Fourth Five-Year Review Report

for

Wausau Groundwater Contamination Site

Marathon County, Wisconsin

April 2010

PREPARED BY:

United States Environmental Protection Agency
Region 5
Chicago, Illinois

Approved by:

Richard C. Karl, Director
Superfund Division

4-9-10
Date

[This page intentionally left blank.]

Table of Contents

Tables

Figures

Attachments

List of Acronyms

AOC	Administrative Order by Consent
ARAR	Applicable, Relevant and Appropriate Requirement
AWQC	Ambient Water Quality Criteria
C12DCE	Cis-1-2 Dichloroethane
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CD	Consent Decree
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
CLP	Contract Laboratory Program (U.S. EPA-approved contract laboratories)
COCs	Chemicals of Concern
CRA	Conestoga Rovers Associates
DCA	Dichloroethane
DCE	Dichloroethylene or Dichloroethene
DEE	Diethyl ether
EPA	United States Environmental Protection Agency
EW	Extraction Well
ESD	Explanation of Significant Differences
FCOR	Final Closeout Report - documents completion of Remedial Action
FR	Federal Register
FS	Feasibility Study
FYR	Five-Year Review
gpm	Gallons per Minute
ICs	Institutional Controls
MGD	Million Gallons per Day
MW	Monitoring Well
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
PCE	Perchloroethylene or Tetrachloroethylene
ppb	Parts per billion or ug/L (water) and ug/kg (soil/sediment)
ppm	Parts per million, or mg/L (water) or mg/kg (soil/sediment)
PRPs	Potentially Responsible Parties
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
RP	Responding Party

RPM	Remedial Project Manager (U.S. EPA)
SARA	Superfund Amendments and Reauthorization Act of 1986
SDWA	Safe Drinking Water Act
SMCL	Secondary Maximum Contaminant Level
SOW	Statement of Work
TAL	Target Analyte List
TBC	To Be Considered
TCA	1,1,1-Trichloroethane or 1,1,1-TCA
TCE	Trichloroethylene
TCFM	Trichlorofluoromethane
U.S. EPA	United States Environmental Protection Agency
VC	Volatile Organic Chemicals
WHPP	Well Head Protection Plan
WPA	Well Head Protection Area
WDNR	Wisconsin Department of Natural Resources
WHPP	Well Head Protection Plan
WHPA	Well head Protection Area

FIVE-YEAR REVIEW REPORT
EXECUTIVE SUMMARY
APRIL 2010

WAUSAU GROUNDWATER SUPERFUND SITE

WAUSAU,
WISCONSIN

This is the fourth Five-Year Review for the Wausau Groundwater Site. The third Five-Year Review was completed and signed in June 2005[1]. The completion of the current Five-Year Review confirms that the Wausau Groundwater Superfund Site remedial action remains protective of human health and the environment in the short-term, and there are no known exposure pathways that could result in unacceptable health. The components of the remedy selected in the 1988 and 1989 Wausau Groundwater Site Records of Decision have been implemented under the 1989 and 1991 Consent Decrees. The City of Wausau's water treatment plant regularly operates as an integral part of the City's municipal water treatment system to ensure protectiveness of the City's drinking water supply. Groundwater extraction well EW1on the West Bank of the Wisconsin River continues to operate under an approved permit, and is monitored under the ongoing Site operation and maintenance monitoring program. All threats at the site have been addressed through the operating ground water treatment systems and the soil vapor treatment of site soils. The West Bank soil vapor extraction (SVE) system was shut down in April 1996 and the East Bank SVE system was shut down in January 2001 after the United States Environmental Protection Agency (U.S. EPA) and the Wisconsin Department of Natural Resources (WDNR) agreed the requisite requirements were met. The Operations and Maintenance (O&M) Plan must be reviewed to ensure that the former SVE treatments areas with residual contamination are subject to effective monitoring and maintenance procedures. The requirements for Institutional Controls (ICs) for the soils area with residual contamination must be reviewed along with the requirement for ground water ICs. Since it is highly unlikely that Site groundwater cleanup standards will be met during the next five years, operation of the groundwater treatment systems should be continued for the foreseeable future.

