THIRD FIVE-YEAR REVIEW REPORT

FOR

PARSONS CHEMICAL WORKS, INC.
SUPERFUND SITE
EATON COUNTY, MICHIGAN

APRIL 2014

Prepared by

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4-11-14
Date

Five-Year Review Report

Table of Contents

Tables

Figures

Attachments

Appendices

List of Acronyms

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DRC	Declaration of Restrictive Covenant and Grant of Environmental Protection Easement
ETM	ETM Enterprises, Inc.
ICs	Institutional Controls
ISV	In-Situ Vitrification
MDNR	Michigan Department of Natural Resources
MDEQ	Michigan Department of Environmental Quality
MW	Monitoring Well
NCP	National Contingency Plan
NPL	National Priorities List
Parsons	Parsons Chemical Works, Inc.
Part 201	Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended
PCOR	Preliminary Close-Out Report
ppb	Parts per billion
ppm	Parts per million
RAOs	Remedial Action Objectives
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act, 1986 PL 99-499, as amended
SOW	Scope of Work
SWRAU	Site Wide Ready for Anticipated Use
USEPA	United States Environmental Protection Agency
UU/UE	Unrestricted Use/Unrestricted Exposure

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Executive Summary

This is the third Five-Year Review (FYR) for the Parsons Chemical Works, Inc. (Parsons) Superfund Site (Site) located in Grand Ledge, Eaton County, Michigan. The purpose of this FYR is to review information to determine if the remedy is and will continue to be protective of human health and the environment.

The United States Environmental Protection Agency (USEPA) conducted the first of two Non-Time Critical Removal Actions at the Parsons Site from October 1990 until June 1994. During this removal, 3,000 cubic yards of contaminated soil were remediated utilizing In-Situ Vitrification, an innovative soil remediation technology.

In November 1998, the second Non-Time Critical Removal Action was undertaken to address the contaminated soil on the plant property and along the north side of Jefferson Street where elevated concentrations of arsenic were found. During the second removal, 5,102 cubic yards of soil were excavated and disposed of in a licensed landfill. Soil excavation was completed in February 1999 and the USEPA signed a Preliminary Close-Out Report in March 1999. Site restoration was completed in the summer of 1999 and the final Site inspection took place in November 1999.

After the two Non-Time Critical Removal Actions were completed, the USEPA selected a remedy for the Parsons Site, as outlined in both the 1997 Record of Decision (ROD) and the 2002 Scope of Work (SOW), and included:

- Long-term monitoring of private water supply wells;
- Long-term monitoring of selected on-site monitoring wells;
- Trend analysis of analytical results to identify indications of groundwater degradation and potential threat to human health;
- Monitoring for exceedances of threshold levels for dieldrin or arsenic; and,
- Contingency plan for alternate water supply in event of unacceptable groundwater degradation while the existing Grand Ledge municipal water supply system is extended and private wells are connected.

Under the 2002 SOW, with funding provided by the USEPA, the Michigan Department of Environmental Quality (MDEQ) sampled the selected Site monitoring wells from 2003 through 2010 and the residential wells from 2003 through 2011. Review of the analytical results indicated that the remedial action cleanup objectives had been achieved, including, but not limited to, preventing contaminated groundwater from migrating to surface water bodies and preventing the consumption of contaminated groundwater by local residents. The Site monitoring wells were plugged and abandoned in 2012. Development and recording of a Declaration of Restrictive Covenant and Grant of Environmental Protection Easement (DRC) was completed on August 26, 2013, and a permanent marker was placed on the Site next to the In-Situ Vitrification Area.

The remedy at the Site is protective of human health and the environment in the long-term.

All remedial action objectives have been achieved. A Declaration of Restrictive Covenant and Grant of Environmental Protection Easement (DRC) prohibits residential use of the property and disturbance of the ISV treatment area. Long-term protectiveness requires compliance with the executed DRC, specifically compliance with land use restrictions that prohibit interference with the Area of Restrictive Deed Covenants as noted in the DRC.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Parsons Chemical Works, Inc.		
EPA ID: MID980476907		
Region: 5	**State:** Michigan	**City/County:** Grand Ledge/Eaton

SITE STATUS	
NPL Status: Final	
Multiple OUs? No	**Has the site achieved construction completion?** Yes. March 29,1999

REVIEW STATUS
Lead Agency: State of Michigan
Author name: Cindy Fairbanks
Author affiliation: Michigan Department of Environmental Quality
Review period: July 31, 2013 – April 10, 2014
Date of site inspection: October 30, 2013
Type of review: Statutory
Review number: 3
Triggering action date: April 14, 2009
Due date *(five years after triggering action date)*: April 14, 2014

Five-Year Review Summary Form (continued)

Site-wide Protectiveness Statement
Protectiveness Determination: Long-term Protective
Protectiveness Statement: The remedy at the Site is protective of human health and the environment in the long-term. All remedial action objectives have been achieved. A Declaration of Restrictive Covenant and Grant of Environmental Protection Easement (DRC) prohibits residential use of the property and disturbance of the ISV treatment area. Long-term protectiveness requires compliance with the executed DRC, specifically compliance with land use restrictions that prohibit interference with the Area of Restrictive Deed Covenants as noted in the DRC.

I. Introduction

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports. In addition, FYR reports identify issues found during the review, if any, and recommendations to address them.

The United States Environmental Protection Agency (USEPA) prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act, (CERCLA) Section 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 USEPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) Section 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."*

The Michigan Department of Environmental Quality (MDEQ) conducted a FYR of the remedy implemented at the Parsons Chemical Works, Inc. (Parsons) Superfund Site (Site) in Grand Ledge, Eaton County, Michigan. The State of Michigan has the lead for developing and implementing the remedy for this Site. USEPA has reviewed all supporting documentation and provided input to MDEQ during the FYR process for this Site.

This is the third FYR for the Parsons Superfund Site. The triggering action for this statutory review is the signature date of the previous FYR, April 14, 2009. The FYR is required due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
Parsons operated as a mixed manufacturing and packaging agricultural chemical facility on-Site.	1945 through 1979
Facility purchased by ETM Enterprises, Inc. (ETM).	1979
Initial discovery of contamination problems. ETM discovered that building floor drains at its plant on-Site discharged into the septic system and then into the county drain which discharged liquid wastes into a stream that flowed into the Grand River. It was also discovered that historical dumping of liquid wastes onto soils surrounding the building occurred during the Parsons' operations.	1979
Initial Michigan Department of Natural Resources (MDNR) Soil and Sediment Investigations of the Site.	1979
Various Site Investigations conducted at the Site for heavy metals and pesticides.	1980 through 1989
Site finalized on the National Priorities List (NPL).	March 31, 1989
Additional contaminated soil discovered adjacent to the southeastern corner of the ETM building.	1991
The USEPA conducted first Non-Time Critical Removal Action of Contaminated Soil using In-Situ Vitrification (ISV).	October 1990 through 1994
The MDNR conducted a Remedial Investigation/Feasibility Study (RI/FS).	1993-1995
Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, (Part 201) enacted.	1995
Declaration of Selected Remedial Alternative (i.e., Record of Decision [ROD] signed).	September 30, 1997
The USEPA conducted second Non-Time Critical Removal Action of contaminated soil discovered in 1991.	November 1998 through February 1999
The MDEQ conducted baseline residential well sampling.	December 1997
Preliminary Close-Out Report (PCOR).	March 29, 1999
The MDEQ funded Manganese Background Investigation.	September 2001
Baseline Environmental Assessment for the Site (now Shappell Corporation) affirmed by MDEQ.	October 2001
Scope of Work (SOW) signed.	July 2002
MDEQ Geoprobe investigation completed.	October 2002

Table 1: Chronology of Site Events (continued)

Event	Date
Annual Monitoring Well Sampling per the SOW.	2003 through 2010
Annual Residential Well Sampling per the SOW.	2003 through 2010 (discontinued in 2011)
First Five-Year Review.	April 14, 2004
Second Five-Year Review.	April 14, 2009
Discontinuation of Monitoring Well Sampling.	2010
Discontinuation of Residential Well Sampling.	2011
Plug and Abandonment of Site Monitoring Well Network.	2012
Land Survey conducted for development of Declaration of Restrictive Covenant (DRC). (i.e., Restrictive Covenant).	2012
DRC filed.	August 26, 2013
SWRAU Achieved	September 27, 2013

III. Background

Physical Characteristics

The Site occupies approximately six acres on West Jefferson Street, west of the city of Grand Ledge, approximately ¼ mile east of the intersection of M-43 and Jefferson Street, Oneida Township. In the immediate vicinity of the former Parsons' plant, (now owned by the Shappell Corporation), Millbrook Printing is located on the south, the Church of the Nazarene and its associated parsonage are located immediately to the west, and commercial operations are located on the north side of Jefferson Street. Two residential subdivisions, Russell Subdivision and Fairview Subdivision, are located immediately east of the Site across Oneida Street. The Grand River is located approximately ¾ of a mile north of the plant. (See Figure 1 - Site Location Map at the end of the report).

Site Geology and Hydrogeology

There are two unique hydrogeologic, water-bearing units beneath the Site; a shallow unconfined aquifer, comprised of a silty clay, sand, and gravel layer with a saturated thickness of approximately 10 feet and a bedrock aquifer, separated from the shallow aquifer by an impermeable confining silty clay layer. Groundwater flow in the shallow aquifer has been documented to be to the north-northeast across the Site toward the Grand River. (See Figure 5 - Groundwater Flow Map for the Shallow Aquifer at the end of the report).

The bedrock aquifer, comprised of two distinct zones, underlies the "confining" silty clay layer. The upper zone was formed by a weathered sand and shale layer which grades into

the lower competent bedrock. A series of discontinuous beds of sand, shale, limestone, and occasional thin coal seams comprised the lower zone. Groundwater in the deep aquifer is flowing generally to the northeast across the Site. The residential wells adjacent to the Site produced water from the lower portion of the bedrock aquifer. (See Figure 6 - Groundwater Flow Map for the Bedrock Aquifer at the end of the report).

Land and Resource Use

Land use in the area surrounding the Site is zoned for, and consists of, a mix of light industrial, commercial, and residential properties. Since 2001, the Shappell Corporation has owned and operated their business on the Site. (See Figure 2 - Site Features Map at the end of the report).

History of Contamination

Parsons, which operated from 1945 through mid-1979, mixed, manufactured, and packaged agricultural chemicals including pesticides, herbicides, solvents, and mercury-based compounds. Floor drains in the Parsons' plant discharged into a septic tank and leach field, which were connected to a catch basin leading to a county drain system. Parsons apparently discharged manufacturing liquid wastes through the drainage system. The drainage system discharged into an unnamed stream northwest of the plant. The stream ultimately discharged into the Grand River. Eventually, the drainage tiles on the steep bank above the unnamed stream washed out, and the liquid discharged onto the bank contaminating the ground. In addition to the discharge of liquid wastes, activities at the plant resulted in the deposition of chemicals on soil primarily around the perimeter of the building, particularly the south side, impacting approximately one acre.

Various government agencies received reports about discharges from the plant and investigated. Concerns arose when soil and sediment samples, collected in the 1970's from the drainage ditch and an unnamed stream, were found to contain pesticides and elevated concentrations of heavy metals.

Initial Response

In 1979, ETM purchased the facility and began operating a fiberglass parts manufacturing facility at this location. The connection between the septic system and the county drain was discovered during one of several investigations performed by ETM in response to environmental concerns about the property. The company had the septic system and tile field removed and connected to the Grand Ledge municipal water and sanitary waste systems.

Several sampling events took place from the late 1970s through the mid-1980s near the Site by USEPA and MDEQ. Sampling data collected by MDEQ confirmed that soil over a large area of the Site was contaminated with pesticides and herbicides, including chlordane, 4,4'-DDE, 4,4'-DDT, dieldrin, low concentrations of TCDD, and inorganic constituents including mercury, chromium, and arsenic. The USEPA conducted the first of two Non-Time Critical Removal Actions at the Site from October 1990 until June 1994. During this removal, 3,000 cubic yards of contaminated soil were remediated utilizing ISV, an innovative soil remediation technology. At the conclusion of the first removal action, an estimated 2,000 cubic yards of contaminated soil remained awaiting a second removal action. The contaminated area was also fenced and posted to prevent accidental exposure until the USEPA conducted a second Non-Time Critical Removal Action.

The RI/FS was conducted between 1993 and 1995. It consisted of a hydrogeologic investigation, surface water and sediment sampling, assessment of the drainage system, and further assessment of the remaining soil conditions. The RI/FS revealed that, with the exception of the contaminated soil eventually removed during the two Non-Time Critical actions described above, the chemicals detected in the soil on the Site pose no acute public health concern.

The RI/FS also revealed that shallow groundwater contained the pesticide dieldrin as well as elevated concentrations of several metals related to the former plant operations. These metals include arsenic, lead, and manganese. The shallow groundwater was not in an aquifer, and the likelihood of it or the groundwater in the weathered portions of the bedrock being ingested or used for watering was deemed low. Samples collected 20 feet into the bedrock aquifer, the area drinking water source, complied with all applicable health-based drinking water criteria. Water supply wells in the vicinity are installed more than 100 feet deep which should assure water quality. However, the potential for chemicals of concern in the shallow groundwater and the weathered bedrock to migrate to private wells was not quantified during the RI/FS.

Because approximately 67 residences and businesses adjacent to the Site rely on private wells for their water supply, a long-term monitoring response was ultimately selected in the ROD to address this unquantified potential threat. The residential wells sampled during the RI/FS revealed no contamination but the MDEQ and the USEPA signed the ROD in 1997, requiring long-term monitoring of groundwater.

The USEPA mobilized to the Site in November 1998 to begin the second Non-Time Critical Removal Action that required removal of contaminated soil on plant property and along the north side of Jefferson Street where elevated concentrations of arsenic were found. During the second removal, 5,102 cubic yards of soil were excavated and disposed of in a licensed landfill. Soil excavation was completed and the PCOR was signed in March 1999. Site restoration was completed in the summer of 1999 and the final Site inspection took place in November 1999.

Basis for Taking Action

The Site was proposed for inclusion on the NPL by the USEPA in 1988. The Site was placed on the NPL in 1989, after the data from the soil samples collected by the MDNR confirmed that soil over a large area of the Site was contaminated with pesticides, including dieldrin, and heavy metals including arsenic, lead, and manganese.

For each potential human receptor, site-specific contaminants from all relevant routes of exposure were evaluated as part of the Site baseline risk assessment process. Both non-carcinogenic health risk effects and carcinogenic health risks were considered. Except for Area 2 of the Site, which lies south of the ETM building in the area surrounding monitoring well MW-07, the chronic and subchronic Hazard Indexes for humans contacting or ingesting soil from the Site were less than one (1). Therefore, the non-carcinogenic potential risks associated with contacting or ingesting soil from the Site were within acceptable levels under the applicable statues. It was also determined that the chronic and subchronic risks associated with dermal contact with groundwater from the bedrock aquifer were both within acceptable limits. With respect to carcinogenic risks, the Site baseline risk assessment determined that there was no unacceptable carcinogenic risk associated with use of groundwater from this Site. The potential excess lifetime cancer risk posed by exposure to Area 1 of the Site, which encompasses soil located around the ETM building not covered with fill dirt or paved over with concrete or asphalt, fell within the USEPA's acceptable risk range of one in 1,000,000 to one in 10,000. Risks from ingestion of, and/or dermal contact with, soil from Area 1 of the Site presented an acceptable carcinogenic risk in the range of four in one million to six in one million which is acceptable under Part 201. The potential excess lifetime cancer risk posed by exposure to soil at the highest arsenic concentration observed (480 parts per million [ppm]) in Area 2 fell within the USEPA's acceptable risk range of one in 1,000,000 to one in 10,000. However, the risk exceeded the Part 201 acceptable risk level of one in 100,000 to four in 100,000.

Remedial Investigation

In 1989, the USEPA and the MDNR agreed to undertake a cooperative effort to address contaminated soil prior to conducting a RI/FS. An innovative soil remediation technology, ISV, was selected as the appropriate technology to address approximately 3,000 cubic yards of contaminated soil. From October 1990 to April 1991, soil from three areas of the Site was excavated and staged in an underground, 16 foot deep, ISV treatment trench on-Site. The ISV melting phase of the removal project began in May 1993 and was completed in May 1994. At the conclusion of the ISV removal, an estimated 2,000 cubic yards of contaminated soil remained on-site awaiting a second removal. The contaminated area was fenced and posted to prevent accidental exposure until the USEPA conducted a second Non-Time Critical Removal Action. (See Figure 3 – ISV Map at the end of the report).

The RI/FS was conducted between 1993 and 1995 and consisted of a hydrogeologic investigation, surface water and sediment sampling, assessment of the drainage system,

and further assessment of the remaining Site soil conditions. The RI/FS revealed that, with the exception of the previously identified contaminated soil (described above), the chemicals detected in the soil on the Site posed no acute public health concern. However, a shallow soil sample collected from a boring on the north side of Jefferson Street, off plant property, contained a concentration of 408 ppm of arsenic. This could pose an acute public health problem via ingestion or direct contact. Shallow groundwater contained the pesticide dieldrin as well as elevated concentrations of several metals related to the former plant operations. These metals included arsenic, lead, and manganese. The shallow groundwater was not in an aquifer, and the likelihood of it or the groundwater in the weathered portions of the bedrock being ingested or used for watering was deemed low. However, in the unlikely event that someone consumed groundwater from the shallow saturated zone or the weathered bedrock, the concentrations of manganese in the water could result in an acute health problem. Samples collected 20 feet into the bedrock aquifer, the area drinking water source, complied with all applicable health-based drinking water criteria. Water supply wells in the vicinity are installed more than 100 feet deep which should assure water quality. However, the potential for chemicals of concern in the shallow groundwater and the weathered bedrock to migrate to private wells was not quantified during the RI/FS. The residential wells sampled during the RI/FS revealed no contamination.

IV. Remedial Actions

Remedy Selection

The MDEQ and the USEPA signed the ROD in September 1997 for long-term monitoring of groundwater. The major remedial action objectives for this ROD as identified in the Feasibility Study for the Site were as follows:

- Reduce groundwater contaminants to Part 201 of NREPA Generic Residential Health Based Cleanup Criteria, and/or assure that groundwater affected by the Site contaminants is not consumed by local residents.
- Prevent contaminated groundwater from migrating to surface water bodies, and ensure that remedial actions do not adversely impact these bodies.
- Comply with specific State and Federal ARARs.
- Reduce/eliminate risks to human health and the environment.

The primary components of the remedy were as follows:

- Long-term monitoring of private water supply wells;
- Long-term monitoring of selected on-Site monitoring wells;
- Trend analysis of analytical results to identify indications of groundwater degradation and potential threat to human health;
- Monitoring for exceedances of threshold levels for dieldrin or arsenic; and,
- Contingency plan for alternate water supply in the event of unacceptable groundwater degradation while the existing Grand Ledge municipal water supply system is extended and private wells are connected.

Remedy Implementation

Activities to comply with requirements of the 1997 ROD began in December 1997 when the MDEQ sampled all of the private water supply wells in the vicinity of the Site, where property owners granted access, to establish a baseline of residential water quality data. These samples were analyzed for pesticides and seven metals. No pesticides were detected in the water samples. No metals exceeded the Part 201 generic residential drinking water standards. However, manganese was detected in approximately half of the wells at levels above the Part 201 health and aesthetic criteria for manganese. The aesthetic criterion, typically associated with non-health-related objectionable characteristics such as taste or staining, is 50 ppb for manganese. The MDEQ provided each well owner with a copy of the results of their well analyses and a letter explaining the results.

Using funding provided by the USEPA, the MDEQ began the remedial design in 1998. Because the concentration of manganese in some wells exceeded the health and aesthetic criteria for manganese, the MDEQ wanted to determine whether its presence could be attributed to the former Parsons operations or if it was naturally occurring.

Contaminant Investigation

The MDEQ began the remedial design (RD) in 1998. The purpose of the RD was to determine whether groundwater contaminants exceeded risk thresholds. All of the existing Site monitoring wells and six residential wells were sampled for manganese, aluminum, arsenic, lead and zinc. A complete round of static water level measurements was taken in October 1999. These data were used to develop new groundwater elevation contour maps to aid in the third task, which consisted of drilling three borings hydraulically upgradient of the Site and at the adjacent subdivisions and sampling them at frequent intervals to a depth of 180 feet. Arsenic and lead had been identified as chemicals of concern during the RI/FS. Aluminum and zinc were included because, while use of these metals at Parsons was not documented, they were detected in Site monitoring wells at elevated concentrations.
Upon evaluation of the sampling data, the MDEQ determined that, while arsenic and lead did not appear to be present at elevated levels upgradient of the Site, manganese, aluminum, and zinc were all present at elevated concentrations at multiple vertical intervals in the background wells. It was concluded that the presence of elevated concentrations of these metals in Site monitoring wells and some residential wells was not attributable to the former Parsons operations. The concentration of arsenic had increased in one monitoring well located off plant property in the direction hydraulically downgradient from the former plant. The concentration of arsenic exceeded applicable criteria for drinking water. No drinking water wells were impacted by this increase in arsenic. (See Attachment I -Final Phase II Manganese Investigation Report Parsons Chemical Works, September 2001 and Table 3 -Historical Groundwater Data).

Review of the soil analytical data indicated that the average concentration of manganese found in soils at the Site was within the range of mean manganese concentrations in soils of

the United States and below the Michigan Default Background Level of 440 ppm. Concentrations of manganese in soil generally decreased with depth. Regardless of the source, it was unlikely that the elevated manganese concentrations in the soil would impact the residential wells set in the bedrock aquifer east of the Site. Although the area south of the Parsons plant was hydraulically upgradient of residential wells, the silty clay layer underlying the shallow aquifer isolated the soil from the bedrock aquifer.

Baseline Environmental Assessment

In 2001, a baseline environmental assessment (BEA) was performed by the Shappell Corporation (Shappell) and submitted to the MDEQ for the Site. The BEA was determined to be adequate for the purpose of obtaining an exemption from liability for the new owner pursuant to *Section* 21126(1)(c) of Part 201. MDEQ staff notified the current property owner, Shappell, in writing, that the state of Michigan would not consider the new property owner liable for any contamination that was attributable to the former Parsons operations. USEPA also determined that there were no viable responsible parties. (See Attachment J -Baseline Environmental Assessment October 2001).

MDEQ Geoprobe Investigation of Off-Site Arsenic

The MDEQ obtained funding from the USEPA in October 2002 for the downgradient geoprobe investigation and implementation of the long-term monitoring required by the ROD.

In late October 2002, MDEQ staff performed a groundwater sampling investigation downgradient from the Site. The work consisted of six geoprobe borings for the collection of soil and groundwater samples. The sample locations were immediately downgradient and lateral to the groundwater flow direction. The analytical results from these samples detected no arsenic above Part 201 criteria in any of the six locations. In addition, soils overlying the bedrock were heterogeneous showing no continuous saturated zone that would comprise a pathway for movement of contamination. Based on this information, it was determined that additional investigation was not necessary. (See Attachment L -MDEQ Geoprobe Investigation of the Off-Site Arsenic, October 2002).

Scope of Work Investigation

The SOW to implement the ROD remedy was developed in 2002. The SOW stated that annual groundwater sampling of both Site monitoring wells and residential wells in the adjacent Russell and Fairview subdivisions, was to be conducted annually for 15 years focusing on analytical data for arsenic, lead, manganese, and dieldrin, or until the data confirmed that any residual groundwater contamination detected was below Part 201 Drinking Water Criteria.

The MDEQ obtained funding from the USEPA in October 2002, through a Cooperative Agreement (CA) in conjunction with the SOW, for 90 percent of the costs of the downgradient investigation and implementation of the long-term monitoring required by the ROD. The remaining 10 percent of the funding was provided by the MDEQ. Annual groundwater sampling began in September 2003, and was conducted in January and August 2004, February and November 2005, and annually in 2006, 2007, and 2008. MDEQ staff performed the on-Site monitoring well groundwater sampling investigation while the Barry -Eaton County Health Department conducted the annual residential well sampling. (See Attachment K -2002 Scope of Work).

Through the CA, in conjunction with the 2002 SOW, the USEPA provided the MDEQ with $434,357 to implement the selected ROD of long-term monitoring with a contingency plan to assure protection of public health. The long-term monitoring consists of monitoring the water quality in private water supply wells located within approximately 1/4 mile of the Site as well as selected Site monitoring wells for a period of 15 years. This monitoring effort started in August 2003 and continued through 2011. Well plug and abandonment activities were conducted at the Site in August 2011 and September 2011. All of the Site monitoring wells were properly pulled, the bore holes filled, and clean soil covered the bore hole locations consistent with current guidelines and procedures.

The CA was closed on June 30, 2013. Of the original award, $299,844 was spent by MDEQ and $78,957 was returned to the USEPA.

USEPA and MDEQ have determined that all remedial action construction activities were performed according to specifications. The groundwater cleanup goals have been met for the contaminants of concern. Therefore, USEPA will issue a Final Close Out Report for this Site in the near future and recommend deletion from the NPL.

Institutional Controls

The 1997 ROD did not require Institutional Controls (ICs) at this Site. However, since the remnants of the ISV treatment remain on-Site, and the 2009 Five-Year Review Report recommended the development of an IC Plan to ensure the implementation of effective ICs, the Agencies identified the ICs needed for the Site. Although, an IC Plan was not formally completed, the Agencies determined that ICs (in the form of a restrictive covenant) were needed to restrict the Site land use and to prevent interference with the remedy. Therefore, a restrictive covenant was developed for the Site as discussed below. Restrictions were not placed on the groundwater since groundwater monitoring in 2010 showed that there were no contaminants of concern remaining in the groundwater above relevant cleanup criteria.

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 areas which do not allow for unrestricted use/unrestricted exposure (UU/UE). Figure 4 (at the end of the report) identifies that the Area of Restrictive Deed Covenants will not support UU/UE.

The table below summarizes the IC for this restricted area.

Table 2 : Institutional Controls Summary Table

Media, Engineered Controls, & Areas that Do Not Support UU/UE Based on Current Conditions.	IC Objective	Title of IC Instrument Implemented (note if planned)
Area of Restrictive Deed Covenants where the contaminated soil was treated with the ISV innovative technology identified in Figure 4.	Prohibit residential use; prohibit use or disturbance of the ISV treatment area.	DRC recorded at liber 2481 page 0900 at the Eaton County Register of Deeds office on August 26, 2013.

The declaration of a restrictive covenant (DRC) states that development of any type in the Area of Restrictive Deed Covenants is prohibited. The MDEQ is responsible for inspecting and monitoring compliance with the land use restrictions in the DRC. (See Attachment A – "Declaration of Restrictive Covenant and Grant of Environmental Protection Easement"). Rescission of the DRC can be considered if future sampling of the Area of Restricted Deed Covenants determines no hazardous substances remain.

System Operations/Operation and Maintenance (O&M) Costs

In July 2002, the USEPA provided to the MDEQ a SOW to implement the remedy contained in the September 1997 ROD. (See Attachment B – "Narrative and Scope of Work Parsons Chemical Works, Inc. Remedial Action and Downgradient Characterization July 2002"). To fund this work, the USEPA awarded a Cooperative Agreement to the MDEQ in the amount of $378,801. The long-term monitoring consisted of monitoring the water quality in private water supply wells located within approximately ¼ mile of the Site as well as selected Site monitoring wells. This monitoring effort started in August 2003 and ended in August 2010 for the Site monitoring wells and August 2011 for the residential wells. The Cooperative Agreement was closed out on June 30, 2013. Of the original award, $269,969.28 was spent and $70,951.72 was returned to the USEPA.

Table 3: Annual System Operations/O&M Costs

Dates		Total Cost rounded to nearest $1,000
From	To	$269,969
July 2002	June 2013	

V. Progress Since the Five-Year Last Review

The 2009 FYR found the remedy at the Site to be protective of human health and the environment in the short term. Long-term protectiveness requires compliance with effective ICs. Compliance with effective ICs will be ensured through implementing ICs and through long-term stewardship. Long-term stewardship involves maintaining, monitoring and enforcing effective ICs as well as maintaining the Site remedy components.

The following issues and recommendation were identified in the previous FYR.

Table 4. Progress Since the Last Five-Year Review

OU	Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Party	Original Milestone Date	Current Status	Completion Date
Sitewide	ICs have not been required under the original remedy for this Site, and, thus, have not been implemented nor have procedures been finalized for long-term stewardship.	An IC Plan will be prepared to ensure effective ICs are implemented and subject to long-term stewardship to assure that the ICs are monitored, maintained and enforced.	USEPA/State	USEPA/State	2009	Considered but not implemented	August 26, 2013
Sitewide (con't)	Implementing, monitoring, maintaining and enforcing ICs should be required to ensure that the remedy is protective in the long-term and continues to function as intended.	An IC Plan will be prepared to ensure effective ICs are implemented and subject to long-term stewardship to assure that the ICs are monitored, maintained and enforced.	USEPA/State	USEPA/State	2009	Considered but not implemented	August 26, 2013
Sitewide	Continue annual groundwater monitoring of both Site monitoring wells and a reduced number of residential wells to monitor contaminant concentrations over time.	Continue annual monitoring of groundwater at Site monitoring wells and a reduced number of residential wells through 2010 and reassess need to continue.	State	State	2010	Completed	September 27, 2013

The development of a declaration of restrictive covenant (DRC) for the Site (now the Shappell Corporation) was finalized on August 26, 2013. Also, a Trend Analysis was completed for the Site. This analysis consisted of a review of the annual groundwater monitoring and residential well data to aid in evaluating the protectiveness of the Site. (See Tables 4 and 5 of Appendix C.) At the request of the USEPA, MDEQ completed a Remedial Action Report for the Site on September 23, 2013.

This is the third FYR written for the Site. The requirements of the ROD and SOW have been implemented and completed. Annual groundwater sampling of both the Site monitoring wells and the residential wells located in the Russell and Fairview Subdivisions adjacent and downgradient from the Site was terminated in 2010 and 2011, respectively. The monitoring wells comprising the Site monitoring well network were plugged and abandoned in 2012. (See Attachment C – "Site Activity Summary Report Parsons Chemical Works, Inc. Superfund Site" [i.e., Well Plug and Abandonment Report]). The DRC for the Site, to fulfill the requirements of an IC, was filed on August 26, 2013, and included placement of a Permanent Marker on the Site at the ISV treatment area denoted as the Area of Restrictive Deed Covenants.

At the request of the USEPA, the MDEQ wrote a Remedial Action Report for the Parsons Site which detailed the above noted Site actions. The report was written in August 2013 and was submitted to, and approved by, the USEPA in September 2013. (See Attachment D – "Remedial Action Report Parsons Chemical Works, Inc. Superfund Site August 2013").

VI. Five-Year Review Process

Administrative Components

The MDEQ Project Manager, Ms. Cindy Fairbanks, notified the USEPA of the initiation of the FYR Process in a letter dated July 31, 2013. The MDEQ Project Manager headed the FYR Team and was assisted by the USEPA Remedial Project Manager, Ms. Lolita Hill, and the USEPA Community Involvement Coordinator, Mr. David Novak. The review schedule included the following components:

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

Community Notification and Involvement

There has not been active interest in the Site since the end of the ISV remedy and the period when the residents were told that their wells would be monitored. The overall involvement from the community has been minimal. The Barry - Eaton County Health Department sent annual notification letters to those residences whose drinking water wells are sampled as required under the SOW. During the Site visit, interviews were held with the Shappell Corporation, current owner of the Site, during the installation of the Permanent Marker. A notice was provided in a local newspaper regarding the availability of this report to the general public. A copy of the notice is included in Appendix B. Since the announcement notice has been issued, no member of the community has notified the USEPA or the MDEQ of any interest in the FYR.

This FYR Report will be placed with all other Site-related documents as part of the Administrative Record File, available for public inspection at the following location:

Grand Ledge Public Library
131 Jefferson Street
Grand Ledge, Michigan

Document Review

The FYR relied upon a review of relevant documents including the following:

- Declaration of Selected Remedial Alternative for the Parsons Chemical Works Site, 1997
- Preliminary Close-Out Report Parsons Chemical Works Site, March 29, 1999
- Narrative and Scope of Work Parsons Chemical Works Remedial Action and Downgradient Characterization, July 2002
- Final Phase II Manganese Investigation Report Parsons Chemical Works, Grand Ledge, Michigan, September 2001
- Final Phase II Manganese Investigation Report Parsons Chemical Works September 2001
- MDEQ Geoprobe Investigation for Parsons Chemical Works, October 2002
- Site Activity Report Parsons Chemical Works Superfund Site (i.e., Well Plug and Abandonment Report)
- Monitoring Well Data 2003 through 2010
- Residential Well Data 2003 through 2011
- DRC August 26, 2013
- Remedial Action Report Parsons Chemical Works Superfund Site 2013

Discussions of both monitoring and residential well data are included in the Data Review section of this report.

Data Review

Soils

Soils were addressed by two non-time critical removal actions conducted previous to the remedial actions.

Monitoring Well Data

Manganese

Historical records indicated that manganese was a component of some of the products manufactured at the former Parsons plant. Since concentrations of manganese above the applicable criterion were detected in some groundwater samples obtained from the RI/FS monitoring wells and some residential wells, it appeared reasonable to attribute manganese to the Site. However, based upon the 1999 - 2001 Manganese Background Investigation, manganese also occurred naturally in the environment and was detected at elevated concentrations in monitoring wells upgradient from the Site.

