



442034

**FIVE-YEAR REVIEW REPORT FOR
SPARTAN CHEMICAL COMPANY SUPERFUND SITE
WYOMING, KENT COUNTY, MICHIGAN**



Prepared by

**U.S. Environmental Protection Agency
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Approved by:

Date:

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9/28/12

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LIST OF ABBREVIATIONS

AS	Air Sparging
AS/SVE	Air Sparging/Soil Vapor Extraction
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene (collectively)
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
C.F.R.	Code of Federal Regulations
FS	Feasibility Study
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
ICs	Institutional Controls
MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
NCP	National Contingency Plan
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SVE	Soil Vapor Extraction
USTs	Underground storage tanks
UU/UE	Unlimited Use/Unrestricted Exposure
VOCs	Volatile Organic Compounds

EXECUTIVE SUMMARY

The Michigan Department of Environmental Quality (MDEQ) is the lead technical agency at the Spartan Chemical Company Site. The U.S. Environmental Protection Agency (EPA) is the support agency for this project. An interim Record of Decision (ROD) was issued in 1993 for groundwater, designated in this report as the groundwater operable unit or operable unit 2 (OU2). A second interim ROD was issued in 1998 for soils, designated in this report as the soils operable unit or operable unit 1 (OU1). A ROD addressing both soils and groundwater was subsequently issued in 2007. The remedy selected in the 2007 ROD is expected to be the final remedial action at the site.

The interim groundwater remedy selected in the 1993 ROD was never implemented due to the disposal location for treated groundwater not being accepted by the local municipality, and no other viable disposal location was available. Construction of a soil vapor extraction (SVE) system pursuant to the 1998 ROD began in September 1999. However, operation of the SVE system was terminated in 2005, as removal efficiency had declined until contaminants were no longer being removed. Although actions taken pursuant to the 1993 and 1998 RODs, did not fully remediate the site, more than 20,000 pounds of volatile organic compounds (VOCs) were removed by the SVE system under the 1998 ROD.

The final site-wide remedy for soils and groundwater selected by the 2007 ROD, which effectively replaced the remedies selected in the two interim RODs, is currently being designed. Completion of the design is expected by December 2012. Both the remedial design and the remedial action at the Spartan Chemical Site are state-lead, fund-financed actions. The start of the remedial action is dependent upon the availability of federal funding.

A protectiveness determination for the site cannot be made until further information is obtained. There are no current human exposures to contaminated soils or groundwater, but vapor intrusion has not been fully investigated. MDEQ is currently evaluating the potential for vapor intrusion at nearby businesses and residences. A protectiveness determination will be made after those investigations are complete. MDEQ's vapor intrusion investigations are expected to be completed by December 2012, and EPA expects to make a protectiveness determination in a five-year review addendum by June 2013.

Long-term protectiveness of the remedy will require implementation of the remedy selected in the 2007 ROD, including compliance with effective ICs. A full evaluation of ICs will be conducted during design and implementation of the remedy and an IC Plan will be prepared.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Spartan Chemical Co.		
EPA ID: MID079300125		
Region: 5	State: MI	City/County: Wyoming / Kent
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	Has the site achieved construction completion? No	
REVIEW STATUS		
Lead agency: MDEQ		
Author name (Federal or State Project Manager): James Hahnenberg		
Author affiliation: EPA		
Review period: December 12, 2011 to September 2012		
Date of site inspection: May 1, 2012		
Type of review: Statutory		
Review number: First		
Triggering action date: September 27, 1999		
Due date (<i>five years after triggering action date</i>): September 27, 2004		

Five-Year Review Summary Form (continued)

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
None

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 1 & 2	Issue Category: Remedy Performance			
	Issue: Unknown whether vapor intrusion is an issue at nearby businesses and residences			
	Recommendation: Complete vapor intrusion investigations at nearby businesses and residences.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	MDEQ	EPA	December 2012

Protectiveness Statement(s)

<i>Operable Units:</i> 1 & 2	<i>Protectiveness Determination:</i> Protectiveness Deferred	<i>Addendum Due Date:</i> June 30, 2013
<p><i>Protectiveness Statement:</i> A protectiveness determination for the site cannot be made until further information is obtained. There are no current human exposures to contaminated soils or groundwater, but vapor intrusion has not been fully investigated. MDEQ is currently evaluating the potential for vapor intrusion at nearby businesses and residences. A protectiveness determination will be made after those investigations are complete. MDEQ's vapor intrusion investigations are expected to be completed by December 2012, and EPA expects to make a protectiveness determination in a five-year review addendum by June 2013.</p> <p>Long-term protectiveness of the remedy will require implementation of the remedy selected in the 2007 ROD, including compliance with effective ICs. A full evaluation of ICs will be conducted during design and implementation of the remedy and an IC Plan will be prepared.</p>		

Five-Year Review Report

I. Introduction

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

EPA prepared this five-year review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (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.

EPA interpreted this requirement further in the NCP at 40 C.F.R. § 300.430(f)(4)(ii), which 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.

EPA Region 5 conducted a five-year review of the remedial actions at the Spartan Chemical Company Site in Kent County, Michigan. This statutory review was conducted from December 9, 2011 through September 2012. This report documents the results of the review.

This is the first five-year review for the site. The triggering action for this review is the start date of the interim remedial action on September 27, 1999. Statutory five-year reviews are required due to the fact that hazardous substances, pollutants, or contaminants remain at the site and are above levels that allow for unlimited use and unrestricted exposure (UU/UE).

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
Spartan Chemical operated as a bulk chemical transfer, blending and repackaging plant	1952 to 1992
Discharge of process water to groundwater by Spartan Chemical. Michigan Department of Natural Resources (MDNR) also reported three minor chemical spills.	Prior to 1963
Initial discovery of ground contamination	1975
Kent County conducts street survey to determine usage of private residential wells north of areas with ground contamination	1981
Spartan Chemical Company retains STS Consultants to conduct hydrogeological investigation	1981
Site placed on the National Priorities List	September 8, 1983
Chemical spill (no information is available on the chemical spilled)	1987
Groundwater treatment system installed by MDNR	1988
Spartan Chemical Company removes 5 underground storage tanks (USTs) containing acetone, methyl ethyl ketone, isopropyl alcohol, and toluene	October 11, 1989
Bankruptcy filed by Spartan Chemical Company	February 1992
Remedial investigation/feasibility study (RI/FS) released by MDNR	October 1992
Groundwater treatment system installed in 1988 is shutdown	January 1993
Interim action ROD for groundwater remediation (OU2) issued by MDNR and EPA	June 29, 1993
Explanation of Significant Differences (ESD) issued by MDNR and EPA to postpone design of groundwater treatment system modifications	July 11, 1995
Follow-up RI issued by MDNR	October 1996
Focused FS for soils issued by MDNR	October 1997
Interim ROD for soils (OU1) issued by MDEQ and EPA	April 9, 1998
Construction of SVE system began pursuant to 1998 interim ROD	September 27, 1999
Kent County (owner of property through tax reversion) places restrictive covenant on the Spartan Chemical Company property	October 2003
SVE system was shut down	2005
ROD for final remedial action to address soils and groundwater (OU1 and OU2) issued by MDEQ and EPA	September 26, 2007
Remedial design starts for remedy selected in 2007 ROD	February 3, 2010