Long-term protectiveness of the groundwater requires continued operation and maintenance of the remedial components including the groundwater monitoring system and extraction well EW1 and the City's municipal groundwater treatment plant as an integral part of the groundwater treatment for the Site. Long-term protectiveness requires compliance with effective groundwater ICs until the attainment of the groundwater standards. The soil portion of the Wausau Groundwater Site remedy is essentially complete, and is documented in the Site file. However, maintenance and monitoring plans must be finalized for those areas. Additionally, the need for

1 The Five-Year Review (FYR) conducted in 2005 erroneously stated that it was the second FYR whereas it actually was the third FYR

groundwater ICs is under review. Long-term protectiveness also requires compliance with effective ICs for the soils. Compliance with effective ICs will be ensured by implementing effective ICs which must be maintained, monitored and enforced by developing long-term stewardship procedures as well as maintaining the site remedy components. To that end, evaluation of the necessity and types of ICs required is underway by U.S. EPA. The U.S. EPA will then require the PRPs to conduct additional IC evaluation activities and submit an IC work plan, including ensuring that effective ICs are implemented and that long-term stewardship procedures are in place to ensure effectiveness, enforceability and long-term stewardship. A review of the need for a clarification of the remedy relative to the need for ICs, such as in an Explanation of Significant Differences (ESD), will also be conducted by U.S. EPA. Last, the declining pumping rate at EW1 must be addressed by the PRPs along with exploring remedy optimization opportunities. These steps are necessary to ensure that the remedy continues to function as intended and to ensure long-term protectiveness.

Five-year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: Wausau Ground Water Contamination		
EPA ID *(from WasteLAN)*: WID980993521		
Region: 5	**State:** WI	**City/County:** Wausau, Marathon

SITE STATUS	
NPL status: X Final _ Deleted _ Other (specify)	
Remediation status (choose all that apply): _ Under Construction X Operating _ Complete	
Multiple OUs?* X YES _ NO	**Construction completion date:** 3/18/94
Has site been put into reuse? _ YES X NO	

REVIEW STATUS	
Lead agency: X EPA _ State _ Tribe _ Other Federal Agency	
Author name: Sheri L. Bianchin	
Author title: Remedial Project Manager	**Author affiliation:** U.S. EPA, Region 5
Review period:** 9/1/09 to April 2010	
Date(s) of site inspection: November 13, 2009	
Type of review: X Post-SARA _ Pre-SARA _ NPL-Removal only _ Non-NPL Remedial Action Site _ NPL State/Tribe-lead _ Regional Discretion	
Review number: _ 1 (first) _ 2 (second) _ 3 (third) X Other (fourth)	
Triggering action: _ Actual RA Onsite Construction at OU #____ Actual RA Start at OU# 1 _ Construction Completion X Previous Five-Year Review Report _ Other (specify)	
Triggering action date ***(from WasteLAN)***: 6/30/2005	
Due date ***(five years after triggering action date)***: 6/30/2010	

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

Five-Year Review Summary Form continued

Issues

The following issues were identified:

1) The decision documents do not specifically state whether the performance standards will allow for UU/UE and whether ICs are required to ensure long-term protectiveness. This must be further reviewed.
2) Effective ICs must be implemented, monitored, maintained and enforced.
3) The O&M Plan should be reviewed and modified to include soils area and inspection procedures for wells.
4) The pumping rate at EW-1 has been declining.
5) Consideration should be given to enhancing and optimizing remedy efficiency, such as modifying pumping rates, while ensuring long-term protectiveness.

Recommendations and Follow-up Actions

The following recommendations and follow-ups are required:

1) The U.S. EPA will review remedy requirements in the Records of Decision (RODs) and clarify if necessary.
2) The PRPs will conduct IC evaluation activities and submit an IC work plan for review and approval including long-term- stewardship procedures.
3) The PRPs will submit modified an O&M Plan to include soils area with residual contamination and inspection procedures for wells.
4) The PRPs shall submit a work plan to rehabilitate EW-1 to address the declining pumping rate.
5) The U.S. EPA and the WDNR will review proposal submitted by PRPs to modifying pumping rates while ensuring protectiveness and looking for optimization opportunities.