The deepest RI/FS monitoring well samples were collected at a depth of 25 feet into the bedrock aquifer. Residential well depths in the vicinity of the Site were estimated to be over

100 feet into the bedrock. It can be determined, based upon the existing monitoring well network, that the elevated manganese concentrations detected from 2003 through 2008 are representative of Site background levels, or attributable to upgradient off-Site source areas. (See Table 4 - Monitoring Well Data 2003 – 2010 in Appendix C and Figure 7 - Monitoring Well Location Map at the end of the report).

Arsenic

Review of the monitoring well data from 2003 through 2010 detected (and some exceedances) of arsenic in three upgradient monitoring wells, MW8, MW10, and MW17; and none above the Part 201 Criterion of 10 parts per billion (ppb) in any of the downgradient monitoring wells. Therefore, the ISV remedy was successful in immobilizing any arsenic present through vitrification. The two soil removal actions aided in reducing any residual arsenic contamination in the Site.

Lead

Review of the monitoring well data from 2003 through 2010 detected lead in monitoring wells upgradient of the Site at concentrations that exceed the Part 201 Criterion of 4 ppb. This supports the position that additional off-Site sources are contributing lead to the area groundwater.

Only two downgradient monitoring wells, MW2 and MW9, detected lead above the Part 201 criteria. However, these detections could be from migration of lead denoted in the upgradient monitoring wells, or a commingling of lead from off-Site with trace residual lead from the Site.

Dieldrin

There was no releases of dieldrin reflected in the monitoring well data from 2003 through 2005. Based on this, sampling for dieldrin was discontinued in 2006.

Residential Well Data

The city of Grand Ledge has a municipal water system that supplies residences and businesses as far as Kennedy Place, the north/south street located east of the Site. West of Kennedy Place to just east of Lawson Road, supplied municipal water was limited to residences, businesses, and industries with frontage on Jefferson Street. Any building structure located outside of these limits is serviced by a private well. Forty-five of these private wells are directly east of the Site in the Russell and Fairview Subdivisions. These residential wells are believed to be screened at approximately 100 feet below ground surface in the bedrock aquifer. Shappell Corporation, located on the Site, obtains water from the municipal water supply.

Manganese

The residential well neighborhood is located north of the Parsons Site (which is side gradient to the Site and not downgradient to the Site). Municipal water is available to the residents. The possibility of the elevated manganese concentrations to impact the residential wells screened in the bedrock aquifer east of the Site is unlikely. The silty clay layer underlying the shallow aquifer isolates the soil from the bedrock aquifer. Elevated manganese concentrations in the bedrock monitor wells (screened within the weathered bedrock) are naturally occurring and not associated with activities of the former Parsons' operations. (See Table 5 - Residential Well Data 2003-2011 in Appendix C).

Arsenic

Review of the residential well data from 2003 through 2011 did not detect arsenic above Part 201 Criterion.

Lead

Review of the residential well data from 2003 through 2008 indicated several detections of lead in 2003 and 2004 in residential wells upgradient of the Site. No lead detections exceeding Part 201 Criterion have been found in residential well samples from 2006 and 2007. Four residential wells had lead concentrations that exceeded Part 201 Criterion in 2008 but these four residential wells are all upgradient of the Site.

Dieldrin

Although dieldrin was detected in groundwater monitoring wells, dieldrin was never found in the residential wells.

Site Inspection

A Site inspection was conducted on October 30, 2013. The Site Inspection Team included Ms. Cindy Fairbanks, the MDEQ Project Manager. The inspection revealed that the permanent marker was installed on-Site near the ISV treatment area. All Site monitoring wells were removed, plugged, and abandoned. All O&M activities were completed at the Site. There was no indication of new sources on the property that would interfere with the effectiveness of the remedy. There was no evidence of construction activities such as excavation, drilling, or grading at the Site which would cause impairment of the remedy. There were no major issues related to the Site. A restrictive covenant for the Site was filed with the Register of Deeds for Eaton County on August 26, 2013.

Interviews

At the time of the Site visit, the MDEQ Project Manager was not able to interview any residents or property owners. However, interviews were held with the Site owner of Shappell

Corporation.

VII. Technical Assessment

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

Yes. Based upon the review of the groundwater data collected from 2003 through 2010 (from the Site monitoring wells) and from 2003 through 2011 (from the area residential wells), and the data from the MDEQ 2000 Manganese investigation, the remedy at the Site is functioning as intended in the ROD and SOW. All remedial action objectives in the ROD have been met. A Declaration of Restrictive Covenant prohibits residential use of the property and disturbance of the ISV treatment area.

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

Yes. All of the exposure assumptions, toxicity data, cleanup levels, and RAOs from the ROD and SOW remedy selection are valid and have been successful at the Site.

Changes in Chemical-Specific Standards

There have been no changes in chemical-specific standards since the 2009 Five-Year Review Report.

Changes in Action-Specific Requirements

There have been no changes in action-specific requirements since the 2009 Five-Year Review Report.

Changes in Location-Specific Requirements

There have been no changes in location-specific requirements since the 2009 Five-Year Review Report.

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

No. No other information has been discovered to question the protectiveness of this remedy.

Technical Assessment Summary

Based upon the review of the groundwater data collected from 2003 through 2010 (from the Site monitoring wells) and from 2003 through 2011 for the area residential wells, and the data from the MDEQ 2000 Manganese Investigation, the remedy at the Site is functioning as intended in the ROD and SOW. The remedy action objectives of both the ROD and SOW

have been met and the Site is a candidate for deletion from the NPL.

VIII. Issues/ Recommendations and Follow-up Actions

The MDEQ identified no issues affecting the current or future protectiveness of the remedy. The Site is a candidate for NPL deletion since all remedial action objectives have been achieved.

IX. Protectiveness Statement

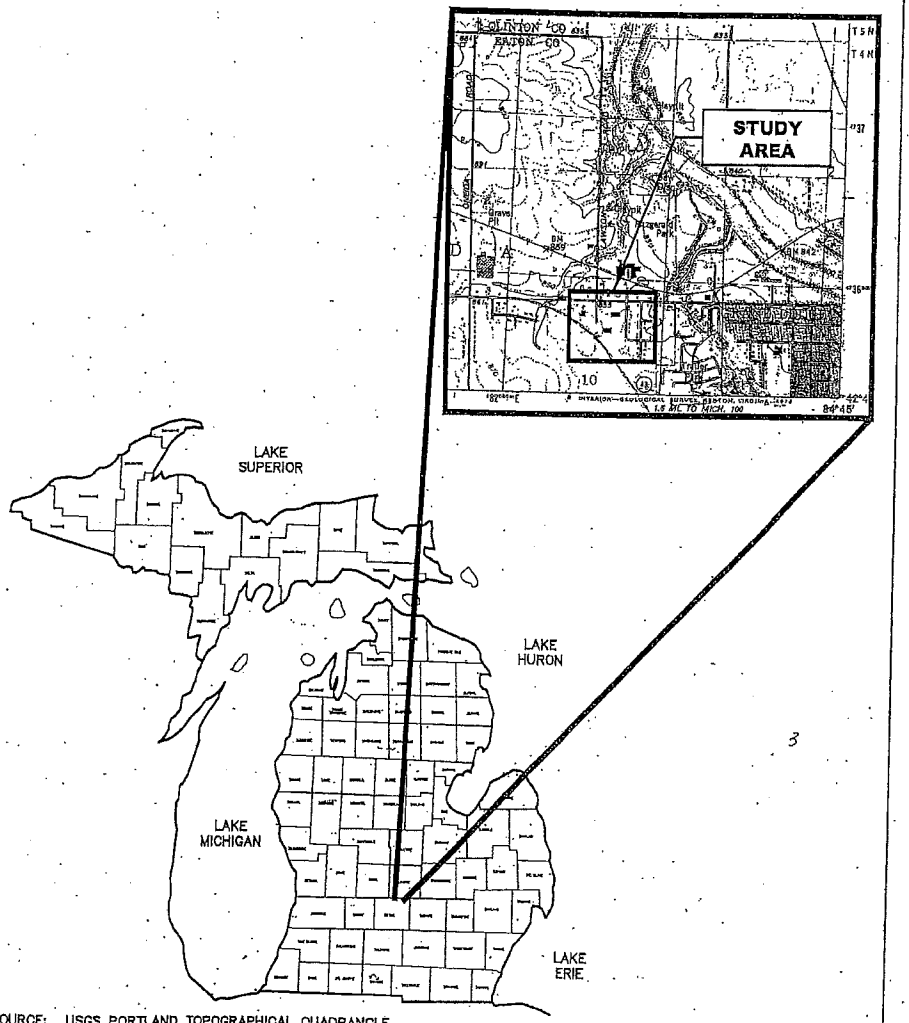
The remedy at the Site is protective of human health and the environment in the long-term. All remedial action objectives have been achieved. A Declaration of Restrictive Covenant and Grant of Environmental Protection Easement (DRC) prohibits residential use of the property and disturbance of the ISV treatment area. Long-term protectiveness requires compliance with the executed DRC, specifically compliance with land use restrictions that prohibit interference with the Area of Restrictive Deed Covenants as noted in the DRC.

X. Next Review

The next Five-Year Review, the fourth, will be due five years from the signature date of this FYR. That Five-Year Review will primarily evaluate compliance with the DRC. No further monitoring or actions are needed at the Site. It is recommended that the Parsons Chemical Works, Inc. Site be deleted from the National Priorities List.

FIGURES

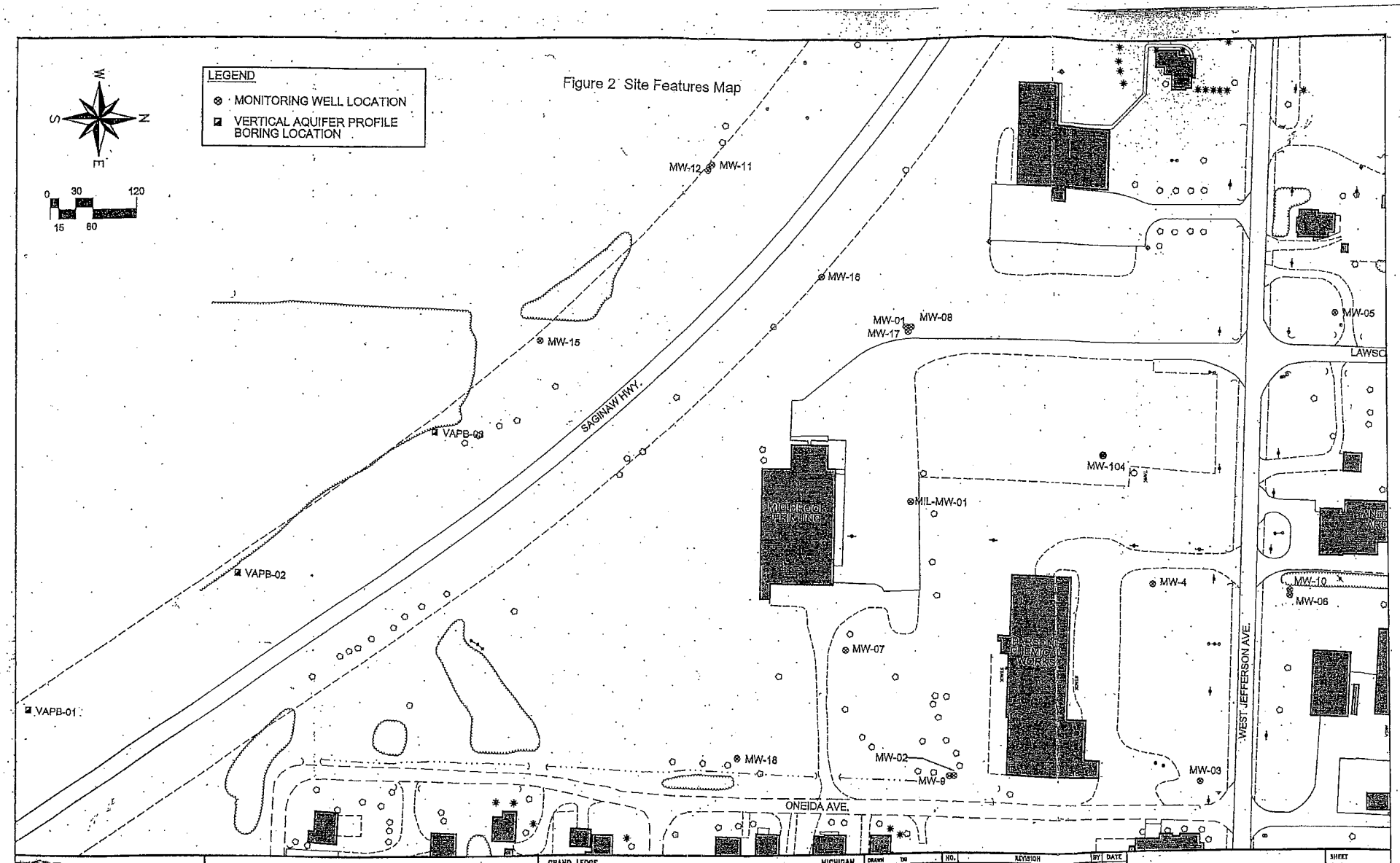
FIGURE 1 SITE LOCATION MAP



SOURCE: USGS PORTLAND TOPOGRAPHICAL QUADRANGLE

DLZ ENGINEERS - ARCHITECTS - SCIENTISTS PLANNERS - SURVEYORS	PARSONS CHEMICAL WORKS GRAND LEDGE, MICHIGAN	SITE LOCATION MAP	SCALE: N.T.S. FIGURE 1

Figure 2 Site Features Map



DLZ
ENGINEERS - ARCHITECTS - SCIENTISTS
PLANNERS - SURVEYORS

SITE MAP

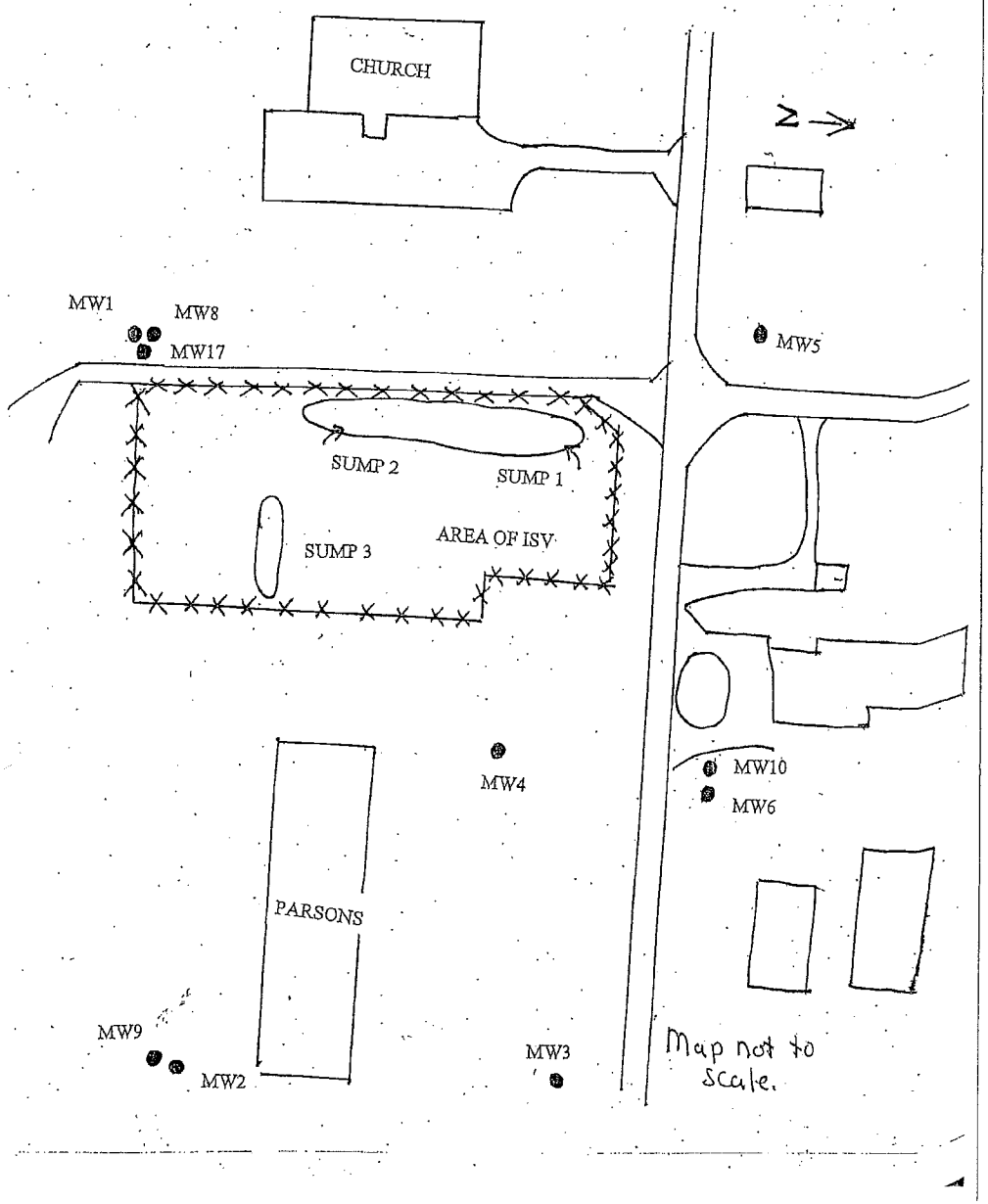
GRAND LEDGE MICHIGAN
PARSONS CHEMICAL WORKS, INC.
3562 WEST JEFFERSON
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
LEVEL OF EFFORT

DRAWN DR
CHK'D. EK
APPR'D CK
DATE JULY, 2001
PROJECT NUMBER 94414848.95

NO.	REVISION	BY	DATE

SHEET OF
DRAWING NUMBER FIG-2

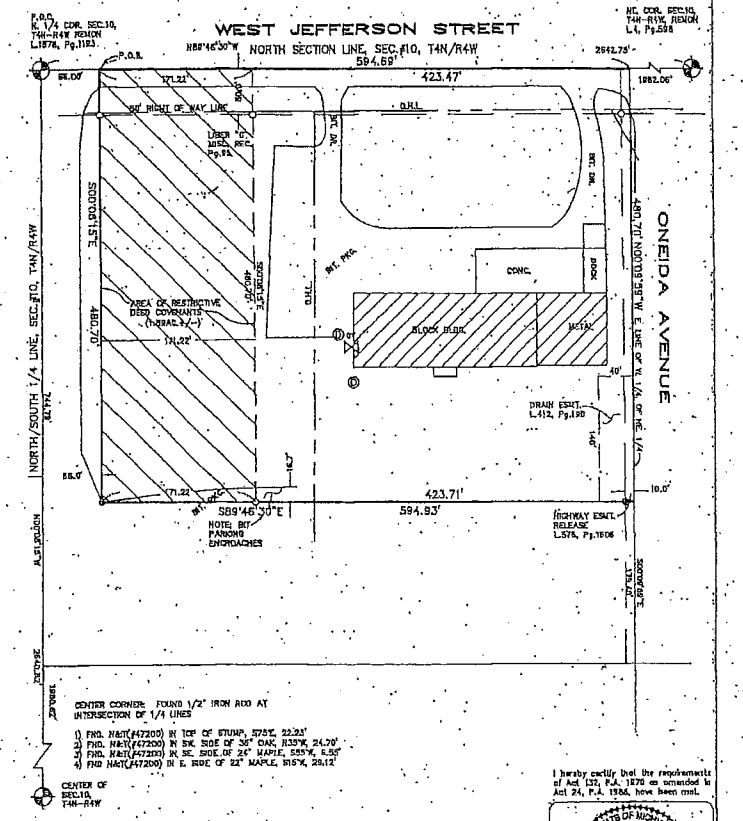
FIGURE 3 .IN-SITU VITRIFICATION (ISV) MAP



CERTIFICATE OF SURVEY

LIBER 2422 PAGE 0756 - 1 of 3
STATE OF MICHIGAN - EATON COUNTY
RECEIVED: 10/29/2012 10:56:04 AM Receipt #12024129
RECORDED: 10/29/2012 10:56:04 AM Y. ERVIN
M. FRANCES FULLER, CLERK/REGISTER OF DEEDS

FIGURE 4 AREA OF RESTRICTIVE DEED COVENANTS



I hereby certify that the requirements of Act 132, P.A. 1970 as amended by Act 24, P.A. 1986, have been met.

STATE OF MICHIGAN
CHRISTOPHER T. COTTER
PROFESSIONAL SURVEYOR
No. 41097
LICENSED PROFESSIONAL SURVEYOR

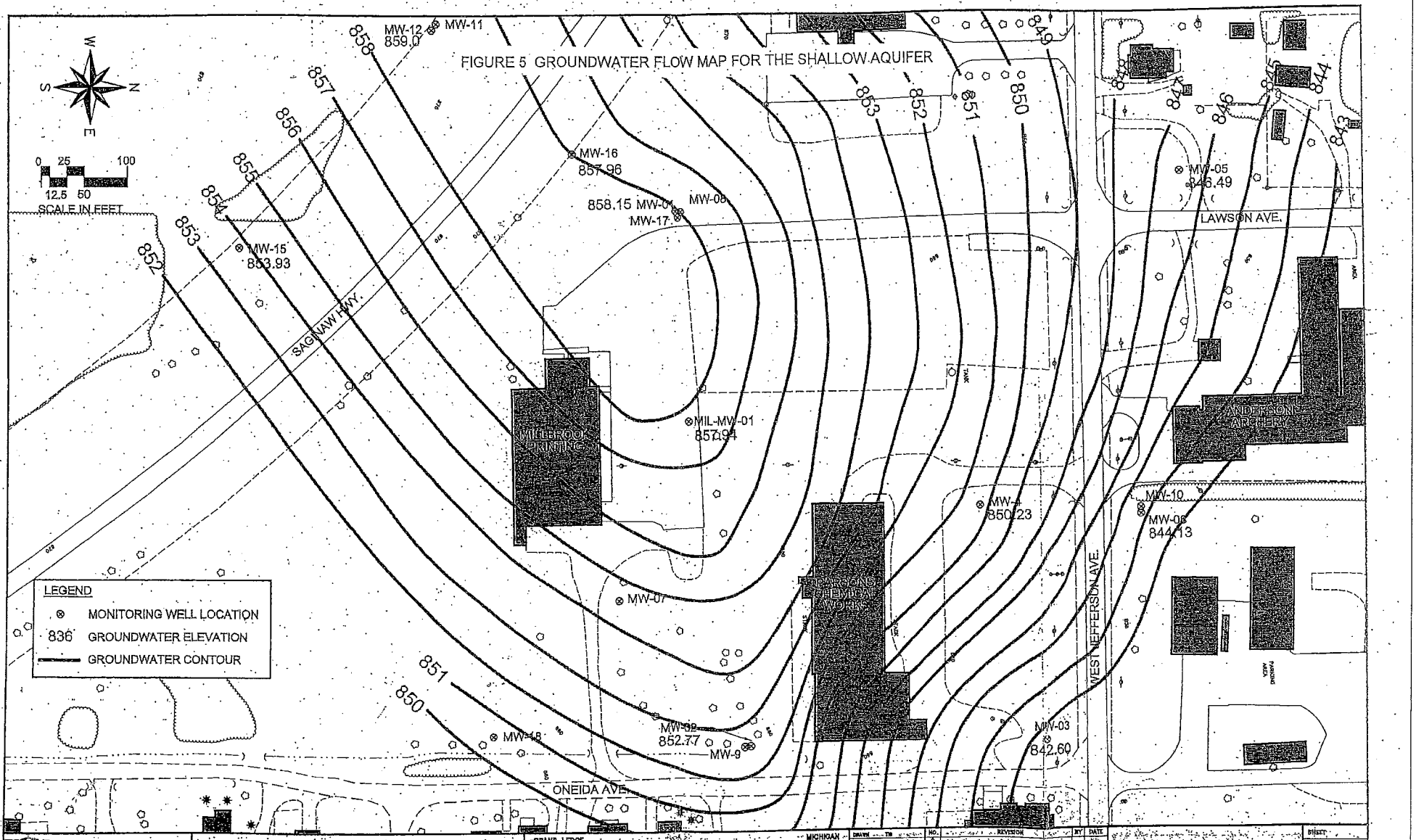
Christopher T. Cotter
P.S. No. 41097

DLZ
DLZ INDUSTRIAL SURVEYING, INC.
LANSING MICHIGAN

CERTIFICATE OF SURVEY
PARSON'S CHEMICAL
PREPARED FOR:
MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY

DRAWN: CTC	CHECKED: SJV	SHEET	1
DESIGNED	APPROVED: SJV	OF	3
DATE: SEPTEMBER 25, 2012			
SCALE: 1" = 100'	PROJECT NUMBER	DRAWING NUMBER	
	1250-9524-90	9524-0001PL	

FIGURE 5 GROUNDWATER FLOW MAP FOR THE SHALLOW AQUIFER



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ENGINEERS - ARCHITECTS - SCIENTISTS
PLANNERS - SURVEYORS

GROUNDWATER FLOW
IN SHALLOW AQUIFER

GRAND LEDGE MICHIGAN
PARSONS CHEMICAL WORKS, INC.
3562 WEST JEFFERSON

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
LEVEL OF EFFORT
94414848.95

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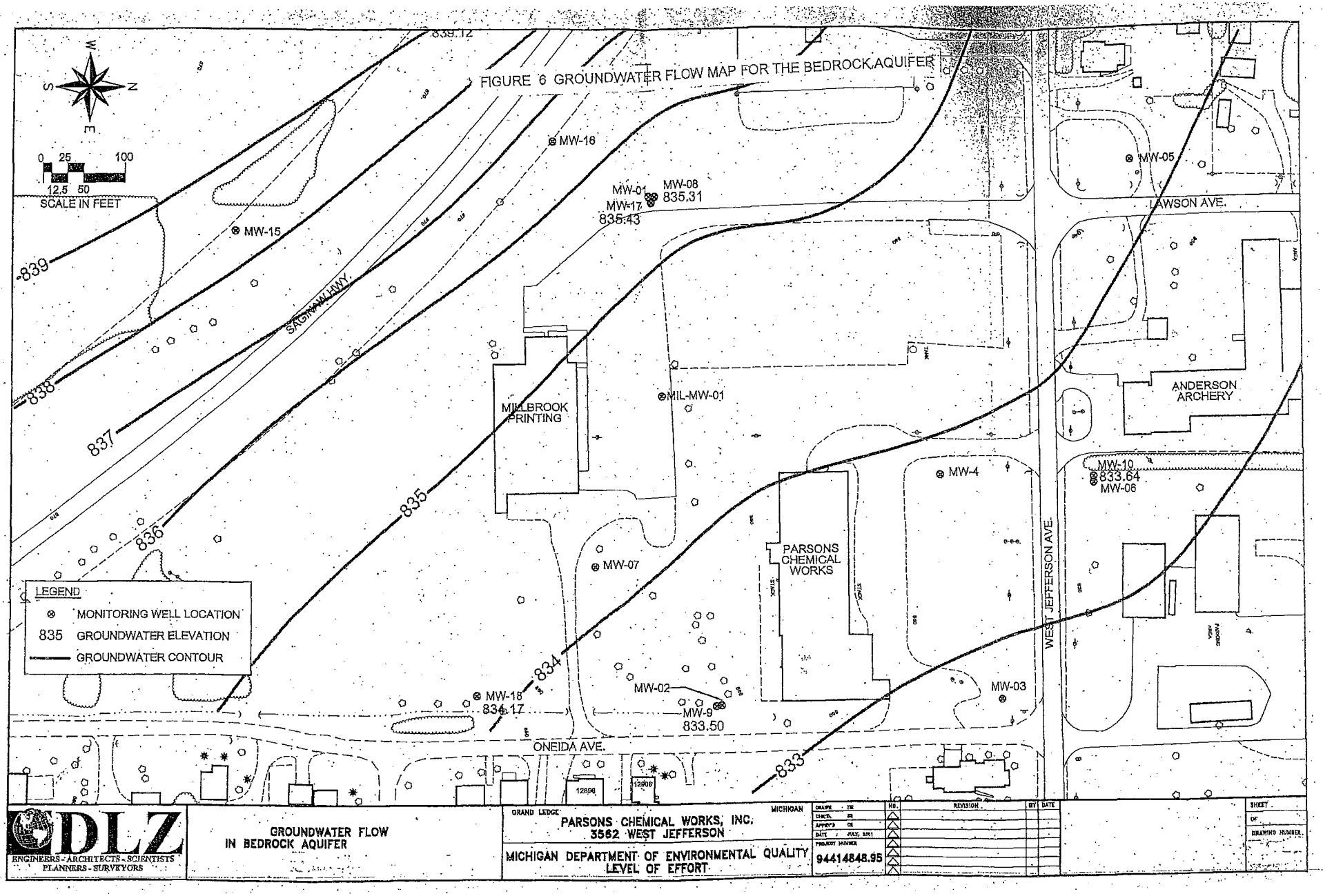


DLZ
ENGINEERS - ARCHITECTS - SCIENTISTS
PLANNERS - SURVEYORS

GROUNDWATER FLOW
IN BEDROCK AQUIFER

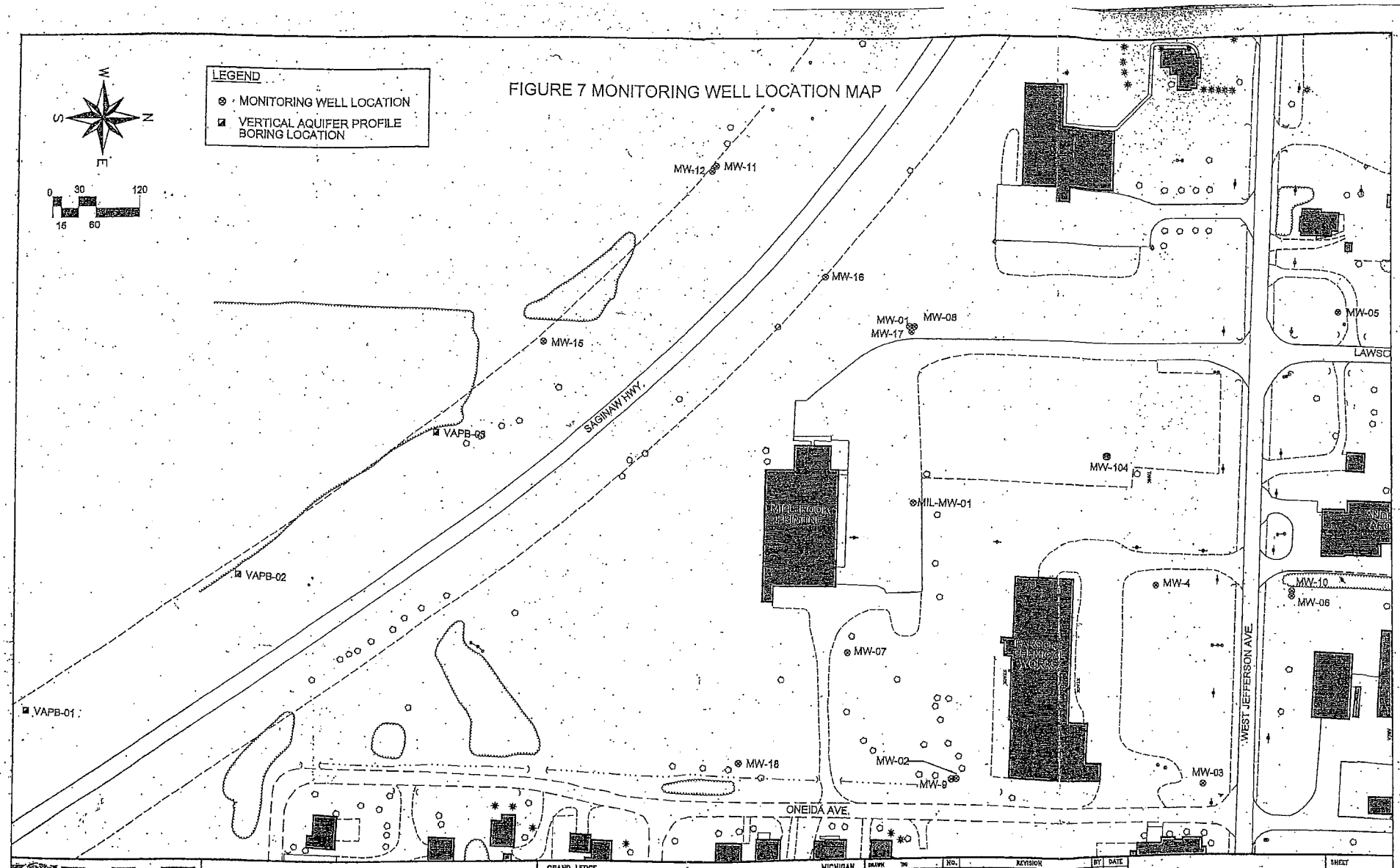
GRAND LEDGE MICHIGAN
PARSONS CHEMICAL WORKS, INC.
3562 WEST JEFFERSON

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
LEVEL OF EFFORT

DRAWN: TH
CHK'D: RS
APPR'D: CE
DATE: JULY, 2001
PROJECT NUMBER
94414848.95

NO. REVISION BY DATE

SHEET
OF
DRAWING NUMBER



DLZ
ENGINEERS - ARCHITECTS - SCIENTISTS
PLANNERS - SURVEYORS

SITE MAP

GRAND LEDGE MICHIGAN
PARSONS CHEMICAL WORKS, INC.
3562 WEST JEFFERSON
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
LEVEL OF EFFORT
94414848.95

NO.	REVISION	BY	DATE

Page 21

SHEET
OF
DRAWING NUMBER
FIG-2

ATTACHMENT A

LIBER 2481 PAGE 0900 1 of 16
STATE OF MICHIGAN - EATON COUNTY
RECEIVED: 08/26/2013 02:17:06 PM Receipt #13019480
RECORDED: 08/26/2013 02:20:18 PM X.REST
DIANA BOSWORTH, CLERK/REGISTER OF DEEDS

ATTACHMENT A

DECLARATION OF RESTRICTIVE COVENANT AND GRANT OF ENVIRONMENTAL PROTECTION EASEMENT

This transfer is exempt from County and State transfer taxes pursuant to MCL 207.505(a) and MCL 207.526(a), respectively.