III. Background

Physical Characteristics

The site is a 5-acre industrial property located at 2539 28th Street in the City of Wyoming, Michigan, approximately one block northwest of the intersection of Byron Center Avenue and 28th Street. The Spartan Chemical Company property is in the Grand River drainage basin and exhibits approximately 13 feet of topographic relief across the site. Site elevations range from 615 to 628 feet above mean sea level north to south across the property. Local surface drainage likely drains to the low-lying area on-site with possible drainage to the nearby storm sewer. Roy's Creek is located approximately 800 feet west of the site. The general site location is shown in Figure 1.

The Michigan Department of Environmental Quality is the lead agency for this state-lead, fund-financed project. EPA is the support agency.

Land and Resource Use

The site property is comprised of approximately five acres and is bordered by a school and residential area to the east, commercial properties to the south, and industrial properties to the north and west. Nearby businesses/industries include metal stamping and finishing plants, construction industry suppliers, a former plating facility, and a former paper/packaging plant. Figure 2 shows the general site area and Figure 3 shows the proximity of the school to the southeastern portion of the site.

The local area is serviced by the City of Wyoming municipal water supply and sanitary sewer system. The municipal water supply system draws its water from Lake Michigan. No private wells are known to exist in the general vicinity of the site. Therefore, the use of groundwater as a drinking water source is not anticipated in the future, even though the aquifer is classified as a potential drinking water aquifer.

Based upon current zoning, nearby land use, and MDEQ discussions with county officials, the anticipated future land use of the site is commercial/industrial and the area surrounding the site is anticipated to remain a mixture of residential, commercial, and industrial land use.

History of Contamination

From 1952 to 1992, the Spartan Chemical Company operated as a bulk chemical transfer, blending, and repackaging plant. During its operation, Spartan Chemical Company handled a variety of chemicals, including aromatic solvents, naphthas, alcohols, ketones, ethers, chlorinated solvents, and lacquer thinners. The Spartan Chemical Company filed for bankruptcy in 1992, and the site has been vacant since that time.

The MDEQ (formerly known as MDNR) reported that the Spartan Chemical Company discharged its wastewater to the groundwater prior to 1963. Groundwater contamination consisting of various solvents was detected in December 1975 during dewatering operations at

an adjacent facility (the former Slagboom Tool & Die facility, currently Ambassador Steel, located immediately west of the site; see Figure 2). At that time, Spartan Chemical Company was the only known handler of solvents in the area. Specifically, the contamination included VOCs such as benzene, toluene, ethylbenzene, and xylene, (collectively referred to as BTEX compounds), as well as various ketones and alcohols. The MDEQ also reported that plant personnel documented three minor chemical spills before 1963.

In 1981, the Spartan Chemical Company retained STS Consultants to conduct a hydrogeologic investigation at the site. From available information, 14 monitoring wells (OW-1 through OW-14) were installed on or north of the site and sampled in August 1981. The analyses identified VOC contaminants, specifically methylene chloride, acetone, 1,1,1-trichloroethane, trichloroethylene, toluene, methyl ethyl ketone, and xylene.

Initial Response

On September 8, 1983, EPA added the site to the National Priorities List, making the site eligible for further study and remediation under the federal Superfund program. The Spartan Chemical Company signed a Consent Order with the MDNR on September 20, 1984, to conduct an investigation and cleanup of contaminated groundwater originating from activities that had occurred at the site.

The Spartan Chemical Company conducted additional investigations in 1986 as required by the Consent Order. Nineteen new monitoring wells (OW-15 through OW-28 and MW-29 through MW-33) and four replacement monitoring wells (MW-10, MW-11, MW-13, and MW-14) were installed as part of these investigations.

According to the MDNR, chemical spills were reported in 1987 and 1990. Both were a result of overfilling of tanker trucks. The 1987 spill was reportedly contained within secondary containment walls, and the 1990 spill (estimated at 50 gallons of a solvent blend containing acetone, toluene, methyl isobutyl ketone, and cyclohexanone) was absorbed by sand and absorbent pads, which were removed by a licensed hazardous waste hauler.

An air stripping groundwater treatment system was installed at the site in 1988, but the system was shut down in January 1993 because of concerns with the impact of discharging treated site water to the City of Wyoming Wastewater Treatment Plant.

In October 1989, five underground storage tanks at the site were removed. The MDNR advised Spartan Chemical Company that the soils at the UST locations needed to be addressed. However, due to company's financial constraints, no soils were removed.

In May 1992, EPA conducted a site assessment, inclusive of groundwater sampling and analyses, to evaluate the need for an emergency response action at the site. EPA determined that an emergency response action was not necessary.

Basis for Taking Action

The MDNR released a Final Remedial Investigation/Feasibility Study Summary document in October 1992. This document summarized work performed in the various previous investigations and provided a summary of the proposed remedial action plan. This summary also indicated that the extent of soil contamination at the site was difficult to determine because of limited soil sampling. It also stated that additional investigations were necessary to better define the boundaries of soil contamination and evaluate the potential source areas. EPA and MDNR issued an interim ROD in June 1993 to address contaminated groundwater at the site. The 1993 ROD did not address soils for the reasons described above, but required additional investigations to better characterize the site, particularly focusing on potential source areas.

The additional investigation to better characterize the site was initiated in 1994, with MDNR conducting the RI/FS. An RI Report was finalized in October 1996. This report summarized investigation activities, the nature and extent of soil and groundwater contamination, and the potential risks associated with exposure to the contamination. MDNR completed a Focused Feasibility Study Report in October 1997 that evaluated remedial alternatives for the cleanup of the contaminated soil.

IV. Remedial Actions

Remedy Selection

1993 Interim Record of Decision for Groundwater (OU 2)

On June 29, 1993, EPA and MDNR issued an interim ROD for remediation of groundwater at the site. The primary objectives of the interim action were to control the further migration of groundwater contamination off-site and to treat on-site groundwater contamination. The major components of the selected interim action included:

- Evaluation of the existing groundwater collection and treatment system and of discharge options available for the treated groundwater. The ROD stated that this evaluation process may result in modifications to the existing treatment system and/or relocation of the discharge point;
- Restart of the existing groundwater collection and treatment system; and
- Groundwater monitoring to evaluate the effectiveness of the groundwater collection and treatment system.

