elevation
MW-107 Elevation
Date
805
795
785
775
900
800
700
01/01/97
06/01/97
11/01/97
04/01/98
09/01/98
02/01/99
07/01/99
12/01/99
05/01/00
10/01/00
03/01/01
08/01/01
01/01/02
06/01/02
11/01/02
04/01/03
09/01/03
02/01/04
07/01/04
12/01/04
05/01/05
10/01/05
W-2
W-8
W-15
MW-101
MW-102
MW-103
MW-104
MW-105
MW-106
MW-108
MW-107

APPENDIX E
GROUNDWATER ELEVATIONS VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Date Measured	Depth To Water (feet)	Reference Elevation (To Top PVC) (feet)	Groundwater Elevation (feet)
W-2	02/01/97	-		798.66
	05/01/97	-		801.01
	09/01/97	-		800.28
	12/01/97	-	804.66	797.69
	03/01/98	-		802.08
	06/01/98	-		799.38
	10/27/98	5.85		798.81
	02/08/99	4.50		800.16
	06/08/99	3.31		801.35
	09/13/99	5.78		798.88
	12/15/99	6.63		798.03
	03/13/00	1.60		803.06
	06/22/00	2.63		802.03
	09/27/00	3.28		801.38
	12/19/00	4.78		799.88
	03/01/01	5.93		798.73
	06/19/01	1.83		802.83
	09/24/01	5.94		798.72
	12/05/01	4.93		799.73
	03/19/02	1.08		803.58
	06/20/02	2.78		801.88
	09/18/02	6.38		798.28
	12/17/02	6.81		797.85
	03/24/03	4.31		800.35
	06/10/03	3.14		801.52
	09/10/03	6.11		798.55
	12/10/03	4.03		800.63
	03/24/04	1.26		803.40
	07/09/04	3.44		801.22
	09/21/04	6.79		797.87
	03/29/05	4.51		800.15
	06/20/05	4.83		799.83
	09/21/05	6.21		798.45
W-8	02/01/97	-		797.22
	05/01/97	-		797.66
	09/01/97	-		798.01
	12/01/97	-	803.36	796.52
	03/01/98	-		798.16
	06/01/98	-		797.31
	10/27/98	6.41		796.95
	02/08/99	5.49		797.87
	06/08/99	4.38		798.98
	09/13/99	6.71		796.65
	12/15/99	6.91		796.45
	03/13/00	6.25		797.11
	06/22/00	6.42		797.34
	09/27/00	5.66		797.70
	12/19/00	6.80		796.56
	03/01/01	5.41		797.95
	06/19/01	5.02		798.34
	09/24/01	3.38		799.98
	12/05/01	7.02		796.34
	03/19/02	3.63		799.73
	06/20/02	5.66		797.70
	09/18/02	6.93		796.43
	12/17/02	9.00		794.36
	03/24/03	6.18		797.18
	06/10/03	6.11		797.25
	09/10/03	6.71		796.65
	12/10/03	6.62		796.74
	03/23/04	6.55		796.81
	07/09/04	6.11		797.25
	09/21/04	7.08		796.28
	03/29/05	6.24		797.12
	06/20/05	6.60		796.76
	09/21/05	6.84		796.52

APPENDIX E
GROUNDWATER ELEVATIONS VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Date Measured	Depth To Water (feet)	Reference Elevation (To Top PVC) (feet)	Groundwater Elevation (feet)
W-15	02/01/97	-		793.97
	05/01/97	-		796.92
	09/01/97	-		797.23
	12/01/97	-	803.76	795.52
	03/01/98	-		796.78
	06/01/98	-		796.32
	10/27/98	7.95		795.81
	02/08/99	9.19		794.57
	06/08/99	6.89		796.87
	09/13/99	7.85		795.91
	12/15/99	8.97		794.79
	03/13/00	7.80		795.96
	06/22/00	6.42		797.34
	09/27/00	6.30		797.46
	12/19/00	7.99		795.77
	03/01/01	9.52		794.24
	06/19/01	6.91		796.82
	09/24/01	6.65		797.11
	12/05/01	8.15		795.61
	03/19/02	7.22		796.54
	06/20/02	6.84		796.92
	09/18/02	7.28		796.48
	12/17/02	9.98		793.78
	03/24/03	9.77		793.99
	06/10/03	7.04		796.72
	09/10/03	7.06		796.70
	12/10/03	7.15		796.61
	03/23/04	6.58		797.18
	07/09/04	6.45	803.66	797.21
	09/21/04	7.26		796.40
	03/29/05	7.50		796.16
	06/20/05	6.82		796.84
	09/21/05	7.05		796.61
MW-101	02/01/97	-		797.16
	05/01/97	-		799.99
	09/01/97	-		798.67
	12/01/97	-	807.59	798.21
	03/01/98	-		803.43
	06/01/98	-		800.48
	10/27/98	10.26		797.33
	02/08/99	11.91		795.68
	06/08/99	9.79		797.80
	09/13/99	10.35		797.24
	12/15/99	9.01		798.58
	03/13/00	12.67		794.92
	06/22/00	6.28		801.31
	09/27/00	10.41		797.18
	12/19/00	10.73		796.86
	03/01/01	12.61		794.98
	06/19/01	8.43		799.16
	09/24/01	10.50		797.09
	12/05/01	10.98		796.61
	03/19/02	8.10		799.49
	06/20/02	7.08		800.51
	09/18/02	10.23		797.36
	12/17/02	12.47		795.12
	03/24/03	10.00		797.59
	06/10/03	7.41		800.18
	09/10/03	9.53		798.06
	12/10/03	8.31		799.28
	03/23/04	5.95		801.64
	07/09/04	7.84		799.75
	09/21/04	10.50		797.09
	03/29/05	9.00		798.59
	06/20/05	9.28		798.31

APPENDIX E
GROUNDWATER ELEVATIONS VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	**Date Measured**	**Depth To Water** (feet)	**Reference Elevation** (To Top PVC) (feet)	**Groundwater Elevation** (feet)
	09/21/05	9.64		797.95