Parsons Chemical Works Superfund Site, Eaton County, Michigan
MDEQ Site ID No. 23000010
U.S. EPA Site No. MID980476907

MDEQ Reference No. RC-SF-201-13-005

This Declaration of Restrictive Covenant and Grant of Environmental Protection Easement ("Restrictive Covenant and Easement") is made on Aug 26, 2013 by Craig-Allen, LLC, a Michigan limited liability company, the Grantor, whose address is 3562 West Jefferson, Grand Ledge, Michigan 48837 for the benefit of the Grantee, the Michigan Department of Environmental Quality ("MDEQ"), whose address is 525 West Allegan Street, Lansing, Michigan 48933.

RECITALS

i. The Grantor is the title holder of the real property located in Eaton County, Michigan and legally described in Exhibit 1 attached hereto ("Property"). The Tax ID Number for this Property is 030-010-200-010-00.

ii. The purpose of this Restrictive Covenant and Easement is to create restrictions that run with the land in the Grantor's real property rights; to protect the public health, safety, and welfare, and the environment; to prohibit or restrict activities that could result in unacceptable exposure to environmental contamination present at the Property; and to grant access to the Grantee, the United States Environmental Protection Agency (U.S. EPA) as a Third Party Beneficiary, and either agency's representatives to monitor and conduct Response Activities.

iii. A Record of Decision (ROD), dated September 30, 1997, was signed and issued by the U.S. EPA for the purpose of carrying out the Response Activities selected to address environmental contamination at the Parsons Chemical Works Superfund Site ("the Site"). The Response Activities summarized below are more fully described in the ROD.

Cindy Fairbanks
MDEQ/ERD/Superfund
Constitution Hall 5 South
525 W Allegan
Lans 48933

5 of 16

contaminated soil using ISV. From 2002 through 2010, annual groundwater sampling and monitoring were conducted at the Site. By 2010, it was determined that no contaminants of concern remained in the groundwater above relevant cleanup criteria. The area of the ISV trench, which remains on the Property under a soil and vegetative cover, will require controls to prevent unacceptable exposures.

DEFINITIONS

"Grantee" shall mean the MDEQ, its successor entities, and those persons or entities acting on its behalf;

"Grantor" shall mean Craig-Allen, LLC, a Michigan limited liability company, the title holder of the Property at the time this Restrictive Covenant and Easement is executed or any future title holder of the Property or some relevant sub-portion of the Property;

"ISV Treatment Area" shall mean the Area of Restrictive Deed Covenants as depicted in Exhibit 2.

"MDEQ" shall mean the Michigan Department of Environmental Quality, its successor entities and those persons or entities acting on its behalf;

"NREPA" shall mean the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.101 *et seq.*;

"Part 201" shall mean Part 201, Environmental Remediation, of the NREPA, MCL 324.20101 *et seq.*;

"Property" shall mean the real property legally described in Exhibit 1;

"Response Activities" shall mean, consistent with Section 101(25) of CERCLA, 42 U.S.C. Section 9601(25), such actions as have been or may be necessary to conduct any removal, remedy or remedial action, as those terms are defined in Sections 101(23) and 101(24) of CERCLA, 42 U.S.C. Sections 9601(23) and 9601(24), on the Property and/or at the Site, including enforcement activities related thereto;

"Site" shall mean the Parsons Chemical Works Superfund Site;

"U.S. EPA" shall mean the United States Environmental Protection Agency, its successor entities and those persons or entities acting on its behalf; and

All other terms used in this document which are defined in Part 3, Definitions, of the NREPA; Part 201; or the Part 201 Administrative Rules ("Part 201 Rules"), 2002 Michigan Register 24, effective December 21, 2002, shall have the same meaning in this document as in Parts 3 and 201 of the NREPA and the Part 201 Rules, as of the date of execution of this Restrictive Covenant and Easement.

NOW THEREFORE,

The Grantor, on behalf of itself, its successors and assigns hereby covenants and declares that the Property shall be subject to the restrictions set forth below, for the benefit of the Grantee, and grants and conveys to the Grantee, and its assigns and representatives, the perpetual right to enforce said restrictions. The Grantor further, on behalf of itself, its successors and assigns does grant and convey to the Grantee and its representatives an environmental protection easement of the nature, character, and purposes set forth below with respect to the

7. **Third Party Beneficiary:** The Grantor, on behalf of itself and its successors, transferees, and assigns, hereby agrees that the United States, acting by and through the U.S. EPA, its successors and assigns, shall be a third party beneficiary ("Third Party Beneficiary") of all the benefits and rights set out in the restrictions, covenants, easements, exceptions, notifications, conditions, and agreements herein, and that the Third Party Beneficiary shall have the right to enforce the restrictions described herein as if it was a party hereto. No other rights in third parties are intended by this Restrictive Covenant and Easement, and no other person or entity shall have any rights or authorities hereunder to enforce these restrictions, terms, conditions, or obligations beyond the Grantor, the MDEQ, their successors, assigns, and the Third Party Beneficiary.

8. **Enforcement:** The State of Michigan, through the MDEQ; and the United States of America through the U.S. EPA as a Third Party Beneficiary, may enforce the restrictions and grant of easement set forth in this Restrictive Covenant and Easement by legal action in a court of competent jurisdiction.

9. **U.S. EPA Entry, Access, and Response Authority:** Nothing in this Restrictive Covenant and Easement shall limit or otherwise affect the U.S. EPA's right of entry and access, or authority to undertake Response Activities as defined in this Restrictive Covenant and Easement, as well as in CERCLA, the National Contingency Plan, 40 Code of Federal Regulations Part 300, and any successor statutory provisions, or other state or federal law. The Grantor consents to officers, employees, contractors, and authorized representatives of the U.S. EPA entering and having continued access to this Property for the purposes described in Paragraph 5, above.

10. **Modification/Release/Rescission:** The Grantor may request in writing to the U.S. EPA and the MDEQ, at the addresses provided in Paragraph 12, below, modifications to, or release or rescission of, this Restrictive Covenant and Easement. This Restrictive Covenant and Easement may be modified, released, or rescinded only with the written approval of the U.S. EPA and the MDEQ. Any approved modification to, or release or rescission of, this Restrictive Covenant and Easement shall be filed with the appropriate county Register of Deeds by the Grantor and a certified copy shall be returned to the MDEQ and the U.S. EPA at the addresses provided in Paragraph 12, below.

11. **Transfer of Interest:** The Grantor shall provide notice at the addresses provided in this document to the MDEQ and to the U.S. EPA of the Grantor's intent to transfer any interest in the Property, or any portion thereof, at least fourteen (14) business days prior to consummating the conveyance. A conveyance of title, easement, or other interest in the Property shall not be consummated by the Grantor without adequate and complete provision for compliance with the terms and conditions of this Restrictive Covenant and Easement and the applicable provisions of Section 20116 of the NREPA. The Grantor shall include in any instrument conveying any interest in any portion of the Property, including, but not limited to, deeds, leases, and mortgages, a notice which is in substantially the following form:

NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO A DECLARATION OF RESTRICTIVE COVENANT AND ENVIRONMENTAL PROTECTION EASEMENT, DATED _____ AND RECORDED WITH THE EATON COUNTY REGISTER OF DEEDS, LIBER _____, PAGE _____.

12. **Notices:** Any notice, demand, request, consent, approval, or communication that is required to be made or obtained under this Restrictive Covenant and Easement shall be made in writing; include a statement that the notice is being made pursuant to the requirements of this Restrictive Covenant and Easement; include the MDEQ Site ID number and reference number; and shall be served either personally, or sent via first class mail, postage prepaid, as follows:

respective agents, successors, and assigns. The rights, but not the obligations or authorities, of the U.S. EPA are freely assignable to any public entity, subject to the notice to the Grantor, its successors and assigns, as their interests appear in the public title records kept and maintained by the Eaton County Register of Deeds.

14. **Exhibits:** The following exhibits are incorporated into this Restrictive Covenant and Easement:

Exhibit 1 – Legal Description

Exhibit 2 – Survey of the Property and Area of Restrictive Deed Covenants

Exhibit 3 – Description of Allowable Uses

Exhibit 4 – Permanent Marker

15. **Authority to Execute Restrictive Covenant and Easement:** The undersigned person executing this Restrictive Covenant and Easement represents and certifies that he or she is duly authorized and has been empowered to execute this Restrictive Covenant and Easement.

The MDEQ approves the form and content of this Restrictive Covenant and Easement on this 15th day of August 2013.

BY: _____
Susan Erickson, Assistant Division Chief
Remediation and Redevelopment Division
Department of Environmental Quality

STATE OF Michigan)
)ss
COUNTY OF Ingham)

Acknowledged before me in Ingham County, Michigan, on August 15 2013, by Susan Erickson, Assistant Division Chief, Remediation and Redevelopment Division.

_____
Kathleen J. Sruba
NOTARY PUBLIC

Kathleen J. Sruba, Notary Public
State of Michigan, County of Eaton
My Commission Expires 9/15/2018
Acting in the County of Ingham

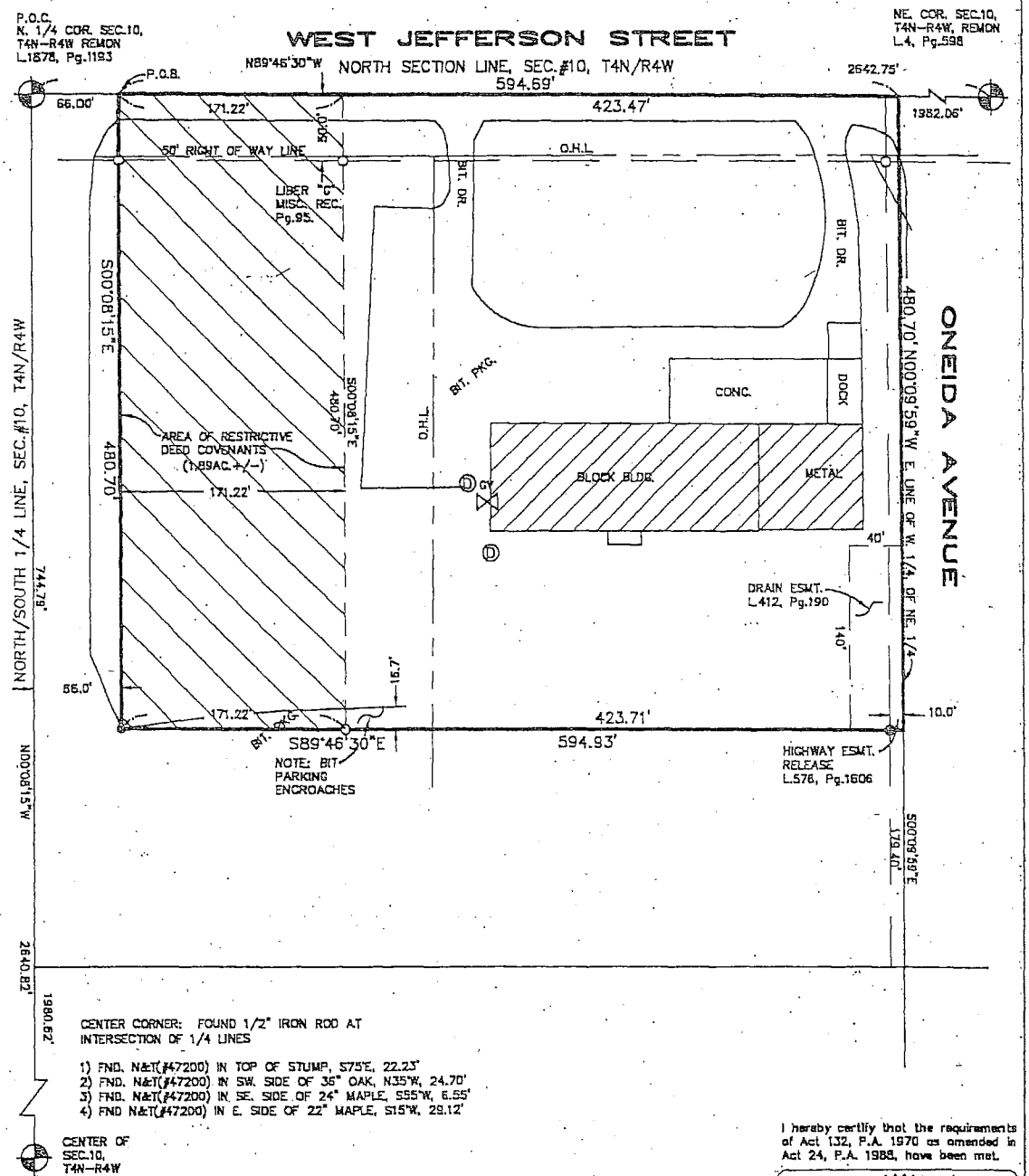
Notary Public, State of Michigan
County of Eaton
My commission expires: 9/15/18
Acting in the County of Ingham

This Document Prepared By:
Bradley J. Ermisch
Michigan Department of Environmental Quality
Remediation and Redevelopment Division
525 West Allegan Street
Lansing, Michigan 48933-2125

CERTIFICATE OF SURVEY

LIBER 2422 PAGE 0756 1 of 3

STATE OF MICHIGAN - EATON COUNTY
RECEIVED: 10/29/2012 10:56:08 AM Receipt #12024129
RECORDED: 10/29/2012 10:58:25 AM X.SRVY
M. FRANCES FULLER, CLERK/REGISTER OF DEEDS



Irons found at all points marked thus "⊕"
Irons set at all points marked thus "O"
Over Head Lines: O.H.L.
The ratio of closure on the unadjusted field observations of this survey did not exceed 1/5,000.

I hereby certify that the requirements of Act 132, P.A. 1970 as amended in Act 24, P.A. 1988, have been met.

STATE OF MICHIGAN
CHRISTOPHER T. COTTER
PROFESSIONAL SURVEYOR
No. 41097
LICENSED PROFESSIONAL SURVEYOR

Christopher T. Cotter
P.S. No. 41097

DLZ INDUSTRIAL SURVEYING, INC.
425 KEYSTONE AVENUE, LANSING, MI 48911
TELEPHONE (517) 393-6800 FAX (517) 272-7390

LANSING MICHIGAN

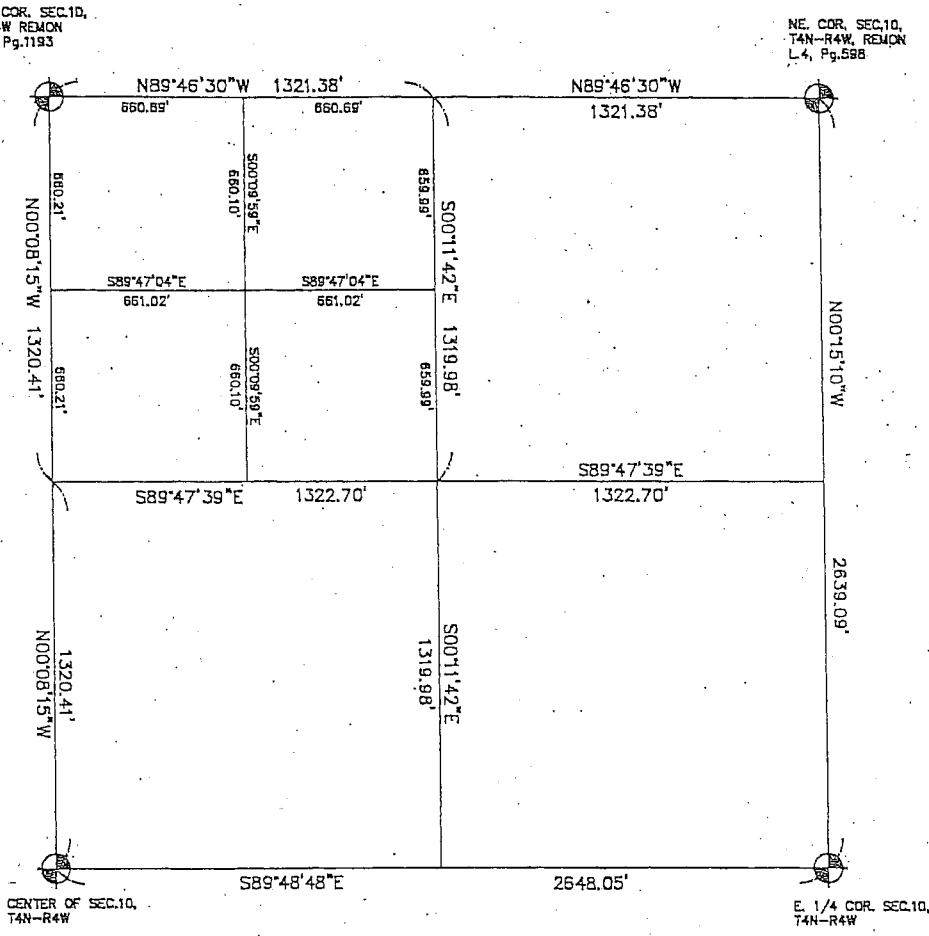
CERTIFICATE OF SURVEY
PARSON'S CHEMICAL
PREPARED FOR:
MICHIGAN DEPT. OF EVIRONMENTAL QUALITY

DRAWN: CTC	CHK'D.: SAJ	SHEET 1
DESIGNED:	APPRV'D.: SAJ	OF 3
DATE: SEPTEMBER 29, 2012		
SCALE: 1" = 100'		DRAWING NUMBER
PROJECT NUMBER 1250-9524-90		9524-0001PL

SECTION DIVISION SKETCH

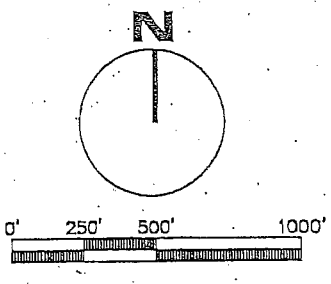
LIBER 2422 PAGE 0758 3 of 3

NORTHEAST 1/4 OF SECTION 10, T4N--R4W



CENTER CORNER: FOUND 1/2" IRON ROD AT INTERSECTION OF 1/4 LINES
1) FND. N&T(#47200) IN TOP OF STUMP, S75°E, 22.23'
2) FND. N&T(#47200) IN SW. SIDE OF 36" OAK, N35°W, 24.70'
3) FND. N&T(#47200) IN SE. SIDE OF 24" MAPLE, S55°W, 6.55'
4) FND N&T(#47200) IN E. SIDE OF 22" MAPLE, S15°W, 29.12'

FOUND CONC. MONUMENT WITH 1/2" REBAR CENTERED IN ROUND POURED MONUMENT 0.5' BELOW GRADE.
1) FOUND NAIL AND TAG IN S. SIDE OF 4"X4" WOOD FENCE POST STAINLESS STEEL TAG, MULTI PS#41095(HIGHEST), N48°W, 2.05'
2) SET MAG NAIL AND TAG IN NW. SIDE OF MULTI 24" ELM, S52°W, 10.97'
3) FOUND NAIL W/RIBBON IN N. ROOT OF MULTI 48" ELM, S85°E, 5.71'
4) FOUND IRON ROD AT SW. COR. OF LOT 8, "WOODSHOLLOW SUB.", S33°W, 240.42'



SCALE 1"=500'

STATE OF MICHIGAN
CHRISTOPHER T. COTTER
PROFESSIONAL SURVEYOR
No. 41097
LICENSED PROFESSIONAL SURVEYOR

Christopher T. Cotter
P.S. No. 41097

DLZ
DLZ INDUSTRIAL SURVEYING, INC.
1425 KEYSTONE AVENUE, LANSING, MI 48911
TELEPHONE (517) 393-6800 FAX (517) 272-7390

LANSING MICHIGAN

CERTIFICATE OF SURVEY
PARSON'S CHEMICAL
PREPARED FOR:
MICHIGAN DEPT. OF EVIRONMENTAL QUALITY

DRAWN: CTC	CHK'D.: SAJ	SHEET 3
DESIGNED:	APPRV'D.: SAJ	OF 3
DATE: SEPTEMBER 29, 2012		
SCALE: 1" = 100'		DRAWING NUMBER
PROJECT NUMBER 1250-9524-90		9524-0D01PL

p. 3 of 3

EXHIBIT 4

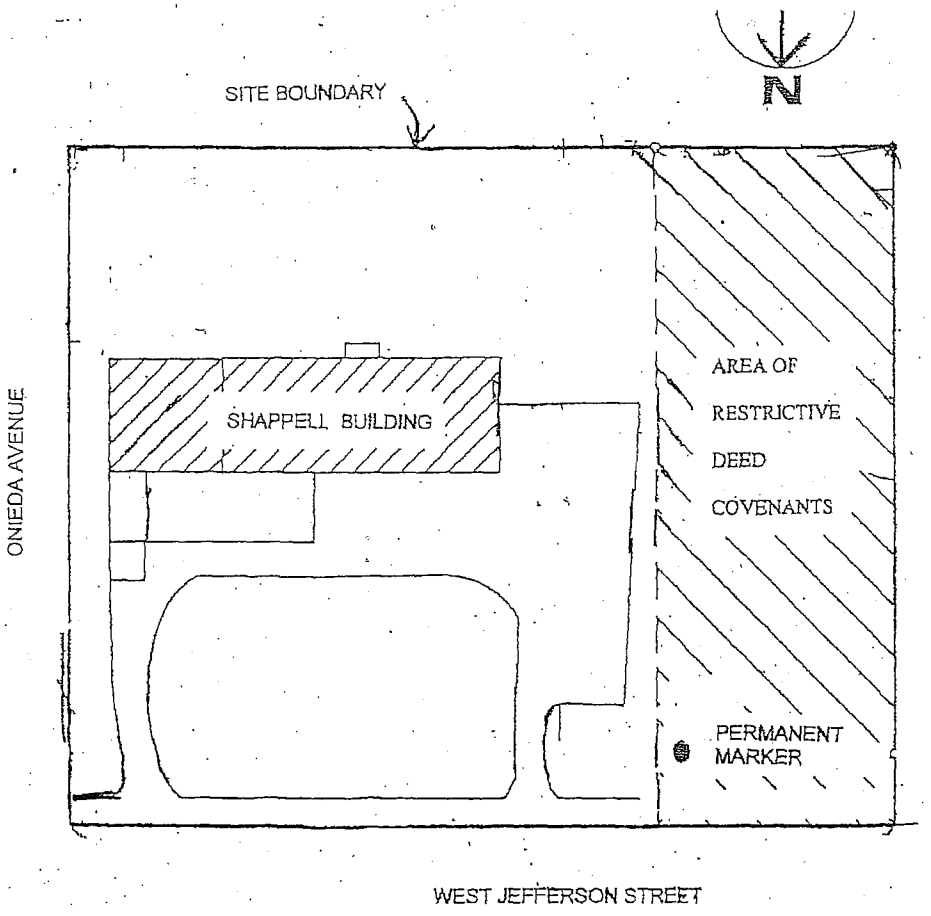
PERMANENT MARKER

NOTICE

PROPERTY DEPICTED OPERATED AS THE PARSONS CHEMICAL WORKS FROM 1945 THROUGH 1979. ENVIRONMENTAL REMEDIATION MEASURES TO ADDRESS CONTAMINATION INCLUDED SOIL REMOVAL AND ON SITE ISV TREATMENT.

EXCAVATION, DIGGING OR REMOVAL OF VEGETATION AND SOIL IS PROHIBITED IN THE ISV TREATMENT AREA DENOTED BELOW AS THE AREA OF RESTRICTIVE DEED COVENANTS.

ADDITIONAL INFORMATION IS CONTAINED IN THE RESTRICTIVE COVENANT RECORDED AT LIBER###, PAGE###, EATON COUNTY REGISTER OF DEEDS.



ATTACHMENT B

ATTACHMENT B

NARRATIVE AND SCOPE OF WORK

PARSONS CHEMICAL WORKS, INC.
REMEDIAL ACTION AND DOWNGRADIENT CHARACTERIZATION
JULY 2002

INTRODUCTION:

With this application the Michigan Department of Environmental Quality (MDEQ) requests $390,921 in federal funds to implement the remedy contained in the Parsons Chemical Works, Inc. (Parsons) September 1997 Record of Decision (ROD). The requested federal funds would pay for 90 percent of the remedial action (RA) and to investigate the post-ROD occurrence of elevated concentrations of two metals in groundwater. The ROD states that the threat posed by the site is the potential for chemicals detected in the top 20 feet of the bedrock aquifer to migrate vertically downward and horizontally in the direction of groundwater flow eventually degrading the groundwater quality in off-plant-property private water supplies.

The selected remedy consists of long-term monitoring of water supply wells within approximately ¼ mile of the Parsons plant property, and selected remedial investigation (RI) monitoring wells (MWs), to detect indications of degrading water quality. Trend analysis of the analytical results will be employed to identify indications of groundwater quality degradation. In the event that unacceptable groundwater degradation is found to be occurring, the ROD contains a contingency for municipal water to be provided to the affected area.

Sampling of RI MWs during the remedial design (RD) phase indicates the possibility that an arsenic plume has migrated off former-plant property. The location of the well having elevated arsenic is hydraulically downgradient of existing water supply wells. Lead was found in one well on plant property at a significantly higher concentration than was detected during the RI. Again, no water supply wells exist in the downgradient direction from this well. The extent of elevated arsenic and lead will be investigated in conjunction with implementation of the long-term monitoring and trend analysis response to determine whether restrictions, in the form of institutional controls, on future groundwater use are appropriate.

DETAILS OF REMEDIAL ACTION:

The ROD stipulates that the long-term monitoring of residential wells and RI selected MWs and trend analysis will take place for a period of 15 years unless it is determined during the 5-year review that a different duration is appropriate.

Four chemicals are identified in the ROD as chemicals of concern (COCs); manganese, arsenic, lead, and dieldrin. Specific threshold levels were established for lead and dieldrin.

The RA will consist of the following tasks: Develop an inventory of all water supply wells within ¼ mile of the Parsons property. Notify owners and renters of our intent to sample wells and obtain access from owners/tenants. Retain services of local health department (LHD) for the collection and transport of samples to the laboratory. Secure laboratory space at the MDEQ lab or overflow lab for analyses. Sample selected RI MWs to ascertain current conditions and confirm the previously identified residential drinking water criteria exceedances identified in August 2000. Tabulate and interpret data, and perform trend analysis. Distribute information.

The existing inventory of residential wells within ¼ mile of the Parsons property will be updated as appropriate. If wells south and west of the property are within ¼ mile of the site, they will be added to the inventory. The MDEQ will seek access agreements with all property owners. The MDEQ anticipates tasking the Barry-Eaton Health Department to collect the samples and transport them to the designated laboratory for analysis. The MDEQ Drinking Water and Radiological Protection Division (DWRPD) maintains contracts with LHDs throughout the state through which we can arrange for private well sampling. Sampling protocols from this contract will be submitted to the United States Environmental Protection Agency (EPA) for approval along with the quality assurance project plan from the MDEQ laboratory and any laboratories under contract with the MDEQ for overflow analytical work. If the EPA requires modification of these documents a level of effort (LOE) contractor will be retained to revise the documents to the satisfaction of the EPA.

Ten RI MWs will be sampled. These include MW-2, MW-3, MW-4, MW-5, MW-6, MW-8, MW-9, MW-10, MW-17, and MW-18. The wells will be analyzed for the site COCs, manganese, arsenic, lead, and dieldrin to determine current groundwater conditions. In addition to the COCs, samples will be analyzed for additional parameters including general chemistry parameters such as specific conductivity and pH, as well as ferric and ferrous iron, sodium, and turbidity to identify the oxidation and reduction conditions that may be present. This information is needed to complete the arsenic/lead assessment described in detail later in the scope of work (SOW). It will assist in the evaluation of the source of the elevated concentrations of the arsenic and lead, their potential mobility, and ability to impact downgradient resources. The deep MWs, 8, 9, 10,

17, and 18 will be redeveloped prior to sampling to provide more stable and representative aquifer conditions. Low-flow sampling will be used whenever well recharge rates allow. Otherwise we will use either a peristaltic pump or, as a last resort, a bailer to evacuate the well, allow its recharge, and then collect samples. To permit direct comparison to both RI analytical results and RD results, samples collected for metals will be filtered as well as unfiltered (total and dissolved).

A complete round of residential well samples will be collected from all locations where access is granted. Following receipt of the analytical results, the MDEQ, with input from the EPA, will determine when a second round of samples should be collected and whether a complete round or a partial subset of the inventory should be sampled.

Trend analysis will consist of development of time versus concentration plots and qualitative evaluation. In addition to the analytical results obtained from the RA sampling, analytical results from previous residential well sampling will be incorporated into the trend analysis to provide a broader data set.

Residents and the community will be apprised of the results of the monitoring.

I. YEAR ONE OF LONG-TERM MONITORING TASKS: done 2002(?) check file

A. Pre-Sampling Activities
   - Inventory of water supply wells
   - Arrangement with LHD and DWRPD
   - Lab scheduling
   - Notification to residents/access

B. Sampling and Analysis Activities
   - MW sampling
   - Residential well sampling (two rounds)
   - Analysis of samples

C. Trend Analysis and Data Interpretation
   - Data tabulation
   - Time versus concentration plots with qualitative evaluation (Following round two)
   - Evaluation for threshold exceedances
   - Determine appropriate sampling intervals for years 2-5 of 15-year monitoring program

D. Information Dissemination
   - Written notification to residents, property owners
   - Inform local officials of results

DETAILS OF THE ARSENIC AND LEAD ASSESSMENT:

Background: The RI MWs were sampled during RD. The concentration of arsenic in MW-10, a bedrock well, was measured at 170 parts per billion (ppb). The well is located hydraulically downgradient from the adjacent residential wells so no impact to any existing drinking water supply is a concern at this time. Low-flow sampling techniques were not in effect at the time of the RI. Therefore, it is difficult to make a direct comparison between the filtered and unfiltered sample results from the RI, and the results obtained from the samples collected via low-flow sampling techniques. Nevertheless, the arsenic concentration in the samples collected during RD is significantly higher than those observed during the RI. Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Part 201), generic residential drinking water criterion for arsenic is 50 ppb. The EPA recently lowered the maximum contaminant level drinking water criterion for arsenic to 10 ppb. In addition to exceeding the drinking water criteria, thus posing a concern for future groundwater use as drinking water, 170 ppb exceeds the Part 201 groundwater to surface water interface criterion for arsenic which is 150 ppb. The arsenic concentrations in the other bedrock monitor wells decreased overall from the time of the RI.

The concentration of lead was high in some of the MWs sampled in October 1999, using low-flow technique, compared to filtered results from the same wells observed during the RI. Of particular significance is the concentration in MW-3, measured at 218 ppb in October 1999.

The MDEQ will implement a series of tasks to assess the current groundwater conditions in order to determine the appropriate response to protect human health and the environment from elevated arsenic and lead. It is the intent of the MDEQ to proceed in a phased sequence. As each phase is completed, we will evaluate the results and determine whether to proceed to the subsequent task or modify the investigation.

Following preparatory tasks, such as access agreements, the MDEQ will conduct a vertical aquifer sampling (VAS) investigation to characterize the extent of the exceedance of drinking water criteria and the potential for further impact to groundwater and to surface water. The investigation will proceed in a phased approach and will be implemented concurrently with other aspects of the investigation. The completion of soil borings and collection of samples will be completed using a Geoprobe from the ground surface to the target depth. Investigation target depth will achieve penetration through the weathered bedrock zone into the consolidated bedrock, which is the local drinking water aquifer. Where shallow groundwater is encountered, a sample will be collected. A second groundwater sample (or first sample, if no shallow groundwater is encountered) will be collected in weathered bedrock, and a third in the competent bedrock. A fourth sample may be collected from the boring depending upon

conditions encountered and the depth to which the Geoprobe can reach. Soil samples are for lithologic information only.

As described previously, a sample from each interval will be filtered in addition to the total analysis to permit direct comparison to RI results.

Initially, a series of three borings approximately 20-40 feet downgradient of MW-10 will be installed. The first boring will be located directly northeast of MW-10. The second and third borings will flank the first boring at 50-foot intervals on an east west line. The exact locations are dependant on physical and legal access. Static water levels will be measured to define water flow directions.