The groundwater treatment system ceased operation because the City of Wyoming determined it was not acceptable for site water to be processed by its wastewater treatment system. Restarting the groundwater treatment system did not occur. Because the 1993 ROD was an interim remedial action decision document, it did not specify groundwater cleanup standards.

1995 Explanation of Significant Differences (OU 2)

On July 11, 1995, EPA and MDNR issued an ESD was issued to postpone the design of the groundwater treatment system modifications called for in the 1993 ROD until all source area and groundwater data could be evaluated. The 1995 ESD was issued because data collected during the source area RI indicated the following: the treatment system was not effective in reducing the migration of contaminants and the interim action alone would not likely improve the effectiveness of the existing treatment system nor meet this primary objective of the 1993 ROD; total capture of the plume by the system was likely not possible; a discharge facility for the treated groundwater could not be found; and secondary treatment would be necessary to meet discharge limits. The ESD stated that the time and expense associated with completing the design and construction work to simply return the system to operation was not warranted.

The source area data and configuration of the confining clay layer indicated that the existing treatment system would not sufficiently capture or contain the contaminant plume, based on the extent and concentrations of contamination being greater than previously known. Therefore, more substantial groundwater and source control measures than the system described in the 1993 ROD would be needed.

1998 Interim Record of Decision for Soils (OU 1)

On April 9, 1998, EPA and MDEQ issued an interim ROD for remediation of VOC-contaminated soils at the site. The selected remedy was designed to remediate soils to state generic residential cleanup criteria using the soil criteria protective of groundwater as a drinking water source. The primary components of the remedy included the following:

- SVE technology for remediation of the VOCs in soil; and
- Treatment of the off-gases generated from the SVE process to meet acceptable air quality standards.

As described in further detail in the "Remedy Implementation" section of this report, the interim remedy selected in the 1998 ROD was implemented, and the SVE system operated for a few years before it was shut down in 2005.

2007 Record of Decision – Site-wide Remedy (OUs 1 and 2)

On September 26, 2007, EPA and MDEQ issued a final ROD to address soils and groundwater contamination at the site. The major components of the selected remedy are as follows:

1. Excavation and off-site disposal of highly-contaminated soils;
2. Expansion of the SVE system for mitigation of vapors from soils;
3. Air sparging/SVE;
4. In-situ chemical oxidation;
5. Contingency for enhanced in-situ bioremediation (if necessary);
6. Institutional controls restricting groundwater use and land use; and
7. Monitored natural attenuation.

Remedy Implementation

As noted earlier, the interim groundwater remedy selected in the 1993 ROD was never implemented.

Construction of the SVE system called for in the 1998 ROD for soils began on September 27, 1999, and was completed in the spring of 2001. The SVE system began full-time operation in April 2003 following a lengthy wastewater permit approval process. Between April 2003 and November 2005, the system removed more than 20,000 pounds of VOCs from the site. Replacement of the SVE system was determined to be necessary, as the majority of the VOC mass was removed during the first year of operation and the system efficiency decreased substantially after November 2005. Total VOC concentrations from the individual vapor extraction wells, based on sampling performed in November 2005, confirmed that cleanup goals in the 1998 ROD were not met and would probably not be met by continued operation of the existing system. Based on the individual well head sampling results and the VOC mass removal, SVE was found to still be a viable technology for the site, although adjustments were determined to be necessary and the system would need to be replaced to be fully effective, implementable, and cost effective. The subsequent ROD in 2007 called for such improvements to the SVE system, including substantially increasing the capacity of the system, and utilizing air sparging of groundwater and other technologies to meet cleanup goals at the site.

MDEQ is conducting the remedial design for the final remedy selected in the 2007 ROD, and completion of the remedial design is expected by December 2012. Following completion of the design, implementation of the remedial action is dependent on the availability of federal funding. Once initiated, construction of the remedy is expected to take approximately 2 years to complete. Operation of the AS/SVE system will likely continue for at least five years. The remedy is expected to be protective upon completion.

MDEQ is currently evaluating the potential for vapor intrusion at nearby businesses and residences to determine whether the vapor intrusion pathway is causing people to be exposed to site-related contaminants.

Institutional Controls

Institutional controls (ICs) are required to ensure the protectiveness of the remedy as described in the 2007 ROD. ICS are non-engineered instruments, such as administrative and/or legal controls, that help minimize the potential for exposure to contamination and protect the integrity of the remedy. Compliance with ICs is required to assure long-term protectiveness for any area that does not allow for unlimited use or unrestricted exposure.

In October 2003, Kent County – owner of the Spartan Chemical Company site property through tax reversion – implemented a Declaration of Restrictive Covenant to restrict land and groundwater use at the property. The 2007 ROD includes ICs as a component of the site-wide remedy, and states that the remedy includes the continuation of the IC currently in place at the site property. Additionally, the ROD states that an institutional controls plan will be prepared

during remedial design for both the site and nearby impacted properties, in order to prevent direct contact with or ingestion of contaminated soil and/or groundwater.

Table 2 summarizes the current status of ICs at the site. As noted in the table, MDEQ and EPA are evaluating the need for ICs at the Ambassador Steel facility and other nearby properties. As part of the implementation of the site-wide remedy, the need for additional ICs will be determined. In accordance with the ROD, an IC Plan will be developed that will specify the types and details of the necessary ICs.

Table 2. Institutional Controls Summary Media, Engineered Controls, & Areas that Do Not Support UU/UE Based on Current Conditions	Institutional Control (IC) Objective	Title of IC Instrument Implemented or Planned
Spartan Chemical Company property	<ul style="list-style-type: none"> • Prohibit unrestricted exposure to hazardous substances; • Restrict on-site groundwater use; • Restrict construction and demolition of existing structures unless plans are submitted and approved by MDEQ; • Prohibit negative impact on monitoring wells; • Restrict excavation or disturbance of soils, unless approved by MDEQ; • Indoor inhalation criteria of Part 201 should be satisfied; and • Restrict activities that may interfere with response activities, including interim response, remedial action, operation and maintenance, monitoring, or other measures necessary to ensure the effectiveness and integrity of the remedial action. 	Declaration of Restrictive Covenant, implemented on October 7, 2003
Ambassador Steel property and other properties (under investigation)	Restrict soil excavations and building or slab demolition, if required	Environmental Covenant – under investigation/ consideration as part of site-wide remedy
Areas of off-site groundwater contamination (under investigation)	Restrict off-site groundwater use	Environmental Covenant -- under investigation/ consideration as part of site-wide remedy

System Operations/Operation and Maintenance

The SVE system that was installed pursuant to the 1998 ROD operated for a few years but then was shut down in 2005. There are no current systems operating at the site, and there are no ongoing operation and maintenance activities.