APPENDIX E
GROUNDWATER ELEVATIONS VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Date Measured	Depth To Water (feet)	Reference Elevation (To Top PVC) (feet)	Groundwater Elevation (feet)
MW-102	02/01/97	-		780.72
	05/01/97	-		780.89
	09/01/97	-		780.79
	12/01/97	-	804.45	780.95
	03/01/98	-		780.47
	06/01/98	-		780.72
	10/27/98	24.11		780.34
	02/08/99	23.84		780.61
	06/08/99	23.59		780.86
	09/13/99	23.70		780.75
	12/15/99	24.27		780.18
	03/13/00	24.00		780.45
	06/22/00	23.69		780.76
	09/27/00	23.65		780.80
	12/19/00	24.06		780.39
	03/01/01	26.01		778.44
	06/19/01	23.35		781.10
	09/24/01	23.88		780.57
	12/05/01	24.08		780.37
	03/19/02	23.75		780.70
	06/20/02	23.05		781.40
	09/18/02	24.50		779.95
	12/17/03	25.30		779.15
	03/24/03	23.80		780.65
	06/10/03	23.09		781.36
	09/10/03	23.98	804.37 ***	780.39
	12/10/03	23.22		781.15
	03/23/04	23.56		780.81
	07/09/04	23.52		780.85
	09/21/04	24.65		779.72
	03/29/05	21.24		783.13
	06/20/05	23.81		780.56
	09/21/05	24.71		779.66
MW-103	02/01/97	-		795.29
	05/01/97	-		791.83
	09/01/97	-		789.60
	12/01/97	-	803.74	787.78
	03/01/98	-		791.03
	06/01/98	-		789.13
	10/27/98	11.96		791.78
	02/08/99	10.24		793.50
	06/08/99	8.69		795.05
	09/13/99	9.79		793.95
	12/15/99	12.68		791.06
	03/13/00	9.63		794.07
	06/22/00	8.22		795.52
	09/27/00	7.76		795.98
	12/19/00	10.78		792.96
	03/01/01	9.15		794.59
	06/19/01	5.52		798.22
	09/24/01	9.80		793.94
	12/05/01	11.13		792.61
	03/19/02	4.96		798.78
	06/20/02	7.42		796.32
	09/18/02	9.00		794.74
	12/17/02	13.01		790.73
	03/24/03	7.63		796.11
	06/10/03	7.77		795.97
	09/10/03	9.60		794.14
	12/10/03	8.09		795.65
	03/23/04	4.01		797.73
	07/09/04	12.91		790.83
	09/21/04	10.30		793.44
	03/29/05	-		-
	06/20/05	9.55		794.19
	09/21/05	9.70		794.04

APPENDIX E
GROUNDWATER ELEVATIONS VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Date Measured	Depth To Water (feet)	Reference Elevation (To Top PVC) (feet)	Groundwater Elevation (feet)
MW-104	02/01/97	-		792.94
	05/01/97	-		789.91
	09/01/97	-		798.59
	12/01/97	-	807.28	795.70
	03/01/98	-		799.46
	06/01/98	-		796.60
	10/27/98	10.51		796.77
	02/08/99	9.04		798.24
	06/08/99	7.49		799.79
	09/13/99	10.28		797.00
	12/15/99	10.78		796.50
	03/13/00	9.51		797.77
	06/22/00	8.41		798.88
	09/27/00	8.61		798.67
	12/19/00	10.49		796.79
	03/01/01	8.44		798.84
	06/19/01	7.51		799.71
	09/24/01	10.39		796.89
	12/05/01	10.81		796.47
	03/19/02	7.82		799.46
	06/20/02	8.60		798.68
	09/18/02	12.05		795.23
	12/17/02	12.70		794.58
	03/24/03	12.60		794.68
	06/10/03	8.81		798.47
	09/10/03	11.17		796.11
	12/10/03	8.66		798.62
	03/23/04	7.44		799.84
	09/21/04	15.21		792.07
	03/29/05	11.09		796.19
	06/20/05	9.57		797.71
	09/21/05	18.95		788.83
MW-105	02/01/97	-		793.74
	05/01/97	-		800.60
	09/01/97	-		800.37
	12/01/97	-	803.96	799.03
	03/01/98	-		800.08
	06/01/98	-		800.50
	10/27/98	5.41		798.55
	02/08/99	6.46		797.50
	06/08/99	3.04		800.92
	09/13/99	4.60		799.36
	12/15/99	5.28		798.68
	03/13/00	4.97		798.99
	06/22/00	3.06		800.90
	09/27/00	3.38		800.58
	12/19/00	5.28		798.68
	03/01/01	7.24		796.72
	06/19/01	2.43		801.53
	09/24/01	3.87		800.09
	12/05/01	5.55		798.41
	03/19/02	3.94		800.02
	06/20/02	4.08		799.88
	09/18/02	5.40		798.56
	12/17/02	7.34		796.62
	03/24/03	6.81		797.15
	06/10/03	4.27		799.69
	09/10/03	4.88	803.84 ***	798.96
	12/10/03	4.36		799.24
	03/23/04	3.80		800.04
	07/09/04	3.61	803.74	800.13
	09/21/04	4.92		798.82
	03/29/05	3.85		799.89
	06/20/05	4.15		799.59
	09/21/05	4.70		799.04

APPENDIX E
GROUNDWATER ELEVATIONS VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Date Measured	Depth To Water (feet)	Reference Elevation (To Top PVC) (feet)	Groundwater Elevation (feet)
MW-106	02/01/97	-		794.75
	05/01/97	-		797.23
	09/01/97	-		796.91
	12/01/97	-	804.08	795.48
	03/01/98	-		797.37
	06/01/98	-		796.76
	10/27/98	8.12		795.96
	02/08/99	9.75		794.33
	06/08/99	6.72		797.36
	09/13/99	7.88		796.20
	12/15/99	8.71		795.37
	03/13/00	8.72		795.36
	06/22/00	6.87		797.21
	09/27/00	7.41		796.67
	12/19/00	8.55		795.53
	03/01/01	9.54		794.54
	06/19/01	6.30		797.78
	09/24/01	7.57		796.51
	12/05/01	8.72		795.36
	03/19/02	7.64		796.44
	06/20/02	7.21		796.87
	09/18/02	7.88		796.20
	12/17/02	10.49		793.59
	03/24/03	9.98		794.10
	06/10/03	7.54		796.54
	09/10/03	7.35	804.00 ***	796.65
	12/10/03	7.18		796.82
	03/23/04	7.54		796.46
	07/09/04	6.48	803.90	797.42
	09/21/04	8.02		795.88
	03/29/05	8.26		795.64
	06/20/05	7.31		796.59
	09/21/05	7.85		796.05
MW-107	02/01/97	-		788.23
	05/01/97	-		796.60
	09/01/97	-		797.64
	12/01/97	-	809.01	796.49
	03/01/98	-		796.68
	06/01/98	-		796.31
	10/27/98	10.71		798.30
	02/08/99	11.11		797.90
	06/08/99	11.04		797.97
	09/13/99	11.55		797.46
	12/15/99	11.66		797.35
	03/13/00	11.13		797.88
	06/22/00	10.69		798.32
	09/27/00	12.36		796.65
	12/19/00	7.32		799.29
	03/01/01 *	-		-
	06/19/01	10.10	809.06 **	798.96
	09/24/01	11.23		797.88
	12/05/01	11.59		797.47
	03/19/02	9.79		799.27
	06/20/02	10.18		798.88
	09/18/02	11.16		797.90
	12/17/02	12.11		796.95
	03/24/03	12.46		796.60
	06/10/03	10.40		798.66
	09/10/03	11.34		797.72
	12/10/03	10.88		798.18
	03/23/04	9.04		800.02
	07/09/04	11.53		797.53
	09/21/04	12.55		746.51
	03/29/05	10.48		798.58
	06/20/05	11.14		797.92
	09/21/05	11.69		797.37