A second series of five borings will be installed on an east west line approximately 400 feet downgradient of MW-10 and spaced 200 feet apart. A third series of four borings will be placed 500-600 feet further downgradient from the second series of borings spaced at intervals of 200 feet.

Data obtained from the first 8 borings will be evaluated to confirm the need to continue with the next series. The planned borings are being proposed as permanent wells, which would provide the ability to gather data over time for trend evaluation.

A contingency method of hollow-stem auger drilling has been selected should the Geoprobe rig fail to achieve the target sampling depth. The use of the drilling rig will necessitate the use of a surface casing set in the confining clay, overlying the weathered bedrock zone, to prevent any potential cross contamination between the shallow zone and the bedrock aquifer. This precaution was used in the RI investigation and the RD background drilling and should be continued.

Borings will be drilled into the competent bedrock next to existing wells MW-5 and MW-3 to further identify the extent of deep aquifer flow off plant property. Permanent wells will be installed in the two borings to facilitate future sampling as needed.

To evaluate the potential for, and location of groundwater impacting surface water, four piezometers will be installed in or next to the unnamed creek. The piezometers are for measuring water levels and to further determine flow direction.

Concurrent with the drilling program, a surface investigation will be conducted to attempt to determine the extent of the weathered bedrock zone in relation to the location of the Grand River. This will be accomplished by walking the bank of the unnamed stream, and the Grand River looking for indications of the clay confining layers and a weathered zone at the surface or in any of the valley erosional cuts. It is possible that this zone has been eroded completely and thus,

the currently identified pathway of highest contamination may not exist a short distance from the site. This could eliminate the threat of downgradient impact to the groundwater and local surface water.

If any groundwater seeps along the unnamed stream path or other land areas near the Grand River are identified, a sample will be collected to evaluate the presence of site related chemicals. Samples will be analyzed for the same parameters as groundwater from borings.

Boring locations will be surveyed for vertical and horizontal control to facilitate producing maps showing sampling locations, analytical results, and groundwater flow direction.

Water level measurements will be collected and mapped to verify groundwater flow direction in both the shallow groundwater and the bedrock aquifer to confirm the interpretation that the Environmental Response Division (ERD) made during the RD phase. With the additional static water level data collected during the RD, the ERD determined that the groundwater flowing beneath the former chemical plant will not impact current water supply wells, particularly those east of the former plant. Characterization of the fate of these contaminant plumes is appropriate because the ROD stipulates that degrading conditions will be assessed.

II. ARSENIC/LEAD ASSESSMENT TASKS:

A. Preparatory Activities
   - Access
   - New regional information

B. Subsurface Investigation Activities
   - VAS investigation
   - Additional borings
   - Piezometers

C. Groundwater Data Activities
   - Submit groundwater samples
   - Evaluate data
   - Survey and obtain static water level measurements
   - Prepare groundwater elevation maps

D. Surface Inventory and Seeps
   - Walking survey of regional geology
   - Seep identification and sampling

DELIVERABLES:

The ERD will prepare and submit semi-annual progress reports for the duration of the grant period summarizing the accomplishments for the previous six months and reporting expenditures.

The 5-year review for this site is scheduled to begin in September 2003. The MDEQ will incorporate the results of the first year of long-term monitoring and the arsenic and lead assessment into the 5-year review. Future site activities will be determined based on the conclusions drawn in the 5-year review. Funding for the 5-year review will be covered under a separate cooperative agreement.

III. PROJECT MANAGEMENT ACTIVITIES

A. Community Relations
B. Grant, Contract and Project Management Activities
C. Project Closeout/Beginning of Long-Term Monitoring and Operation and Maintenance (O&M)

PARSONS CHEMICAL WORKS, INC.
REMEDIAL ACTION LONG-TERM MONITORING WITH TREND ANALYSIS
AND
ARSENIC AND LEAD PLUME ASSESSMENT

ACTIVITY	OUTPUT	ANTICIPATED START DAY/MONTH of Grant Period	ANTICIPATED END DAY/MONTH of Grant Period
I. YEAR ONE OF LONG-TERM MONITORING TASKS			
A. Pre-Sampling Activities	-Inventory of wells -LHD & DWRPD -Lab scheduling -Access/notification	1-1	 30-3
B. Sampling and Analysis	-Monitoring wells -1st Round Res Well Samples -2nd Round Res Well Samples	1-2 1-4 To be det.	30-2 30-4
C. Trend Analysis and Data Interpretation	Time/Conc Plots	1-12	30-18
D. Information Dissemination	Letters et al	1-12	To be det.
II. ARSENIC/LEAD ASSESSMENT TASKS			
A. Preparation	Additional non-S'fund Information + Access	1-1	30-3
B. Subsurface Investigation	VAS, Borings, Piezometers	1-4	30-4
C. Groundwater Data Activities	Environmental samples to lab Data Evaluation Survey/Statics Groundwater Maps & Interpretation	15-4 ~1-9 1-6 1-7	30-5 30-13 30-6 30-12
D. Surface Inventory and Seeps	Bank walk + Seeps	1-4	30-4
III. PROJECT MANAGEMENT ACTIVITIES			
A. Community Relations		Ongoing	Ongoing
B. Grant/Contract/Project Management Activities		Ongoing	Ongoing
C. Project Closeout/Beginning of Long-Term Monitoring and O&M	(Follows 5-Year Rev.)		30-24

June 2002

PARSONS CHEMICAL WORKS, INC. BUDGET DETAIL
Co-operative Agreement Amendment
June 2002

PERSONNEL

FTE	CLASS & LEVEL	SALARY	COST	TOTAL
1	Environment Quality Analyst 12	$54,539	$54,539	
1	Geologist 12	$54,539	$54,539	
.15	Water Quality Technician 12	$48,483	$ 7,273	
.02	Environmental Engineer 13	$61,951	$ 1,239	
.04	Environmental Manager 14	$64,352	$ 2,574	
.08	Toxicologist 13	$61,951	$ 4,956	
.15	Statistician 12	$54,539	$ 8,181	
.10	Secretary 9	$38,336	$ 3,834	
.23	Student Assistant	$35,141	$ 8,082	
				$145,217

FRINGES

Based on 40 percent of salaries.....$ 58,087

INDIRECT

Based on 19.08 percent of total of salaries and fringes.....$ 38,790

CONTRACTUAL

Geoprobe	$ 5,000	
Residential well sampling	$ 6,400*	
Analytical	$ 24,175**	
LOE QAPP & field sampling plan	$ 50,000.....	$ 85,575
Contingency LOE expense for hollow-stem auger work		$100,000

TRAVEL

Based on 100 round trips of 26 miles each @ 0.29/mile	$754	
Additional cost of Geoprobe equipment	$500	$ 1,254

SUPPLIES

Includes sampling supplies, safety equipment, Geoprobe supplies, postage, protective clothing, etc. $ 5,000

OTHER

Based on 10 percent of grant total for audit $ 434

$ 434,357

*Up to 2 complete round of res. well samples w/ dups, blanks, estimate 80 samples/round @ $40/sample to collect and transport to lab..... $ 6,400

**10 RI wells + 1 dup X 2 (total & filtered) @ $100/sample.....	$ 2,200
160 Res well samples @ $75/sample.....	$12,000
96 VAS @ $100/sample.....	$ 9,600
5 Seeps (4.+ dup) @ $75/sample.....	$ 375
	$24,175

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OMB CIRCULAR A-87 COGNIZANT AGENCY
NEGOTIATION AGREEMENT

State of Michigan
Department of Environmental Quality
Lansing, MI

Date: September 12, 2001
Filing Ref: September 7, 2000

The indirect cost rates contained herein are for use on grants and contracts with the Federal Government to which Office of Management and Budget Circular A-87 applies, subject to the limitations contained in the Circular and in Section II, A below.

SECTION I: RATES

Type	Effective Period From	To	Rate	Base
Fixed	10/1/2001	9/30/2002	19.08%	(a)

Basis for Application
(a) Direct salaries and wages and fringe benefits.

Treatment of Fringe Benefits: Fringe benefits applicable to direct salaries and wages are treated as direct costs and charged in accordance with rates established by the State.

SECTION II: GENERAL

A. LIMITATIONS: The rates in this Agreement are subject to any statutory and administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the department/agency or allocated to the department/agency by an approved cost allocation plan were included in the indirect cost pool as finally accepted; such costs are legal obligations of the department/agency and are allowable under governing cost principles; (2) The same costs that have been treated as indirect costs have not been claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the department/agency which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. CHANGES. The fixed rate contained in this agreement is based on the organizational structure and the accounting system in effect at the time the proposal was submitted. Changes in the organizational structure or changes in the method of accounting for costs which affect the amount of reimbursement resulting from use of the rate in this agreement, require the prior approval of the authorized representative of the responsible negotiation agency. Failure to obtain such approval may result in subsequent audit disallowances.

C. THE FIXED RATE contained in this agreement is based on an estimate of the cost which will be incurred during the period for which the rate applies. When the actual costs for such a period have been determined, an adjustment will be made in the negotiation following such determination to compensate for the difference between the cost used to establish the fixed rate and that which would have been used were the actual costs known at the time.

D. NOTIFICATION TO FEDERAL AGENCIES: Copies of this document may be provided to other Federal agencies as a means of notifying them of the agreement contained herein.

E. SPECIAL REMARKS: None

ACCEPTANCE

By the State Agency:

Gary R. Hughes
(Signature)

Gary R. Hughes
(Name)

Deputy Director
(Title)

Michigan Department of Environmental Quality
(Agency)

September 21, 2001
(Date)

By the Federal Agency:

David Buntz
(Signature)

David Buntz, Cost Negotiator
Cost and Rate Negotiation Service Center
U.S. Environmental Protection Agency
September 12, 2001

Negotiated by: David Buntz
Telephone: (202) 564-4418

ATTACHMENT C

AECOM
401 S. Washington Square, Suite 103
Lansing, MI 48933

517-913-5800 tel
517-319-5401 fax

ATTACHMENT C

October 20, 2011

Ms. Cindy Fairbanks
Michigan Department of Environmental Quality
Superfund Section
Constitution Hall
525 West Allegan
Lansing, MI 48933

Subject: **Site Activity Summary Report**
Parsons Chemical Superfund Site Grand Ledge, Michigan

Dear Ms. Fairbanks,

AECOM is pleased to provide the Michigan Department of Environmental Quality (MDEQ), Superfund Section with the following Site Activity Summary Report associated with the well abandonment activities that occurred at the Parsons Chemical Superfund Site in Grand Ledge, Eaton County, Michigan.

Project Understanding and Objective

The overall project goals were to

- Collect Global Positioning System (GPS) data on all monitoring well locations
- Complete well abandonment and removal of 16 monitoring wells

Well Coordinate Collection

AECOM field personnel collected northing and easting coordinates using a hand held Trimble GeoXH unit. The coordinates collected are located in ***Table 1*** and are displayed on ***Figure 1***.

Well Abandonment

AECOM contracted Stearns Drilling Company of Dutton, Michigan to complete the well abandonment at the Site. Monitoring well abandonment activities commenced on August 30 and were completed on September 7, 2011. ***Appendix A*** contains the field notes completed by AECOM field personnel. ***Appendix B*** contains the well abandonment logs completed by Stearns.

As indicated in Appendix B, the bedrock wells, MW-8, MW-9, MW-10, MW-11, MW-16, MW-17 and MW-18, were overdrilled using 12.25-inch diameter hollow stem augers to remove the 10-inch casing set in the bedrock, and 4.25-inch diameter hollow stem augers to remove the 2-inch casing set above the bedrock. All bedrock boreholes were filled with cement bentonite grout. All wells were tremie grouted to within 6 inches of ground surface, filled in with 6 inches of topsoil, and seeded.

The remaining wells were overdrilled using only 4.25- inch diameter hollow stem augers and were filled with a quik grout slurry. All wells were tremie grouted to within 6 inches of the ground surface, filled in with 6 inches of topsoil, and seeded. The fence that was around MW-4 was removed and disposed during the well abandonment activities.

Disposal

The drill cuttings from wells MW-11, MW-12, MW-13, and MW-15 (all on the southwest side of M-43) were spread on the ground. The drill cuttings from the remaining wells were placed in a dumpster for subsequent disposal at Granger Landfill, as arranged by Stearns. AECOM field personnel collected a waste characterization sample for laboratory analysis. The results are included in ***Appendix C***.

While awaiting laboratory results, MDEQ requested that AECOM field personnel attempt to cover the dumpster as the site owner indicated that debris was blowing out of the dumpster. AECOM field personnel covered the dumpster.

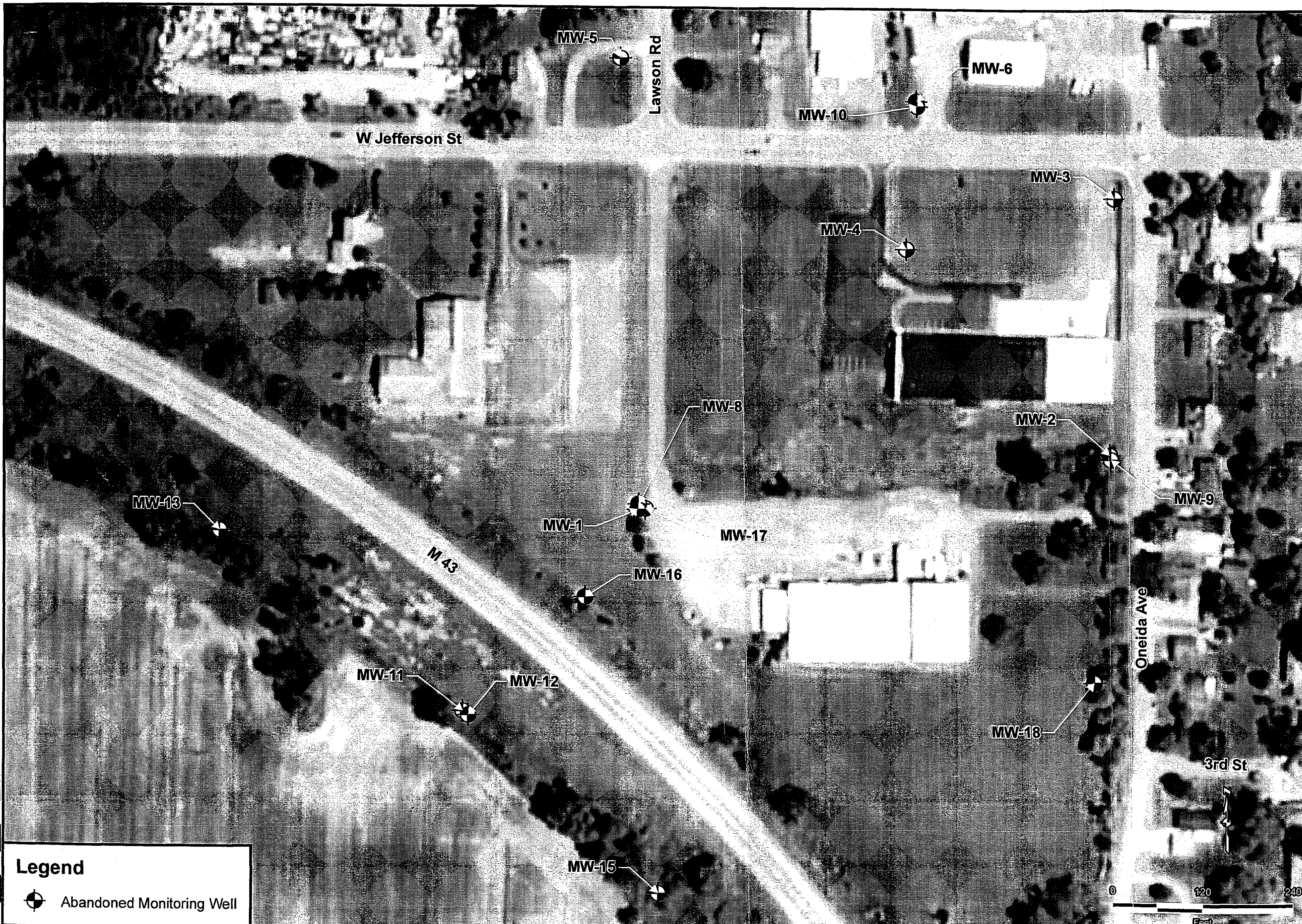
Thank you for the opportunity to assist on this project. If you have any questions or comments, feel free to contact Renée Lester at (517) 913-5821.

Respectfully,

Renée Lester, PE, CP
Project Engineer

Scott Park, CPG
Project Manager

Enclosures



AECOM

www.aecom.com

ABANDONED MONITORING WELL LOCATIONS
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
PARSONS CHEMICAL
3562 WEST JEFFERSON
GRAND LEDGE MICHIGAN

Drawn:	JWW	9/21/2011
Approved:	RL	9/21/2011
Scale:	AS SHOWN	
PROJECT NUMBER	60222431	
FIGURE NUMBER	1	

TABLE 1
PARSON CHEMICAL SUPERFUND SITE
FORMER MONITORING WELL COORDINATES

Well Identification	Northing	Easting
MW-1	457287.473	13015260.894
MW-2	457362.288	13015884.999
MW-3	457702.850	13015890.645
MW-4	457633.610	13015615.709
MW-5	457886.066	13015237.688
MW-6	457830.326	13015629.073
MW-8	457294.693	13015262.287
MW-9	457356.340	13015886.682
MW-10	457823.788	13015629.948
MW-11	457019.454	13015031.851
MW-12	457014.425	13015038.999
MW-13	457257.145	13014709.796
MW-15	456779.718	13015289.440
MW-16	457171.743	13015191.701
MW-17	457288.816	13015271.017
MW-18	457060.467	13015865.450

AECOM

DAILY FIELD REPORT

DATE 8/30/11

DAY	S	M	T	W	T	F	S
			X				

PROJECT: Parsons Chemical

JOB NO.: 60222431

CLIENT: MDEQ

CONTRACTOR: Stearns

PROJECT MANAGER: Scott Park

WEATHER	Mostly Cloudy			
TEMP.	70°			
WIND	Still to low X	Mod	High	Report No
HUMIDITY	Dry X	Mod	Humid	

EQUIPMENT AT THE SITE ROTARY RIG, BOBCAT, 2 SUPPORT TRUCKS

NUMBER OF PERSONNEL ON SITE

JERRY HUNTOON, GARY GEERLIGS (STEARNS), J. PANCO (AECOM)

FIELD ACTIVITIES

0745: J. PANCO ON SITE, TALK W/ DAVE SHAPPELL (SITE OWNER) TO LET HIM KNOW WE ARE ABOUT TO BEGIN AND WHERE HE WOULD LIKE FOR US TO STAGE EQUIPMENT.

0840: R. LESTER & S. PARK (AECOM) ON SITE.

0905: STEARNS ON SITE.

0910: LESTER & PARK OFF SITE.

0935: OFF SITE TO FILL STEARNS' WATER TANK AT G.L. WATER TREATMENT PLANT.

1025: BACK ON SITE, SET UP AT MW-4. EOB 12.5'

NOTE: ALL BORINGS WILL BE GROUTED TO WITHIN 6" OF GROUND SFC, THEN TOPPED W/ TOPSOIL.

1139: AT MW-3. EOB 22'.

1208: BREAK FOR LUNCH

1230: PANCO BACK - LOOK FOR WELLS ACROSS SAGINAW

1250: STEARNS BACK.

By J. Panco Title

AECOM

DAILY FIELD REPORT

(Continuation Sheet)

PROJECT PARSONS REPORT NO.

JOB NO. 60222437 DATE 8/30/11

FIELD ACTIVITIES (Continued)

1406: AT MW-13, EOB 10'

1410: CINDY & BILL (MDEQ) ON SITE. DISCUSS W/ THEM ABOUT SPREADING SOILS AROUND BORINGS ON S. SIDE OF SAGINAW HWY. CINDY IS OK WITH THAT.

1500: AT MW-17, EOB 12'.

1540: CINDY & BILL OFF SITE.

1556: AT MW-11, DOUBLE CASING WELL.

1730: CEMENT BREAKS FREE, WILL PULL CASING AND GROUT WELL TOMORROW.

1740: OFF SITE

NOTE: MW-13 AND MW-12 WERE SHALLOW WELLS. THE GROUT IN THESE WELLS EXTENDED INTO THE LOWER PORTION OF THE PROTECTIVE COVERS, THUS CAUSED THE CASING TO COME OUT OF THE GROUND WITH THE COVER. STEARNS THEN DRILLED DOWN TO THE END OF BORING DEPTH AND TREMMIE GROUTED FROM THERE.

By _____ Title _____

AECOM

DAILY FIELD REPORT

DATE 8/31/11

DAY	S	M	T	W	T	F	S
				X			

PROJECT: Parsons Chemical

JOB NO.: 60222431

CLIENT: MDEQ

CONTRACTOR: Stearns

PROJECT MANAGER: Scott Park

WEATHER	CLOUDY, INT. RAIN			
TEMP.	65° / 75°			
WIND	Still to low X	Mod	High	Report No
HUMIDITY	Dry	Mod X	Humid	

EQUIPMENT AT THE SITE: ROTARY RIG, BOBCAT, 2 SUPPORT TRUCKS

NUMBER OF PERSONNEL ON SITE

THUNTOON, G. GEERLICS (STEARNS), J. PANCO (AECOM)

FIELD ACTIVITIES

0715: J. PANCO ON SITE.

0730: STEARNS ON SITE, SET UP TO FINISH MW-11. 39' EOB, 35 BAGS OF CEMENT USED IN CEMENT/BENTONITE SLURRY.

1116: AT MW-15, CLEAR OUT BRUSH AROUND WELL.

1135: GO TO SPOT DUMPSTER.

1245: BACK ON SITE, STEARNS WAS TO REPAIR FUEL LEAK ON BOBCAT. ALSO GO TO GET MORE WATER

1319: BILL (MDEQ) ON SITE, STEARNS HAVING TROUBLE GETTING COVER & CASING OUT OF TROUND. WHEN IT FINALY COMES OUT THE GROUT IS @ 8" IN DIA. TO A DEPTH OF @ 10'. BOTTOM 1' OF SCREEN IS CLEAN, REST HAS COVERING OF THAT LOOKS AS THOUGH IT WOULD BLOCK WATER FROM ENTERING SCREEN. EOB 15'.

1500: DONE WITH MW-15, STEARNS BEGINS TO COLLECT SCRAP FROM ALL WELLS TO CONSOLIDATE @ 1 SPOT.

1530: BILL OFF SITE

By [signature] Title

AECOM

DAILY FIELD REPORT

(Continuation Sheet)

PROJECT Parsons REPORT NO.

JOB NO. 60277431 DATE 8/31/11

FIELD ACTIVITIES (Continued)

1600: AT MW-1. EOB 15'.

1705: AT MW-17.

1735: MW-17 PREPD FOR DRILLING. OFF SITE

By _____ Title _____

AECOM

DAILY FIELD REPORT

DATE 9/1/11

DAY	S	M	T	W	T	F	S
					X		

PROJECT: Parsons Chemical

JOB NO.: 60222431

CLIENT: MDEQ

CONTRACTOR: Stearns

PROJECT MANAGER: Scott Park

WEATHER	Sunny			
TEMP.	68°			
WIND	Still to low X	Mod	High	Report No
HUMIDITY	Dry	Mod X	Humid	

EQUIPMENT AT THE SITE: Rotary Rig, Bobcat, 2 Support Trucks

NUMBER OF PERSONNEL ON SITE

J. Hutoon, G. Geerlgs (Stearns), J. Panco (AECOM)

FIELD ACTIVITIES

0720: J. Panco on site. Begin to Trimble in well locations.

0800: Stearns on site. They had to pick up concrete. They will continue with MW-17.

0915: 10" casing sand-locked in auger and casing spun apart @ 18' BGS. Stearns will have to continue with 4½" auger inside remaining casing, leaving 10" in place. Actually, all of 10" casing came out w/ the concrete.

1119: Bill (MDEQ) on site. Explain situation at MW-17 and he is appeased.

1155: Lunch.

1245: Back on site, continue with MW-17. EOB 60'.

1315: Bill back

1340: Cindy (MDEQ) on site.

1410: At MW-8.

1600: Cindy off site.

By John Panco Title

AECOM

DAILY FIELD REPORT

(Continuation Sheet)

PROJECT PARSONS REPORT NO.

JOB NO. 60222431 DATE 9/1/11

FIELD ACTIVITIES (Continued)

1135: J. Powco OFF SITE. BILL WILL WATCH STEARNS FINISH DRILLING ON MW-8

Page 2 of 2

By _____ Title _____

AECOM

DAILY FIELD REPORT

DATE 9/2/11

DAY	S	M	T	W	T	F	S
						X	

PROJECT: Parsons Chemical

JOB NO.: 60222431

CLIENT: MDEQ

CONTRACTOR: Stearns

PROJECT MANAGER: Scott Park

WEATHER	T. Storms			
TEMP.	80 / 20			
WIND	Still to low	Mod X	High	Report No
HUMIDITY	Dry	Mod	Humid X	

EQUIPMENT AT THE SITE Rotary Rig, Bobcat, 2 Support Trucks

NUMBER OF PERSONNEL ON SITE

J. Huntoon, G. Geerligs (Stearns), J. Panco (AECOM)

FIELD ACTIVITIES

0730: on site, Stearns already here. Finish MW28. EOB 35'. Hit Bed Rock at 35', can't drill down any further. Recover all of well casing except for screen. Used rod to knock tip out of screen, then grout through rod to fill bottom of boring.

1000: Bill (MDEQ) on site. Gave him rundown about MW-8; he is happy with it.

1022: At MW-16. EOB 18'

1100: Scott Park (AECOM) on site for H&S audit

1130: S. Park off site

1138: Bill off site

1333: At MW-2. EOB 15'.

1413: At MW-9. Will leave this for Tuesday. Rest of day spent cleaning up around wells.

1458: Bill back on site.

1500: All off site

By _____ Title _____

AECOM

DAILY FIELD REPORT

DATE 9/6/11

DAY	S	M	T	W	T	F	S
			X				

PROJECT: Parsons Chemical

JOB NO.: 60222431

CLIENT: MDEQ

CONTRACTOR: Stearns

PROJECT MANAGER: Scott Park

WEATHER	CLOUDY			
TEMP.	49°			
WIND	Still to low	Mod X	High	Report No
HUMIDITY	Dry	Mod X	Humid	

EQUIPMENT AT THE SITE: ROTARY RIG, BOBCAT, 2 SUPPORT TRUCKS

NUMBER OF PERSONNEL ON SITE

J. HUNTOON, G. GEERLIGS (STEARNS), J. PANCO (AECOM)

FIELD ACTIVITIES

0730: J. PANCO ON SITE

0810: STEARNS ON SITE, UNLOAD SUPPLIES

0855: AT MW-9, 32' EOB

1015: BILL (MDEQ) ON SITE.

1125: BILL OFF SITE.

1135: BREAK FOR LUNCH.

1444: AT MW-18

1515: BILL BACK ON SITE.

1710: RIG DRILLING THROUGH BEDROCK, SO STOP BORING AT 28'. FORCE ROD DOWN TO BOTTOM OF SCREEN AND PUSH THROUGH IT. PLACE TREMMIE ROD TO 40' AND START GROUTING.

1730: BILL OFF SITE

1855: DONE W/GROUTING. WILL FINISH CLEANING UP AROUND BORING IN MORNING. OFF SITE

By John Panco Title

AECOM

DAILY FIELD REPORT

DATE 9/7/11

DAY	S	M	T	W	T	F	S
				X			

PROJECT: Parsons Chemical

JOB NO.: 60222431

CLIENT: MDEQ

CONTRACTOR: Stearns

PROJECT MANAGER: Scott Park

WEATHER	Partly Cloudy			
TEMP.	50°			
WIND	Still to low X	Mod	High	Report No
HUMIDITY	Dry	Mod X	Humid	

EQUIPMENT AT THE SITE Rotary Rig, Bobcat, 2 Support Trucks

NUMBER OF PERSONNEL ON SITE

T. Huntoon, G. Geerligs (Stearns), J. Panco (AECOM)

FIELD ACTIVITIES

0650: J. Panco on site

0700: Stearns on site, proceed to clean up at MW-18.

0750: At MW-5. EOB 15'.

0845: At MW-6. EOB 15'.

0940: At MW-10. Ground level has been raised, so will have to do some digging to get down to the casing.

0950: Bill (MDEQ) on site.

1030: Bill off site.

1110: Break for lunch.

1407: Done w/ MW-10. EOB 25'. Clean-up of site.

1600: Off site

By J. Panco Title

AECOM

DAILY FIELD REPORT

DATE 9/12/11

DAY	S	M	T	W	T	F	S
		X					

PROJECT: Parsons Chemical

JOB NO.: 60222431

CLIENT: MDEQ

CONTRACTOR: Stearns

PROJECT MANAGER: Scott Park

WEATHER				
TEMP.				
WIND	Still to low	Mod	High	Report No
HUMIDITY	Dry	Mod	Humid	

EQUIPMENT AT THE SITE

NUMBER OF PERSONNEL ON SITE

J. Panco

FIELD ACTIVITIES

1030: ON SITE TO COLLECT COMPOSIT SAMPLE FOR TCLP.

1130: OFF SITE

By J. Panco Title

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Job No. 11-12959-8

LOG OF TEST BORING NO. MW-1

Sheet 1 of 1

Project Parsons Chemical

Location Grand Ledge, MI

Date Completed 8/31/11

Crew Chief Hartman
Drill Rig 1050
Boring Method 4.25

Hole Plugged With Quik Grout Slurry

GROUNDWATER:
Encountered @ _____ ft.
After completion _____ ft.
After _____ hrs. _____ ft.
Seepage _____ ft.
Boring Caved at _____ ft.

MONITOR WELL DATA:
Pipe/Type
Length
Above Ground
Cap

Screen/Type
Size
Slot
Set @
Backfilled

Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned

Development

REMARKS:

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth In Feet	SOIL DESCRIPTION	TW
				Remove pro-cover	
				Overdrill 2" well w/ 4.25 H.S.A. to 15'	
				Pull well & screen	
				Tremie grout hole	
			5	Total Depth = 15'	
			10		
			15		
			20		
			25		
			30		

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Job No. 11-12959-8

LOG OF TEST BORING NO. MW-2

Sheet 1 of 1

Project Parsons Chemical

Location Grand Ledge, MI

Date Completed 9/2/11

Crew Chief Hunton
Drill Rig 1050
Boring Method 4.25

Hole Plugged With Quik Grout Slurry

GROUNDWATER:
Encountered @ 5 ft.
After completion ____ ft.
After ____ hrs. ____ ft.
Seepage ____ ft.
Boring Caved at ____ ft.

MONITOR WELL DATA:
Pipe/Type 2" SCH 40
Length
Above Ground
Cap

Screen/Type
Size
Slot
Set @
Backfilled

Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned

Development

REMARKS:

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth In Feet	SOIL DESCRIPTION	T W
				Remove Pro-cover	
				Overdrill 2" well w/ 4.25	
				H.S.A. and Remove well	
				materials.	
				Tremie Grout Hole	
			5	Total Depth = 15'	
			10		
			15		
			20		
			25		
			30		

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Job No. 11-12959-B

LOG OF TEST BORING NO. MW-4

Sheet 1 of 1

Project Parsons Chemical

Location Grand Ledge, MI

Date Completed 8/30/11

Crew Chief Huntoon
Drill Rig 1050
Boring Method 4.25

Hole Plugged With Quik-Grout Slurry

GROUNDWATER:
Encountered @ 3 ft.
After completion ____ ft.
After ____ hrs. ____ ft.
Seepage ____ ft.
Boring Caved at ____ ft.

MONITOR WELL DATA:
Pipe/Type 2" GALV
Length
Above Ground
Cap

Screen/Type
Size
Slot
Set @
Backfilled

Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned

Development

REMARKS:

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth In Feet	SOIL DESCRIPTION	TW
				REMOVE protective FENCE REMOVE pro. COVER	
				USE 4.25 H.S.A TO OVERDRILL 2" GALV. WELL	
			5	REMOVE WELL/SCREEN TREMIE GROUT TO SURFACE	
				TOTAL Depth 12.5'	
				E.O.B. @ 12.5'	
			10		
			15		
			20		
			25		
			30		

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Job No. 11-12959-8

LOG OF TEST BORING NO. MW-5

Sheet 1 of 1

Project Parsons Chemical

Location Grand Ledge, MI

Date Completed 9.7.11

Crew Chief Hanton
Drill Rig 1050
Boring Method 4.25

Hole Plugged With Quick Grout Slurry

GROUNDWATER:
Encountered @ 5 ft.
After completion ____ ft.
After ____ hrs. ____ ft.
Seepage ____ ft.
Boring Caved at ____ ft.

MONITOR WELL DATA:
Pipe/Type 2" PVC
Length
Above Ground
Cap

Screen/Type
Size
Slot
Set @
Backfilled

Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned

Development

REMARKS:

LEGEND:
BlowCount/Blows per 6" w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth In Feet	SOIL DESCRIPTION	TW
				Remove pro-cover	
				Overdrill 2" well w/ 4.25 Augers to 15'	
				Remove well materials & grout hole	
			5	Total Depth = 15'	
			10		
			15		
			20		
			25		
			30		

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Job No. 11-12959-8

LOG OF TEST BORING NO. MW-3

Sheet 1 of 1

Project Parsons Chemical

Location Grand Ledge, MI

Date Completed 8/30/11

Crew Chief Hudson
Drill Rig 1050
Boring Method 4.25
Hole Plugged With Quik Grout Slurry

GROUNDWATER:
Encountered @ 8 ft.
After completion ____ ft.
After ____ hrs. ____ ft.
Seepage ____ ft.
Boring Caved at ____ ft.