V. Progress Since the Last Review

This is the first five-year review for the site, although the triggering action for this review was the initiation of the interim remedial action on September 27, 1999. From April 2003 to November 2005, 20,070 pounds of contaminants were removed from soils at the site. Operation of the interim SVE system was terminated after November 2005 when the system was no longer removing contamination in significant quantities. Further investigations and evaluations led to the selection of a final remedy for the site in a 2007 ROD that addressed both soils and groundwater. MDEQ began the remedial design in February 2010 is expected to complete the RD by December 2012.

VI. Five-Year Review Process

Administrative Components

During December 2011, after discovering that a five-year review should have been conducted within five years of the initiation of the 1999 remedial action work, EPA notified MDEQ that it was undertaking a five-year review at the site.

Community Notification and Involvement

EPA intended to place an advertisement notice regarding the initiation of the five year-review process in the newspaper for public review, but due to an administrative error, the public notice advertisement was not placed. Following the signature of this report, EPA will place a public notice advertisement in the newspaper regarding the completion of the five-year review.

Document Review

EPA reviewed historical reports and recent remedial design evaluations developed by MDEQ. The complete list of documents reviewed is as follows:

- a. MACTEC Engineering and Consulting of Michigan, Inc., prepared for MDEQ, Spartan Chemical Company Superfund Site, AS/SVE Pilot Study Work Plan, August 2010.
- b. MACTEC Engineering and Consulting of Michigan, Inc., prepared for MDNR, Spartan Chemical Company Superfund Site, In-Situ Chemical Oxidation, Treatability Study and Pilot Test Work Plan, August 2010.
- c. MACTEC Engineering and Consulting of Michigan, Inc., prepared for MDNR, Spartan Chemical Company Superfund Site, Remedial Design Work Plan, August 2010.
- d. MACTEC Engineering and Consulting of Michigan, Inc., prepared for MDNR, Spartan Chemical Company Superfund Site, Vapor Intrusion Assessment Work Plan, August 2010.

- e. Record of Decision, Spartan Chemical Company Superfund Site, September 26, 2007 (issued by MDEQ and EPA).
- f. Interim Action Record of Decision for the Spartan Chemical Company Superfund Site, Kent County, Michigan, April 9, 1998 (issued by MDEQ and EPA).
- g. Explanation of Significant Differences, Spartan Chemical Superfund Site, Wyoming, Kent County, Michigan, July 11, 1995 (issued by MDNR and EPA).
- h. Record of Decision, Spartan Chemical, June 29, 1993 (issued by MDNR and EPA).

Data Review

During the five-year review, EPA reviewed pre-design data and historical data from the site. Information reviewed was contained in the 1993 ROD, the 1998 ROD, the 2007 ROD, and other documents cited in the "Document Review" section of this report. It should be noted that the data review conducted during this five-year review was not done for the purpose of evaluating the effectiveness of the remedy, since the remedy selected in the 2007 ROD – which replaced the remedies selected in the two interim RODs – has not yet been implemented.

Site Inspection

James Hahnenberg, EPA remedial project manager, conducted a site inspection on May 1, 2012. A representative of MACTEC (MDEQ contractor) accompanied Mr. Hahnenberg. Observations were made of site conditions and measures in place to mitigate risks (i.e., to prevent public access to the site). The fencing around the site appeared secure and well-maintained. Roads on the Spartan Chemical site property are in fair condition and adequate for purposes of accessing different portions of the site.

VII. Technical Assessment

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

No. The interim groundwater remedy selected in the 1993 ROD was never implemented, and the interim remedy for soils selected in the 1998 ROD operated for just a few years before it was shut down. The site remedy selected in the 2007 ROD is currently being designed and will be constructed in accordance with the requirements of the ROD and design specifications. The remedy is expected to be protective upon completion. MDEQ is currently evaluating the potential for vapor intrusion at nearby businesses and residences, and additional actions may be needed to address vapor intrusion, if it is occurring.

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

Yes. The exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection are still valid. Site conditions are essentially unchanged since the 2007 ROD. More than 20,000 pounds of VOCs were removed by the interim SVE system installed pursuant to the 1998 ROD.

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

No. At this time, nothing has come to light that would call into question the protectiveness of the planned remedy.

Technical Assessment Summary

The final remedy is currently being designed, and will be constructed in accordance with the requirements of the 2007 ROD. The remedy is expected to be protective upon completion and is expected to meet the 2007 ROD cleanup standards. MDEQ is currently assessing areas overlying groundwater contamination for possible vapor intrusion in nearby businesses and residences (see Figure 4). The exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection are still valid, and there is no other information that calls into question the expected protectiveness of the remedy.

VIII. Issues

The final site-wide remedy selected in the 2007 ROD has not yet been implemented but is expected to be protective when it is complete. As part of the design and implementation of the remedy selected in the 2007 ROD, ICs for the site property as well as all impacted off-site areas will be evaluated and an IC Plan prepared.

An investigation regarding possible vapor intrusion at nearby businesses and residences is currently underway. Pending the outcome of that investigation, vapor intrusion mitigation measures at those properties may be required.

Table 3 below lists the issues that were identified during this five-year review that affect the protectiveness of the remedy.

Table 3. Issues

Issue	Affects Current Protectiveness	Affects Future Protectiveness
Unknown whether vapor intrusion is an issue at nearby businesses and residences	No	Yes

IX. Recommendations and Follow-Up Actions

Table 4. Recommendations and Follow-Up actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
Unknown whether vapor intrusion is an issue at nearby businesses and residences	Complete vapor intrusion investigations at nearby businesses and residences	MDEQ	EPA	December 2012	No	Yes

X. Protectiveness Statement(s)

A protectiveness determination for the site cannot be made until further information is obtained. There are no current human exposures to contaminated soils or groundwater, but vapor intrusion has not been fully investigated. MDEQ is currently evaluating the potential for vapor intrusion at nearby businesses and residences. A protectiveness determination will be made after those investigations are complete. MDEQ's vapor intrusion investigations are expected to be completed by December 2012, and EPA expects to make a protectiveness determination in a five-year review addendum by June 2013.

Long-term protectiveness of the remedy will require implementation of the remedy selected in the 2007 ROD, including compliance with effective ICs. A full evaluation of ICs will be conducted during design and implementation of the remedy and an IC Plan will be prepared.

XI. Next Review

The next five-year review for the Spartan Chemical Company Site is required within five years of the signature date of this review.