APPENDIX E
GROUNDWATER ELEVATIONS VERSUS TIME GRAPHS / ALL WELLS

N.W. Mauthe Groundwater Treatment System

Well Name	Date Measured	Depth To Water (feet)	Reference Elevation (To Top PVC) (feet)	Groundwater Elevation (feet)
MW-108	02/01/97	-		798.36
	05/01/97	-		793.32
	09/01/97	-		790.53
	12/01/97	-	806.61	788.65
	03/01/98	-		795.59
	06/01/98	-		789.30
	10/27/98	6.98		799.63
	02/08/99	6.72		799.89
	06/08/99	5.80		800.81
	09/13/99	6.68		799.93
	12/15/99	6.87		799.74
	03/13/00	6.84		799.77
	06/22/00	6.28		800.33
	09/27/00	6.31		800.30
	12/19/00	11.42		797.59
	03/01/01	7.04		799.57
	06/19/01	5.87		800.74
	09/24/01	6.52		800.09
	12/05/01	7.70		798.91
	03/19/02	6.25		800.36
	06/20/02	6.43		800.18
	09/18/02	6.72		799.89
	12/17/02	7.78		798.83
	03/24/03	8.69		797.96
	06/10/03	7.00		799.61
	09/10/03	6.91		799.70
	12/10/03	5.18		801.43
	03/23/04	6.24		800.37
	07/09/04	6.12		800.49
	09/21/04	6.91		799.70
	03/29/05	6.64		799.97
	06/20/05	6.78		799.83
	09/21/05	6.66		799.95

Appendix F – Site Inspection Checklist

Site Inspection Checklist

I. SITE INFORMATION

Site name: N. W. Mauthe Superfund Site	**Date of inspection:** 2/27/2006
Location and Region: Appleton, WI, Region 5	**EPA ID:** WID083290981
Agency, office, or company leading the five-year review: WDNR	**Weather/temperature:** Light snow, overcast, 20°F

Remedy Includes: (Check all that apply)

- v **Landfill cover/containment**
- v **Access controls**
- v **Institutional controls**
- Groundwater pump and treatment
- Surface water collection and treatment
- Other_____
- Monitored natural attenuation
- v **Groundwater containment**
- Vertical barrier walls

II. INTERVIEWS

1. **O&M site manager** Jim Peichl (Name) O&M Operator (Title) 2/27/2006 (Date)
   Interviewed at site (treatment building)
   Problems and suggestions provided. See Peichl interview record

2. **O&M staff** ____not applicable_____ _____ _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

   Agency City of Appleton Health Department
   Contact Kurt Eggebrecht, (Name) City of Appleton Health Officer (Title) 2/27/2006 (Date) 920-832-6429 (Phone no.)
   No problems or suggestions reported. See Eggebrecht interview record

4. **Other interviews**

Brian Wayner, Engineer, OMNNI Associates, System Evaluation Consultant, See Wayner Interview Record

Paul Much, MCO, Quarterly Sampler and Monthly Report Writer, See Much Interview Record

Stuart Boerst, McMahon, O&M Report Writer, See Boerst Interview Record

Robert Ludwig, private resident at 801 S Outagamie St, Appleton , WI, See Ludwig Interview Record

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

O&M manual	Readily available	Up to date	N/A
As-built drawings	Readily available	Up to date	N/A
Maintenance logs	**v Readily available**	**v Up to date**	N/A

Remarks The O&M Manual is located at the WDNR Oshkosh office. O&M checklists created by O&M operator are present on site, readily available and up to date. As-built drawings are located at the WDNR Oshkosh office. Final as-builts were not generated by CH2M Hill according to Ike Johnson with CH2M Hill. As-builts provided are primarily copies of construction documents.

2. **Site-Specific Health and Safety Plan** **v Readily available** **v Up to date** N/A
   Contingency plan/emergency response plan **v Readily available** **v Up to date** N/A
   Remarks_____

3. **O&M and OSHA Training Records** Readily available **v Up to date** N/A
   Remarks located at MCO office

4. **Permits and Service Agreements**

Air discharge permit	Readily available	Up to date	**v N/A**
Effluent discharge	**v Readily available**	**v Up to date**	N/A
Waste disposal, POTW	**v Readily available**	**v Up to date**	N/A
Other permits__N/A_____	Readily available	Up to date	**v N/A**

   Remarks effluent discharge and POTW permit are the same

5. **Gas Generation Records** Readily available Up to date **v N/A**
   Remarks_____

6. **Settlement Monument Records** Readily available Up to date **v N/A**
   Remarks_____

7. **Groundwater Monitoring Records** **v Readily available** **v Up to date** N/A
   Remarks_____

8. **Leachate Extraction Records** Readily available Up to date **v N/A**
   Remarks_____

9. **Discharge Compliance Records**

Air	Readily available	Up to date	**v N/A**
Water (effluent)	**v Readily available**	**v Up to date**	N/A

   Remarks_____

10. **Daily Access/Security Logs** **v Readily available** **v Up to date** N/A
    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

State in-house — **v Contractor for State**
PRP in-house — Contractor for PRP
Federal Facility in-house — Contractor for Federal Facility
Other_____