MONITOR WELL DATA:
Pipe/Type 2" Galv
Length
Above Ground
Cap

Screen/Type
Size
Slot
Set @
Backfilled

Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned

Development

REMARKS:

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth in Feet	SOIL DESCRIPTION	TW
				REMOVE PRO-COVER	
				OVERDRILL w/ 4.25 H.S.A TO 22'	
				REMOVE CASING/SCREEN	
			5	TREMIE GROUT HOLE THROUGH AUGERS	
				TOTAL DEPTH = 22'	
			10		
			15		
			20		
			25		
			30		

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Job No. 11-12959-8

LOG OF TEST BORING NO. MW-6

Sheet 1 of 1

Project Parsons Chemical

Location Grand Ledge, MI

Date Completed 9-7-11

Crew Chief Hunton
Drill Rig 1050
Boring Method 4.25

Hole Plugged With Quik Grout Slurry

GROUNDWATER:
Encountered @ 5 ft.
After completion ____ ft.
After ____ hrs. ____ ft.
Seepage ____ ft.
Boring Caved at ____ ft.

MONITOR WELL DATA:
Pipe/Type 2" Stainless
Length
Above Ground
Cap

Screen/Type
Size
Slot
Set @
Backfilled

Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned

Development

REMARKS:

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth in Feet	SOIL DESCRIPTION	T W
				Remove pro-cover	
				Overdrill 2" well w/ 4.25 Augers to 14'	
				Remove well materials & Grout Hole	
			5	Total Depth = 14'	
			10		
			15		
			20		
			25		
			30		

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Job No. 11-12959-8

LOG OF TEST BORING NO. MW-8

Sheet 1 of 1

Project Parsons Chemical

Location Grandledge, MI

Date Completed 9.2.11

Crew Chief Hunton
Drill Rig 1050
Boring Method 12.25 – 18'
4.25 – 35'
Hole Plugged With Cement Bent. Grout 42'-0

GROUNDWATER:
Encountered @ 33 ft.
After completion ____ ft.
After ____ hrs. ____ ft.
Seepage ____ ft.
Boring Caved at ____ ft.

MONITOR WELL DATA: 10" CASING
Pipe/Type 2" SCH 40
Length
Above Ground
Cap

Screen/Type
Size
Slot
Set @
Backfilled

Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned

Development

REMARKS: Bedrock App. 35'
Couldn't proceed w/ 4.25 H.S.A past that point. GROUTED SCREEN IN PLACE Through A/W Rods THAT WERE placed IN WELL Before drilling. (Knocked hole in Screen w/ Rods)

LEGEND:
BlowCount/Blows per 6" w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth In Feet	SOIL DESCRIPTION	TW
				CUT/Remove pro. cover	
				Overdrill 10" CASING w/ 12.25 H.S.A. TO 18'	
				REMOVE 10" CASING FROM Hole.	
				Overdrill 2" well Through 12.25 H.S.A. TO 35' + After Refusal point. (Bedrock)	
			5	TREMIE CEMENT GROUT Through A/W Rods which were placed in 2" well Before drilling From 42'-0 (TOTAL Depth of well)	
				(2" well Broke off @ 20' Below Grade	
				* (KNOCKED Bottom of Screen out By pounding w/ A/W Rods	
			10	TOTAL DEPTH w/ 12.25 H.S.A = 18'	
				TOTAL Depth w/ 4.25 H.S.A = 35'	
				(TOTAL Depth of 2" well = 42')	
			15		
			20		
			25		
			30		

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Job No. 11-12959-B

LOG OF TEST BORING NO. MW-9

Sheet 1 of 1

Project Parsons Chemical

Location Grand Ledge, MI

Date Completed 9-6-11

Crew Chief Huntoon
Drill Rig 1050
Boring Method 12.25 → 18'
4.25 → 32'
Hole Plugged With Cement Bent. Grout

GROUNDWATER:
Encountered @ 18 ft.
After completion ft.
After hrs. ft.
Seepage ft.
Boring Caved at ft.

MONITOR WELL DATA:
Pipe/Type 2" SCH. 40 PVC
Length (10" CASING)
Above Ground
Cap

Screen/Type
Size
Slot
Set @
Backfilled

Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned

Development

REMARKS:

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth in Feet	SOIL DESCRIPTION	T W
			0	CUT PRO-COVER/WELL FLUSH	
				OVERDRILL 10" CASING	
				W/ 12.25 H.S.A.	
				REMOVE 10" CASING -	
				OVERDRILL 2" WELL W/	
				4.25 H.S.A THROUGH 12.25 H.S.A.	
			5	TO 32'. REMOVE REMAINING	
				WELL MATERIALS & TREMIE	
				GROUT HOLE 32'-0.	
				TOTAL DEPTH = 32' - 4.25 H.S.A	
				TD = 18' - 12.25 H.S.A	
			10		
			15		
			20		
			25		
			30		

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Job No. 11-12959-8

LOG OF TEST BORING NO. MW-10

Sheet 1 of 1

Project Parsons Chemical

Location Grand Ledge, MI

Date Completed 9-7-11

Crew Chief Huntoon
Drill Rig 1050
Boring Method 12.25 → 18'
4.25 → 25'
Hole Plugged With Cement Bent. Grout

GROUNDWATER:
Encountered @ 15.5 ft.
After completion ft.
After hrs. ft.
Seepage ft.
Boring Caved at ft.

MONITOR WELL DATA:
Pipe/Type 2" PVC
Length (10" CASED)
Above Ground
Cap

Screen/Type
Size
Slot
Set @
Backfilled

Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned

Development

REMARKS:

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth In Feet	SOIL DESCRIPTION	T W
				REMOVE PRO-COVER	
				OVERDRILL 10" CASING W/ 12.25 H.S.A & REMOVE WELL MATERIALS.	
				OVERDRILL 2" HOLE W/ 4.25 H.S.A & CEMENT GROUT HOLE	
			5	TOTAL D = 12.25 ± 18'	
				TD = 4.25 ± 25'	
			10		
			15		
			20		
			25		
			30		

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Job No. 11-12959-B

LOG OF TEST BORING NO. MW-11
10" DOUBLE CASED

Sheet 1 of 1

Project Parsons Chemical

Location Grand Ledge, Mi

Date Completed 8-31-11

Crew Chief Huntoon
Drill Rig 1050
Boring Method * 4.25 → 39'
* 12.25 → 30'
Hole Plugged With Cement Bent. Grout

GROUNDWATER:
Encountered @ 25 ft.
After completion ____ ft.
After ____ hrs. ____ ft.
Seepage ____ ft.
Boring Caved at ____ ft.

MONITOR WELL DATA:
Pipe/Type 2" Galv.
Length
Above Ground
Cap

Screen/Type
Size
Slot
Set @
Backfilled

Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned

Development

REMARKS: Bedrock App. 34'
Able to proceed to 39' w/ 4.25
Through former Existing Well Hole.

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth in Feet	SOIL DESCRIPTION	TW
				CUT PRO-COVER EVEN W/ 10" CASING	
				OVERDRILL 10" CASING W/ 12.25 H.S.A. TO 30'. CASING BROKE FREE ALONG W/ 2" WELL WHICH WAS GROUTED THROUGH CASING.	
				REMOVE ENTIRE 10" CASING/ WELL & SCREEN.	
			10	DRILL W/ 4.25 AUGERS THROUGH 12.25 H.S.A TO 39'.	
				CEMENT TREMIE GROUT 39'-0	
			20	(TOTAL DEPTH of Hole = 39' W/ 4.25 H.S.A.)	
				(TOTAL DEPTH 12.25 H.S.A. 30')	
			30		
			40		
			50		
			60		

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Job No. 11.12959-B

LOG OF TEST BORING NO. MW-12

Sheet 1 of 1

Project Parsons Chemical

Location Grand Ledge, MI

Date Completed 8/30/11

Crew Chief Huston
Drill Rig 1050
Boring Method 4.25

Hole Plugged With Quik Grout Slurry

GROUNDWATER:
Encountered @ 5.7 ft.
After completion ____ ft.
After ____ hrs. ____ ft.
Seepage ____ ft.
Boring Caved at ____ ft.

MONITOR WELL DATA:
Pipe/Type
Length
Above Ground
Cap

Screen/Type
Size
Slot
Set @
Backfilled

Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned

Development

REMARKS:

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth In Feet	SOIL DESCRIPTION	TW
				REMOVE PRO-COVER	
				OVERDRILL W/ 4.25 H.S.A TO 12'	
				REMOVE CASING / SCREEN	
			5	TREMIE GROUT HOLE THROUGH AUGERS.	
				TOTAL DEPTH = 12'	
			10		
			15		
			20		
			25		
			30		

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Job No. 11-12959-B

LOG OF TEST BORING NO. MW-13

Sheet 1 of 1

Project Parsons Chemical

Location Grand Ledge, MI

Date Completed 9/30/11

Crew Chief Hunteon
Drill Rig 1050
Boring Method 4.25 HSA

Hole Plugged With Quik Grout Slurry

GROUNDWATER:
Encountered @ 6' ft.
After completion ft.
After hrs. ft.
Seepage ft.
Boring Caved at ft.

MONITOR WELL DATA:
Pipe/Type 2" Galv.
Length
Above Ground
Cap

Screen/Type
Size
Slot
Set @
Backfilled

Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned

Development

REMARKS:

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth In Feet	SOIL DESCRIPTION	TW
				Remove pro-cover	
				Overdrill w/ 4.25 H.S.A. to 10'	
				Remove casing/screen	
				Tremie Grout	
				Total Depth = 10'	
			5		
			10		
			15		
			20		
			25		
			30		

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Job No. 11-12959-B

LOG OF TEST BORING NO. MW-15

Sheet 1 of 1

Project Parsons Chemical

Location Grand Ledge, Mi

Date Completed 8/31/11

Crew Chief Hunton
Drill Rig 1050
Boring Method 4.25

Hole Plugged With Quik-Grout Slurry

GROUNDWATER:
Encountered @ 8 ft.
After completion ____ ft.
After ____ hrs. ____ ft.
Seepage ____ ft.
Boring Caved at ____ ft.

MONITOR WELL DATA:
Pipe/Type 2" SCH
Length
Above Ground
Cap

Screen/Type
Size
Slot
Set @
Backfilled

Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned

Development

REMARKS:

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth In Feet	SOIL DESCRIPTION	TW
				Remove pro. cover	
				Overdrive 2" well w/ 4.25 H.S.A. to 15'	
				Pull well + screen	
				Tremie grout hole	
			5	Total Depth = 15'	
			10		
			15		
			20		
			25		
			30		

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Job No. 11-12959-8

LOG OF TEST BORING NO. MW-17

Sheet 1 of 1

Project Parsons Chemical

Location Grand Ledge, Mi

Date Completed 9/1/11

Crew Chief Huntoon
Drill Rig 1050
Boring Method 12.25 → 19'
4.25 → 60'
Hole Plugged With Cement/Bent. Grout

GROUNDWATER:
Encountered @ 33 ft.
After completion ft.
After hrs. ft.
Seepage ft.
Boring Caved at ft.

MONITOR WELL DATA:
Pipe/Type (2" Galv.)
Length (10" CASING)
Above Ground
Cap

Screen/Type
Size
Slot
Set @
Backfilled

Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned

Development

REMARKS: Bedrock App. @ 40'
Able to proceed w/ 4.25 to 60'
Through over top 2" well w/ previous hole drilled w/ 4 1/8" bit.

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth In Feet	SOIL DESCRIPTION	T W
				CUT/Remove Pro. cover	
				Overdrill 10" CASING w/ 12.25 H.S.A. to 19'	
				Pull 10" CASING out of Ground	
				Overdrill Remaining 2" well w/ 4.25 H.S.A. To 60' Through 12.25 H.S.A.	
				Tremie Grout Hole using Cement Bent. Grout.	
			5	2" Galv. well Broke 21' Below Grade @ joint. Grouted the rest in place in hole.	
				Total Depth 12.25 H.S.A = 19'	
				Total Depth 4.25 H.S.A = 60'	
			10		
			15		
			20		
			25		
			30		

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Job No. 11.12959-8

LOG OF TEST BORING NO. MW-18

Sheet 1 of 1

Project Parsons Chemical

Location Grand Ledge, Mi.

Date Completed 9-6-11

Crew Chief Huntoon
Drill Rig 1050
Boring Method 12.25 → 18'
4.25 → 28'
Hole Plugged With Cement Bent. Grout 42'-0'

GROUNDWATER:
Encountered @ 25 ft.
After completion ft.
After hrs. ft.
Seepage ft.
Boring Caved at ft.

MONITOR WELL DATA:
Pipe/Type 2" Galv.
Length (10" casing)
Above Ground
Cap
Screen/Type
Size
Slot
Set @
Backfilled
Bentonite Seal
Grout/Type
Depth
Protective Casing
Materials Cleaned
Development

REMARKS: Bedrock stones App. @ 25'.

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS - 2" Split Spoon Sampler
LS - Brass Liner Sample
ST - Shelby Tube Sample
SNR - Sample not recovered

Sample Type	REC	Blow Count	Depth In Feet	SOIL DESCRIPTION	TW
				Cut pro. concr/well flush	
				Overdrill 10" casing w/ 12.25 H.S.A.	
				Remove 10" casing	
				Overdrill 2" well w/ 4.25 H.S.A Through 12.25.	
			5	Auger refusal @ 28' (Bedrock)	
				Grout well through A/w Rods which were placed in 2" well prior to drilling. After pounding Rods through bottom of well.	
				(Total grouted = 42' (Depth of well)	
			10	12.25 H.S.A = 18'	
				4.25 H.S.A = 28'	
			15		
			20		
			25		
			30		

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September 23, 2011

Ms. Cindy Fairbanks
MDEQ
530 W. Allegan, 3rd Floor, South
Lansing, MI 48933

RE: Trace Project T11I143
MDEQ Site Parsons

Dear Ms. Fairbanks:

Enclosed are the analytical results that represent the completed report for the above project. All analyses were completed at Trace Analytical Laboratories, Inc.

The sample was received on 9/14/2011 12:00:00 PM , in good condition, correctly labeled and properly preserved. Any problems encountered during sample receipt are addressed in the enclosed Sample Log-In Checklist.

Every practical effort was made to meet the quality control requirements of each analytical method and the reporting limit specifications of the project. The analytical data associated with this project has been reviewed for accuracy, precision, and completeness. Methods used for analyses are indicated on analytical reports. A Statement of Data Qualifications Section is provided for any data that required qualification.

Ms. Gina M. Roe has reviewed the QA/QC results associated with the analysis of these samples. To the best knowledge of the signer, the QA/QC data are complete and accurate. The review was completed on September 23, 2011.

If you have questions or require further information, please contact me at 231.773.5998 or by email at groe@trace-labs.com.

Sincerely,

Gina M. Roe
Project Manager

Enclosures

c: Ms. Renee Lester
AECOM
5555 Glenwood Hills Pkwy., SE
Grand Rapids, MI 49588

ACCREDITED IN ACCORDANCE WITH nelac

NJDEP Accreditation No. MI008 PADEP Accreditation No. 68-04471

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TRACE ID T11I143
MDEQ Site Parsons

CROSS REFERENCE TABLE

MDEQ ID	TRACE ID
SC-1	T11I143-01

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QUALIFIER KEY

DEFINITIONS

<, ND or U	Indicates the compound was analyzed for but not detected.
*	Indicates a result that exceeds its associated MCL or Surrogate control limits.
N	Indicates that the compound has not been evaluated by NELAC.
NA	Indicates that the compound is not available.
RDL	Reporting Detection Limit
MCL	Maximum Contamination Limit
TIC	Tentatively Identified Compound
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference

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ANALYTICAL RESULTS

Trace Project ID: T11I143
Client Project ID: Parsons

Trace ID: T11I143-01 Date Collected: 09/12/11 10:30 Matrix: Solid
Sample ID: SC-1 Date Received: 09/14/11 12:00

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS, TCLP										
Analysis Method: EPA 8260B										
Batch: T025281										
Vinyl chloride	<0.050	mg/L	0.050	50	09/16/11	jq	09/16/11	jq		0.20
1,1-Dichloroethene	<0.050	mg/L	0.050	50	09/16/11	jq	09/16/11	jq		0.70
2-Butanone	<0.25	mg/L	0.25	50	09/16/11	jq	09/16/11	jq		200
Chloroform	<0.050	mg/L	0.050	50	09/16/11	jq	09/16/11	jq		6.0
Carbon tetrachloride	<0.050	mg/L	0.050	50	09/16/11	jq	09/16/11	jq		0.50
Benzene	<0.050	mg/L	0.050	50	09/16/11	jq	09/16/11	jq		0.50
1,2-Dichloroethane	<0.050	mg/L	0.050	50	09/16/11	jq	09/16/11	jq		0.50
Trichloroethene	<0.050	mg/L	0.050	50	09/16/11	jq	09/16/11	jq		0.50
Tetrachloroethene	<0.050	mg/L	0.050	50	09/16/11	jq	09/16/11	jq		0.70
Chlorobenzene	<0.050	mg/L	0.050	50	09/16/11	jq	09/16/11	jq		100
1,4-Dichlorobenzene	<0.050	mg/L	0.050	50	09/16/11	jq	09/16/11	jq		7.5
Surrogates:										
1,2-Dichloroethane-d4	110	%	70-133	50	09/16/11	jq	09/16/11	jq		
Toluene-d8	106	%	76-125	50	09/16/11	jq	09/16/11	jq		
4-Bromofluorobenzene	88	%	72-123	50	09/16/11	jq	09/16/11	jq		
1,2-Dichlorobenzene-d4	91	%	71-123	50	09/16/11	jq	09/16/11	jq		
PESTICIDES/PCBS, TCLP										
Analysis Method: EPA 8081A										
Batch: T025275										
Chlordane	<0.00050	mg/L	0.00050	1	09/19/11	kb	09/21/11	tim		0.030
Endrin	<0.00010	mg/L	0.00010	1	09/19/11	kb	09/21/11	tim		0.020
gamma-BHC (Lindane)	<0.00010	mg/L	0.00010	1	09/19/11	kb	09/21/11	tim		0.40
Heptachlor	<0.00010	mg/L	0.00010	1	09/19/11	kb	09/21/11	tim		0.0080
Heptachlor epoxide	<0.00010	mg/L	0.00010	1	09/19/11	kb	09/21/11	tim		0.0080
Methoxychlor	<0.00010	mg/L	0.00010	1	09/19/11	kb	09/21/11	tim		10
Toxaphene	<0.0050	mg/L	0.0050	1	09/19/11	kb	09/21/11	tim		0.50
Surrogates:										
Tetrachloro-m-xylene	52	%	38-94	1	09/19/11	kb	09/21/11	tim	N	
Decachlorobiphenyl	85	%	40-93	1	09/19/11	kb	09/21/11	tim	N	

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ANALYTICAL RESULTS

Trace Project ID: T11I143
Client Project ID: Parsons

Trace ID: T11I143-01 Date Collected: 09/12/11 10:30 Matrix: Solid
Sample ID: SC-1 Date Received: 09/14/11 12:00

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
METALS, TCLP										
Analysis Method: EPA 6010B										
Batch: T025380										
Arsenic	<0.30	mg/L	0.30	1	09/23/11	ns	09/23/11	jlm		5.0
Barium	<1.0	mg/L	1.0	1	09/23/11	ns	09/23/11	jlm		100
Cadmium	<0.10	mg/L	0.10	1	09/23/11	ns	09/23/11	jlm		1.0
Chromium	<0.50	mg/L	0.50	1	09/23/11	ns	09/23/11	jlm		5.0
Copper	<0.50	mg/L	0.50	1	09/23/11	ns	09/23/11	jlm		
Lead	<0.50	mg/L	0.50	1	09/23/11	ns	09/23/11	jlm		5.0
Selenium	<0.60	mg/L	0.60	1	09/23/11	ns	09/23/11	jlm		1.0
Silver	<0.10	mg/L	0.10	1	09/23/11	ns	09/23/11	jlm		5.0
Zinc	<0.50	mg/L	0.50	1	09/23/11	ns	09/23/11	jlm		
Analysis Method: EPA 7470A										
Batch: T025349										
Mercury	<0.010	mg/L	0.010	1	09/21/11	ns	09/22/11	jlm		0.20

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QUALITY CONTROL RESULTS

Trace Project ID: T11I143
Client Project ID: Parsons

QC Batch: T025248	Analysis Description: TCLP Extraction, SVOC
QC Batch Method: Leaching proceedures	Analysis Method: EPA 1311

Trace Project ID: T11I143
Client Project ID: Parsons

QC Batch: T025380	Analysis Description: Cadmium, TCLP
QC Batch Method: EPA 3015 Microwave Assisted Digestions for	Analysis Method: EPA 6010B

METHOD BLANK: T025380-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Silver	mg/L	<0.10	0.10	
Arsenic	mg/L	<0.30	0.30	
Barium	mg/L	<1.0	1.0	
Cadmium	mg/L	<0.10	0.10	
Chromium	mg/L	<0.50	0.50	
Copper	mg/L	<0.50	0.50	
Lead	mg/L	<0.50	0.50	
Selenium	mg/L	<0.60	0.60	
Zinc	mg/L	<0.50	0.50	

METHOD BLANK: T025380-BLK2

Parameter	Units	Blank Result	Reporting Limit	Notes
Silver	mg/L	<0.10	0.10	
Arsenic	mg/L	<0.30	0.30	
Barium	mg/L	<1.0	1.0	
Cadmium	mg/L	<0.10	0.10	
Chromium	mg/L	<0.50	0.50	
Copper	mg/L	<0.50	0.50	
Lead	mg/L	<0.50	0.50	
Selenium	mg/L	<0.60	0.60	
Zinc	mg/L	<0.50	0.50	

METHOD BLANK: T025380-BLK3

Parameter	Units	Blank Result	Reporting Limit	Notes
Silver	mg/L	<0.10	0.10	
Arsenic	mg/L	<0.30	0.30	
Barium	mg/L	<1.0	1.0	
Cadmium	mg/L	<0.10	0.10	
Chromium	mg/L	<0.50	0.50	
Copper	mg/L	<0.50	0.50	
Lead	mg/L	<0.50	0.50	
Selenium	mg/L	<0.60	0.60	

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METHOD BLANK: T025380-BLK3

Parameter	Units	Blank Result	Reporting Limit	Notes
Zinc	mg/L	<0.50	0.50	

METHOD BLANK: T025380-BLK4

Parameter	Units	Blank Result	Reporting Limit	Notes
Silver	mg/L	<0.10	0.10	
Arsenic	mg/L	<0.30	0.30	
Barium	mg/L	<1.0	1.0	
Cadmium	mg/L	<0.10	0.10	
Chromium	mg/L	<0.50	0.50	
Copper	mg/L	<0.50	0.50	
Lead	mg/L	<0.50	0.50	
Selenium	mg/L	<0.60	0.60	
Zinc	mg/L	<0.50	0.50	

LABORATORY CONTROL SAMPLE: T025380-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Silver	mg/L	0.0278	<0.10	92	80-120	
Arsenic	mg/L	0.0556	<0.30	95	80-120	
Barium	mg/L	0.889	<1.0	94	80-120	
Cadmium	mg/L	0.0278	<0.10	98	80-120	
Chromium	mg/L	0.0278	<0.50	97	80-120	
Copper	mg/L	0.889	0.841	95	80-120	
Lead	mg/L	0.0556	<0.50	89	80-120	
Selenium	mg/L	0.0556	<0.60	93	80-120	
Zinc	mg/L	0.889	0.850	96	80-120	

MATRIX SPIKE / MATRIX SPIKE DUPLICATE: T025380-MSD1 Original: **T11I143-01**

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Notes
Silver	mg/L	0	0.250	0.225	0.219	90	88	75-125	3	20	
Arsenic	mg/L	0	0.500	0.512	0.518	102	104	75-125	1	20	
Barium	mg/L	0.373	8.00	7.86	7.59	94	90	75-125	4	20	
Cadmium	mg/L	0	0.250	0.255	0.239	102	95	75-125	6	20	
Chromium	mg/L	0	0.250	0.253	<0.50	101	98	75-125	3	20	
Copper	mg/L	0	8.00	7.54	7.31	94	91	75-125	3	20	
Lead	mg/L	0	0.500	0.439	0.517	88	103	75-125	16	20	
Selenium	mg/L	0	0.500	0.520	<0.60	104	98	75-125	6	20	
Zinc	mg/L	0.0576	8.00	7.97	7.51	99	93	75-125	6	20	

Trace Project ID: T11I143
Client Project ID: Parsons

QC Batch: T025349
QC Batch Method: EPA 7470A Prep

Analysis Description: Mercury, TCLP
Analysis Method: EPA 7470A

CERTIFICATE OF ANALYSIS

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METHOD BLANK: T025349-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Mercury	mg/L	<0.010	0.010	

METHOD BLANK: T025349-BLK2

Parameter	Units	Blank Result	Reporting Limit	Notes
Mercury	mg/L	<0.010	0.010	

METHOD BLANK: T025349-BLK3

Parameter	Units	Blank Result	Reporting Limit	Notes
Mercury	mg/L	<0.010	0.010	

METHOD BLANK: T025349-BLK4

Parameter	Units	Blank Result	Reporting Limit	Notes
Mercury	mg/L	<0.010	0.010	

LABORATORY CONTROL SAMPLE: T025349-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Mercury	mg/L	0.00200	<0.010	101	80-120	

MATRIX SPIKE / MATRIX SPIKE DUPLICATE: T025349-MSD1 Original: **T11I143-01**

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Notes
Mercury	mg/L	0	0.0500	0.0565	0.0530	113	106	75-125	6	20	

Trace Project ID: T11I143
Client Project ID: Parsons

QC Batch: T025246 — Analysis Description: TCLP Extraction, Metals
QC Batch Method: Leaching proceedures — Analysis Method: EPA 1311

Trace Project ID: T11I143
Client Project ID: Parsons

QC Batch: T025249 — Analysis Description: TCLP ZHE, Volatiles
QC Batch Method: Leaching proceedures — Analysis Method: EPA 1311

Trace Project ID: T11I143
Client Project ID: Parsons

QC Batch: T025275 — Analysis Description: TCLP Pesticides
QC Batch Method: EPA 3510C Separatory Funnel Liquid-Liquid Extr. — Analysis Method: EPA 8081A

METHOD BLANK: T025275-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Chlordane	mg/L	<0.00005 0	0.000050	
Endrin	mg/L	<0.00001 0	0.000010	
gamma-BHC (Lindane)	mg/L	<0.00001 0	0.000010	

CERTIFICATE OF ANALYSIS

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METHOD BLANK: T025275-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Heptachlor	mg/L	<0.000010	0.000010	
Heptachlor epoxide	mg/L	<0.000010	0.000010	
Methoxychlor	mg/L	<0.000010	0.000010	
Toxaphene	mg/L	<0.00050	0.00050	
Tetrachloro-m-xylene (S)	%	60	38-94	
Decachlorobiphenyl (S)	%	80	40-93	

LABORATORY CONTROL SAMPLE: T025275-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Endrin	mg/L	0.0000500	0.0000392	78	31-145	
gamma-BHC (Lindane)	mg/L	0.0000500	0.0000278	56	38-125	
Heptachlor	mg/L	0.0000500	0.0000263	53	34-124	
Heptachlor epoxide	mg/L	0.0000500	0.0000288	58	35-125	
Methoxychlor	mg/L	0.0000500	0.0000339	68	54-109	
Tetrachloro-m-xylene (S)	%	0.000100	0.0000530	53	38-94	
Decachlorobiphenyl (S)	%	0.000100	0.0000727	73	40-93	

Trace Project ID: T11I143
Client Project ID: Parsons

QC Batch: T025281 — Analysis Description: TCLP Volatiles
QC Batch Method: EPA 5035 Purge-and-Trap for Solids and Wastes — Analysis Method: EPA 8260B

METHOD BLANK: T025281-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Vinyl chloride	mg/L	<0.050	0.050	
1,1-Dichloroethene	mg/L	<0.050	0.050	
2-Butanone	mg/L	<0.25	0.25	
Chloroform	mg/L	<0.050	0.050	
Carbon tetrachloride	mg/L	<0.050	0.050	
Benzene	mg/L	<0.050	0.050	
1,2-Dichloroethane	mg/L	<0.050	0.050	
Trichloroethene	mg/L	<0.050	0.050	
Tetrachloroethene	mg/L	<0.050	0.050	
Chlorobenzene	mg/L	<0.050	0.050	
1,4-Dichlorobenzene	mg/L	<0.050	0.050	
1,2-Dichloroethane-d4 (S)	%	106	70-133	
Toluene-d8 (S)	%	109	76-125	
4-Bromofluorobenzene (S)	%	85	72-123	
1,2-Dichlorobenzene-d4 (S)	%	79	71-123	

CERTIFICATE OF ANALYSIS

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LABORATORY CONTROL SAMPLE: T025281-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Vinyl chloride	mg/L	0.0200	<0.050	95	47-184	
1,1-Dichloroethene	mg/L	0.0200	<0.050	103	64-156	
2-Butanone	mg/L	0.0200	<0.25	75	70-130	
Chloroform	mg/L	0.0200	<0.050	93	80-120	
Carbon tetrachloride	mg/L	0.0200	<0.050	87	79-141	
Benzene	mg/L	0.0200	<0.050	88	80-120	
1,2-Dichloroethane	mg/L	0.0200	<0.050	92	80-120	
Trichloroethene	mg/L	0.0200	<0.050	85	69-133	
Tetrachloroethene	mg/L	0.0200	<0.050	86	70-120	
Chlorobenzene	mg/L	0.0200	<0.050	90	80-120	
1,4-Dichlorobenzene	mg/L	0.0200	<0.050	83	80-120	
1,2-Dichloroethane-d4 (S)	%	40.0	41.3	103	70-133	
Toluene-d8 (S)	%	40.0	42.2	105	76-125	
4-Bromofluorobenzene (S)	%	40.0	38.4	96	72-123	
1,2-Dichlorobenzene-d4 (S)	%	40.0	39.0	98	71-123	

MATRIX SPIKE / MATRIX SPIKE DUPLICATE: T025281-MSD1 Original: **T11I143-01**

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Notes
Vinyl chloride	mg/L	0	1.00	1.07	1.05	107	105	60-153	2	13	
1,1-Dichloroethene	mg/L	0	1.00	1.16	1.04	116	104	60-146	10	15	
2-Butanone	mg/L	0	1.00	0.908	0.876	91	88	60-140	4	23	
Chloroform	mg/L	0	1.00	1.01	0.960	101	96	68-124	5	13	
Carbon tetrachloride	mg/L	0	1.00	0.942	0.904	94	90	68-125	4	12	
Benzene	mg/L	0	1.00	0.947	0.906	95	91	78-114	4	11	
1,2-Dichloroethane	mg/L	0	1.00	1.02	0.986	102	99	63-132	4	11	
Trichloroethene	mg/L	0	1.00	0.837	0.830	84	83	70-117	0.8	14	
Tetrachloroethene	mg/L	0	1.00	0.768	0.832	77	83	57-126	8	12	
Chlorobenzene	mg/L	0	1.00	0.956	0.927	96	93	75-116	3	12	
1,4-Dichlorobenzene	mg/L	0	1.00	0.864	0.775	86	78	69-118	11	18	
1,2-Dichloroethane-d4 (S)	%		40.0	42.5	42.3	106	106	70-133			
Toluene-d8 (S)	%		40.0	38.5	42.9	96	107	76-125			
4-Bromofluorobenzene (S)	%		40.0	37.7	35.2	94	88	72-123			
1,2-Dichlorobenzene-d4 (S)	%		40.0	38.4	34.6	96	87	71-123			

CHAIN-OF-CUSTODY RECORD

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Page 1 of 1

TRACE ID NO. T111143

TRACE USE ONLY

Logged By: [signature] Checked By: [signature]

Received on Ice: (Yes) No Preservative Checked: Yes No (N/A)

Soil Volatiles Preserved: MeOH Low Level Lab Sampling Time:

Report Results To:

Client Name: MDEQ RD

Contact Person: Cindy Fairbanks.