Protectiveness Statement

The completion of the current Five-Year Review (FYR) confirms that the Wausau Groundwater Superfund Site remedial action remains protective of human health and the environment in the short-term, and there are no known exposure pathways that could result in unacceptable health risks. The remedy was implemented at two (2) operable units (OUs) which required removal and treatment of volatile organic compounds (VOCs) contamination from soils and capture and treatment of VOCs in groundwater. The remedy for the OUs was documented in 1) an interim action Record of Decision (ROD) dated 1988, and 2) a final ROD dated 1989. The components of the remedy selected in the 1988 and 1989 Wausau Groundwater Site RODs have been implemented under the 1989 and 1991 Consent Decrees. The objectives of the remedy included elimination of the continued sources of groundwater contamination located at the former City landfill / Marathon Electric property and the Wausau Chemical property, and prevention of exposure to contaminants present in the three groundwater contaminant plumes identified and to ensure that groundwater is remediated. The response actions outlined for the interim action ROD included installation of an extraction well and construction and operation of a treatment system for removal of contaminants as well as formalizing an operation, maintenance, and monitoring program. The additional remedial components required in the Operable Unit 2 ROD included use of soil vapor extraction (SVE) systems to remove volatile contaminants from soils at each of the identified source areas, groundwater remediation utilizing the City's municipal wells, and the use of air strippers for removal of contaminants from contaminated groundwater plumes affecting the wells, and monitoring of the groundwater and soil.

Currently, the City of Wausau's water treatment plant regularly operates as an integral part of the City's municipal water treatment system to ensure protectiveness of the City's drinking water supply. Groundwater extraction well EW1 on the West Bank of the Wisconsin River continues to operate under an approved permit, and is monitored under the ongoing Site operation and maintenance monitoring program. All threats at the Site have been addressed through the operating ground water treatment systems and the soil vapor treatment of Site soils. The West Bank SVE system was shut down in April 1996 and the East Bank SVE system was shut down in January 2001 after U.S. EPA and WDNR agreed the requisite requirements were met.

Based upon the Five-Year Review, the following protectiveness determinations have been made.

OU 1 Protectiveness

The OU1 remedy is protective of human health and the environment in the short-term. However, long-term protectiveness requires follow-up actions, as indicated further below, such as implementation of ICs, preparation of a long-term stewardship plan, and an updating of the O&M plan.

OU 2 Protectiveness

The OU2 remedy is protective of human health and the environment in the short-term. However, long-term protectiveness requires follow-up actions, as indicated further below, such as addressing the declining pumping rate at EW1, implementation of ICs, preparation of a long-term stewardship plan, and an updating of the O&M plan.

Site Wide Protectiveness

The remedy is protective in the short-term as all immediate risks have been addressed. Additional work is needed to ensure long-term protectiveness. Long-term protectiveness of the groundwater requires continued operation and maintenance of the remedial components including the groundwater monitoring system and extraction well EW1, and the City's municipal groundwater treatment plant as an integral part of the groundwater treatment for the Site. The O&M plan must be reviewed to ensure that the former SVE treatment areas with residual contamination are subject to effective monitoring and maintenance procedures. The requirements for ICs for the soils area with residual contamination must be reviewed along with the requirement for ground water ICs. Since it is highly unlikely that Site groundwater cleanup standards will be met during the next five years, operation of the groundwater treatment systems should be continued for the foreseeable future. Long-term protectiveness also requires compliance with effective ICs until the attainment of the groundwater standards. The soil portion of the Wausau Groundwater Site remedy is essentially complete, and is documented in the Site file. However, maintenance and monitoring plans must be finalized for those areas. Additionally, long-term protectiveness requires compliance with effective ICs for the soils. Compliance with effective ICs will be ensured by implementing effective ICs which must be maintained, monitored and enforced by developing long-term stewardship procedures as well as by maintaining the Site remedy components. To that end, evaluation of the necessity and types of ICs required is underway by U.S. EPA. The U.S. EPA will then require the PRPs to conduct additional IC evaluation activities and submit an IC work plan including ensuring that effective restrictive covenants are implemented and that long-term stewardship procedures are in place to ensure effectiveness, enforceability and long-term stewardship. A review of the need for a clarification of the remedy in an Explanation of Significant Differences (ESD) for

ICs will also be conducted by U.S. EPA. Last, the declining pumping rate at EW1 must be addressed by the PRPs. The PRPs must also look for remedy optimization opportunities. These steps are necessary to ensure that the remedy continues to function as intended and to ensure long-term protectiveness.