Figures

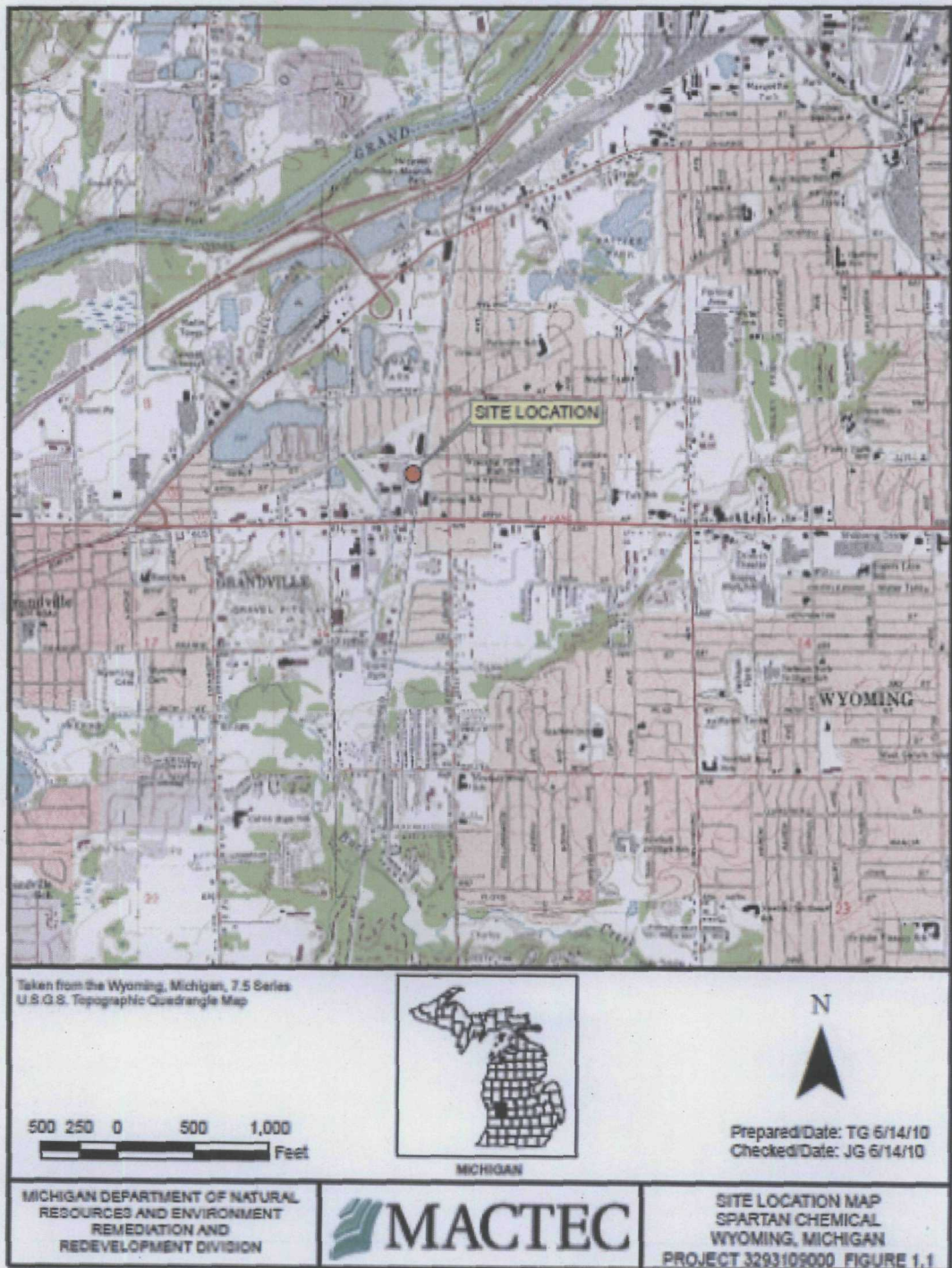


Figure 1. Spartan Chemical Company site location

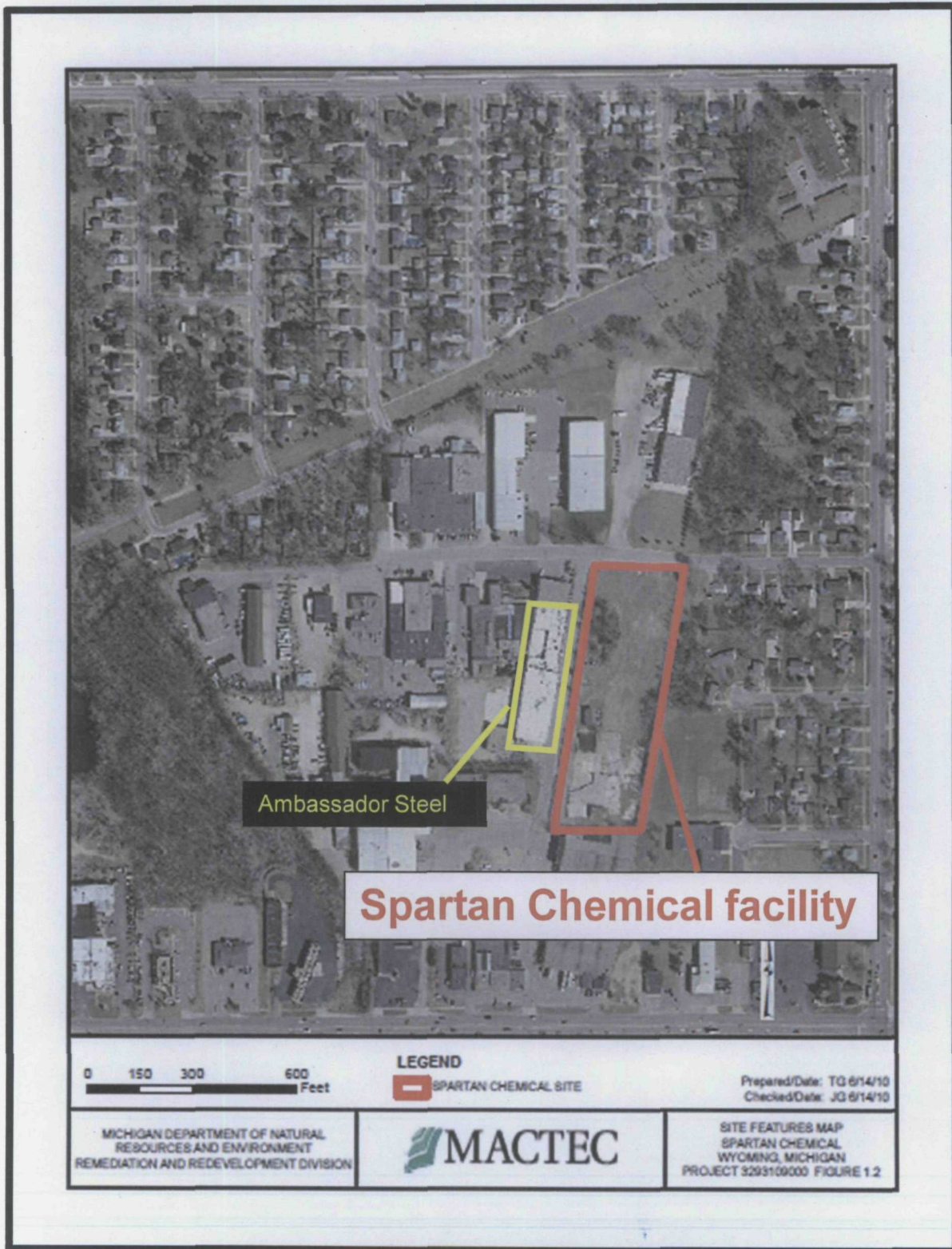


Figure 2. Spartan Chemical Company property and surrounding area



Figure 3. Southeastern portion of the Spartan Chemical Company Site, adjacent school property to the east, site fence, and excavation plans

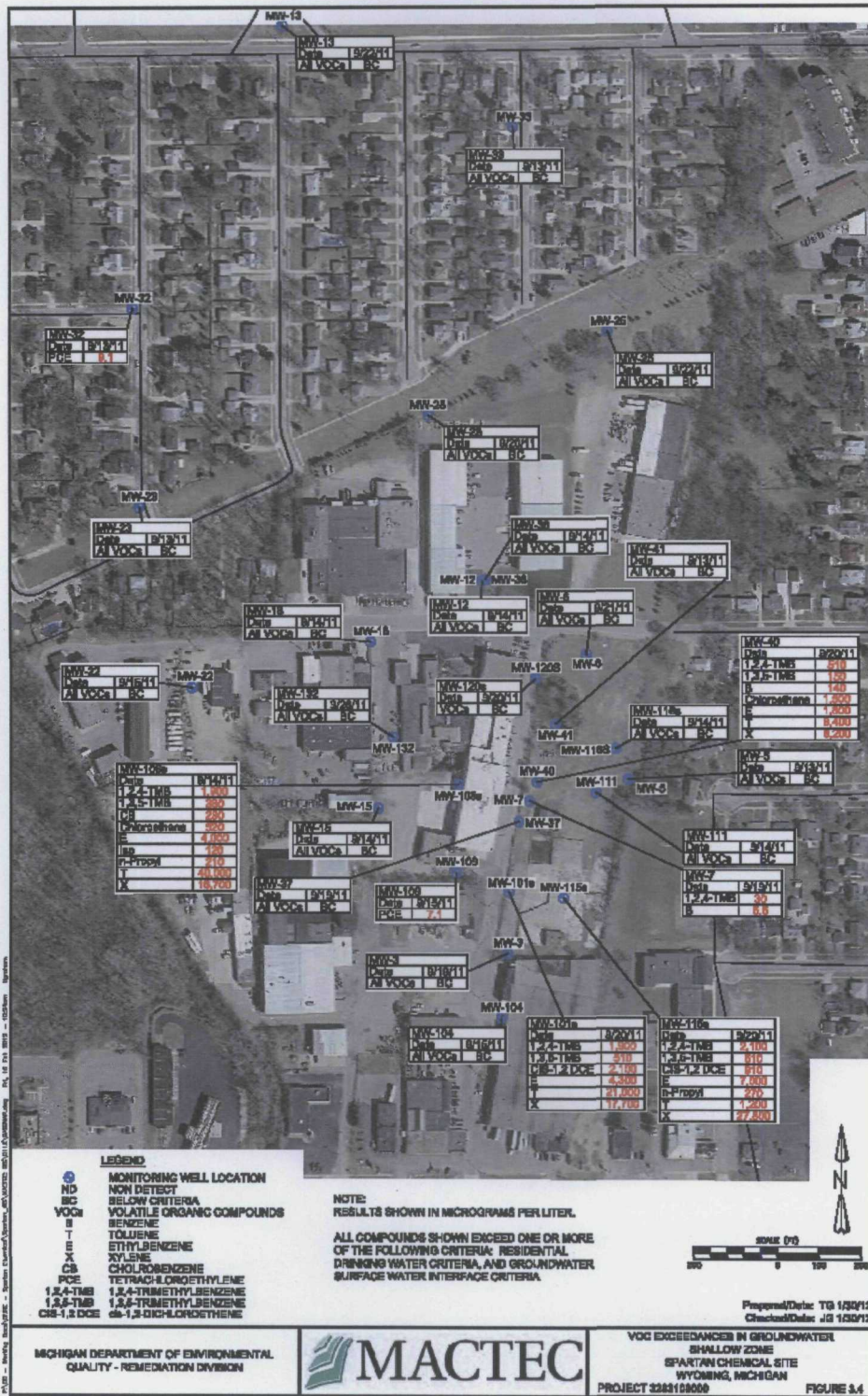


Figure 4. Spartan Chemical Company Site, groundwater contamination

Attachment 1

Site Inspection Checklist

Please note that "O&M" is referred to throughout this checklist. At sites where Long-Term Response Actions are in progress, O&M activities may be referred to as "system operations" since these sites are not considered to be in the O&M phase while being remediated under the Superfund program.

Five-Year Review Site Inspection Checklist (Template)

(Working document for site inspection. Information may be completed by hand and attached to the Five-Year Review report as supporting documentation of site status. "N/A" refers to "not applicable.")

I. SITE INFORMATION																	
Site name: <u>Spartan Chemical</u>	Date of inspection: <u>5-1-12</u>																
Location and Region: <u>Wyoming, WY - 5</u>	EPA ID: <u>MID679300125</u>																
Agency, office, or company leading the five-year review: <u>U.S. EPA - Region 5</u>	Weather/temperature: <u>cool - cloudy</u>																