_____

2. **O&M Cost Records**

Readily available — **v Up to date**

v Funding mechanism/agreement in place

Original O&M cost estimate_____

Total WDNR fiscal year costs for review period
(Note: Costs detailed below do not include WDNR salaries for oversight)

From July 1, 2000 to June 30, 2001 (FY01)	$77,959.72
From July 1, 2001 to June 30, 2002 (FY02)	$83,954.75
From July 1, 2002 to June 30, 2003 (FY03)	$87,241.10
From July 1, 2003 to June 30, 2004 (FY04)	$53,201.95
From July 1, 2004 to June 30, 2005 (FY05)	$57,182.48
From July 1, 2005 to Dec 31, 2005 (1/2 FY06)	$31,217.72

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: In FY01, $2,532.97 of the $77,959.72 was for purchase of a backup pump, QA/QC data package and piping modifications for connection of 1428 W Second St to the southeast collection trench. In FY03, WDNR began paying utilities directly. In the past, these utility invoices were paid by MCO. MCO's lump sum contract was not amended to reflect this change. In November 2003, WDNR rebid the O&M of the system. MCO provided the low bid of $35,649.84 for annual O&M. This lump sum bid did not include utility and permit costs or repairs above the O&M scope of work paid directly by WDNR. With the exception of the piping modifications in FY01 and adjustment of the contract with MCO on utility payments, there were no unusually high O&M costs that would indicate an issue with the system.

V. ACCESS AND INSTITUTIONAL CONTROLS **v Applicable** N/A

A. Fencing

1. Fencing damaged Location shown on site map **v Gates secured** N/A

Remarks chain link fence installed at Mauthe property in 1991 and/or 1996 in good condition. Purpose of site fence unclear since clay cap installed and treatment building locked. Gate for fence installed by WDNR in June 2005 to access Mauthe property for piezometer installation. Wooden residential fence in good condition. A portion of the wooden fence at 801 S Outagamie St temporarily removed for access to 1414 W Second St and then replaced. According to Robert Ludwig, the EPA offered the fence to appease residents during construction of the remedy (See Ludwig Interview Record).

B. Other Access Restrictions			
1.	**Signs and other security measures**	Location shown on site map	N/A
	Remarks No signs posted. No building identification posted.		

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented — Yes No N/A

Site conditions imply ICs not being fully enforced — **v Yes** No N/A

Type of monitoring (*e.g.*, self-reporting, drive by) O&M operator observations

Frequency daily site visits

Responsible party/agency MCO, O&M contractor

Contact Jim Peichl (Name) O&M operator (Title) cell: 920-858-7080 (Phone no.)

Reporting is up-to-date — Yes No **v N/A**

Reports are verified by the lead agency — Yes No **v N/A**

Specific requirements in deed or decision documents have been met — Yes No N/A

Violations have been reported — Yes No N/A

Other problems or suggestions:

Remarks: Clay cap and fencing is inspected and maintained by O&M operator, however, it is unknown if the chain link fence at the Mauthe property is a IC for the purpose of preventing access to clay cap. It is unknown if restrictions to the deeds have been filed that would limit access, prevent excavation of the clay cap, prevent excavation of contaminated soil remaining in the railroad right-of-way or prevent installation of drinking water wells, as required in the ROD. O&M reports do not include discussion of ICs. Post RA reports also do not include discussion of ICs (e.g. whether in place or documented). WDNR/EPA is performing a title search to determine if restrictions to properties filed. ICs will be addressed by WDNR/EPA after the title search is complete.

2. **Adequacy** ICs are adequate **v ICs are inadequate** N/A

Remarks ICs being evaluated. See remarks under C.1. above.

D. General

1. **Vandalism/trespassing** Location shown on site map **v No vandalism evident**

Remarks occasional liter on lawn within site fence includes baseballs, hacky sacks, superballs, stones, etc.

2. **Land use changes on site v N/A**

Remarks Site not utilized for any purpose other than groundwater treatment system

3. **Land use changes off site v N/A**

Remarks land use at all neighboring properties same as time of remedy in 1995/1996

VI. GENERAL SITE CONDITIONS

A. Roads Applicable **v N/A**

1. **Roads damaged** Location shown on site map Roads adequate N/A

Remarks_____

B. Other Site Conditions

Remarks _____

_____

_____

_____

_____

_____

VII. LANDFILL COVERS **v Applicable** N/A

A. Landfill Surface

1. **Settlement** (Low spots) Location shown on site map **v Settlement not evident**
   Areal extent_____ Depth__ ___
   Remarks_____
   _____

2. **Cracks** Location shown on site map **v Cracking not evident**
   Lengths_____ Widths_____ Depths_____
   Remarks_____
   _____

3. **Erosion** Location shown on site map **v Erosion not evident**
   Areal extent_____ Depth_____
   Remarks_____
   _____

4. **Holes** Location shown on site map **v Holes not evident**
   Areal extent_____ Depth_____
   Remarks_____
   _____

5. **Vegetative Cover** **v Grass** Cover properly established **v No signs of stress**
   v Trees/Shrubs (indicate size and locations on a diagram)
   Remarks No signs of stress to vegetative grass cover over clay cap. Presence of trees assumed to be aesthetic only. Stressed trees likely due to lawnmower damage at base, inadequate precipitation and/or compacted clay cap.

6. **Alternative Cover (armored rock, concrete, etc.)** **v N/A**
   Remarks_____
   _____

7. **Bulges** Location shown on site map **v Bulges not evident**
   Areal extent_____ Height_____
   Remarks_____
   _____

8. **Wet Areas/Water Damage** **v Wet areas/water damage not evident**

Wet areas	Location shown on site map	Areal extent_____
Ponding	Location shown on site map	Areal extent_____
Seeps	Location shown on site map	Areal extent_____
Soft subgrade	Location shown on site map	Areal extent_____

Remarks_____
_____

9. **Slope Instability** Slides Location shown on site map **v No evidence of slope instability**
Areal extent_____
Remarks_____
_____

B. Benches Applicable **v N/A**

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** Location shown on site map N/A or okay
Remarks_____
_____

2. **Bench Breached** Location shown on site map N/A or okay
Remarks_____
_____

3. **Bench Overtopped** Location shown on site map N/A or okay
Remarks_____
_____

C. Letdown Channels Applicable **v N/A**

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** Location shown on site map No evidence of settlement
Areal extent_____ Depth_____
Remarks_____
_____

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type_____ Areal extent_____
Remarks_____
_____