Other Comments: none

Date of last Regional review of Human Exposure Indicator (from CERCLIS): *06/17/2009*

Human Exposure Survey Status (from CERCLIS): *Current Human Exposure Controlled and Protective Remedy in Place*

Date of last Regional review of Groundwater Migration Indicator (from CERCLIS): *06/17/2009*

Groundwater Migration Survey Status (from CERCLIS): *Contaminated Ground Water Under Control*

Ready for Reuse Determination Status (from CERCLIS): *Not Ready for Reuse*

U.S. Environmental Protection Agency
Region 5
Five-Year Review
Wausau Groundwater Superfund Site
Wausau, Wisconsin
April 2010

I. Introduction

This report documents that the United States Environmental Protection Agency (U.S. EPA) Region 5 has conducted a Five-Year Review of the remedial actions implemented at the Wausau Groundwater Superfund Site in Wausau, Wisconsin. The review was conducted between September 2009 and April 2010. This report documents the results of the Five-Year Review (FYR).

Purpose of the Review

The purpose of five-year reviews is to determine whether the remedy at a Site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify issues found during the review, if any, and make recommendations to address them.

Authority for Conducting the Five-Year Review

The Agency is preparing this five-year review pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

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

The agency interpreted this requirement further in the National Contingency Plan (NCP); 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency

shall review such action no less often than every five years after the initiation of the selected remedial action.

CERCLA requires five-year reviews if both of the following conditions are true:
• Upon completion of the remedial action, hazardous substances, pollutants, or contaminants will remain on site and therefore will not allow for unlimited use and unrestricted exposure[2]; and
• The ROD for the Site was signed on or after October 17, 1986 (the effective date of SARA) and the remedial action was selected under CERCLA §121.

Five-year reviews should be conducted either to meet the statutory mandate under CERCLA §121(c) or as a matter of U.S. EPA policy[3]. Consequently, five-year reviews are classified in this guidance as either "statutory" or "policy." The five-year review requirement applies to all remedial actions selected under CERCLA §121. Although the previous Five-Year Reviews for the Site stated that the reviews were required by policy[4], it is more accurate to state that the five-year reviews are required by statute because hazardous substances will remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE) after completion of the remedial action. The two RODs, completed in 1988 and 1989, documented the selected remedial action at the Wausau Groundwater Superfund Site and established soil and groundwater clean up standards. Although the groundwater remedy allows for eventual unlimited use of groundwater beyond the Wausau Groundwater Site boundaries, that will take many years. Additionally, that is not the case for the soils areas. The future uses need to be limited to non-residential or to commercial /industrial uses. That latter requirement may need to be further documented and clarified in an Explanation of Significant Differences (ESD).

Other Review Characteristics

U.S. EPA Region 5 has conducted a Five-Year Review of the remedial actions implemented at the Wausau Groundwater Superfund Site in Wausau, Wisconsin. The statutory review was conducted between September 2009 and April 2010. This report documents the results of the

---

2 "Unlimited use and unrestricted exposure" (UU/UE) means that the selected remedy will place no restrictions on the potential use of land or other natural resources. In general, if the selected remedy relies on restrictions of land and/or groundwater use by humans and/or ecological populations to be protective, then the use has been limited and a five-year review should be conducted according to the statute.. For example, if a site is cleaned up to an industrial-use level, and/or other types of uses are restricted (*e.g.*, residential use), then, generally, UU/UE is not met.

3 This policy is outlined in OSWER Directives 9355.7-02 (Structure and Components of Five-Year Reviews. May 23, 1991), 9355.7-02A (Supplemental Five-Year Review Guidance, July 26, 1994) and 9355.7-03A (Supplemental Five-Year Review Guidance, December 21, 1995).

Fourth FYR for the Site. The first FYR was completed on August 20, 1996. The second FYR was completed on July 10, 2000 and the third FYR was completed on June 30, 2005. This is the trigger date for the current FYR.

II. Site Chronology

Table 1 lists the chronology of events for the Wausau Groundwater Superfund Site.

Table 1: Chronology of Site Events

Date	Event
1982	Initial discovery of problem
1985	State of Wisconsin treatment system
1985	Proposed for NPL listing
1986	NPL final listing
1987	Remedial Investigation/FS initiated
1989	Remedial Investigation/FS completed
1988	Interim ROD signed
1989	Final ROD signed
1989	Interim RD/RA Consent Decree
1991	Final RD/RA Consent Decree
1990	Remedial Action Start
1994	Remedy construction completion
1996	West side SVE system shut down
1996	First Five-Year Review
2000	Modified groundwater monitoring
2000	Second Five-year Review
2001	Proposed SVE system completion
2005	Third Five-year Review