Mailing Address:

City, State, Zip Code: Lansing Mi

Phone: 335.4111 Fax:

Email Address:

Cell #: Sampled by: JP

Project Name & #: Parsons.

cc to: AECom

Regulatory Requirements		Turnaround Requirements		Matrix Key	
MERA TMDL's	☐	Standard	☐	S = Soil	WI = Wipes
Drinking Water	☐	3-4 Day (RUSH)*	☐	W = Water	LW = Liquid Waste
NPDES	☐	24-48 Hour (RUSH)*	☐	SE = Sediment	A = Air
USACE	☐	* Requires prior approval		OI = Oil	D = Drinking Water
Special	☐			SO = Solid Waste	SL = Sludge

Bill To:

Billing Address (if different)

City, State, Zip Code

Attn: Phone: PO #:

Request for Analytical Services

ANALYSIS REQUESTED

TRACE NO.	DATE TAKEN	TIME TAKEN	METALS FIELD FILTERED	CLIENT SAMPLE ID	MATRIX	NUMBER OF CONTAINERS	TCL Volatiles	TCL Pesticides	TCL MIO Metals	REMARKS	Possible Health Hazard
01	9/12/11	10:30		SC-1	S	1	X	X	X		

9/13/11

Please Sign

Item #	RELEASED BY	RECEIVED BY	DATE	TIME	Item #	RELEASED BY	RECEIVED BY	DATE	TIME
1)	[signature]	[signature]	9-14-11	12:00	3)				
2)	[signature]	[signature]	9-14-11	15:55	4)				

In executing this Chain of Custody, the client acknowledges acceptance of the terms and conditions of the agreement as set forth at http://www.trace-labs.com/cocterms.php

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DEQ

MICHIGAN DEPT. OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY
ANALYSIS REQUEST SHEET

Page 1 of 1

LAB ORDER #

MATRIX=ASTM LEACH / TCLP / SPLP

SITE CODE NUMBER	SITE NAME			ACCEPT HT CODES? YES / NO If yes, which parameters?
	PARSONS			
DIVISION	DISTRICT/OFFICE	MDEQ PROJECT MANAGER	E-MAIL ADDRESS	PHONE
RD	CADILLAC	CINDY FAIRBANKS	@mdf.gov	335-4111
PRIMARY CONTACT PERSON	CONTRACT FIRM NAME (If applicable)	PHONE	AY: INDEX: PROJECT:	PCA: PH:
RENEE CESTER	AECOM	(517) 913-5821		
1ST CHOICE: TRACE	OVERFLOW LAB (Required) 2ND CHOICE:		E-MAIL ADDRESSES TO SEND ADDITIONAL REPORTS TO: 1.) RENEE.CESTER@AECOM.COM	
COLLECTED BY: JOHN PANCO	PHONE: (517) 488-5314		2.) JOHN.PANCO@AECOM.COM	

**** SAFETY INFORMATION REQUIRED ****
SEE BACK OF FORM

LAB USE ONLY		FIELD ID (Sample Identification)	SAMPLE COLLECTED DATE MM/DD/YY	SAMPLE COLLECTED TIME MILITARY	GPS COORDINATES LATITUDE	GPS COORDINATES LONGITUDE	COMMENTS
1	AB	SC-1	9/12/11	10:30			ML 10 METALS
2	AB						
3	AB						
4	AB						
5	AB						
6	AB						
7	AB						
8	AB						
9	AB						
10	AB						

↓Circle Requested Parameter and Corresponding Sample No.↓

TCLP/SPLP

OX

TCLP Volatiles	(1) 2 3 4 5 6 7 8 9 10
SPLP Volatiles	1 2 3 4 5 6 7 8 9 10
TCLP Semi-Volatiles	1 2 3 4 5 6 7 8 9 10
SPLP Semi-Volatiles	1 2 3 4 5 6 7 8 9 10
TCLP Pesticides	(1) 2 3 4 5 6 7 8 9 10
SPLP Pesticides	1 2 3 4 5 6 7 8 9 10

TCLP/SPLP

MX

TCLP Metals	(1) 2 3 4 5 6 7 8 9 10
SPLP Metals	1 2 3 4 5 6 7 8 9 10
As Ba Cd Cr Cu Pb Hg Se Ag Zn	1 2 3 4 5 6 7 8 9 10
List Other Metals	1 2 3 4 5 6 7 8 9 10

GX

SPLP Cyanide	1 2 3 4 5 6 7 8 9 10
SPLP Cr^{+6}	1 2 3 4 5 6 7 8 9 10

ASTM LEACH (Neutral Leach)

MS

Cl SO_4 Alk.	1 2 3 4 5 6 7 8 9 10
Cr^{+6}	1 2 3 4 5 6 7 8 9 10
Ca Mg K Na	1 2 3 4 5 6 7 8 9 10
Al Sb As Ba Be Cd Cr Co Cu Fe Pb Li Mn Hg Mo Ni Se Ag Tl Ti V Zn	1 2 3 4 5 6 7 8 9 10
% Total Solids	1 2 3 4 5 6 7 8 9 10

GS

NO_3, Ortho P	1 2 3 4 5 6 7 8 9 10
COD	1 2 3 4 5 6 7 8 9 10
TOC	1 2 3 4 5 6 7 8 9 10
NO_2+NO_3, NH_3	1 2 3 4 5 6 7 8 9 10
Kjel N, Tot. P	1 2 3 4 5 6 7 8 9 10
Phenolics	1 2 3 4 5 6 7 8 9 10
Cyanide	1 2 3 4 5 6 7 8 9 10
% Total Solids	1 2 3 4 5 6 7 8 9 10

Chain-of-Custody

	RELEASED BY / ORGANIZATION	RECEIVED BY / ORGANIZATION	DATE	TIME
Print Name & Organization	JOHN PANCO AECOM	Melissa Smith	9/13/11	930
Signature	John Panco			
Print Name & Organization				
Signature				
Print Name & Organization				
Signature				

CERTIFICATE OF ANALYSIS

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SAMPLE LOG IN CHECKLIST

Date: 9-14-11 Client Name: MDEQ # of Coolers: 1

Trace ID #: T11I143 Project Name: Cooler #s:

Logged in by: Cooler #s:

Cooler Receipt

Cooler/samples delivered by: Trace courier [X] Hand delivered [ ] Commercial courier [ ] Name of delivery person: Tim B UPS [ ] DHL [ ] FED EX [ ] US Mail [ ]

Did cooler come with a bill of lading? No [ ] Yes [ ] [X] Not Applicable Way Bill or Tracking #:

COC Seals present and intact on cooler? No [ ] Yes [ ] [X] Not Applicable

Custody seals signed by Client? No [ ] Yes [ ] Client custody seal # (if applicable):

Coolant and Temperature

Type of Coolant Used

	Yes	No
Slurry w/ crushed, cubed, or chip ice?	[ ]	[ ]
Multiple bags of ice around samples?	[X]	[ ]
Ice Packs/ Blue Ice :	[ ]	[ ]
No Coolant Present:	[ ]	

Cooler Temperature Correction Factor +0.1 °C

Date: 9-14-11 Time: 15:56

Temperature Blank: °C

Range of 3 samples: 14 °C

Melt Water: °C

Ice still present upon receipt: [ ] Yes [X] No

General

	Yes	No	NA
COC taped to inside of cooler lid?	[ ]	[X]	[ ]
All bottles arrived unbroken with labels in good condition?	[X]	[ ]	[ ]
Each sample point is in a sealed plastic bag?	[ ]	[X]	[ ]
Labels filled out completely?	[X]	[ ]	[ ]
All bottle labels agree with Chain of Custody (COC)?	[X]	[ ]	[ ]
Sufficient sample to run tests requested?	[X]	[ ]	[ ]
pH checked and samples at correct pH?	[ ]	[ ]	[X]
Correct preservative added to samples?	[ ]	[ ]	[X]
DRO/GRO samples received and appropriate check in form completed?	[ ]	[ ]	[X]
Air bubbles absent from VOAs?	[ ]	[ ]	[X]
COC filled out properly and signed by client?	[X]	[ ]	[ ]
COC signed in by TRACE sample custodian?	[X]	[ ]	[ ]
Was project manager called and samples discussed?	[X]	[ ]	[ ]

Contact: Date:

Notes:

Rev.8 11/21/06

LOGIN4 TRACE Analytical Laboratories, Inc.

ATTACHMENT D

ATTACHMENT D

Remedial Action Report

Parsons Chemical Works Superfund Site

Eaton County, Michigan

MID980476907

Prepared by

Michigan Department of Environmental Quality

August 2013

Table of Contents

Table of Contents (cont.)

Figures

ATTACHMENTS Documents Referenced in this Report

List of Acronyms

Acronym	Definition
BEA	Baseline Environmental Assessment
CA	Cooperative Agreement
ICs	Institutional Controls
ISV	In-Situ Vitrification
MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
ppb	Parts per billion
PCOR	Preliminary Close-Out Report
RC	Restrictive Covenant
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SOW	Scope of Work
USEPA	United States Environmental Protection Agency
UU/UE	Unlimited Use/Unrestricted Exposure

Remedial Action Report
Parsons Chemical Works Superfund Site
Eaton County, Michigan

1. Introduction

Site Description

The Parson Chemical Site, also known as ETM Enterprises, Inc., occupies approximately six acres on West Jefferson Street, west of the city of Grand Ledge, approximately ¼ mile east of the intersection of M-43 and Jefferson Street, Oneida Township. In the immediate vicinity of the former Parsons' plant, Millbrook Printing is located on the south, the Church of the Nazarene and its associated parsonage are located immediately to the west, and commercial operations are located on the north side of Jefferson Street. Two residential subdivisions, Russell Subdivision and Fairview Subdivision, are located immediately east of the Site across Oneida Street. The Grand River is located approximately ¾ of a mile north of the plant. (See Figure 1 Site Location Map and Figure 2 Site Features Map).

The property immediately surrounding the Site is mostly developed and zoned with a mix of light industrial, commercial, and residential properties. The site building and property are currently occupied by the Shappell Corporation.

Past Operations and Waste Management Practices that led to Contamination

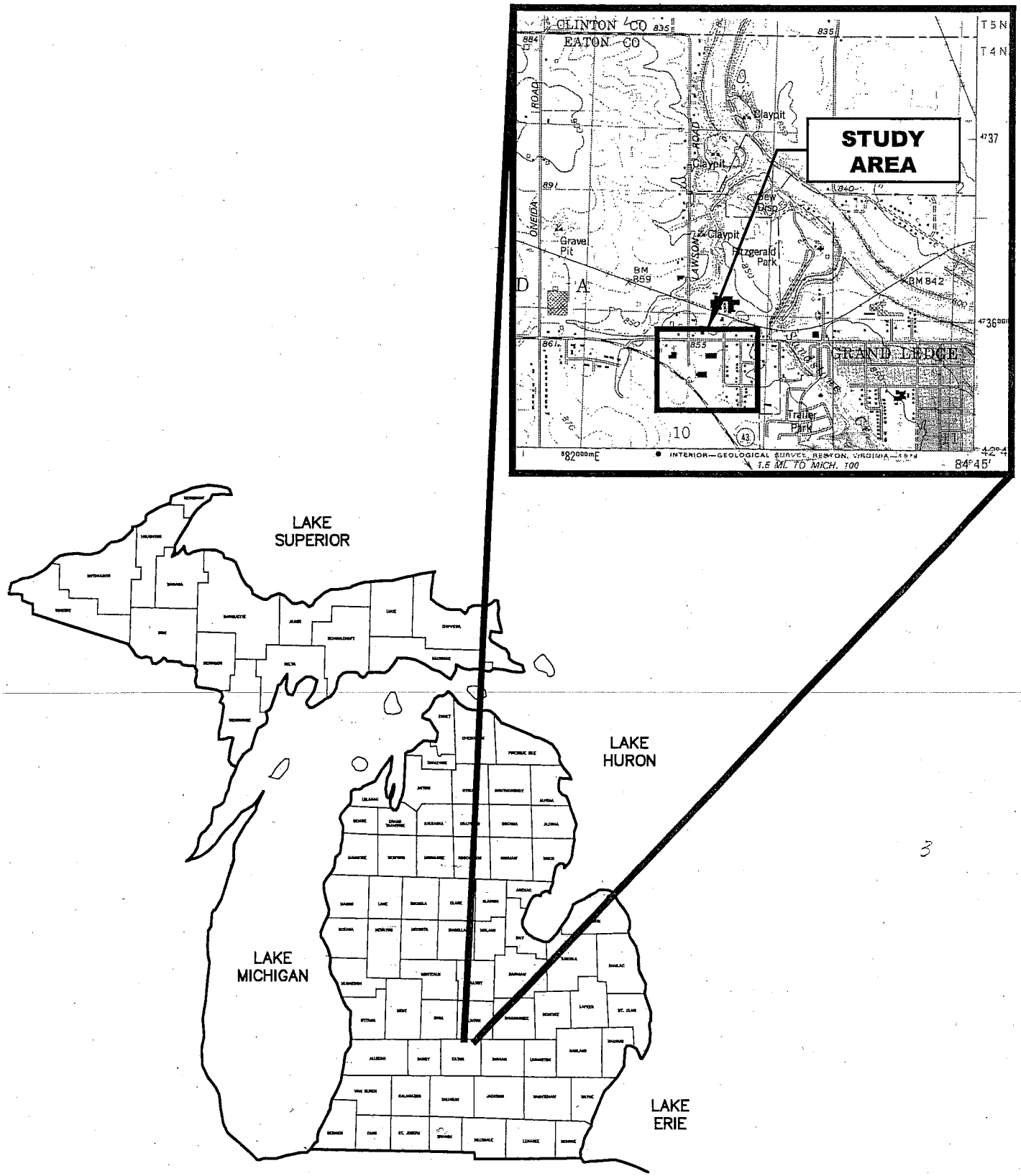
Parsons Chemical, which operated from 1945 through mid-1979, mixed manufacturing and packaged agricultural chemicals including pesticides, herbicides, solvents, and mercury-based compounds. Floor drains in the Parsons Chemical plant discharged into a septic tank and leach field, which were connected to a catch basin leading to a county drain system. Parsons Chemical apparently discharged manufacturing liquid wastes through the drainage system. The drainage system discharged into an unnamed stream northwest of the plant. The stream ultimately discharges into the Grand River. Eventually, the drainage tiles on the steep bank above the unnamed stream washed out and the liquid discharged onto the bank contaminating the ground. In addition to the discharge of liquid wastes, activities at the plant resulted in the deposition of chemicals on soil primarily around the perimeter of the building, particularly the south side, impacting approximately one acre. In 1979, ETM Enterprises, Inc., purchased the Site and began operating a fiberglass parts manufacturing facility at this location. The connection between the septic system and the county drain was discovered during one of several investigations performed by ETM Enterprises, Inc., in response to environmental concerns about the property. The company

had the septic system and the tile field removed and was connected to the Grand Ledge municipal water and sanitary waste systems.

Major Findings and Results of Site Investigation Activities

The United States Environmental Protection Agency (USEPA) conducted the first of two Non Time-Critical Removal Actions at the Site from October 1990 until June 1994. During this removal, 3,000 cubic yards of contaminated soil were remediated utilizing In-Situ Vitrification (ISV), an innovative soil remediation technology. From October 1990 to April 1991, soil from three areas (i.e., sumps), (See Figure 3 In-Situ Vitrification Map), in the first Removal Action of the Site, was excavated and staged in an underground 16 foot deep ISV treatment trench on-site. The ISV melting phase of the project began in May 1993 and was completed in May 1994. At the conclusion of removal number one, an estimated 2,000 cubic yards of contaminated soil remained on-site awaiting a second removal. The contaminated area was fenced and posted to prevent accidental exposure until the USEPA conducted a second Non Time-Critical Removal, which took place in 1998. (See Figure 4 Second Removal Action Map).

A remedial investigation/feasibility study (RI/FS), conducted between 1993 and 1995, consisted of a hydrogeologic investigation, surface water and sediment sampling, assessment of the drainage system, and further assessment of the remaining site soil conditions. The RI revealed that, with the exception of the previously identified contaminated soil (described above), the chemicals detected in the soil on the Site pose no acute public health concern. However, a shallow soil sample collected from a boring on the north side of Jefferson Street, off plant property, contained a concentration of 408 parts per million of arsenic. This could pose an acute public health problem via ingestion or direct contact. The RI revealed that shallow groundwater contained the pesticide dieldrin as well as elevated concentrations of several metals related to the former plant operations. These metals include manganese, lead, and arsenic. The shallow groundwater is not in an aquifer, and the likelihood of it or the groundwater in the weathered portions of the bedrock being ingested or used for watering was deemed low. However, in the unlikely event that someone consumed groundwater from the shallow saturated zone or the weathered bedrock, the concentrations of manganese in the water could result in an acute health problem. Samples collected 20 feet into the bedrock aquifer, the area drinking water source, complied with all applicable health-based drinking water criteria. Water supply wells in the vicinity are installed more than 100 feet deep which should assure water quality. However, the potential for chemicals of concern in the shallow groundwater and the weathered bedrock to migrate to private wells was not quantified during the RI. Because approximately 67 residences and businesses adjacent to the Site rely on private wells for their water supply, a long-term monitoring response was selected in the Record of Decision (ROD), signed on September 30, 1997, to address this unquantified potential threat. The residential wells sampled during the RI revealed no contamination.



SOURCE: USGS PORTLAND TOPOGRAPHICAL QUADRANGLE

DLZ
ENGINEERS - ARCHITECTS - SCIENTISTS
PLANNERS - SURVEYORS

PARSONS CHEMICAL WORKS
GRAND LEDGE, MICHIGAN

SITE LOCATION MAP

SCALE: N.T.S.

FIGURE 1

Figure 2 Site Features Map

LEGEND

- ⊗ MONITORING WELL LOCATION
- ◪ VERTICAL AQUIFER PROFILE BORING LOCATION

W S N E

0 30 120
15 60

MW-12 MW-11
MW-16
MW-15
MW-01 MW-08
MW-17
MW-05
LAWSO
SAGINAW HWY.
VAPB-03
VAPB-02
VAPB-01
MW-104
TANK
MIL-MW-01
MILLBROOK PRINTING
ANDE ARC
MW-10
MW-06
MW-4
MW-07
PARSONS CHEMICAL WORKS
STACK
STACK
WEST JEFFERSON AVE.
MW-18
MW-02
MW-9
MW-03
ONEIDA AVE.
12896
12906

ENGINEERS - ARCHITECTS - SCIENTISTS
PLANNERS - SURVEYORS

SITE MAP

GRAND LEDGE MICHIGAN
PARSONS CHEMICAL WORKS, INC.
3562 WEST JEFFERSON

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
LEVEL OF EFFORT

DRAWN	TIG
CHK'D.	SR
APPRV'D	CR
DATE	JULY, 2001
PROJECT NUMBER	94414848.95

NO.	REVISION	BY	DATE

SHEET
OF
DRAWING NUMBER
FIG-2

Figure 3 In-Situ Vitrification Map

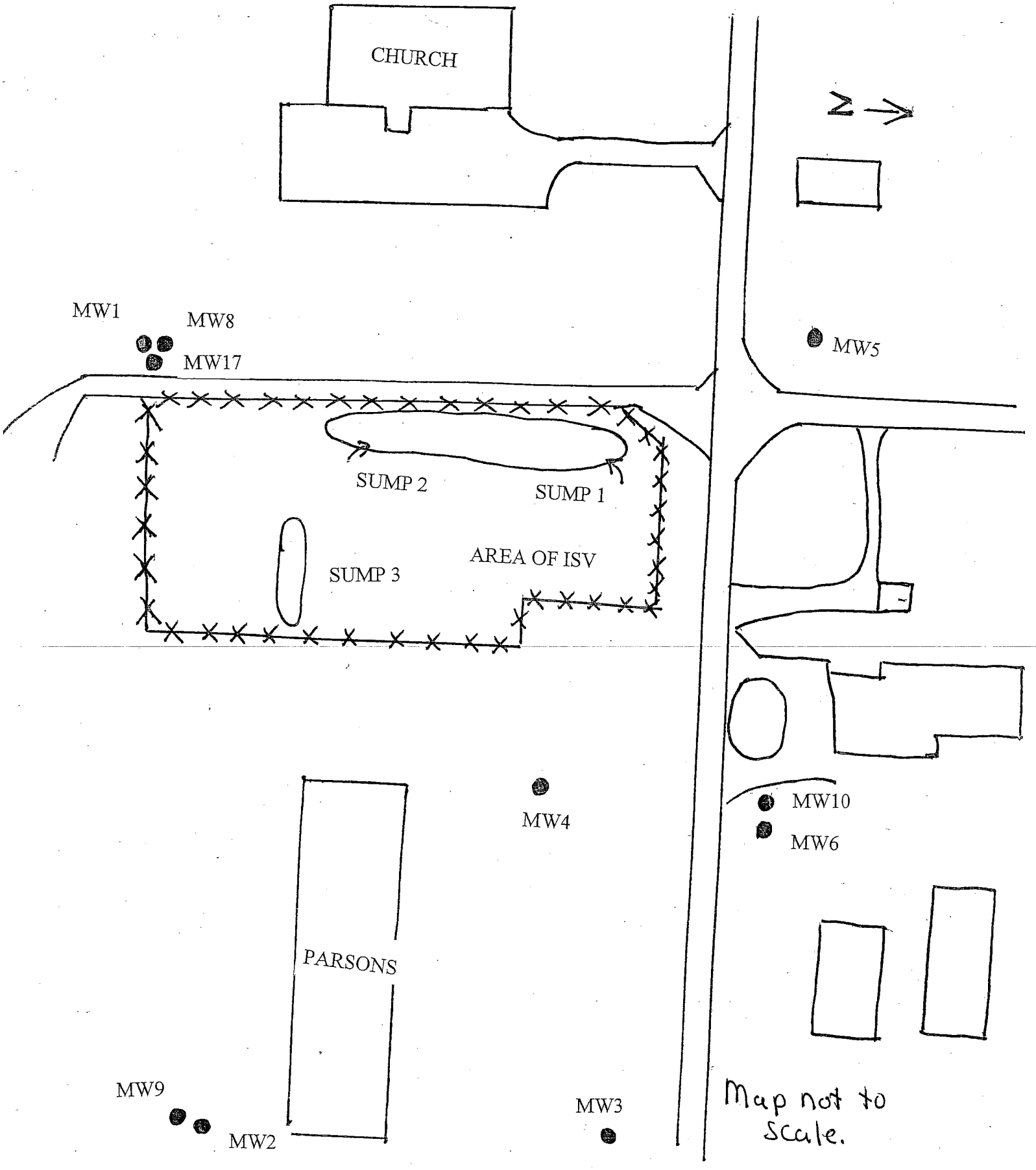
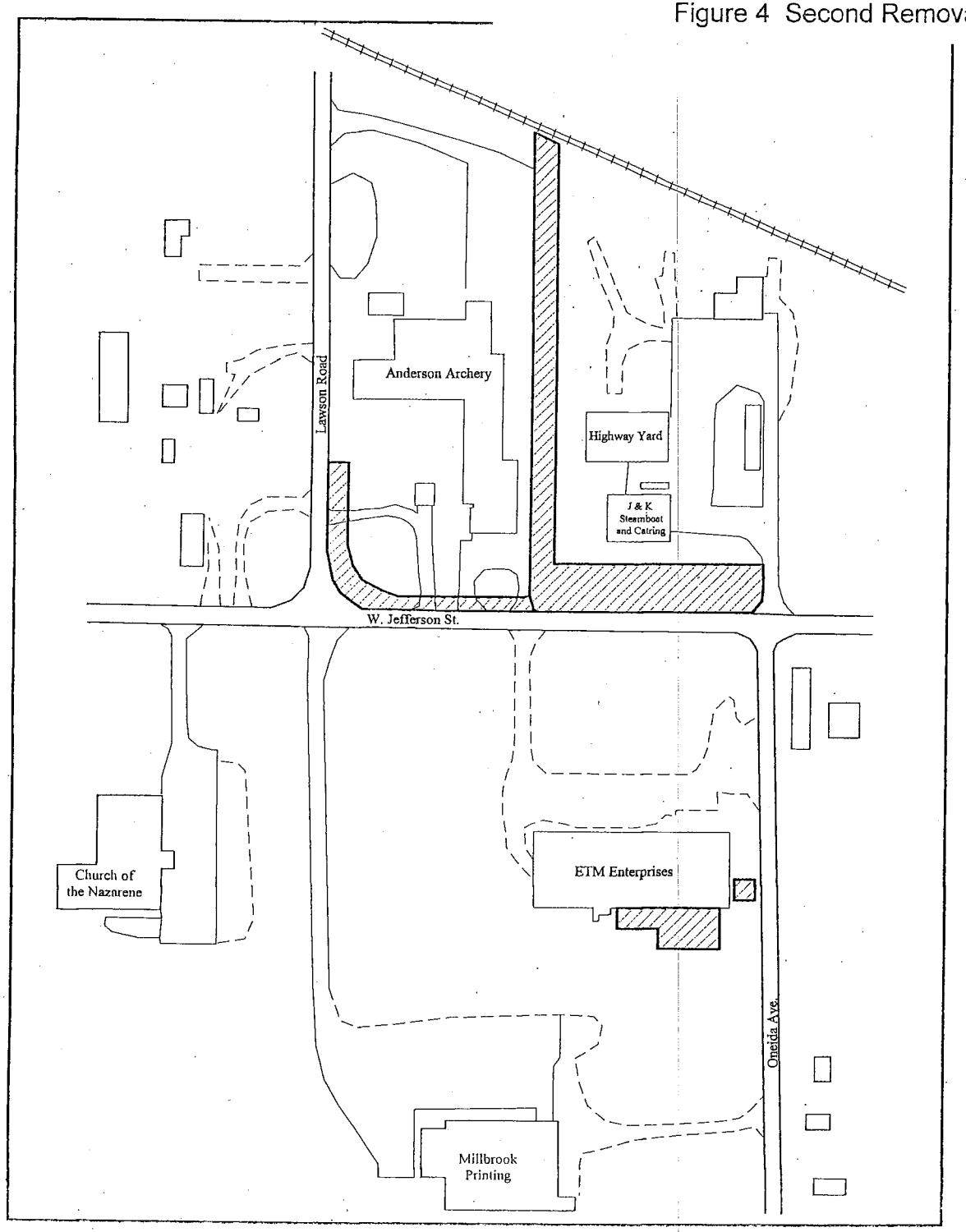


Figure 4 Second Removal Action Map

From: Parsons Chemical
Final Report 1998
Vol I



= Excavated area

0 100' 200' 300' 500'

Scale

Figure 2
General Site Plan
Parsons Chemical Manufacturing

Project Number: 777231

PREPARED FOR
USACE

Drawn By: Mjw
Reviewd By:
File NameDrawing2.tcw

Date: 12/20/99
Revised:

the group

The USEPA mobilized to the Site in November 1998 to begin the second Non Time-Critical Removal Action of contaminated soil on plant property and along the north side of Jefferson Street where elevated concentrations of arsenic were found. Prior to mobilization, the USEPA conducted three sampling events to characterize and quantify the soil contaminant concentrations for determining the most appropriate response. The project technical planning document, known as the Engineering Evaluation/Cost Analysis, stipulated that the soil be excavated and disposed of in a licensed landfill. During the second removal, 5,102 cubic yards of soil were excavated and disposed of in a licensed landfill. Soil excavation was completed in February 1999. The USEPA signed a Preliminary Close-Out Report (PCOR) in March 1999. Site restoration was completed in the summer of 1999 and the final site inspection took place in November 1999.

2. Record of Decision Requirements/Remedy Selection

The Michigan Department of Environmental Quality (MDEQ) and the USEPA signed the ROD on September 30, 1997. The primary components of the remedy were as follows:

- Long-term monitoring of private water supply wells;
- Long-term monitoring of selected on-site monitoring wells;
- Trend analysis of analytical results to identify groundwater degradation and potential threat to human health;
- Monitoring for exceedance of threshold levels for dieldrin or arsenic;
- Contingency plan for alternate water supply in the event of unacceptable groundwater degradation; and,
- Extend the Grand Ledge municipal water supply to homes with impacted wells.

(See Attachment A 1997 Record of Decision).

Remedy Implementation

Activities to comply with requirements for the 1997 ROD began in December 1997. The MDEQ sampled all of the private water supply wells in the vicinity of the Site, where property owners granted access, to establish a baseline of residential water quality data. These samples were analyzed for pesticides and seven metals. No pesticides were detected in the water samples. No metals exceeded the generic health-based residential drinking water standards. However, concentrations in excess of the aesthetic criterion for manganese were detected in approximately half of the samples. The aesthetic criterion, typically associated with non health-related objectionable characteristics such as taste or staining, is 50 parts per billion (ppb) for manganese. The MDEQ provided each well owner with a copy of the results of their well analyses and a letter explaining the results.

Remedial Design Summary

Using funding provided by the USEPA, the MDEQ began the remedial design (RD) in 1998. The purpose of the RD was to determine if the source of the manganese contamination was a result of the Parsons Chemical Site. Because the concentration of manganese in some wells exceeded the aesthetic criterion, the MDEQ's intent was to determine whether its presence could be attributed to the former Parsons operations or was naturally occurring. This was accomplished through several tasks. First, all of the manganese data related to this Site was combined and assessed comprehensively to determine if a historic pattern could be established. Second, all of the existing Site monitoring wells and six residential wells were sampled for manganese, and a complete round of static water level measurements was taken in October 1999. These data were used to develop new groundwater elevation contour maps to aid in the third task, which consisted of drilling three borings hydraulically upgradient of the Site and the adjacent subdivisions and sampling them at frequent intervals to a depth of 180 feet. In addition to manganese, the samples were analyzed for aluminum, arsenic, lead, and zinc. Arsenic and lead had been identified as chemicals of concern during the RI. Aluminum and zinc were included because, while use of these metals at Parsons Chemical is not documented, they were detected in Site monitoring wells at elevated concentrations.

Upon evaluation of the data, the MDEQ determined that, while arsenic and lead do not appear to be present at elevated levels upgradient of the Parsons Chemical Site, manganese, aluminum, and zinc are all present at elevated concentrations at multiple vertical intervals in the background wells. It was concluded that the presence of elevated concentrations of these metals in Site monitoring wells and some residential wells is not attributable to the former Parsons Chemical plant.

3. Completion of Remedial Activities

Preliminary Close-Out Report

The USEPA signed a PCOR in March 1999. Site restoration was completed in the summer of 1999 and included regrading and revegetation of the areas excavated and backfilled during the second Non Time-Critical Removal. (See Attachment B Preliminary Close-Out Report).

Final Inspection

As part of the PCOR, the final site inspection took place in November 1999 after the completion of the backfilling, regrading, and revegetation of the areas involved in the second Non Time-Critical Removal actions.

Institutional Controls

Institutional Controls (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 areas which do not allow for unlimited use or unrestricted exposure (UU/UE). The ROD does not require ICs at this Site. However, ICs are needed at the Site since contaminant concentrations remain above that which would allow for UU/UE. Development and implementation of a site-specific Restrictive Covenant (RC) was included as a site recommendation and follow-up action in the 2009 Five-Year Review Report for the Parsons Chemical Site.

Table 1 summarizes ICs for this restricted area.

Table 1: Institutional Controls Summary Table

Media, Engineered Controls, and Areas that Do Not Support UU/UE Based on Current Conditions	IC Objective	Title of IC Instrument Implemented (note if planned)
Soil- The area of the ISV treatment must remain restricted to prevent excavation or other disturbance of the area soils. Currently the area is covered with dirt and a vegetative cover.	Prohibit use or future disturbance of the ISV treatment area.	RC developed by the MDEQ and filed by the current property owner in the Register of Deeds Office for Eaton County on August 26, 2013.

Restrictive Covenant

An RC was developed and filed with the Register of Deeds Office for Eaton County on August 26, 2013, Liber 2481 and Page number 0900. A permanent marker, denoting the area of the site under the RC, will also be placed on the site near the area of the previous ISV treatment. (See Attachment C Restrictive Covenant)

4. Operation and Maintenance Activities

In July 2002, the USEPA provided to the MDEQ a Scope of Work (SOW) to implement the remedy contained in the September 1997 ROD. To fund this work, the USEPA awarded a Cooperative Agreement (CA) to the MDEQ in the amount of $378,801. (See Attachment D Scope of Work).

The selected remedy utilized long-term monitoring with a contingency plan to assure protection of public health. The long-term monitoring consisted of monitoring the water quality in private water supply wells located within approximately ¼ mile of the Site as well as selected Site monitoring wells for a period of 15 years. This monitoring effort started in August 2003 and ended in August 2010. The CA was closed on June 30, 2013. Of the original award, $299,844 was spent and $78,957 was returned to the USEPA.

Site Work Performed under the 2002 Scope of Work

Under the SOW, the MDEQ performed the following tasks:-------

- Geoprobe® Investigation of Off-Site Arsenic;
- Semi-annual then annual groundwater sampling of both the Site monitoring wells and nearby area residential wells in the Russell and Fairview Subdivisions;
- Plug and Abandonment of the Site Monitoring Wells.

MDEQ Geoprobe® Investigation of Off-Site Arsenic

The MDEQ obtained funding from the USEPA in October 2002 for the downgradient investigation and implementation of the long-term monitoring required by the ROD.

In late October 2002, MDEQ staff performed a groundwater sampling investigation downgradient from the Site. The work consisted of six Geoprobe® borings for the collection of soil and groundwater samples. The sample locations were immediately downgradient and lateral to the groundwater flow direction. The analytical results from these samples detected no arsenic above Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Part 201) criterion, in any of the six locations. In addition, soils overlying the bedrock were heterogeneous showing no continuous saturated zone that would comprise a pathway for movement of contamination. Based on this information, it was determined that additional investigation was not necessary. (See Attachment E MDEQ Geoprobe® Investigation of the Off-Site Arsenic, October 2002).

Site Geology and Hydrogeology

There are two unique hydrogeologic, water-bearing units beneath the Site; a shallow unconfined aquifer, comprised of a silty clay, sand, and gravel layer with a saturated thickness of approximately 10 feet and a bedrock aquifer, separated from the shallow aquifer by an impermeable confining silty clay layer. Groundwater flow in the shallow aquifer has been documented to be to the north-northeast across the Site toward the Grand River. (See Figure 5 Groundwater Flow Map for the Shallow Aquifer).