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent_____ Depth_____
Remarks_____
_____

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____
_____

5. **Obstructions** Type_____ No obstructions
Location shown on site map Areal extent_____
Size_____
Remarks_____
_____

6. **Excessive Vegetative Growth** Type_____
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent_____
Remarks_____
_____

D. Cover Penetrations **v Applicable** N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance
v N/A
Remarks_____
_____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance **v N/A**
Remarks_____
_____

3. **Monitoring Wells** (within surface area of landfill)
v Properly secured/locked **v Functioning** **v Routinely sampled** **v Good condition**
Evidence of leakage at penetration Needs Maintenance N/A
Remarks <u>According to Paul Much, Quarterly Sampler, the flush mount well covers are secured with bolts and monitoring well PVC pipe is capped with orange screw-on caps with the potential to be locked. There are no locks on the wells, likely removed for frequent access by contractor (See Much Interview Record)</u>

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance **v N/A**
Remarks_____
_____

5. **Settlement Monuments** Located Routinely surveyed **v N/A**
Remarks_____
_____

E. Gas Collection and Treatment Applicable **v N/A**

1. **Gas Treatment Facilities**
   Flaring Thermal destruction Collection for reuse
   Good condition Needs Maintenance
   Remarks_____
   _____

2. **Gas Collection Wells, Manifolds and Piping**
   Good condition Needs Maintenance
   Remarks_____
   _____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   Good condition Needs Maintenance N/A
   Remarks_____
   _____

F. Cover Drainage Layer Applicable **v N/A**

1. **Outlet Pipes Inspected** Functioning N/A
   Remarks_____
   _____

2. **Outlet Rock Inspected** Functioning N/A
   Remarks_____
   _____

G. Detention/Sedimentation Ponds Applicable **v N/A**

1. **Siltation** Areal extent_____ Depth_____ N/A
   Siltation not evident
   Remarks_____
   _____

2. **Erosion** Areal extent_____ Depth_____
   Erosion not evident
   Remarks_____
   _____

3. **Outlet Works** Functioning N/A
   Remarks_____
   _____

4. **Dam** Functioning N/A
   Remarks_____
   _____

H. Retaining Walls Applicable **v N/A**

1. **Deformations** Location shown on site map Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____
   _____

2. **Degradation** Location shown on site map Degradation not evident
   Remarks_____
   _____

I. Perimeter Ditches/Off-Site Discharge Applicable **v N/A**

1. **Siltation** Location shown on site map Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Vegetative Growth** Location shown on site map N/A
   Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____
   _____

3. **Erosion** Location shown on site map Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

4. **Discharge Structure** Functioning N/A
   Remarks_____
   _____

VIII. VERTICAL BARRIER WALLS Applicable **v N/A**

1. **Settlement** Location shown on site map Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Performance Monitoring** Type of monitoring_____
   Performance not monitored
   Frequency_____ Evidence of breaching
   Head differential_____
   Remarks_____
   _____

IX. GROUNDWATER/SURFACE WATER REMEDIES **v Applicable** N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines **v Applicable** N/A

1. Pumps, Wellhead Plumbing, and Electrical

Good condition **v All required wells properly operating** **v Needs Maintenance** N/A

Remarks Manhole #2 recently had disconnect switch wires corroded and needed replacing. Disconnect switch no longer operating. Damage due to hydrogen sulfide and sulfuric acid. Pumps in manholes originals from EPA installation.

2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances

v Good condition Needs Maintenance

Remarks_____

_____

3. Spare Parts and Equipment

v Readily available **v Good condition** Requires upgrade Needs to be provided

Remarks_____

_____

B. Surface Water Collection Structures, Pumps, and Pipelines Applicable **v N/A**

1. Collection Structures, Pumps, and Electrical

Good condition Needs Maintenance

Remarks_____

_____

2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances

Good condition Needs Maintenance

Remarks_____

_____

3. Spare Parts and Equi pment

Readily available Good condition Requires upgrade Needs to be provided

Remarks_____

_____

C. Treatment System **v Applicable** N/A

1. **Treatment Train** (Check components that apply)

v Metals removal Oil/water separation Bioremediation
Air stripping Carbon adsorbers
Filters_____
v Additive (*e.g.*, chelation agent, flocculent) ferrous sulfate for converting hex to tri chrome, sodium hydroxide to bring pH back up to approved discharge range
Others_____
v Good condition Needs Maintenance
Sampling ports properly not marked as sample ports and **v functional**
v Sampling/maintenance log displayed and up to date
v Equipment properly identified
Quantity of groundwater treated annually average 857,850 gallons influent treated from 2001 thru 2005.
Quantity of surface water treated annually none
Remarks nothing amended since EPA construction in 1996

2. **Electrical Enclosures and Panels** (properly rated and functional)

N/A **v Good condition** Needs Maintenance
Remarks_____
_____

3. **Tanks, Vaults, Storage Vessels**

N/A **v Good condition** **v Proper secondary containment** Needs Maintenance
Remarks secondary containment is the building

4. **Discharge Structure and Appurtenances**

N/A **v Good condition** Needs Maintenance
Remarks discharge is single pipe lateral to City sewer

5. **Treatment Building(s)**

N/A **v Good condition** (esp. roof and doorways) Needs repair
v Chemicals and equipment properly stored
Remarks no building repairs needed since construction in 1996

6. **Monitoring Wells** (pump and treatment remedy)

v Properly secured/locked **v Functioning** **v Routinely sampled** **v Good condition**
v All required wells located Needs Maintenance N/A
Remarks According to Paul Much, Quarterly Sampler, the flush mount well covers are secured with bolts and monitoring well PVC pipe is capped with orange screw-on caps with the potential to be locked. There are no locks on the wells, likely removed for frequent access by contractor (See Much Interview Record)

D. Monitoring Data

1. Monitoring Data

Is routinely submitted on time - No **v Is of acceptable quality**

2. Monitoring data suggests:

v Groundwater plume is effectively contained **v Contaminant concentrations are declining**
exceptions: chromium and VOCs at MW-107 are relatively stable; chromium at MW-104 is stable to increasing; Cd, Cu, Hg, Zn & CN^- no longer sampled

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
Properly secured/locked Functioning Routinely sampled Good condition
All required wells located Needs Maintenance **v N/A**
Remarks_____
_____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

