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*N.W. Mauthe Site
Appleton, Wisconsin
First Five Year Review*

I. Introduction

EPA Region 5 has conducted a five year review of the remedial actions implemented at the N. W. Mauthe (Mauthe) Site in Appleton, Wisconsin. This five year review represents the first review for the Mauthe Site. This review was conducted from March 15, 2001 to April 1, 2001 and a site visit was conducted on March 22, 2001. This site visit was attended by Dion Novak, Remedial Project Manager, Jennifer Huffman, Wisconsin Department of Natural Resources (WDNR), and John Stoeger, Midwest Contract Operations, Inc.(MCO) - WDNR contractor. This report documents the results of this review. The purpose of five year reviews is to determine whether the remedy at the site remains protective of human health and the environment. The methods, findings, and conclusions of these reviews are documented in five year review reports. In addition, five year review reports identify deficiencies found during the review, if any, and identify recommendations to address them.

This review is required by statute and is a Level 1 review. EPA must implement five year reviews consistent with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 (c) as amended states:

If the President selects a remedial action that results in any hazardous substances, pollutants or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after initiation of such remedial actions to assure that human health and the environment are being protected by the remedial action being implemented.

The NCP Part 300.430 (f)(ii) of the Code of Federal Regulations (CFR) 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 remedial action.

This is the first five year review conducted for the N.W. Mauthe Site. The triggering action for this statutory review is the date of actual on-site remedial action construction, which was April 1996. Because hazardous substances remain at the site above levels that allow for unlimited use and unrestricted exposure, a five year review is required by statute.

II Site Chronology

Table 1 below lists the chronology of events for the NW Mauthe Site.

TABLE 1

<u>Date</u>	<u>Event</u>
March 1982	Ponded yellow water in the railroad ditches adjacent to the property was reported to the WDNR.
April 1982	Over 30,000 gallons of water were pumped from the railroad ditches to the publicly owned treatment works (POTW).
May 1982	WDNR installed a shallow drain system to collect groundwater and contaminated surface water with discharge to the POTW.
November 1982	Approximately 1.3 million gallons of water was collected. WDNR contracted for soil borings and installation of 16 monitoring wells for investigation purposes.
1982-1985	WDNR negotiations with NW Mauthe for site remediation.
October 1984	WDNR contractors regraded the site and applied an asphalt cover to channel surface runoff into a new storm sewer inlet and limit infiltration of surface water into the ground.
October 1984	EPA Field Investigation Team (FIT) conducts site inspection.
1985	NW Mauthe ordered to develop a cleanup plan by the Outagamie County Circuit Court.
1986	Mauthe insurance carrier rejected claims for incurred remediation costs and remedial efforts by Mauthe ceased.
June 1988	Mauthe site proposed for National Priorities List (NPL) as Wisconsin's #1 priority site.
September 1988	WDNR signs a cooperative agreement with EPA to conduct a fund financed state lead remedial investigation/feasibility study (RI/FS).
March 1989	Mauthe site finalized on NPL.
February 1993	RI report approved by EPA and WDNR.
October 1993	FS report approved by EPA and WDNR.

III Background

The N.W. Mauthe site (Mauthe) is a former electroplating facility, located at 725 Outagamie Street, Appleton, Wisconsin (see Figure 1). Located in a neighborhood of mixed commercial, light industrial, and residential properties, the 2-acre site is roughly triangular in shape and is bordered by Melvin Street on the north, a parking lot owned by Miller Electric and Manufacturing company on the west, and the Wisconsin Central Transportation Corporation railroad right-of-way on the southeast. Private residences are located immediately southeast of the railroad tracks and on the north side of Melvin Street. The property was used for a chrome

MELVIN STREET

MW-108

MW-102

ELECTRIC
SUBSTATION

WEST
GROUNDWATER
COLLECTION
TRENCH

GROUNDWATER
TREATMENT
FACILITY

MW-107

MANHOLE NO. 1

RI 103

TAVERN
SUMP EFFLUENT
PIPE

CAR

CAR

MW-104

HSE

HSE

FOUNDATION
DRAIN LATERAL

MW-103

CENTRAL
GROUNDWATER
COLLECTION
TRENCH

FOUNDATION
DRAIN LATERAL

HSE

MW-102

TAVERN

PZ-2

MW-106

MW-15

PZ-1

MANHOLE NO. 2

OUTAGAMIE STREET

SOUTHEAST
GROUNDWATER
COLLECTION
TRENCH

MW-8

SECOND STREET

MW-105



FIGURE 2

COLLECTION TRENCH AND
MONITORING WELL LOCATIONS
N.W. MAUTHE SUPERFUND S

APPROXIMATE DATE: MARCH 1991
MCM# M050-99746.14

plating company, from 1960 to 1976. Electroplating of zinc, cadmium, and possibly, copper and silver, was conducted from 1978 to 1987 in an adjacent building on the property. After 1987, all plating operations ceased on the property.

Concerns over subsurface discharges to the surrounding environment led the WDNR and the US Environmental Protection Agency (EPA) to conduct a remedial investigation (RI) and cleanup of the Mauthe site and surrounding properties.