Remedy Includes: (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Landfill cover/containment</td> <td style="width: 50%;">Monitored natural attenuation</td> </tr> <tr> <td>Access controls</td> <td>Groundwater containment</td> </tr> <tr> <td>Institutional controls</td> <td>Vertical barrier walls</td> </tr> <tr> <td>Groundwater pump and treatment</td> <td></td> </tr> <tr> <td>Surface water collection and treatment</td> <td></td> </tr> <tr> <td colspan="2">Other <u>Soils excavation & Air Sparging/Soil Vapor Extraction</u></td> </tr> <tr> <td colspan="2"><u>(as needed) In-situ chemical oxidation and enhanced bioremediation</u></td> </tr> </table>				Landfill cover/containment	Monitored natural attenuation	Access controls	Groundwater containment	Institutional controls	Vertical barrier walls	Groundwater pump and treatment		Surface water collection and treatment		Other <u>Soils excavation & Air Sparging/Soil Vapor Extraction</u>		<u>(as needed) In-situ chemical oxidation and enhanced bioremediation</u>	
Landfill cover/containment	Monitored natural attenuation																
Access controls	Groundwater containment																
Institutional controls	Vertical barrier walls																
Groundwater pump and treatment																	
Surface water collection and treatment																	
Other <u>Soils excavation & Air Sparging/Soil Vapor Extraction</u>																	
<u>(as needed) In-situ chemical oxidation and enhanced bioremediation</u>																	
Attachments: Inspection team roster attached	Site map attached																
II. INTERVIEWS (Check all that apply)																	
1. O&M site manager	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>														
	Name	Title	Date														
Interviewed at site	at office	by phone	Phone no. _____														
Problems, suggestions; Report attached _____																	