According to the ROD, signed 3/31/1994, the remedy selected is intended to "…contain and/or control groundwater contamination with ultimate compliance with groundwater ARARs… installation of foundation drain systems…to prevent seepage of contaminated water into the buildings…institutional controls… that are intended to prevent access, excavation, disturbance of the newly constructed cap, future soil excavation in the railroad corridor for areas in the corridor where contaminated soils will remain and installation of drinking water wells…" The existing containment system is effectively containing the contaminated groundwater, however, ultimate compliance with groundwater groundwater cleanup goals does not appear achievable in a reasonable period of time. Installation of the foundation drain systems appears to have prevented further seepage of contaminated water into basements. It is not known if foundation drain systems still need to be attached to the collection system. This will be evaluated. It is currently unknown if institutional controls are in place. This is an on-going evaluation.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

The existing treatment system (batch treatment and manual discharge) is meeting discharge permit conditions and contributing to the success of the containment system but is labor intensive. Newer technology is available to minimize the costs and labor associated with treatment of collected groundwater (e.g. ion exchange resins). Alternative options to meet the intended RA goals are currently being evaluated. O&M of the collection trenches is proving to be difficult. The WDNR is evaluating options for an exit strategy for the foundation drain systems and collection trenches, specifically the West Trench, but do not have the capability to sample water from individual trenches or manually disconnect individual trenches. The WDNR is also evaluating options for maintenance on manhole no. 2. The inability to sample individual trenches or temporarily shut down collection trenches is adding to the difficulty.

C.	Early Indicators of Potential Remedy Problems
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. Corrosion within manhole no. 2, if not addressed, will result in further degredation and may impact the overall collection system. The air pressure regulator is leaking air and needs to be replaced. There is no backup variable speed drive box. If the treatment process does not change, a backup box needs to be obtained.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. WDNR has contracted with OMNNI Associates to perform an evaluation of the groundwater collection and treatment systems to recommend a more cost-effective approach to obtain ARARs. Options being considered include direct discharge to the Appleton sewer, alternative treatment of contaminated groundwater (e.g. ion exchange resins), reduction in collection of uncontaminated water (via trenches and/or residential sump drains), inclusion of source area groundwater contamination in collection, other active remedies for metals reduction.

Appendix G – Interview Records

Interview Documentation Form
Jim Peichl, MCO
Brian Wayner, OMNNI
Kurt Eggebrecht, City of Appleton Health Officer
Paul Much, MCO
Stuart Boerst, McMahon
Robert Ludwig, Private Resident at 801 S. Outagamie St., Appleton, WI

INTERVIEW DOCUMENTATION FORM

The following is a list of individuals interviewed for this five-year review. See the attached contact record(s) for a detailed summary of the interviews.

Name	Title/Position	Organization	Date
Jim Peichl	Maintenance/Instrumentation Specialist / O&M Operator	MCO	2/27/2006
Brian Wayner	Engineer / System Evaluation Consultant	OMNNI Associates	2/27/2006
Kurt Eggebrecht	City of Appleton Health Officer	City of Appleton	2/27/2006
Paul Much	Environmental Scientist / O&M Monitoring	MCO	3/2/2006
Stuart Boerst	Hydrogeologist / O&M Report Writer	McMahon Associates	3/1/2006
Robert Ludwig	Neighbor to Mauthe Site / Collection Trench & Manhole #2 on Property	Private Residence	3/1/2006

INTERVIEW RECORD

Site Name: N. W. Mauthe Superfund Site		**EPA ID No.: WID083290981**
Subject: Five Year Review Interview		**Time: 8:45 AM** **Date: 2/27/2006**
Type: Telephone v **Visit** Other **Location of Visit: N. W. Mauthe Treatment Building**		Incoming Outgoing
Contact Made By:		
Name: Jennifer Borski	**Title: Hydrogeologist, Proj. Mgr.**	**Organization: WDNR**
Individual Contacted:		
Name: Jim Peichl	**Title: O&M Operator**	**Organization: MCO**
Telephone No: 920-858-7080 (cell) **Fax No: 920-751-4767** **E-Mail Address:**		**Street Address: PO Box 418** **City, State, Zip: Menasha, WI 54952-0418**

Summary Of Conversation

The following questions were asked by Borski and answered by Peichl:

Is there continuous on-site O&M operator presence? Describe staff, activities, frequency. Yes. John Stoeger operated the system from 1997 – 2001. Peichl operated from 2001 to present. Peichl manually performs 0-4 discharges of treated batches at the site, seven days a week, 365 days per year. The number of batch discharges is dependent upon the volume of influent. Stoeger followed the same O&M schedule. The daily, weekly, monthly and annual O&M activities are detailed in O&M Reports, submitted to the WDNR and EPA semi-annually.

Is the 1997 Final O&M Manual used by MCO? Yes. MCO detailed the O&M requirements into checklist forms for daily, weekly, monthly and annual inspection and maintenance. These forms are utilized on site.

Have there been any significant changes in O&M requirements, maintenance schedules or routines in the past five years? Describe. No but the air conditioning unit in the control room was repaired in 2005.

Have there been any unexpected O&M difficulties in the past five years? Describe. No.

Are you aware of any opportunities to optimize O&M or sampling? Describe the changes and resultant or desired cost savings. There are no opportunities with the current collection and treatment systems and discharge permit from the City of Appleton. If the collection or treatment systems are amended or conditions of the discharge permit change, there would be opportunity to optimize O&M.

Is the remedy functioning as expected? Yes

What is your overall impression of the site? There are other ways of achieving the same goals in a more cost-effective and less labor-intensive manner. Utilizing ion exchange canisters for the treatment of chromium is a possibility to reduce the necessary labor involved in operating the treatment system and saving money. Utilizing ion exchange canisters may also allow for direct discharge by the City of Appleton.

Do you have any comments/suggestions/recommendations? MCO is always talking internally about the potential to use the ion exchange canisters at this site as a more effective treatment option instead of the batch treatment system. MCO is also concerned about the residential basement sump drains tied into the collection system and the potential for backup into residences. This is the reason for batch discharges seven days a week and 365 days a year to assure the water levels in the collection trenches allows for drainage of residential sumps to the collection system. This excessive level of O&M is a concern for MCO. MCO has two back-up operators with 40-hour OSHA certifications trained to operate the system in the event the primary O&M Operator (Peichl) is unavailable. Those back-up operators are Rob Franck and Rodger Renike with MCO. Paul Much with MCO is also trained to operate the system but is not 40-hour OSHA certified.