2006	Revised Monitoring Plan approved
2007	U.S. EPA approves discontinuation of SVE
2010	Fourth Five-year Review

III. Background

A. Physical Characteristics

Wausau, Wisconsin is located in the north central portion of the state along both sides of the Wisconsin River. The Wausau Groundwater Contamination Site encompasses an area in the northern section which includes the well field (and all the production wells). The extent of the area of concern for the Site includes both industrial and residential areas. The City of Wausau provides drinking water for approximately 35,000 people. Several Site location maps are shown on Figures 1, 1.1. 1.2 and 1.3

B. Land and Resource Use

Historically, there were two areas of concern which are associated with the Wausau Groundwater Site. The first area is a Marathon Electric Corporation property along the west bank of the Wisconsin River, which includes a closed former municipal landfill. The second area is the Wausau Chemical facility property located along the East Bank of the river. A Site plan is presented on Figure 1.2. A Site schematic is shown on Figure 1.3.

C. Site Geology and Hydrology

The Site is underlain by glacial outwash and alluvial sediments that have filled in the pre-glacial stream valley in which the Wisconsin River now flows. This alluvial aquifer ranges from 0 to 160 feet thick and has an irregular base and lateral boundaries. The relatively impermeable bedrock that underlies the aquifer and forms its lateral boundaries within the pre-glacial valley defines the boundaries of the aquifer. Six production wells in the Site area provide drinking water for the City of Wausau. These wells are screened in the glacial outwash and alluvial sand and gravel deposits that underlie and are adjacent to the Wisconsin River.

Under natural conditions, groundwater would flow toward and discharge to the Wisconsin River and its tributary, Bos Creek. Under existing conditions, however, groundwater flows toward EW1 and the production wells. The operation of EW1 has created groundwater flow divides between the west and east City well fields and has isolated the former landfill source of contaminated groundwater from the production wells.

D. History of Contamination

In 1982, three of Wausau's deep aquifer water production wells (CW3, CW4 & CW6) were found to be contaminated with VOCs. The primary contaminants were tetrachloroethene (PCE), trichloroethene (TCE) and 1,2-dichloroethene (DCE)[5]. U.S. EPA awarded the City of Wausau a federal grant in 1983 for design and installation of packed-tower VOC air strippers for water supply treatment. However, as high VOC levels persisted, U.S. EPA's emergency response team was called in 1984 to install a granular activated carbon (GAC) treatment system at CW6 until the air strippers for CW3 and CW6 were completed later that year. At that point, CW4 was used only occasionally during peak periods until 1989, and then decommissioned when new production well CW10 went on-line.

As described below, US EPA issued two Records of Decision to remediate the sources of contamination and ensure that the human health and the environment are protected.

E. Initial Response

A groundwater extraction system with air stripping treatment (required by the State of Wisconsin) began operating at the Wausau Chemical facility in 1985. The system consisted of a series of extraction wells in the shallow portion of the aquifer at the south end of the Wausau Chemical property. The Wausau Chemical groundwater system operated until 1996, when it was shut down and abandoned.

F. Basis for Taking Action

Remedial planning began at Wausau Groundwater as the Site was proposed for the National Priorities List on April 10, 1985. The Site became a final NPL listing on June 10, 1986. A two phase remedial investigation (RI) was carried out from August 1987 to September 1988. The significant results of the RI documented, in a 1989 report, included:

* The City's production wells were located in a wedge shaped aquifer composed of glacial outwash materials deposited within the pre-glacial bedrock river valley of the Wisconsin River. The aquifer was the sole-source of potable water for the City of Wausau.

* Two separate sources of contamination were identified within the zone of influence of the City's production wells. The first source was a former municipal landfill located south of CW6 on the Marathon Electric property in the west study

---

5 The Site specific list of contaminants of concern include the following: Acetone, Benzene, Carbon tetrachloride, Chloroform, 1,1-Dichloroethene, cis-1,2-Dichloroethene, Ethylbenzene, Methylene chloride, Tetrachloroethene, Toluene, 1,1,2-Trichloroethane, Trichloroethene Vinyl chloride, and Xylenes

area. The second source was the Wausau Chemical facility located between CW3 and CW4 in the east study area.

* Three plumes of contamination were found within the zone of influence of the City's production wells. The first was composed primarily of TCE and was emanating from the former municipal landfill. This plume was found to split at the boundary of the source area, with one leg migrating north to CW6 and the second leg migrating under the river to CW3. The second plume originated from the southern boundary of the Wausau Chemical property and impacted both CW3 and CW4. This plume was comprised primarily of PCE, but contained other VOCs as well. The third plume originated from the northern boundary of the Wausau Chemical property and was impacting CW3. This contamination in the plume was comprised primarily of PCE.