2. O&M staff	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>														
	Name	Title	Date														
Interviewed at site	at office	by phone	Phone no. _____														
Problems, suggestions; Report attached _____																	

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	Michigan Department of Environmental Quality			
Contact	Matthew Williams	Vapor Intrusion Specialist	5-1-12	(517) 373-4821
	Name	Title	Date	Phone no.
Problems; suggestions;	Report attached N/A			
Agency	_____			
Contact	_____	_____	_____	_____
	Name	Title	Date	Phone no.
Problems; suggestions;	Report attached _____			
Agency	_____			
Contact	_____	_____	_____	_____
	Name	Title	Date	Phone no.
Problems; suggestions;	Report attached _____			
Agency	_____			
Contact	_____	_____	_____	_____
	Name	Title	Date	Phone no.
Problems; suggestions;	Report attached _____			

4. **Other interviews** (optional) Report attached.

N/A

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	O&M Documents O&M manual As-built drawings Maintenance logs Remarks _____	Readily available Readily available Readily available	Up to date Up to date Up to date	<input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A
2.	Site-Specific Health and Safety Plan Contingency plan/emergency response plan Remarks _____	Readily available Readily available	Up to date Up to date	<input type="checkbox"/> N/A <input type="checkbox"/> N/A
3.	O&M and OSHA Training Records Remarks _____	Readily available	Up to date	<input type="checkbox"/> N/A
4.	Permits and Service Agreements Air discharge permit Effluent discharge Waste disposal, POTW Other permits _____ Remarks _____	Readily available Readily available Readily available Readily available	Up to date Up to date Up to date Up to date	<input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A
5.	Gas Generation Records Remarks _____	Readily available	Up to date	<input type="checkbox"/> N/A
6.	Settlement Monument Records Remarks _____	Readily available	Up to date	<input type="checkbox"/> N/A
7.	Groundwater Monitoring Records Remarks _____	Readily available	Up to date	<input type="checkbox"/> N/A
8.	Leachate Extraction Records Remarks _____	Readily available	Up to date	<input type="checkbox"/> N/A
9.	Discharge Compliance Records Air Water (effluent) Remarks _____	Readily available Readily available	Up to date Up to date	<input type="checkbox"/> N/A <input type="checkbox"/> N/A
10.	Daily Access/Security Logs Remarks _____	Readily available	Up to date	<input type="checkbox"/> N/A

IV. O&M COSTS																																																					
1.	O&M Organization State in-house PRP in-house Federal Facility in-house Other _____	Contractor for State Contractor for PRP Contractor for Federal Facility _____																																																			
2.	O&M Cost Records Readily available Up to date <i>N/A</i> Funding mechanism/agreement in place Original O&M cost estimate _____ Breakdown attached Total annual cost by year for review period if available <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">From _____</td> <td style="width: 15%;">To _____</td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 40%;">Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td>Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td>Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td>Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td>Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> <td></td> </tr> </table>			From _____	To _____			Breakdown attached	Date	Date	Total cost			From _____	To _____			Breakdown attached	Date	Date	Total cost			From _____	To _____			Breakdown attached	Date	Date	Total cost			From _____	To _____			Breakdown attached	Date	Date	Total cost			From _____	To _____			Breakdown attached	Date	Date	Total cost		
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Date	Date	Total cost																																																			
3.	Unanticipated or Unusually High O&M Costs During Review Period Describe costs and reasons: <i>N/A</i> _____ _____ _____ _____																																																				
V. ACCESS AND INSTITUTIONAL CONTROLS																																																					
			<i>Applicable</i> N/A																																																		
A. Fencing																																																					
1.	Fencing damaged Remarks _____	Location shown on site map	<i>Gates secured</i> N/A																																																		
B. Other Access Restrictions																																																					
1.	Signs and other security measures Remarks <i>None</i>	Location shown on site map	N/A																																																		

C. Institutional Controls (ICs)			
1.	Implementation and enforcement		
	Site conditions imply ICs not properly implemented	Yes	<input checked="" type="radio"/> No N/A
	Site conditions imply ICs not being fully enforced	Yes	<input checked="" type="radio"/> No N/A
	Type of monitoring (e.g., self-reporting, drive by) <u>Ongoing</u>		
	Frequency <u>monthly</u>		
	Responsible party/agency <u>M DER</u>		
	Contact <u>Matt Williams</u>	<u>Site Specialist</u>	<u>5-1-12</u> <u>517-373-4821</u>
	Name	Title	Date Phone no.
	Reporting is up-to-date <u>Vapor Intrusion Specialist</u>	Yes	No N/A
	Reports are verified by the lead agency	<input checked="" type="radio"/> Yes	No N/A
	Specific requirements in deed or decision documents have been met	<input checked="" type="radio"/> Yes	No N/A
	Violations have been reported	Yes	No <input checked="" type="radio"/> N/A
	Other problems or suggestions: Report attached		
2.	Adequacy	<input checked="" type="radio"/> ICs are adequate	<input type="radio"/> ICs are inadequate N/A
	Remarks		
D. General			
1.	Vandalism/trespassing	Location shown on site map	<input checked="" type="radio"/> No vandalism evident
	Remarks		
2.	Land use changes on site	<input checked="" type="radio"/> N/A	
	Remarks		
3.	Land use changes off site	<input checked="" type="radio"/> N/A	
	Remarks		
VI. GENERAL SITE CONDITIONS			
A. Roads	Applicable	N/A	
1.	Roads damaged	Location shown on site map	<input checked="" type="radio"/> Roads adequate N/A
	Remarks		