INTERVIEW RECORD

Site Name: N. W. Mauthe Superfund Site	**EPA ID No.: WID083290981**	
Subject: Five Year Review Interview	**Time: 12:30 PM**	**Date: 2/27/2006**
Type: Telephone v **Visit** Other **Location of Visit: OMNNI Associates Office**	Incoming Outgoing	

Contact Made By:

Name: Jennifer Borski	**Title: Hydrogeologist, Proj. Mgr.**	**Organization: WDNR**

Individual Contacted:

Name: Brian Wayner	**Title: Engineer**	**Organization: OMNNI Associates**
Telephone No: 920-735-6900 **Fax No: 902-830-6100** **E-Mail Address: brian.wayner@omnni.com**	**Street Address: One System Drive** **City, State, Zip: Appleton, WI 54914**	

Summary Of Conversation

The following questions were asked by Borski and answered by Wayner:

What is your overall impression of the site? The system is doing what it was intended to do but Wayner does not agree with the RD, specifically the selected long-term remedy of containment vs. active treatment and length of time anticipated to achieve ARARs. A more cost-effective remedy can be implemented to achieve ARARs sooner and save WDNR money by reduced O&M costs over the long term.

What site issues have you observed during site visits? Corrosion within manhole #2 from hydrogen sulfide and sulfuric acid. Possible historic well or trench cleanout in Carter's property (1428 W Second St). Health of trees on Mauthe site (two trees died in 2005 and base of all remaining trunks damaged). Poor health of trees may be due to lawnmower damage, inadequate precipitation and/or presence of two-foot compacted clay cap. Sanitary line in the bathroom in the treatment building was clogged in 2005 and needed cleaning by a professional plumber. The bathroom is not used enough to have developed this sort of problem just nine years after construction and may be a recurring issue in the future.

Do you believe the remedy is functioning as expected? Yes.

Have you observed any trends? The influent trends have consistently been below discharge limit concentrations, as required by the City of Appleton. MW-107 chromium trend shows that the excavation significantly reduced the chromium concentrations in groundwater (from approximate source area high of 890 ppm prior to excavation to approximately 2 ppm in February 1997). The chromium trend in groundwater post excavation is relatively stable from 1997 to present. This is likely due to the construction of the compacted clay cap, treatment building and asphalt drive over the remaining soil contamination, which significantly limits migration of the remaining contamination.

Do you have any recommended changes to the ROD or RD? The ARARs do not appear to be necessary based on the surrounding conditions (primarily residents served by municipal water system and lack of receptors within migration distance). The WDNR PALs may be appropriate for direct contact with sump water but do not appear to be appropriate goals for any other conditions of the site or neighboring community. The ARARs are difficult, if not impossible, to achieve due to metals being the contaminant and little natural attenuation happening.

Do you have any comments/suggestions/recommendations? Wayner is glad that the WDNR is evaluating the site for more efficient and cost-effective means of achieving the ARARs, however, changes to the ARARs should be considered. Items that would have been useful to the WDNR in on-going evaluation of the remedy include: the ability to monitor individual trench concentrations (e.g. groundwater collected in Central Trench vs. Southeast Trench); the ability to shut down one collection trench to monitor hydrogeologic response; an exit strategy for the residential sump laterals and collection trenches. Long term O&M costs to the WDNR do not appear to have been considered when developing the RD. While the goal of the EPA appears to have been to address the health threat while responsibly utilizing Superfund monies, EPA should also have considered a remedy that would allow for the remaining threat to be addressed while responsibly utilizing WDNR environmental fund monies.

INTERVIEW RECORD

Site Name: N. W. Mauthe Superfund Site		**EPA ID No.: WID083290981**
Subject: Five Year Review Interview		**Time: 2:45 PM** **Date: 2/27/2006**
Type: Telephone v **Visit** Other **Location of Visit: City of Appleton Health Department Office**		Incoming Outgoing
Contact Made By:		
Name: Jennifer Borski	**Title: Hydrogeologist, Proj. Mgr.**	**Organization: WDNR**
Individual Contacted:		
Name: Kurt Eggebrecht	**Title: City of Appleton Health Officer**	**Organization: City of Appleton**
Telephone No: 920-832-6429 **Fax No: 920-832-5853** **E-Mail Address: kurt.eggebrecht@appleton.org**		**Street Address: 100 N. Appleton St.** **City, State, Zip: Appleton, WI 54914**

Summary Of Conversation

The following questions were asked by Borski and answered by Eggebrecht:

Have any complaints been received by your office in the past five years in regard to this project? No complaints that Eggebrecht is aware of. However, Eggebrecht received one comment from a new neighbor at a public meeting for another project, Midwest Plating Corp, that he was not aware of the Mauthe project.

Are you aware of any community concerns? No.

Do you feel well informed about the activities and progress of the project? Yes.

Do you understand the remedy performed and the remedial goals? Yes

What is your overall impression of this project? The cleanup of the potentially highly dangerous area is a positive for the community and City.

Do you have any comments/suggestions/recommendations on the management or operation of this project?
No

INTERVIEW RECORD

Site Name: N. W. Mauthe Superfund Site		**EPA ID No.: WID083290981**	
Subject: Five Year Review Interview		**Time: 7:50 AM**	**Date: 3/2/2006**
Type: v **Telephone** Visit Other **Location of Visit:**		Incoming Outgoing	
Contact Made By:			
Name: Jennifer Borski	**Title: Hydrogeologist, Proj. Mgr.**	**Organization: WDNR**	
Individual Contacted:			
Name: Paul Much	**Title: Environmental Scientist**	**Organization: MCO**	
Telephone No:920-475-0054 (cell) **Fax No: 920-751-4767** **E-Mail Address: pmuch@nmscwwtp.com**		**Street Address: PO Box 418** **City, State, Zip: Menasha, WI 54952-0418**	

Summary Of Conversation

The following questions were asked by Borski and answered by Much:

What is your role at the Mauthe site? Quarterly sampling and monthly report writing.

How long have you performed the sampling at Mauthe? Since 2004.

How often do you inspect the integrity of all wells? All wells are check quarterly during water level readings.

What condition are the wells and well covers in? Most are in pretty good shape. MW-105 needs a new well cover and Stuart Boerst will order one. The wells are not locked under the well covers but have the orange screw-on cap that can be locked at all wells except W-2 and W-8 which have a PVC screw-on cap. Flush mounts are in place with bolts.