The bedrock aquifer, comprised of two distinct zones, underlies the "confining" silty clay layer. The upper zone was formed by a weathered sand and shale layer which grades into the lower competent bedrock. A series of discontinuous beds of sand, shale, limestone, and occasional thin coal seams comprised the lower zone. The residential wells adjacent to the Site produced water from the lower portion of the bedrock aquifer. (See Figure 6 Groundwater Flow Map for the Bedrock Aquifer).

Discussion of Monitoring Well Data

Manganese

Historical records indicated that manganese was a component of some of the products manufactured at the former Parsons Chemical plant. Since concentrations of manganese above the applicable criterion were detected in some groundwater samples obtained from the RI/FS monitoring wells and some residential wells, it appeared reasonable to attribute manganese to the Site. However, based upon the 1999 - 2001 Manganese Background Investigation, manganese also occurred naturally in the environment and was detected at elevated concentrations in monitoring wells upgradient from the Site.

The deepest RI/FS monitoring well samples were collected at a depth of 25 feet into the bedrock aquifer. Residential well depths in the vicinity of the Site were estimated to be over 100 feet into the bedrock. It can be determined, based upon the existing monitoring well network, that the elevated manganese concentrations detected from 2003 through 2010 are representative of Site background levels, or attributable to upgradient off-site source areas. The groundwater data confirms that manganese was detected throughout the area of the Site, in both upgradient and downgradient monitoring wells and was not exclusively originating from the Parsons Chemical Site. (See Table 2 Monitoring Well Data).

Arsenic

The monitoring well data from 2003 through 2010, detected arsenic in three upgradient monitoring wells, MW8 (2003, 2005, and 2008), MW10 (2008), and MW17 (2003 and 2008) at varying concentrations. However, arsenic was either non-detect or below the Part 201 criterion of 10 ppb in all of the downgradient monitoring wells. Therefore, the ISV remedy was successful in immobilizing any arsenic present through vitrification. The two soil removal actions aided in reducing any residual arsenic contamination on the Site. (See Table 2 Monitoring Well Data).

Lead

Review of the monitoring well data from 2003 though 2010 indicated detections of lead in monitoring wells upgradient of the site in concentrations that exceed the Part 201 criterion of 4 ppb. This supports the position that additional off-site sources are contributing lead to the area groundwater.

Only two downgradient monitoring wells, MW2 and MW9, had detections of lead above the Part 201 criterion. However, these detections could be from migration of lead denoted in the upgradient monitoring wells, or a commingling of lead from off-site with trace residual lead from the Site and was trending downward in concentrations from 2003 through 2010. (See Table 2 Monitoring Well Data).

Dieldrin

There were no detections of dieldrin in the monitoring well data from 2003 through 2005. Based on this, sampling for dieldrin was discontinued in 2006.

Discussion of Residential Well Data

The city of Grand Ledge municipal water system supplies residences and businesses as far as Kennedy Place, the north/south street located east of the Site. West of Kennedy Place to just east of Lawson Road, supplied municipal water was limited to residences, businesses, and industries with frontage on Jefferson Street. Any building structure located outside of these limits was serviced by a private well.

Forty-five of these private wells are directly east of the Site in the Russell and Fairview Subdivisions. These residential wells are believed to be screened at approximately 100 feet below ground surface in the bedrock aquifer. Shappell Corporation, on the Site, obtains water from the municipal water supply.

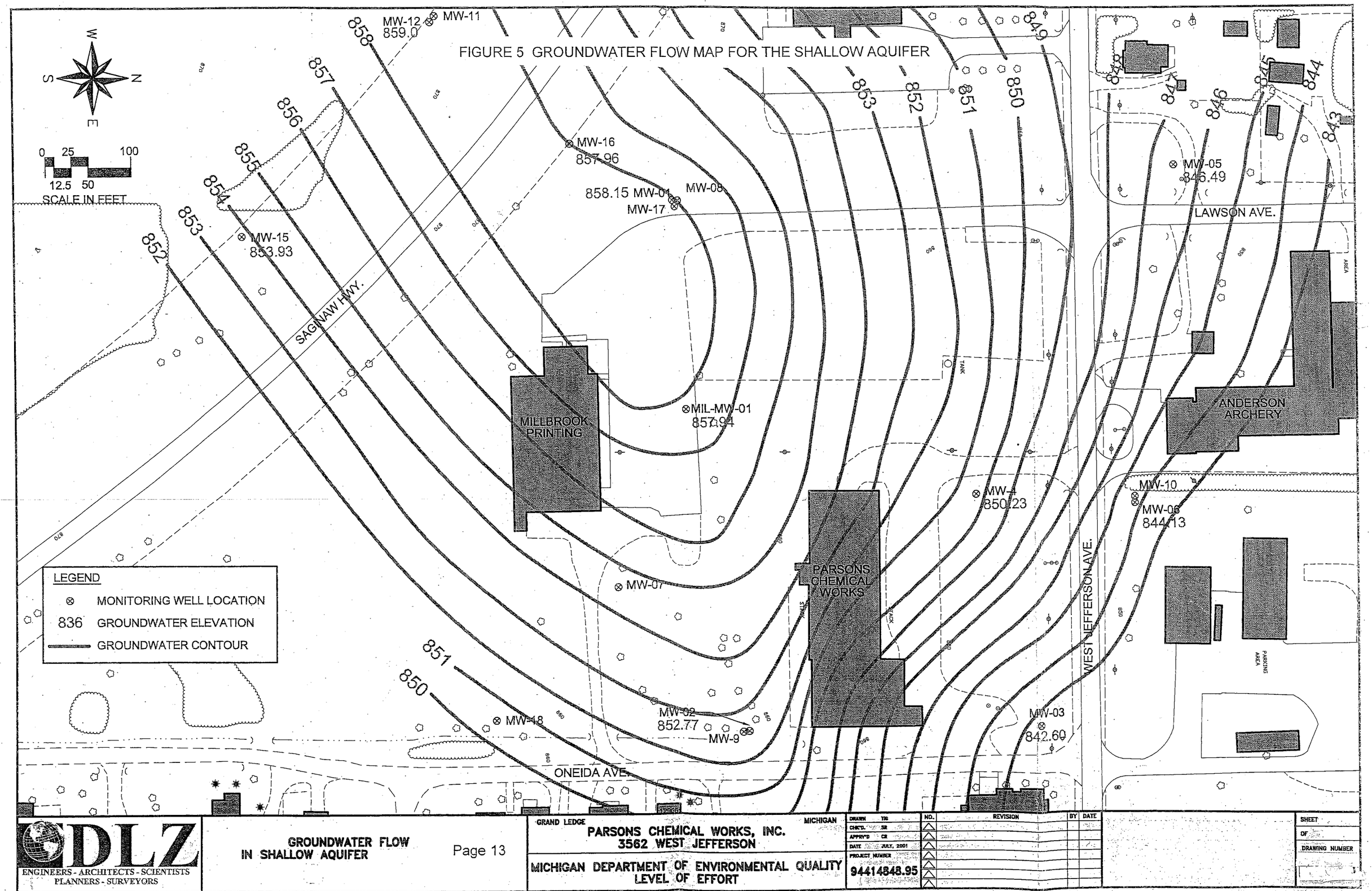
Manganese

The possibility of the elevated manganese concentrations to impact the residential wells screened in the bedrock aquifer east of the Site is unlikely. The silty clay layer underlying the shallow aquifer isolates the soil from the bedrock aquifer. Elevated manganese concentrations in the bedrock monitor wells (screened within the weathered bedrock) are naturally occurring and not associated with activities of the former Parsons Chemical operations. However, manganese was detected in various residential wells sampled from 2003 through 2010. (See Table 3 Residential Well Data).

Arsenic

Review of the residential well data from 2003 through 2010 did not find any detections of arsenic above Part 201 criterion. (See Table 3 Residential Well Data).

FIGURE 5 GROUNDWATER FLOW MAP FOR THE SHALLOW AQUIFER



DLZ
ENGINEERS - ARCHITECTS - SCIENTISTS
PLANNERS - SURVEYORS

GROUNDWATER FLOW
IN SHALLOW AQUIFER

GRAND LEDGE MICHIGAN
PARSONS CHEMICAL WORKS, INC.
3562 WEST JEFFERSON

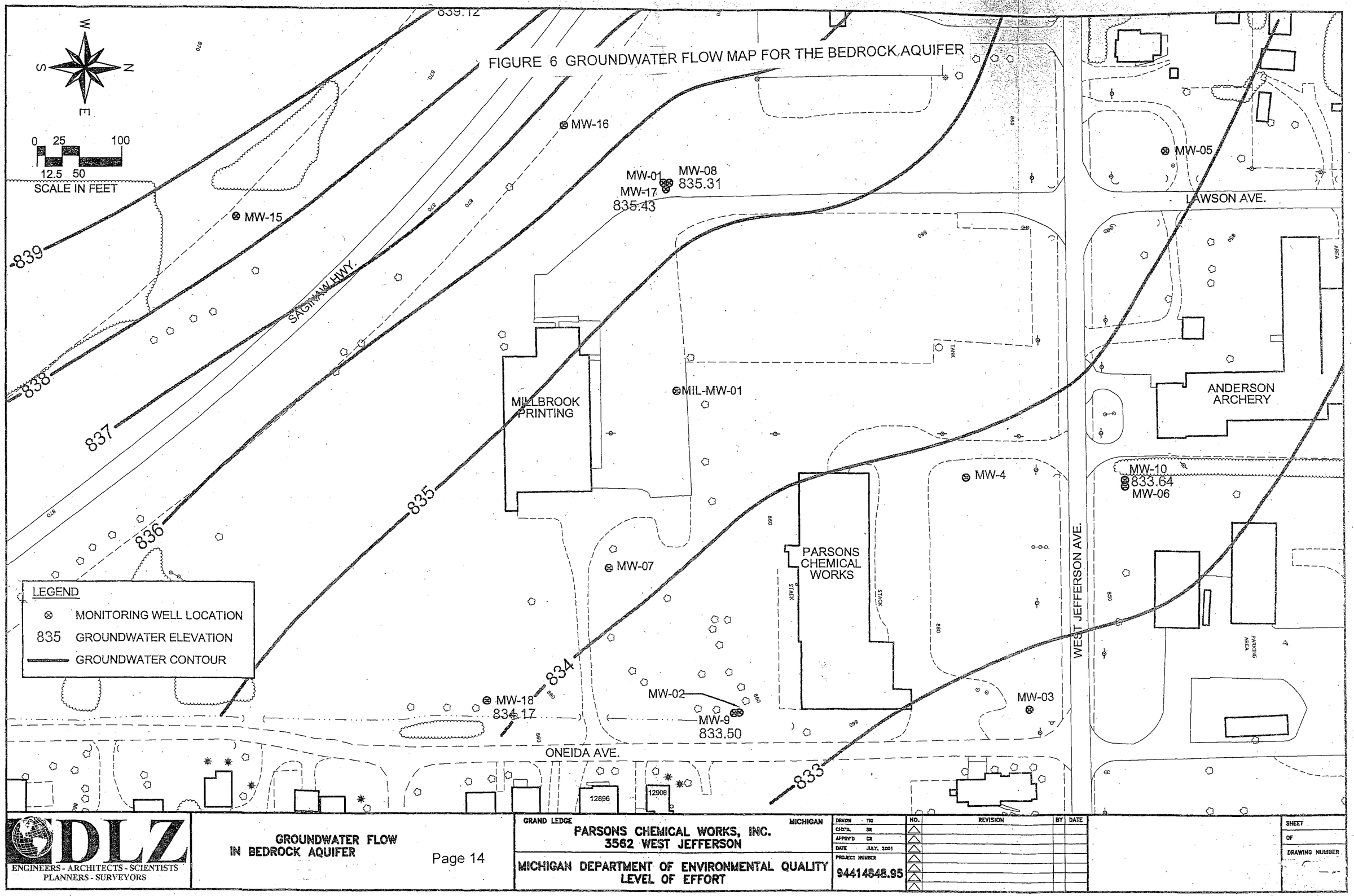
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
LEVEL OF EFFORT

DRAWN	TIG
CHK'D.	SR
APPRV'D	CR
DATE	JULY, 2001
PROJECT NUMBER	94414848.95

NO.	REVISION	BY	DATE

SHEET
OF
DRAWING NUMBER

FIGURE 6 GROUNDWATER FLOW MAP FOR THE BEDROCK AQUIFER



DLZ
ENGINEERS - ARCHITECTS - SCIENTISTS
PLANNERS - SURVEYORS

GROUNDWATER FLOW
IN BEDROCK AQUIFER

GRAND LEDGE MICHIGAN
PARSONS CHEMICAL WORKS, INC.
3562 WEST JEFFERSON

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
LEVEL OF EFFORT

DRAWN	TIG
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NO.	REVISION	BY	DATE

SHEET
OF
DRAWING NUMBER

K:\Proj\94414848\Best\Mesa INCAD\Figure 004 - Groundwater Flow in Deep Aquifer October 1991.dwg, 09/25/2001 11:34:11 AM, C_OFFICE1.pc3

TABLE 2
MONITORING WELL DATA TABLE
2003 – 2010

Date	Monitoring Well	Arsenic (10 ppb)	Lead (4 ppb)	Manganese (50 ppb)
September 2003	MW1			
	MW2		32 ppb	
	MW3			
	MW4		4.2 ppb	
	MW6			450 ppb
	MW8	99 ppb	1200 ppb	180 ppb
	MW9		21 ppb	69 ppb
	MW10			
	MW17	8.8 ppb		
	MW18			57 ppb
January 2004	MW1			
	MW2			51 ppb
	MW3			
	MW4		6.1 ppb	
	MW5		130 ppb	120 ppb
	MW6			400 ppb
	MW8		160 ppb	630 ppb
	MW9		200 ppb	
	MW10			
	MW17		34 ppb	99 ppb
	MW18			64 ppb
August 2004	MW1			52 ppb
	MW2			
	MW3			
	MW4			
	MW6			310 ppb
	MW8			160 ppb
	MW9			56 ppb
	MW10			
	MW17			81 ppb
	MW18			54 ppb

	Monitoring Well	Arsenic (10 ppb))	Lead (4 ppb)	Manganese (50 ppb)
February 2005	MW1			
	MW2		18 ppb	
	MW3			
	MW4		4.3 ppb	63 ppb
	MW6			74 ppb
	MW8	51 ppb		110 ppb
	MW9			55 ppb
	MW10			80 ppb
	MW17		32 ppb	57 ppb
	MW18			
November 2005	MW1		4.6 ppb	
	MW2		27 ppb	49 ppb
	MW3			
	MW4		4.5 ppb	
	MW6			580 ppb
	MW8		12 ppb	140 ppb
	MW9		7.5 ppb	51 ppb
	MW10			
	MW17			100 ppb
	MW18			65 ppb
October 2006	MW1			
	MW2			
	MW3			
	MW4		4.0 ppb	
	MW6			
	MW8		120 ppb	
	MW9		4.8 ppb	
	MW10			
	MW17			
	MW18			
	Monitoring Well	Arsenic (10 ppb)	Lead (4 ppb)	Manganese (50 ppb)
June 2007	MW1			
	MW2		4.7 ppb	
	MW3			
	MW4			210 ppb

	Monitoring Well	Arsenic (10 ppb)	Lead (4 ppb)	Manganese (50 ppb)
June 2007	MW5		17 ppb	84 ppb
	MW6			610 ppb
	MW8		4.2 ppb	130 ppb
	MW9		24 ppb	64 ppb
	MW10			
	MW17		5.8 ppb	100 ppb
	MW18			59 ppb
June 2008	MW1		4.7 ppb	
	MW2			93 ppb
	MW3			
	MW4		20 ppb	280 ppb
	MW5		19 ppb	110 ppb
	MW6			860 ppb
	MW8	18 ppb	11 ppb	370 ppb
	MW9		25 ppb	61 ppb
	MW10	11 ppb		
(upgradient)	MW11		8.8 ppb	
(upgradient)	MW12		7.3 ppb	76 ppb
(upgradient)	MW13			
(upgradient)	MW15			
	MW17	12 ppb	13 ppb	410 ppb
	MW18			62 ppb
June 2009	MW1			
	MW2		17 ppb	62 ppb
	MW3			
	MW4			400 ppb
	MW5		20 ppb	98 ppb
	MW6			720 ppb
	MW8		10 ppb	120 ppb
	MW9		5.1 ppb	75 ppb
	MW10			
	MW17			95 ppb
	MW18			62 ppb
	Monitoring Well	Arsenic (10 ppb)	Lead (4 ppb)	Manganese (50 ppb)
June 2010	MW1			
	MW2		12 ppb	51 ppb

	Monitoring Well	Arsenic (10 ppb)	Lead (4 ppb)	Manganese (50 ppb)
June 2010	MW3			
	MW4			570 ppb
	MW5			
	MW6			510 ppb
	MW8		12 ppb	130 ppb
	MW9		6.5 ppb	69 ppb
	MW10			
	MW17			110 ppb
	MW18			69 ppb

TABLE 3
RESIDENTIAL WELL DATA TABLE
2003 – 2010

DATE	ADDRESS	ARSENIC	LEAD	MANGANESE
		10 ppb	4 ppb	50 ppb
August 2003	RW1 Cliff St			
	RW2 Cliff St			
	RW3 Fourth			
	RW4 Franklin			
	RW5 Franklin			
	RW6 Franklin		6 ppb	220 ppb
	RW7 Franklin			
	RW8 Franklin			
	RW9 Georgia			
	RW10 Georgia			80 ppb
	RW11 Georgia			
	RW12 Georgia			
	RW13 Georgia			110 ppb
	RW14 Georgia			80 ppb
	RW15 Georgia			50 ppb
	RW16 Georgia			
	RW17 Georgia		4 ppb	70 ppb
	RW18 Georgia			
	RW19 Georgia			
	RW20 Georgia			
	RW21 Georgia			240 ppb
	RW22 Georgia		4 ppb	
	RW23 Lawson			160 ppb
	RW24 Lawson			
	RW25 Oneida			
	RW26 Oneida			
	RW27 Oneida			
	RW28 Partlow			120 ppb
	RW29 Partlow			
	RW30 Partlow			80 ppb
	RW31 Partlow		17 ppb	60 ppb
	RW32 Partlow			70 ppb
	RW33 Partlow			180 ppb
	RW34 Partlow			80 ppb
	RW35 Partlow			410 ppb
	RW36 Partlow			440 ppb
	RW37 Second			190 ppb
	RW38 Third			
	RW39 Third			60 ppb

	Address	Arsenic (10 ppb)	Lead (4 ppb)	Manganese (50 ppb)
January 2004	RW1 Cliff St			
	RW2 Cliff St			
	RW3 Fourth			
	RW4 Franklin			
	RW5 Franklin		260 ppb	22 ppb
	RW6 Franklin			
	RW7 Franklin			80 ppb
	RW8 Franklin			
	RW9 Georgia			
	RW10 Georgia			
	RW11 Georgia			
	RW12 Georgia			70 ppb
	RW13 Georgia			90 ppb
	RW14 Georgia			
	RW15 Georgia			
	RW16 Georgia			140 ppb
	RW17 Georgia			
	RW18 Georgia			
	RW19 Georgia			
	RW20 Georgia			
	RW21 Georgia			
	RW22 Georgia			
	RW23 Lawson			170 ppb
	RW24 Lawson			
	RW25 Oneida			
	RW26 Oneida			
	RW27 Oneida			
	RW28 Partlow			
	RW29 Partlow			60 ppb
	RW30 Partlow		4 ppb	70 ppb
	RW31 Partlow			50 ppb
	RW32 Partlow			70 ppb
	RW33 Partlow			
	RW34 Partlow			70 ppb
	RW35 Partlow			460 ppb
	RW36 Partlow			430 ppb
	RW37 Second			
	RW38 Third			
	RW39 Third			

	Address	Arsenic (10 ppb)	Lead (4 ppb)	Manganese (50 ppb)
July 2005	RW1 Cliff St			70 ppb
	RW2 Cliff St			
	RW3 Fourth			70 ppb
	RW4 Franklin			
	RW5 Franklin			290 ppb
	RW6 Franklin			
	RW7 Franklin			100 ppb
	RW8 Franklin			
	RW9 Georgia			
	RW10 Georgia			70 ppb
	RW11 Georgia			
	RW12 Georgia			
	RW13 Georgia			90 ppb
	RW14 Georgia			60 ppb
	RW15 Georgia			70 ppb
	RW16 Georgia			150 ppb
	RW17 Georgia			
	RW18 Georgia			
	RW19 Georgia			
	RW20 Georgia			
	RW21 Georgia			
	RW22 Georgia			
	RW23 Lawson			160 ppb
	RW24 Lawson			
	RW25 Oneida			
	RW26 Oneida			
	RW27 Oneida			
	RW28 Partlow			
	RW29 Partlow			
	RW30 Partlow		14 ppb	
	RW31 Partlow			50 ppb
	RW32 Partlow		4 ppb	50 ppb
	RW33 Partlow			
	RW34 Partlow			70 ppb
	RW35 Partlow			470 ppb
	RW36 Partlow			380 ppb
	RW37 Second			
	RW38 Third			60 ppb
	RW39 Third			

	Address	Arsenic (10 ppb)	Lead (4 ppb)	Manganese (50 ppb)
June 2006	RW1 Cliff St			80 ppb
	RW2 Cliff St			
	RW3 Fourth			50 ppb
	RW4 Franklin			
	RW5 Franklin			330 ppb
	RW6 Franklin			
	RW7 Franklin			100 ppb
	RW8 Franklin			
	RW9 Georgia			
	RW10 Georgia			70 ppb
	RW11 Georgia			
	RW12 Georgia			
	RW13 Georgia			90 ppb
	RW14 Georgia			80 ppb
	RW15 Georgia			
	RW16 Georgia			160 ppb
	RW17 Georgia			
	RW18 Georgia			
	RW19 Georgia			
	RW20 Georgia			
	RW21 Georgia			
	RW22 Georgia			
	RW23 Lawson			180 ppb
	RW24 Lawson			
	RW25 Oneida			50 ppb
	RW26 Oneida			
	RW27 Oneida			
	RW28 Partlow			
	RW29 Partlow			60 ppb
	RW30 Partlow			
	RW31 Partlow			
	RW32 Partlow			80 ppb
	RW33 Partlow			60 ppb
	RW34 Partlow			80 ppb
	RW35 Partlow			
	RW36 Partlow			380 ppb
	RW37 Second			
	RW38 Third			
	RW39 Third			

	Address	Arsenic (10 ppb0	Lead (4 ppb)	Manganese (50 ppb)
July 2007	RW1 Cliff St			80 ppb
	RW2 Cliff St			
	RW3 Fourth			50 ppb
	RW4 Franklin			
	RW5 Franklin			360 ppb
	RW6 Franklin			
	RW7 Franklin			60 ppb
	RW8 Franklin			
	RW9 Georgia			
	RW10 Georgia			
	RW11 Georgia			
	RW12 Georgia			
	RW13 Georgia			90 ppb
	RW14 Georgia			90 ppb
	RW15 Georgia			
	RW16 Georgia			170 ppb
	RW17 Georgia			
	RW18 Georgia			
	RW19 Georgia			50 ppb
	RW20 Georgia			
	RW21 Georgia			220 ppb
	RW22 Georgia			70 ppb
	RW23 Lawson			170 ppb
	RW24 Lawson			
	RW25 Oneida			60 ppb
	RW26 Oneida			
	RW27 Oneida			
	RW28 Partlow			
	RW29 Partlow			
	RW30 Partlow			
	RW31 Partlow			
	RW32 Partlow			
	RW33 Partlow			
	RW34 Partlow			70 ppb
	RW35 Partlow			450 ppb
	RW36 Partlow			430 ppb
	RW37 Second			150 ppb
	RW38 Third			
	RW39 Third			50 ppb

	Address	Arsenic (10 ppb)	Lead (4 ppb)	Manganese (50 ppb)
June-July 2008	RW1 Cliff St			70 ppb
	RW2 Cliff St			70 ppb
	RW3 Fourth			
	RW4 Franklin			
	RW5 Franklin			290 ppb
	RW6 Franklin			
	RW7 Franklin			90 ppb
	RW8 Franklin			
	RW9 Georgia			
	RW10 Georgia			
	RW11 Georgia			
	RW12 Georgia			
	RW13 Georgia			90 ppb
	RW14 Georgia			80 ppb
	RW15 Georgia			
	RW16 Georgia			
	RW17 Georgia			
	RW18 Georgia			
	RW19 Georgia			60 ppb
	RW20 Georgia			
	RW21 Georgia			
	RW22 Georgia			
	RW23 Lawson			
	RW24 Lawson			
	RW25 Oneida			
	RW26 Oneida			
	RW27 Oneida			
	RW28 Partlow			
	RW29 Partlow			
	RW30 Partlow			
	RW31 Partlow			
	RW32 Partlow			79 ppb
	RW33 Partlow			70 ppb
	RW34 Partlow			
	RW35 Partlow			310 ppb
	RW36 Partlow			
	RW37 Second			
	RW38 Third			
	RW39 Third			

	Address	Arsenic (10 ppb)	Lead (4 ppb)	Manganese (50 ppb)
August 2009	RW1 Cliff St			80 ppb
	RW2 Cliff St			
	RW3 Fourth			60 ppb
	RW4 Franklin			
	RW5 Franklin			270 ppb
	RW6 Franklin			
	RW7 Franklin			90 ppb
	RW8 Franklin			520 ppb
	RW9 Georgia			
	RW10 Georgia			
	RW11 Georgia			
	RW12 Georgia			
	RW13 Georgia			100 ppb
	RW14 Georgia			80 ppb
	RW15 Georgia			
	RW16 Georgia			180 ppb
	RW17 Georgia			
	RW18 Georgia			
	RW19 Georgia			
	RW20 Georgia			
	RW21 Georgia			290 ppb
	RW22 Georgia			
	RW23 Lawson			
	RW24 Lawson			
	RW25 Oneida			80 ppb
	RW26 Oneida			
	RW27 Oneida			
	RW28 Partlow			90 ppb
	RW29 Partlow			60 ppb
	RW30 Partlow			
	RW31 Partlow			
	RW32 Partlow			70 ppb
	RW33 Partlow			
	RW34 Partlow			
	RW35 Partlow			300 ppb
	RW36 Partlow			390 ppb
	RW37 Second			170 ppb
	RW38 Third			
	RW39 Third			

Lead

Review of the residential well data from 2003 through 2010 indicated several detections of lead in 2003, 2004, and 2005 in residential wells upgradient of the Site. No lead detections exceeding Part 201 criterion have been found in residential well samples from 2006 through 2010. (See Table 3 Residential Well Data).

Dieldrin

Although dieldrin was detected in groundwater monitoring wells, dieldrin was never analyzed in the residential wells.

Achievement of Cleanup

Item 3 in the Recommendations and Follow-up Actions from the 2009 Five-Year Review report for Parsons Chemical stated the following: "Continue annual groundwater monitoring and reduce the number of residential well monitoring events through 2010 and reassess the need to continue." The additional groundwater data through 2010 confirmed what the previous decreasing data trends depicted, that the requirements of the SOW had been achieved and the long-term groundwater monitoring, originally scheduled to 2017, and was no longer required. The MDEQ requested that the USEPA designate a portion of the remaining CA monies be tasked to pay for the plug and abandonment of the site monitoring wells. The USEPA concurred and approved the modification to the CA.

Well Plug and Abandonment

Well Plug and Abandonment activities were conducted on the site in late August 2011 into early September 2011. All of the site monitoring wells were properly pulled, the bore holes filled, and clean soil covered the bore hole locations following current guidelines and procedures. These tasks are documented in the Site Activity Summary Report Parsons Chemical Superfund Site Grand Ledge, Michigan, dated October 20, 2011. (See Attachment F Well Plug and Abandonment Report).

5. Enforcement Activity

The state of Michigan has notified the current property owner in writing that the state will not consider him liable for any contamination that is attributable to the former Parsons' operations. The USEPA determined that there are no viable responsible parties.

Baseline Environmental Assessment

In 2001, a Baseline Environmental Assessment (BEA) was submitted to the MDEQ for the Site. The BEA was determined to be adequate for the purpose of obtaining an exemption from liability for the new owner pursuant to Section 21126(1)(c) of Part 201. MDEQ staff notified the current property owner, the Shappell Corporation, in writing, that the state of Michigan would not consider the new property owner liable for any contamination that was attributable to the former Parsons' operations. The USEPA also determined that there were no viable responsible parties. (See Attachment G Baseline Environmental Assessment).

6. Summary of Final Project Costs/Cooperative Agreement

Table 4

Activity	Total Funding	Total Expenditures	Remaining Funds
Task 1 Off site Arsenic and Lead Groundwater Investigation, Long Term Monitoring and Sampling of the site Monitoring wells and Residential Wells, Project Management, Well Abandonment, Property Survey and Development of Restrictive Covenant	$378,801	$299,844	$78,957

7. Chronology of Site Events

Table 5: Chronology of Site Events

Event	Date
Parsons operated as a mixed manufacturing and packaged agricultural chemical facility.	1945 through 1979
Facility purchased by ETM Enterprises, Inc. (ETM).	1979
Initial discovery of problem of contamination ETM discovered building floor drains discharged into the septic system then into the county drain which was discharging liquid wastes into a stream that flowed into the Grand River. It was also discovered that historical dumping of liquid wastes onto soils surrounding the building occurred during the Parsons' operations.	1979
Initial Michigan Department of Natural Resources (MDNR) Soil and Sediment Investigations of the Site.	1979
Various Site Investigations conducted at the Site for heavy metals and pesticides.	1980 through 1989

Table 5: Chronology of Site Events

Event	Date
Site placed on the National Priorities List.	1989
Additional contaminated soil discovered adjacent to the southeastern corner of the ETM building.	1991
USEPA conducted first Non Time-Critical Removal Action of Contaminated Soil via In-Situ Vitrification (ISV).	October 1990 through 1994
MDNR conducted Remedial Investigation/Feasibility Study (RI/FS).	1993-1995
Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, (Part 201) enacted.	1995
Declaration of Selected Remedial Alternative (i.e., Record of Decision [ROD] signed).	September 30, 1997
USEPA conducted second Non Time-Critical Removal Action of contaminated soil discovered in 1991.	November 1998 through February 1999
Michigan Department of Environmental Quality (MDEQ) conducted baseline residential well sampling.	December 1997
MDEQ begins Remedial Design	1998
Preliminary Close-Out Report (PCOR).	March 29, 1999
MDEQ funded Manganese Background Investigation.	September 2001
Baseline Environmental Assessment (BEA) for the Site (now Shappell Corporation) affirmed by MDEQ.	October 2001
Scope of Work (SOW) signed.	July 2002
MDEQ Geoprobe® investigation completed.	October 2002
Annual Monitoring Well Sampling per the SOW.	2003 through 2010
Annual Residential Well Sampling per SOW.	2003 through 2010
First Five-Year Review.	April 14, 2004
Second Five-Year Review	2009
Monitor Well Removal and Plug and Abandonment Activities	September 2011
Residential Well Annual Sampling Discontinued	September 2011
Restrictive Covenant Developed and Recorded	August 26, 2013

Contact Information

The following are the current MDEQ and USEPA personnel assigned to the project:

Person	Duties	Agency
Cindy Fairbanks	MDEQ Project Manager	MDEQ
Lolita Hill	USEPA Regional Project Manager	USEPA

APPENDIX A

Appendix A

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site name: Parsons Chemical Works	**Date of inspection:** October 30, 2013
Location and Region: Region V Grand Ledge, MI	**EPA ID:** MID980476907
Agency, office, or company leading the five-year review: MDEQ	**Weather/temperature:**

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other _____
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☒ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** N/A _____ _____ _____
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

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

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 — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks N/A

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

   Remarks N/A

3. **O&M and OSHA Training Records** — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks N/A

4. **Permits and Service Agreements**
   - ☐ Air discharge permit — ☐ Readily available — ☐ Up to date — ☐ N/A
   - ☐ Effluent discharge — ☐ Readily available — ☐ Up to date — ☐ N/A
   - ☐ Waste disposal, POTW — ☐ Readily available — ☐ Up to date — ☐ N/A
   - ☐ Other permits _____ — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks N/A

5. **Gas Generation Records** — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks N/A

6. **Settlement Monument Records** — ☒ Readily available — ☒ Up to date — ☐ N/A

   Remarks Permanent Marker installed onsite near IJV treatment area. RC on file with Eaton County.

7. **Groundwater Monitoring Records** — ☒ Readily available — ☒ Up to date — ☐ N/A

   Remarks Annual Groundwater sampling conducted from 2003-2010; Residential well sampling conducted 2003-2011. Site monitor wells have been PEA'd.

8. **Leachate Extraction Records** — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks N/A

9. **Discharge Compliance Records**
   - ☐ Air — ☐ Readily available — ☐ Up to date — ☐ N/A
   - ☐ Water (effluent) — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks N/A

10. **Daily Access/Security Logs** — ☐ Readily available — ☐ Up to date — ☐ N/A

    Remarks N/A

IV. O&M COSTS

1. **O&M Organization**
   - ☐ State in-house
   - ☐ Contractor for State
   - ☐ PRP in-house
   - ☐ Contractor for PRP
   - ☐ Federal Facility in-house
   - ☐ Contractor for Federal Facility
   - ☐ Other N/A Site has been remediated. O&M no longer required.