The investigation determined that the Mauthe site was contaminated with zinc, cadmium, chromium and cyanide. Additionally, several volatile organic compounds (VOCs) were also present. Based on the findings of the RI, the following actions were taken to remediate the Mauthe site and adjacent properties of the subsurface contamination.

IV Remedial Actions

Remedy Selection/Objectives

The site remedy, as outlined in the ROD dated March 31, 1994, entails the following activities:

- Demolition and removal of the buildings on the Mauthe property
- Excavation and off-site treatment of soils with a chromium concentration of greater than 500 mg/kg
- Backfilling of the excavation with clean soils, capping the site with 2 feet of clay and topsoil, and the establishment of a vegetative cover
- Installation of groundwater collection trenches and construction and operation of a groundwater treatment facility to contain and/or control groundwater contamination with ultimate compliance with groundwater applicable or relevant and appropriate requirements (ARARs)
- Improvement or installation of foundation drain systems and cleaning, painting or sealing of basement walls and floors, as needed, for homes and businesses in the area of the site, to prevent seepage of contaminated water into the buildings

Remedy Implementation

The U.S. EPA determined that the remedial action would be constructed in two phases. Phase 1 occurred from June 1995 to June 1996 and involved the excavation of contaminated soils and installation of the groundwater collection trenches and manholes. Excavated soil was characterized and appropriately disposed of or used as backfill on the site. Additional monitoring wells and piezometers were also constructed to monitor groundwater conditions over time. Residential foundation drain systems were also installed and connected to the groundwater collection trenches and interior floor and wall coatings were applied to the interior basement floors and walls. A two foot clay cap was constructed over the site followed by the placement of topsoil, seeding and mulch in June, 1996.

Phase 2 involved the construction of the groundwater treatment facility and occurred between August 1996 and May 1997. The groundwater collection trench system is over 1400 linear feet and approximately 30 feet deep. The collection trenches are equipped with 4 inch diameter drainpipes that drain groundwater to two deep manholes; each equipped with pumps that lift the collected groundwater to the treatment system in the plant. The groundwater treatment system is designed to control the concentration of total chromium and operates in batch mode, treating 2600 gallons per batch. Two chemical processes are used to treat chromium including the reduction of hexavalent chromium to trivalent chromium using ferrous sulfate. Chromium, along with other metals, are co-precipitated with sodium hydroxide. The chromium is removed by settling the hydroxide precipitate and collecting the metal hydroxide sludge. Treated effluent is discharged to the sanitary sewer in compliance with the City of Appleton's discharge permit for the site. A perimeter gate and fencing system was also installed around the site.

System Operations/O&M

Midwest Contract Operations (MCO) began operating the groundwater treatment system in 1997 under contract with EPA. WDNR took over responsibility for O & M in October, 1998. Each batch of groundwater collected by the collector trench is pumped to a 9000 gallon storage tank, located within the treatment building. Water is then pumped from the storage tank to the reaction tank where it is mixed with ferrous sulfate and caustic additions for treatment. Through chemical addition, mixing, aeration, and settling, the chromium is removed from the groundwater. Treated groundwater is then conveyed to the City of Appleton sanitary sewer system. The chromium containing sludge settles to the bottom of the reaction tank and excess sludge is pumped to a sludge storage tank. Effluent is tested for chromium with a Hach test kit after each treated batch and is tested quarterly for total chromium at a WDNR approved laboratory.

Progress Since the Last Five Year Review

This is the first five year review for the Site.

V Five Year Review Findings

The groundwater treatment operations began in February 1997. EPA operated the treatment plant until October 1998, when the WDNR assumed the responsibility from EPA. MCO has been retained by the WDNR for the operation and maintenance of the entire groundwater treatment system, including the groundwater monitoring wells. As of September, 2000, MCO has completed eight rounds of groundwater sampling and is operating the batch treatment process, which is designed to remove chromium from the groundwater.

Figure 1 Groundwater cleanup standards

<u>Compound</u>	<u>Cleanup Standard</u>
Cadmium	5 parts per billion (ppb)
Chromium	50 ppb
Cyanide	200 ppb
Copper	1000 ppb
Mercury	2 ppb
Manganese	50 ppb
Zinc	5,000 ppb
Chloroform	6 ppb
1,1-Dichloroethane	850 ppb
1,1-Dichloroethene	7 ppb
1,2-Dichloroethene (cis/trans)	70/100 ppb
Toluene	343 ppb
1,1,1-Trichloroethane	200 ppb
1,1,2-Trichloroethane	0.6 ppb
Trichloroethene	5 ppb
Benzene	5 ppb
Xylene (total)	620 ppb

Figure 2 City of Appleton POTW discharge limits

<u>Compound</u>	<u>Discharge Criteria</u>
Hexavalent Chromium	4500 ppb
Chromium(total)	7000 ppb
Aluminum	70,000 ppb
Cadmium	400 ppb
Copper	3500 ppb
Lead	2000 ppb
Mercury	2 ppb
Nickel	2000 ppb
Zinc	8500 ppb
Cyanide	300 ppb

In December 1999, a request for a reduction in groundwater monitoring, submitted by the WDNR, was received by EPA. This request asked for; elimination of quarterly copper, zinc, mercury and cyanide sampling at all site wells due to the lack of detections in site sampling; reduction of sampling frequency for VOCs at the following monitoring wells-W-2, W-8, W-15, MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, and MW-108 due to lack of detections in site sampling and; elimination of the weekly testing for Total Suspended Solids (TSS) on the treated effluent-the effluent is already sampled for hexavalent chromium and the POTW permit does not require TSS sampling.