Have you experienced any unexpected difficulties in sampling in the past five years? No

Do you follow the sampling protocols identified in the FSP in the LTRA Plans and Final O&M Manual? Yes

Are there opportunities to optimize sampling? No

Have you received any complaints or questions while performing monitoring in the past five years? The residents at 801 S Outagamie St have complained of odors from manhole no. 2.

Do you understand the remedy performed and the RA goals? Yes

Do you believe the remedy is functioning as expected? Yes

What is your overall impression of the site? The system appears to be working.

Do you have any comments/suggestions/recommendations? MW-104 was very turbid with silt and sand present during the 12/05 event. There was little turbidity in the 9/05 event. PZ-7 was installed adjacent to MW-104 in 6/05 which may be the reason for the increase in turbidity. Much will note the turbidity in the 3/06 event and discuss with Borski.

No comments in regard to sampling but Much is not clear on the filtering protocol after a recent discussion with Boerst. [Borski clarified for Much that **total chrome samples are to be filtered and hex chrome samples are to be unfiltered**. Borski sent an electronic message to Boerst on 2/26/06 stating that filtering of samples has not been consistent. Specifically, the 6/05 event was not filtered according to the chain of custody.] Much stated that the COC for the 6/05 event had to be filled out incorrectly because he has always filtered both total and hex chrome samples. Much stated he will filter total chrome and not filter hex chrome samples in the future. [Borski also stated that historically, the analytical method used for total chrome in groundwater is SW846 6010 from Northern Lake Lab. EnChem began being used in 3/05 which was bought by Pace Analytical and used started 9/05. **Borski asked Much why the labs were switched.**] Much stated MCO receives results back from EnChem/Pace much faster which allows for more timely reporting. [Borski stated that EnChem/Pace have used analytical method SW846 6020 or 6010B. This change in analytical method will affect the trend analysis.] Much stated he will call Pace Analytical and confirm future total chrome samples can be analyzed using SW846 6010. [Borski will follow up with EPA in regard to the QAPP to determine which lab needs to be utilized.]

INTERVIEW RECORD

Site Name: N. W. Mauthe Superfund Site		**EPA ID No.: WID083290981**
Subject: Five Year Review Interview		**Time: 4:00 PM** **Date: 3/1/2006**
Type: v **Telephone** Visit Other **Location of Visit:**		Incoming Outgoing
Contact Made By:		
Name: Jennifer Borski	**Title: Hydrogeologist, Proj. Mgr.**	**Organization: WDNR**
Individual Contacted:		
Name: Stuart Boerst	**Title: Hydrogeologist**	**Organization: McMahon**
Telephone No: 920-751-4200 **Fax No:920-751-4284** **E-Mail Address:**		**Street Address: 1445 McMahon Drive** **City, State, Zip: Neenah, WI 54956**

Summary Of Conversation

The following questions were asked by Borski and answered by Boerst:

Note: Boerst writes the quarterly status update reports and semi-annual O&M reports for MCO.

Do you understand the remedy performed and the RA goals? Goals unknown but Boerst understands the remedy included excavating soil with total chromium greater than 500 mg/kg.

Do you believe the remedy is functioning as expected? Boerst is unaware of the expected remedy. The plume is being contained horizontally.

What observations do you have on the status of the plume? The perimeter wells have decreased for chromium in the first couple years after excavation and show the plume is being contained. The monitoring well network is not adequate to evaluate the status of the plume.

Have you observed any trends? Perimeter wells decreased in concentrations since excavation.

Are there opportunities to optimize reporting? No.

What is your overall impression of the site? No comment.

Do you have any recommended changes to the ROD or RD? Boerst is not aware of the details in these reports but it appears all the contaminated soil should have been excavated when it was accessible.

Do you have any comments/suggestions/recommendations?
WDNR should pursue a permit for direct discharge of the influent with the City since influent data has been below discharge limits since 1997. Boerst questions the necessity of treating the influent. The plume appears to be controlled horizontally.

INTERVIEW RECORD

Site Name: N. W. Mauthe Superfund Site		**EPA ID No.: WID083290981**
Subject: Five Year Review Interview		**Time: 4:30 PM** **Date: 3/1/2006**
Type: v **Telephone** Visit Other **Location of Visit:**		Incoming Outgoing
Contact Made By:		
Name: Jennifer Borski	**Title: Hydrogeologist, Proj. Mgr.**	**Organization: WDNR**
Individual Contacted:		
Name: Robert Ludwig	**Title: Private Resident**	**Organization: N/A**
Telephone No: 920-733-9251 **Fax No: N/A** **E-Mail Address: N/A**		**Street Address: 801 S Outagamie St** **City, State, Zip: Appleton, WI 54914**

Summary Of Conversation

The following questions were asked by Borski and answered by Ludwig:

Do you understand the remedy performed and the RA goals? Yes.

Are you aware of any institutional controls in place for your property (e.g. restriction to the deed)? No restrictions filed that Ludwig recalls.

Was the wooden residential fence in place prior to the remedy? No.

Do you recall the purpose of the residential fence? EPA offered the fence to appease residents so they did not have to look at the construction mess across from the railroad tracks. All the bushes were removed during the remedy and there was much construction activity.

Are you aware of any community concerns? Yes. Ludwig is concerned about the odor from the manhole located on his property (manhole no. 2).

Do you feel well informed about the activities and progress of the project? Yes. Ludwig does not believe there is much going besides operation of the system.

What level of communication from the WDNR do you prefer in regard to plans for changes to the system? Ludwig wants to know everything going on. Ludwig's sump pump runs into the collection trench and this concerns him. He has no concern about backup into the basement due to the presence of a check valve, however, his drain tile does goes directly into the collection trench. His drain tile is no longer connected to the sump. Possible disconnection of his drain tile from the collection trench is a concern because Appleton requires underground connection to the storm sewer. Ludwig is concerned there may be cost to Ludwig. [Borski clarified for Ludwig that the WDNR would need to finance a compliant connection to the sewer when his drain tile is disconnected since the intiial connection to the collection trench was part of the remedy.]

What is your overall impression of the site? Ludwig stated, "It's nice. Hell of a lot better than it used to be."

Do you have any comments/suggestions/recommendations? Ludwig believes the chain fence at the Mauthe site should be removed to allow use of the grass and tree area. [Borski clarified that Mrs. Mauthe holds title to the property . Ludwig was not aware of this.]