2. **O&M Cost Records** CA was closed out on June 30, 2013.
   - ☒ Readily available
   - ☒ Up to date
   - ☐ Funding mechanism/agreement in place
   - Original O&M cost estimate _____ ☐ Breakdown attached

   Total annual cost by year for review period if available

   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

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons: NONE

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☐ N/A
   Remarks None - Site unrestricted

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
   Remarks N/A

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 ☐ Yes ☒ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) Drive by; check Register of Deeds for Eaton County

Frequency Annual

Responsible party/agency MDEQ

Contact

Name	Title	Date	Phone no.

Reporting is up-to-date ☒ Yes ☐ No ☐ N/A

Reports are verified by the lead agency ☒ Yes ☐ No ☐ 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: ☐ Report attached

RC was filed on August 26, 2013. Permanent Marker installed at site on October 30, 2013.

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

Remarks

D. General

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

Remarks N/A

2. **Land use changes on site** ☐ N/A

Remarks N/A

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

Remarks N/A

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☐ N/A

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

Remarks N/A

B. Other Site Conditions

Remarks

Not Applicable Site is not a landfill.

VII. LANDFILL COVERS ☐ Applicable ☐ N/A

A. Landfill Surface Not Applicable

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks N/A

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks N/A

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks N/A

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent_____ Depth_____
   Remarks N/A

5. **Vegetative Cover** ☐ Grass ☒ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks ISV treatment area material left in place and covered with maintained vegetative cover.

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks N/A

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent_____ Height_____
   Remarks N/A

8. **Wet Areas/Water Damage** ☐ 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 N/A

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
   Areal extent_____
   Remarks N/A

B. Benches ☐ Applicable ☐ 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.) N/A

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

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
   Remarks N/A

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
   Remarks N/A

C. Letdown Channels ☐ Applicable ☐ 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 N/A

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
   Material type_____ Areal extent_____
   Remarks N/A

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
   Areal extent_____ Depth_____
   Remarks N/A

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
   Areal extent_____ Depth_____
   Remarks N/A

5. **Obstructions** Type_____ ☐ No obstructions
   ☐ Location shown on site map Areal extent_____
   Size_____
   Remarks N/A

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 N/A

D. Cover Penetrations ☐ Applicable ☐ N/A

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

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

3. **Monitoring Wells** (within surface area of landfill)
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
   Remarks N/A

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

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
   Remark Annual Driveby required to ensure Permanent Marker remains in place and maintained

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**
   ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
   ☐ Good condition ☐ Needs Maintenance
   Remarks N/A

2. **Gas Collection Wells, Manifolds and Piping**
   ☐ Good condition ☐ Needs Maintenance
   Remarks N/A

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

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
   Remarks N/A

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A

Remarks N/A

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
   ☐ Siltation not evident
   Remarks N/A

2. **Erosion** Areal extent_____ Depth_____
   ☐ Erosion not evident
   Remarks N/A

3. **Outlet Works** ☐ Functioning ☐ N/A
   Remarks N/A

4. **Dam** ☐ Functioning ☐ N/A
   Remarks N/A

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks N/A

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
   Remarks N/A

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

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
   Areal extent_____ Depth_____
   Remarks N/A

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

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks N/A

4. **Discharge Structure** ☐ Functioning ☐ N/A
   Remarks N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☐ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks N/A

2. **Performance Monitoring** Type of monitoring_____
   ☐ Performance not monitored
   Frequency_____ ☐ Evidence of breaching
   Head differential_____
   Remarks N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☐ N/A

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

1. **Pumps, Wellhead Plumbing, and Electrical**
   ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
   Remarks N/A

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks N/A

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks N/A

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

1. **Collection Structures, Pumps, and Electrical**
   ☐ Good condition ☐ Needs Maintenance
   Remarks N/A

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks N/A

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks N/A

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
   ☐ Air stripping ☐ Carbon adsorbers

☐ Filters_____
☐ Additive (*e.g.*, chelation agent, flocculent)_____
☐ Others_____
☐ Good condition ☐ Needs Maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
☐ Quantity of groundwater treated annually_____
☐ Quantity of surface water treated annually_____
Remarks N/A

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks N/A

3. **Tanks, Vaults, Storage Vessels**
☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
Remarks N/A

4. **Discharge Structure and Appurtenances**
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks N/A

5. **Treatment Building(s)**
☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks N/A

6. **Monitoring Wells** (pump and treatment remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☒ N/A
Remarks All site monitoring wells have been removed and plugged and abandoned.

D. Monitoring Data N/A Site is remediated, OEM no longer required.

1. Monitoring Data
☐ Is routinely submitted on time ☐ Is of acceptable quality

2. Monitoring data suggests:
☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☒ N/A
Remarks All site monitoring wells have been removed and plugged and abandoned.

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. Not Applicable

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.).

Site and groundwater have been remediated. Site monitoring wells have all been removed and plugged and abandoned. OEM is completed.

Restrictive Covenant has been filed on August 26, 2013.

Permanent marker has been installed on site near the ISV Treatment Area.

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.

OEM has been completed.

Remedy is currently protective in both the short term and the long term.

C. Early Indicators of Potential Remedy Problems

None observed

D.	Opportunities for Optimization
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.
	None

APPENDIX B

EPA Begins Review of Parsons Chemical Superfund Site

Grand Ledge, Michigan

U.S. Environmental Protection Agency is conducting a five-year review of the Parsons Chemical Superfund site at 3562 W. Jefferson, Grand Ledge. The Superfund law requires regular checkups of sites that have been cleaned up – with waste managed on-site – to make sure the cleanup continues to protect people and the environment. This is the second five-year review of this site.

EPA's cleanup at the former chemical plant consisted of a time-critical removal of contaminated soil and long-term ground water monitoring. Prior reviews of the site found that the remedy at the site was protective of human health and the environment in the short term. Long-term protectiveness requires compliance with effective institutional controls and continual monitoring.

More information is available at the Grand Ledge Public Library, 131 East Jefferson Street, Grand Ledge, Michigan 48837, and at www.epa.gov/region5/sites/xyz. The review should be completed by the end of April 2014.

The five-year review is an opportunity for you to tell EPA about site conditions and any concerns you have. Contact:

Lolita Hill
Remedial Project Manager
312-353-1621
hill.lolita@epa.gov

Dave Novak
Community Involvement Coordinator
312-886-7478
novak.dave@epa.gov

You may also call Region 5 toll-free at 800-621-8431, 8:30 a.m. to 4:30 p.m., weekdays.

EPA Region 5
77 W. Jackson Blvd.
Chicago, IL 60604

APPENDIX C

TABLE 4
MONITORING WELL DATA TABLE
2003 – 2010

Date	Monitoring Well	Arsenic (10 ppb)	Lead (4 ppb)	Manganese (50 ppb)
September 2003	MW1			
	MW2		32 ppb	
	MW3			
	MW4		4.2 ppb	
	MW6			450 ppb
	MW8	99 ppb	1200 ppb	180 ppb
	MW9		21 ppb	69 ppb
	MW10			
	MW17	8.8 ppb		
	MW18			57 ppb
January 2004	MW1			
	MW2			51 ppb
	MW3			
	MW4		6.1 ppb	
	MW5		130 ppb	120 ppb
	MW6			400 ppb
	MW8		160 ppb	630 ppb
	MW9		200 ppb	
	MW10			
	MW17		34 ppb	99 ppb
	MW18			64 ppb
August 2004	MW1			52 ppb
	MW2			
	MW3			
	MW4			
	MW6			310 ppb
	MW8			160 ppb
	MW9			56 ppb
	MW10			
	MW17			81 ppb
	MW18			54 ppb

	Monitoring Well	Arsenic (10 ppb))	Lead (4 ppb)	Manganese (50 ppb)
February 2005	MW1			
	MW2		18 ppb	
	MW3			
	MW4		4.3 ppb	63 ppb
	MW6			74 ppb
	MW8	51 ppb		110 ppb
	MW9			55 ppb
	MW10			80 ppb
	MW17		32 ppb	57 ppb
	MW18			
November 2005	MW1		4.6 ppb	
	MW2		27 ppb	49 ppb
	MW3			
	MW4		4.5 ppb	
	MW6			580 ppb
	MW8		12 ppb	140 ppb
	MW9		7.5 ppb	51 ppb
	MW10			
	MW17			100 ppb
	MW18			65 ppb
October 2006	MW1			
	MW2			
	MW3			
	MW4		4.0 ppb	
	MW6			
	MW8		120 ppb	
	MW9		4.8 ppb	
	MW10			
	MW17			
	MW18			
June 2007	MW1			
	MW2		4.7 ppb	
	MW3			
	MW4			210 ppb
	MW5		17 ppb	84 ppb
	MW6			610 ppb
	MW8		4.2 ppb	130 ppb

	Monitoring Well	Arsenic (10 ppb)	Lead (4 ppb)	Manganese (50 ppb)
June 2007	MW9		24 ppb	64 ppb
	MW10			
	MW17		5.8 ppb	100 ppb
	MW18			59 ppb
June 2008	MW1		4.7 ppb	
	MW2			93 ppb
	MW3			
	MW4		20 ppb	280 ppb
	MW5		19 ppb	110 ppb
	MW6			860 ppb
	MW8	18 ppb	11 ppb	370 ppb
	MW9		25 ppb	61 ppb
	MW10	11 ppb		
(upgradient)	MW11		8.8 ppb	
(upgradient)	MW12		7.3 ppb	76 ppb
(upgradient)	MW13			
(upgradient)	MW15			
	MW17	12 ppb	13 ppb	410 ppb
	MW18			62 ppb
June 2009	MW1			
	MW2		17 ppb	62 ppb
	MW3			
	MW4			400 ppb
	MW5		20 ppb	98 ppb
	MW6			720 ppb
	MW8		10 ppb	120 ppb
	MW9		5.1 ppb	75 ppb
	MW10			
	MW17			95 ppb
	MW18			62 ppb
June 2010	MW1			
	MW2		12 ppb	51 ppb
	MW3			
	MW4			570 ppb
	MW5			
	MW6			510 ppb
	MW8		12 ppb	130 ppb

	Monitoring Well	Arsenic (10 ppb)	Lead (4 ppb)	Manganese (50 ppb)
June 2010	MW9		6.5 ppb	69 ppb
	MW10			
	MW17			110 ppb
	MW18			69 ppb

TABLE 5
RESIDENTIAL WELL DATA TABLE
2003 – 2010

DATE	ADDRESS	ARSENIC 10 ppb	LEAD 4 ppb	MANGANESE 50 ppb
August 2003	RW1 Cliff St			
	RW2 Cliff St			
	RW3 Fourth			
	RW4 Franklin			
	RW5 Franklin			
	RW6 Franklin		6 ppb	220 ppb
	RW7 Franklin			
	RW8 Franklin			
	RW9 Georgia			
	RW10 Georgia			80 ppb
	RW11 Georgia			
	RW12 Georgia			
	RW13 Georgia			110 ppb
	RW14 Georgia			80 ppb
	RW15 Georgia			50 ppb
	RW16 Georgia			
	RW17 Georgia		4 ppb	70 ppb
	RW18 Georgia			
	RW19 Georgia			
	RW20 Georgia			
	RW21 Georgia			240 ppb
	RW22 Georgia		4 ppb	
	RW23 Lawson			160 ppb
	RW24 Lawson			
	RW25 Oneida			
	RW26 Oneida			
	RW27 Oneida			
	RW28 Partlow			120 ppb
	RW29 Partlow			
	RW30 Partlow			80 ppb
	RW31 Partlow		17 ppb	60 ppb
	RW32 Partlow			70 ppb
	RW33 Partlow			180 ppb
	RW34 Partlow			80 ppb
	RW35 Partlow			410 ppb
	RW36 Partlow			440 ppb
	RW37 Second			190 ppb
	RW38 Third			
	RW39 Third			60 ppb

DATE	ADDRESS	ARSENIC 10 ppb	LEAD 4 ppb	MANGANESE 50 ppb
January 2004	RW1 Cliff St			
	RW2 Cliff St			
	RW3 Fourth			
	RW4 Franklin			
	RW5 Franklin		260 ppb	22 ppb
	RW6 Franklin			
	RW7 Franklin			80 ppb
	RW8 Franklin			
	RW9 Georgia			
	RW10 Georgia			
	RW11 Georgia			
	RW12 Georgia			70 ppb
	RW13 Georgia			90 ppb
	RW14 Georgia			
	RW15 Georgia			
	RW16 Georgia			140 ppb
	RW17 Georgia			
	RW18 Georgia			
	RW19 Georgia			
	RW20 Georgia			
	RW21 Georgia			
	RW22 Georgia			
	RW23 Lawson			170 ppb
	RW24 Lawson			
	RW25 Oneida			
	RW26 Oneida			
	RW27 Oneida			
	RW28 Partlow			
	RW29 Partlow			60 ppb
	RW30 Partlow		4 ppb	70 ppb
	RW31 Partlow			50 ppb
	RW32 Partlow			70 ppb
	RW33 Partlow			
	RW34 Partlow			70 ppb
	RW35 Partlow			460 ppb
	RW36 Partlow			430 ppb
	RW37 Second			
	RW38 Third			
	RW39 Third			

DATE	ADDRESS	ARSENIC 10 ppb	LEAD 4 ppb	MANGANESE 50 ppb
July 2005	RW1 Cliff St			70 ppb
	RW2 Cliff St			
	RW3 Fourth			70 ppb
	RW4 Franklin			
	RW5 Franklin			290 ppb
	RW6 Franklin			
	RW7 Franklin			100 ppb
	RW8 Franklin			
	RW9 Georgia			
	RW10 Georgia			70 ppb
	RW11 Georgia			
	RW12 Georgia			
	RW13 Georgia			90 ppb
	RW14 Georgia			60 ppb
	RW15 Georgia			70 ppb
	RW16 Georgia			150 ppb
	RW17 Georgia			
	RW18 Georgia			
	RW19 Georgia			
	RW20 Georgia			
	RW21 Georgia			
	RW22 Georgia			
	RW23 Lawson			160 ppb
	RW24 Lawson			
	RW25 Oneida			
	RW26 Oneida			
	RW27 Oneida			
	RW28 Partlow			
	RW29 Partlow			
	RW30 Partlow		14 ppb	
	RW31 Partlow			50 ppb
	RW32 Partlow		4 ppb	50 ppb
	RW33 Partlow			
	RW34 Partlow			70 ppb
	RW35 Partlow			470 ppb
	RW36 Partlow			380 ppb
	RW37 Second			
	RW38 Third			60 ppb
	RW39 Third			

DATE	ADDRESS	ARSENIC 10 ppb	LEAD 4 ppb	MANGANESE 50 ppb
June 2006	RW1 Cliff St			80 ppb
	RW2 Cliff St			
	RW3 Fourth			50 ppb
	RW4 Franklin			
	RW5 Franklin			330 ppb
	RW6 Franklin			
	RW7 Franklin			100 ppb
	RW8 Franklin			
	RW9 Georgia			
	RW10 Georgia			70 ppb
	RW11 Georgia			
	RW12 Georgia			
	RW13 Georgia			90 ppb
	RW14 Georgia			80 ppb
	RW15 Georgia			
	RW16 Georgia			160 ppb
	RW17 Georgia			
	RW18 Georgia			
	RW19 Georgia			
	RW20 Georgia			
	RW21 Georgia			
	RW22 Georgia			
	RW23 Lawson			180 ppb
	RW24 Lawson			
	RW25 Oneida			50 ppb
	RW26 Oneida			
	RW27 Oneida			
	RW28 Partlow			
	RW29 Partlow			60 ppb
	RW30 Partlow			
	RW31 Partlow			
	RW32 Partlow			80 ppb
	RW33 Partlow			60 ppb
	RW34 Partlow			80 ppb
	RW35 Partlow			
	RW36 Partlow			380 ppb
	RW37 Second			
	RW38 Third			
	RW39 Third			

DATE	ADDRESS	ARSENIC 10 ppb	LEAD 4 ppb	MANGANESE 50 ppb
July 2007	RW1 Cliff St			80 ppb
	RW2 Cliff St			
	RW3 Fourth			50 ppb
	RW4 Franklin			
	RW5 Franklin			360 ppb
	RW6 Franklin			
	RW7 Franklin			60 ppb
	RW8 Franklin			
	RW9 Georgia			
	RW10 Georgia			
	RW11 Georgia			
	RW12 Georgia			
	RW13 Georgia			90 ppb
	RW14 Georgia			90 ppb
	RW15 Georgia			
	RW16 Georgia			170 ppb
	RW17 Georgia			
	RW18 Georgia			
	RW19 Georgia			50 ppb
	RW20 Georgia			
	RW21 Georgia			220 ppb
	RW22 Georgia			70 ppb
	RW23 Lawson			170 ppb
	RW24 Lawson			
	RW25 Oneida			60 ppb
	RW26 Oneida			
	RW27 Oneida			
	RW28 Partlow			
	RW29 Partlow			
	RW30 Partlow			
	RW31 Partlow			
	RW32 Partlow			
	RW33 Partlow			
	RW34 Partlow			70 ppb
	RW35 Partlow			450 ppb
	RW36 Partlow			430 ppb
	RW37 Second			150 ppb
	RW38 Third			
	RW39 Third			50 ppb

DATE	ADDRESS	ARSENIC 10 ppb	LEAD 4 ppb	MANGANESE 50 ppb
June-July 2008	RW1 Cliff St			70 ppb
	RW2 Cliff St			70 ppb
	RW3 Fourth			
	RW4 Franklin			
	RW5 Franklin			290 ppb
	RW6 Franklin			
	RW7 Franklin			90 ppb
	RW8 Franklin			
	RW9 Georgia			
	RW10 Georgia			
	RW11 Georgia			
	RW12 Georgia			
	RW13 Georgia			90 ppb
	RW14 Georgia			80 ppb
	RW15 Georgia			
	RW16 Georgia			
	RW17 Georgia			
	RW18 Georgia			
	RW19 Georgia			60 ppb
	RW20 Georgia			
	RW21 Georgia			
	RW22 Georgia			
	RW23 Lawson			
	RW24 Lawson			
	RW25 Oneida			
	RW26 Oneida			
	RW27 Oneida			
	RW28 Partlow			
	RW29 Partlow			
	RW30 Partlow			
	RW31 Partlow			
	RW32 Partlow			79 ppb
	RW33 Partlow			70 ppb
	RW34 Partlow			
	RW35 Partlow			310 ppb
	RW36 Partlow			
	RW37 Second			
	RW38 Third			
	RW39 Third			

DATE	ADDRESS	ARSENIC 10 ppb	LEAD 4 ppb	MANGANESE 50 ppb
August 2009	RW1 Cliff St			80 ppb
	RW2 Cliff St			
	RW3 Fourth			60 ppb
	RW4 Franklin			
	RW5 Franklin			270 ppb
	RW6 Franklin			
	RW7 Franklin			90 ppb
	RW8 Franklin			520 ppb
	RW9 Georgia			
	RW10 Georgia			
	RW11 Georgia			
	RW12 Georgia			
	RW13 Georgia			100 ppb
	RW14 Georgia			80 ppb
	RW15 Georgia			
	RW16 Georgia			180 ppb
	RW17 Georgia			
	RW18 Georgia			
	RW19 Georgia			
	RW20 Georgia			
	RW21 Georgia			290 ppb
	RW22 Georgia			
	RW23 Lawson			
	RW24 Lawson			
	RW25 Oneida			80 ppb
	RW26 Oneida			
	RW27 Oneida			
	RW28 Partlow			90 ppb
	RW29 Partlow			60 ppb
	RW30 Partlow			
	RW31 Partlow			
	RW32 Partlow			70 ppb
	RW33 Partlow			
	RW34 Partlow			
	RW35 Partlow			300 ppb
	RW36 Partlow			390 ppb
	RW37 Second			170 ppb
	RW38 Third			
	RW39 Third			

DATE	ADDRESS	ARSENIC 10 ppb	LEAD 4 ppb	MANGANESE 50 ppb
September 2010 (reduced Residential Well Sampling Event)				
	RW19 Georgia	3 ppb		60 ppb
	RW22 Georgia			
	RW24 Lawson			10 ppb
	RW25 Oneida			60 ppb
	RW26 Oneida			30 ppb
	RW27 Oneida			
	RW37 Second			170 ppb
Residential Well Sampling Discontinued in 2011				

Computers could help fight depression

MSU prof. says seniors benefit

By Robin Erb
Gannett Michigan

EAST LANSING — Depression, a common problem for older adults, might have an easy antidote: The Internet.

According to new research by a Michigan State University professor, computer use among retirees reduces the risk of depression by more than 30 percent.

And don't worry that Grandpa doesn't yet understand the Internet.

It's never too late to learn, said Sheila Cotten, lead author and a professor of telecommunication, information studies and the media.

In earlier research, Cotten and others led 300 seniors through an eight-week course to get them proficient online. Many had never used a computer before. Their average age: 82. The oldest: 102.

"If you start out with some very basic training ... and get them to see how Internet use can be beneficial to them, they get over that fear and they get engaged," Cotten said.

Her latest research was published online last week in the "Journal of Gerontology: Social Sciences."

Cotten and her team sorted through data of 3,075 men and women who were retired and 50 or older. The participants were part of a larger, unrelated study and had been surveyed four times between 2002 and 2008.

Researchers wanted to focus on retirees — those who no longer have jobs that force them to interact in person or online.

With other factors held constant — such as whether the seniors lived with other people — the authors found that roughly seven in 100 Internet users were estimated to have depression, whereas 10 in 100 noncomputer users were estimated to have depression.

In other words, Internet use led to a reduction in the probability of depression.

It's not clear what the participants were doing — checking e-mail, shopping or searching for information.

And that doesn't matter, Cotten said: "It's really about being able to connect and communicate and find information you need."

The results don't surprise Annena McCleskey.

At 70, she's recuperating from hip replacement at Maple Manor in Novi, a facility that opened last month with a bank of computers near the dining area. As the long-term care facility begins to fill up, staff members hope to keep residents connected to loved ones.

McCleskey keeps her Mac Pro laptop and cell phone nearby, regularly texting and calling loved ones, including a grandson in California.

She tracks her medical records online, too, to make sure she's following doctor's orders.

And she has been checking out restaurant discounts and playing solitaire.

"I didn't want to be in a closed situation, where I'd be removed from my buddies and everything," McCleskey said.

While she's using a walker and her mobility is limited, she said, the laptop "brought my family to me, my friends to me and my games to me."

For others, keeping in touch might mean an introduction to Facebook, said Amy Patterson, activities director at Maple Manor in Wayne.

But that's OK, Patterson said.

Staff can introduce seniors to e-mail and to Facebook.

And simple, big-lettered instructions on index cards can help.

Finally, they let the seniors' support network — friends and family — know their loved one is online. The e-mails and Facebook friend requests start.

With staff help, they can store passwords and eke out shortcuts.

One picture of a grandchild, Patterson said, and human nature takes over.

"They figure it out. They start pressing buttons and getting to the next picture and next picture and the next picture."

Robin Erb is a reporter for the Detroit Free Press.

TIPS TO INTRODUCE OLDER LOVED ONES TO THE INTERNET

» Show loved ones how the Internet can be useful — to communicate with relatives or research medical information.
» Consider needs and disabilities. A tablet or touch-screen computer may be easier to operate than a keyboard and mouse. Some companies make computers specifically for seniors.
» Start with the basics if you're training someone. Be patient.
» Send frequent e-mail messages or find other ways to keep them engaged.
» Keep security issues in mind. Show seniors ways to stay safe online and what information not to give out.

OTHER CANDIDATES

Filings by the 4 p.m. Tuesday deadline:

INGHAM COUNTY BOARD OF COMMISSIONERS

1st District
» John McNamara, R
» Victor G. Celentino, D *
2nd District
» Patricia Muscovalley, R
» Rebecca Bahar-Cook, D *
3rd District
» Beverly Hansen, R
» Sarah Anthony, D *
4th District
» Vickie Niklas, R
» Bryan L. Crenshaw, D *
5th District
» Robert Kerr, R
» Todd Tennis, D *
6th District
» Randy Maiville, R *
» Jim Dravenstatt-Moceri, D
7th District
» Kara Hope, D *
» Anthony Markwort, R
8th District
» Alasdair Whitney, R
» Penelope Tsernoglou, D *
9th District
» Derek M. Drushel, R
» Justin Hodge, D
» Carol N. Koenig, D *
10th District
» Michelle Gormas, R
» Brian McGrain, D *
11th District
» Gerry Polverento, R
» Teri Banas, D
12th District
» Deb Nolan, D *
» Jim Hershiser, R
13th District
» Randy Schafer, R *
14th District
» Robin Case Naeyaert, R

INGHAM COUNTY PROBATE COURT JUDGE
» Richard J. Garcia *

EATON COUNTY BOARD OF COMMISSIONERS

District 1
» Mike Hosey, D*
District 2
» Blake Mulder, R*
» Lyonel Woolley, D
District 3
» Terrance Augustine, D*
» Fredrick McPhail, R
District 4
» Howard T. Spence, D*
» Ashley E. Forsberg, D
» Larry Brunette, R
District 5
» John H. Finn, D
» John Baron, R
» Steven E. Coates, R
» Jim Osieczonek, R*
District 6
» Jane M. Whitacre, D*
District 7
» Glenn Freeman III, D*
District 8
» Joseph Brehler, D*
» Brian Brandt, R
» Charlene Wagner, R
District 9
» Walter Miars, R*
District 10
» Tony Chandler, D
» Roger A. Eakin, R*
District 11
» Mike Whitson, D
» Wayne Ridge, R*
» Bret L. McAtee, R
District 12
» Lothar Konietzko, D
» Cindy Miller, D
» Ronald E. Hannold, R
» Brian Lautzenheiser, R
» Tony Sanfilippo, R
District 13
» Kathi Schroder, D
» Kent C. Austin, R
» Dale Barr, R*
District 14
» Jeremy Whittum, R*
District 15
» Roger Harris, D*

CLINTON COUNTY BOARD OF COMMISSIONERS

1st District
» Kam Washburn, R*
2nd District
» David W. Pohl, R*
3rd District
» Bruce DeLong, R*
4th District
» Kenneth B. Mitchell, R.
» Patricia Relyea, R
» Brian Wethy, R
» Richard W. Hawkins, D
5th District
» Robert E. Showers, R*
6th District
» Anne Hill, R
» Eileen Heideman, D*
7th District
» Adam Stacey, R*

(ASTERISK DENOTES INCUMBENT)

Candidates

Continued from Page 3A

ship resident, faces Democrat Harold J. Leeman Jr., a former Lansing City Council member, and Democrat Larry J. Hutchinson in the Aug. 5 primary. The winner of that contest faces Republican Craig L. Whitehead, a General Motors Co. line worker who lives in Leslie, in the general election.

Elsewhere, first-term Democratic incumbent state representatives Andy Schor of Lansing and Sam Singh of East Lansing are fending off general election challenges. Schor faces Republican Rob Secaur in the 68th District in Lansing, and Singh faces Republicans Frank Lambert and George Nastas III in the 69th District in northern Ingham County.

In the 93rd House District, state Rep. Tom Leonard, R-DeWitt Township, is facing a general election challenge from Democrat Josh Derke of Bath. The district includes Clinton County and southern Gratiot County.

State Sen. Rick Jones, R-Grand Ledge, is fending off a challenge from Democrat Dawn Levey of Elsie in the 23rd Senate District, which includes Eaton, Clinton and Shiawassee counties and northeastern Ingham County.

Police

Continued from Page 3A

not able to negotiate a short-term lease with developer Harry Hepler's H Inc., which owns the Motor Wheel building on the northside.

Bernero said he could not provide details of the proposed length of a new lease for the Motor Wheel site on May Street, formerly the department's north precinct.

Lansing has estimated it would cost $360,553 to rent the May Street building through June 30.

Steve Purchase, a vice president with H Inc., told the State Journal in a recent editorial board interview a 10-year renewal option was offered.

The Lansing School District board unanimously supported the move last week.

Under the agreement, the city will not pay rent for the first two years. But it will spend $800,000 to renovate the building for police use.

That work will include basic upgrades such as paint, carpet and technology, police Chief Mike Yankowski said. The department also will create locker, workout, break and interview rooms.

The city said it will pay $25,000 in rent the third year and $125,000 in the fourth year, should it stay that long. The lease runs through June 30, 2018, with an option to renew.

"Why make this move? The bottom line is it's about making the right decisions" for the department's future, he said. "This, I believe, is the right move at the right time to meet our needs."

Yankowski said police also are looking at opening a northside substation, aside from the downtown police headquarters on Michigan Avenue, to keep a presence there.

A Lansing City Council committee is reviewing a budget amendment that will fund part of the renovations. A final vote is expected soon, council President A'Lynne Boles said.

Yankowski said the roughly 22,000-square-foot May Street site isn't large enough for current police operations. Much of the Hill Center location will be used for equipment and file storage, he said, which there isn't space for now.

The school district will pay to renovate a swimming pool at the Hill Center, which hasn't been used for two years. Superintendent Yvonne Caamal Canul said the cost could range from $350,000 to $500,000, although a funding source has not yet been identified.

The pool could be open by January 2016, she said.

The district also will use sinking fund dollars to repair a roof over the pool and replace a boiler, she said.

WHAT'S NEXT

» The Lansing Police Department will move into a portion of the southside Harry Hill Center, owned by the Lansing School District, by the end of August, officials said.
» A Lansing City Council committee is reviewing a budget amendment that will fund part of the renovations. A final vote is expected soon.

Deaths

Continued from Page 5A

St. Louis

» **Harris, Steven Franklin "Steve,"** 53, of St. Louis, truck driver, died Monday. Services 1 p.m. today at Smith Family Funeral Homes, St. Louis Chapel.

Elsewhere

» **Bodo, May Y.,** 87, of Harrison, died Monday. Graveside services 2 p.m. Friday at Deepdale Memorial Gardens, Lansing. Arrangements by Gorsline Runciman Funeral Homes, Lansing Chapel.

Births

Eaton Rapids

» **Hanna:** To Christopher Hanna and Julee Hancock, a son, Ryan Thomas Hanna, at McLaren Greater Lansing, March 8.

Grand Ledge

» **Efting:** To Lawrence and Marie Efting, a daughter, Clare Quinn Efting, at McLaren Greater Lansing, April 8.

Holt

» **Christie:** To Micheal and Angela Christie, a daughter, Arielle Jasmine Christie, at Sparrow Hospital, April 6.

Muir

» **Falor:** To Kory Falor and Victoria Clark, a son, Owen Neil Falor, at Sparrow Hospital, April 10.

Owosso

» **Rankin:** To Casey Rankin and Stephanie Pearson, a daughter, Savanah Jolynn Rankin, at McLaren Greater Lansing, April 4.

Portland

» **Huhn:** To Brent and Lynne Huhn, a son, Isaac Chad Huhn, at Sparrow Hospital, March 25.
» **Graef:** To Dan and Diana Graef, a son, Grayson David Graef, at Sparrow Hospital, April 3.
» **Platte:** To Andrew and Rachel, a daughter, Allie Lynn Platte, at Sparrow Hospital, April 5.

Westphalia

» **Spitzley:** To Ryan and Alissa Spitzley, a daughter, Everlee Alyse Spitzley, at Sparrow Hospital, April 7.

IN BRIEF

Okemos, Haslett, E.L. schools lauded

Okemos High School ranks among Michigan's 10 best high schools, according to a new ranking by U.S. News & World Report magazine.

Okemos ranked ninth in Michigan and 452nd nationally on the list, published Tuesday.

East Lansing came in 17th and Haslett High School ranked 33rd in Michigan.

Ranking No. 1 in Michigan was International Academy in Bloomfield Hills. It was ranked ninth nationally.

Excel Charter Academy-Grand River prep School in Grand Rapids was second. Others on the state list include: Troy High School in the third spot, Frankenmuth in fourth, City Middle/High School in Grand Rapids at fifth, Saline High School in sixth, Black River Public School in Holland at seventh, Rochester Adams High School in eighth, and Bloomfield Hills Andover High School in 10th.

The top high school in the nation, according to the rankings, is the School for the Talented and Gifted in Dallas.

The U.S. News Best High Schools rankings and data includes profiles on more than 19,400 high schools and rankings of the nation's 4,707 highest-scoring schools in the country.

Bicycle delivery service kicks off

An eco-friendly delivery service officially began operating Tuesday in the Lansing area.

Go Green Trikes, founded by Yvonne LeFave, relies on electric-assist bicycles to move cargo around the Lansing area. The Allen Marketplace Exchange is one of its first clients.

LeFave will make smaller deliveries in the solar-powered ELF three-wheeler she bought last year. She expects to add a Truck Trike, capable of hauling 600 pounds, early next month.

Go Green Trikes will operate from April to November. For now, LeFave is the only employee, although four other people are interested in working, she said.

"I've got to see how things go and how quickly this takes off," LeFave said. "But I suspect I'll be employing them soon."

LeFave is raising funds for the business online.

Proceeds from her launch party on Tuesday night will benefit the Mid-Michigan Environmental Council.

— From staff reports