B. Other Site Conditions			
Remarks _____ _____ _____ _____			
VII. LANDFILL COVERS Applicable <u>N/A</u>			
A. Landfill Surface			
1.	Settlement (Low spots) Areal extent _____ Remarks _____	Location shown on site map Depth _____	Settlement not evident
2.	Cracks Lengths _____ Remarks _____	Widths _____ Depths _____	Cracking not evident
3.	Erosion Areal extent _____ Remarks _____	Location shown on site map Depth _____	Erosion not evident
4.	Holes Areal extent _____ Remarks _____	Location shown on site map Depth _____	Holes not evident
5.	Vegetative Cover Trees/Shrubs (indicate size and locations on a diagram) Remarks _____	Grass _____ Cover properly established	No signs of stress
6.	Alternative Cover (armored rock, concrete, etc.) Remarks _____		N/A
7.	Bulges Areal extent _____ Remarks _____	Location shown on site map Height _____	Bulges not evident

8.	Wet Areas/Water Damage Wet areas Ponding Seeps Soft subgrade Remarks _____	Wet areas/water damage not evident Location shown on site map Location shown on site map Location shown on site map Location shown on site map	Areal extent _____ Areal extent _____ Areal extent _____ Areal extent _____
9.	Slope Instability Areal extent _____ Remarks _____	Slides Location shown on site map	No evidence of slope instability
B. Benches Applicable <u>N/A</u> (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 Remarks _____	Location shown on site map	N/A or okay
2.	Bench Breached Remarks _____	Location shown on site map	N/A or okay
3.	Bench Overtopped Remarks _____	Location shown on site map	N/A or okay
C. Letdown Channels Applicable <u>N/A</u> (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 Areal extent _____ Remarks _____	Location shown on site map Depth _____	No evidence of settlement
2.	Material Degradation Material type _____ Remarks _____	Location shown on site map Areal extent _____	No evidence of degradation
3.	Erosion Areal extent _____ Remarks _____	Location shown on site map Depth _____	No evidence of erosion

4.	Undercutting	Location shown on site map _____ Depth _____	No evidence of undercutting
	Areal extent _____		
	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			
	Applicable	(N/A)	
1.	Gas Vents	Active	Passive
	Properly secured/locked	Functioning	Routinely sampled
	Evidence of leakage at penetration		Needs Maintenance
	N/A		
	Remarks _____		
2.	Gas Monitoring Probes	Functioning	Routinely sampled
	Properly secured/locked		Good condition
	Evidence of leakage at penetration		Needs Maintenance
	N/A		
	Remarks _____		
3.	Monitoring Wells (within surface area of landfill)	Functioning	Routinely sampled
	Properly secured/locked		Good condition
	Evidence of leakage at penetration		Needs Maintenance
	N/A		
	Remarks _____		
4.	Leachate Extraction Wells	Functioning	Routinely sampled
	Properly secured/locked		Good condition
	Evidence of leakage at penetration		Needs Maintenance
	N/A		
	Remarks _____		
5.	Settlement Monuments	Located	Routinely surveyed
	N/A		
	Remarks _____		

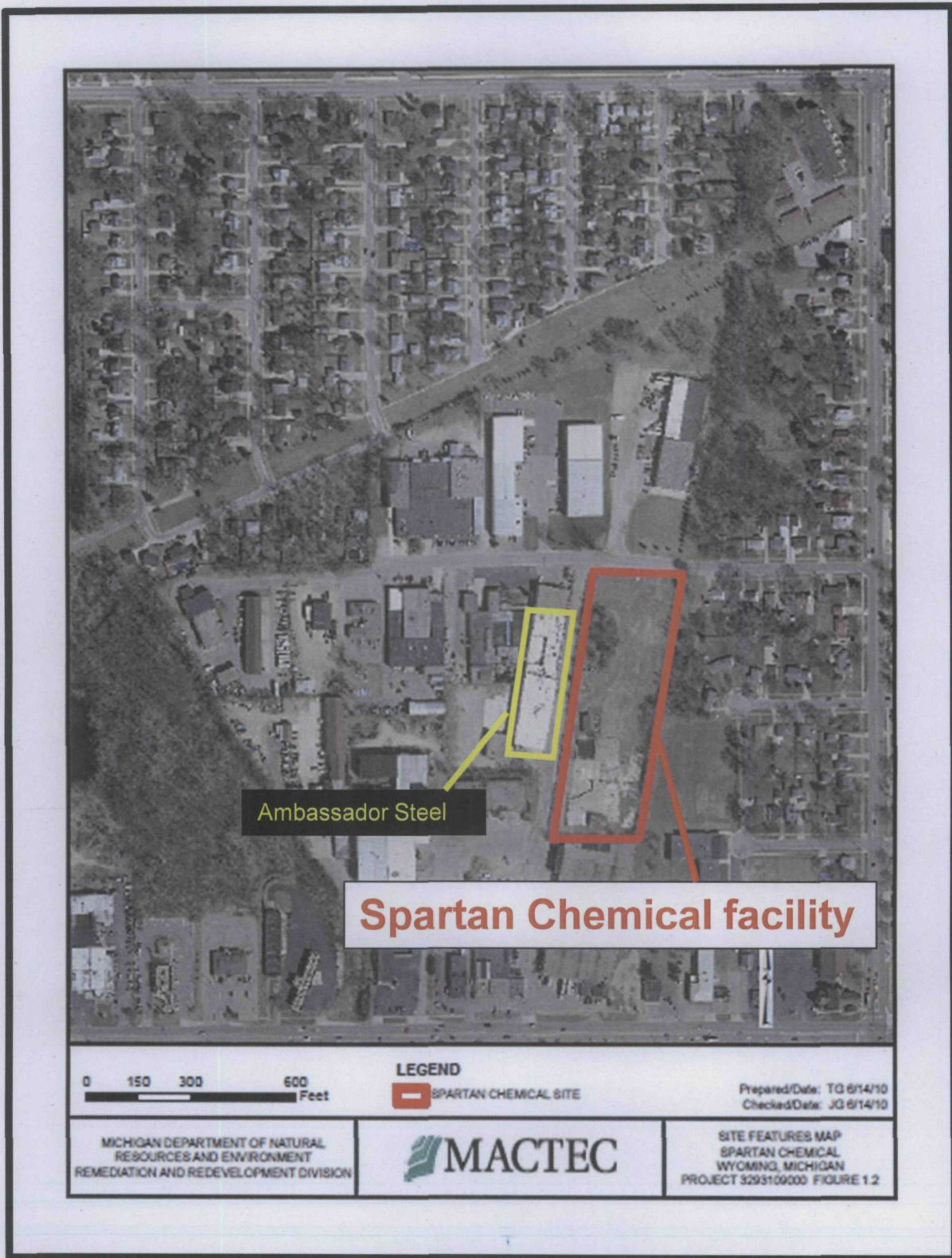


Figure 2. Spartan Chemical Company property and surrounding area