The EPA reviewed this request, along with the accompanying concentration trend graphs and approved this reduction in monitoring on January 18, 2000.

The site visit demonstrated that all components of the site remedy are working properly.

VI Assessment

The groundwater flow patterns demonstrate that the groundwater collection trench system is creating a capture zone that prevents the contamination plume from expanding and directs the groundwater to the trenching, and ultimately, the remediation system. There have been no exceedances of the City of Appleton Industrial Discharge Permit for the treated effluent.

Data collected to date shows stable concentrations in the site monitoring wells with the exception of MW-103, MW-104 and MW-107. Currently, exceedances of DNR NR 140.10 ES standards for chromium and VOCs exist but are being contained by the groundwater trenching system. Additional monitoring data is needed before a proper trend analysis can be done on the monitoring data to more fully evaluate treatment system effectiveness at achieving remediation goals and reductions in site contaminant concentrations.

During review of the site groundwater monitoring data, a question arose regarding the groundwater sampling protocol. From October 1998 to December 2000, groundwater samples were not filtered for metals analysis. The QAPP calls for unfiltered sampling for metals while the Field Sampling Plan calls for filtered samples. Beginning with the March 2001 sampling round, samples will again be filtered, which is the correct sampling procedure for groundwater for O&M sampling. It remains to be determined if the initial system sampling in 1997 was filtered or unfiltered. This needs to be determined in order for a proper trend analysis to be performed.

WDNR staff presented a conceptual plan for an alternate groundwater treatment at the site visit. Current groundwater treatment consists of addition of ferrous sulfate and caustic solution with mixing, aeration, and settling to remove chromium from the groundwater. The alternate treatment proposed uses a canister system that utilizes ion exchange resins to remove the chromium. The canisters could then be recycled instead of requiring additional ferrous sulfate material. A treatability study will be completed in April with results communicated to EPA shortly thereafter as to the treatment effectiveness and the cost effectiveness of changing treatment. The City of Appleton is comfortable with this ion exchange resin technology so any decision would be based solely on effectiveness.

Direct groundwater discharge to the City of Appleton POTW was also discussed at the site visit. Influent sampling appears to indicate that groundwater quality may be good enough that ferrous sulfate treatment may not be necessary to directly discharge to the POTW. The Hach testing for hexavalent chromium that is conducted on each batch of treated groundwater for discharge has been utilized for reporting purposes for compliance with the POTW permit. A correlation

between the results of the Hach test and actual laboratory results can be developed to use in making the decision whether bypassing the treatment and directly discharging to the City can be done, while meeting permit standards. The WDNR has begun the process of determining whether a correlation can be made between the two methods and will continue to do so at the suggestion of EPA. The POTW permit was recently renewed (fall 2000) for a two year period and any changes to groundwater treatment could be factored into the next permit renewal, scheduled for fall 2002.

After analysis of groundwater collected to date, it appears that contaminant concentrations are rising at MW-107, the well located in the source area, as well as at MW-103 and MW-104, the two wells immediately downgradient of the source area. A trend analysis should be initiated to further investigate this phenomenon and thought should be given to try to determine why concentrations are rising in this area, especially considering that a soil removal has removed the majority of the source area contamination.

VII Deficiencies

At present, the site remedy is performing adequately and achieving ROD performance standards. There are no deficiencies at present with any component of the implemented remedy.

VIII Recommendations and Required Actions

This five year review report has summarized the current remedial activities at the Site and also describes the future monitoring activities at the Site. The following actions are recommended for continued operation and maintenance of site remedies.

The groundwater collection and treatment system should continue to be operated, providing downgradient containment of the VOC and hexavalent chromium contaminant plumes.

It is recommended that the current groundwater monitoring data be studied to prepare a trend analysis report to evaluate contaminant trends in groundwater near the Site. This report should also include an analysis of the current monitoring network to determine the optimal configuration and frequency for Site remedy monitoring.

The results of the groundwater treatment treatability study should be shared with the EPA along with any recommendations to change groundwater treatment. EPA would then determine if an Explanation of Significant Differences would be required for such a change.

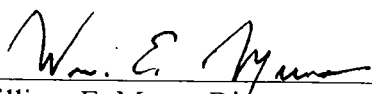
If results of the treatability study are not favorable for such a change, then WDNR should complete their development of a correlation between the Hach test kit and laboratory sampling to determine if direct discharge to the Appleton POTW is possible.

IX Protectiveness of Remedy

The remedy for the NW Mauthe Site is protective of human health and the environment.

X Next Review

The next five year review will be conducted within five years of the completion of this report, which will be April, 2006.



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4/26/01

Date