* Soils at both source areas were contaminated with VOCs. The soils in the vicinity of the former municipal landfill were contaminated primarily with TCE. Soils on the Wausau Chemical property were contaminated primarily with PCE, along with other VOCs.

During the RI/FS, several important potential exposure pathways were found for the Site and are listed below and summarized in Table 3. Potential health risks were evaluated for the following exposure pathways and potentially exposed population: 1) Residents using municipal water exposed to contaminant concentrations equal to the laboratory detection limits of 0.5 ug/l for PCE and TCE, and 1.0 ug/l for DCE; 2) Hypothetical users of private well water assuming a private well is installed within the contaminated aquifer in the future. It was assumed that a user would be exposed to the highest concentrations found in groundwater, approximately 4300 ug/l, to obtain the worst case scenario for this

Feasibility study (FS) reports that evaluated remedial alternatives based on the findings of the two phases of the RI were completed in September 1988 and August 1989. U.S. EPA issued an interim ROD in December 1988 that called for a groundwater pump and treatment system to address the contaminant plume emanating from the former municipal landfill. A final ROD, which incorporated the interim ROD with remedy objectives for the Wausau Chemical source areas and plumes, was signed in September 1989.

IV. Remedial Actions

A. Remedy Selection

The Site was managed as two (2) Operable Units. Therefore, there are two RODs for the Site.

Following are the remedial action objectives of the ROD for Operable Unit 1 (Interim Action ROD):

1) Prevent exposure to contaminated drinking water from groundwater supply wells located within the contaminant plume threatening West Well Field; and

2) Protect the West Well Field from future increased levels of contamination.

The response actions outlined for the Wausau Groundwater Site in the December 1988 interim ROD included the following remedial components:

* Construction and operation of a treatment system for removal of contaminants.

* Installation of a groundwater extraction well located in the southern portion of the west contaminant plume.

* Discharge of treated water to the Wisconsin River.

* Installation of additional wells, as necessary.

* Preparation of an operation and maintenance monitoring program.

The selected remedy established cleanup levels for the contaminants of concern in groundwater based on the Safe Drinking Water Levels (MCLs) and the Wisconsin Administrative Rule chapter NR 140 for groundwater protection.

The remedial action objectives of the ROD for Operable Unit 2 (Final ROD) were to address the remaining concerns at the Site, following implementation of the Interim Action and included:

1) Elimination of the continued sources of groundwater contamination identified as the former City landfill / Marathon Electric property and the Wausau Chemical property, and

2) Prevention of exposure to contaminants present in the two additional groundwater contaminant plumes identified.

The response actions outlined for the Wausau Groundwater Site in the September 1989 final ROD included the following additional components:

* Construction and operation of soil vapor extraction (SVE) systems to remove volatile contaminants from soils at each of the identified source areas.

* Treatment of off-gases from the SVE system operation using vapor phase carbon units, which would be regenerated off-site.

* Groundwater remediation utilizing the City municipal wells and existing air strippers for

removal of contaminants from plumes affecting the wells.

* Monitoring of groundwater and soil.

The soils cleanup levels for contaminants of concern were established with the goal of protecting groundwater.

B. Remedy Implementation

Interim Action

A Consent Decree (CD) addressing the December 1988 interim ROD was entered in U.S. District Court in September 1989. The contractor representing the responsible parties (Wausau PRP Group) completed the remedial design (RD) in March 1990.

On-site construction began in June 1990, with the installation of a 16-inch diameter extraction well screened over the bottom 40 feet of the aquifer. The extraction well is located at the north boundary of the former municipal landfill and was originally pumped at 1600 gallons per minute (gpm). The pumping rate was later reduced to 850 gpm following a determination that the higher rate created a groundwater zone of influence too far to the south. A pump house with associated force main and piping was installed to facilitate treatment and discharge of the extracted groundwater. The groundwater is pumped from the well to the pump house, and is discharged to a manhole storm sewer leading to a fenced rip rap outfall structure designed to enhance volatilization prior to final discharge into the Wisconsin River. The discharge was required to meet the substantive requirements of the Wisconsin Pollution Discharge Elimination System (WPDES) permit issued by the WDNR. A final inspection for the interim remedy was completed by U.S. EPA in October 1990.

Additional groundwater remediation was provided by an extraction system operated by Wausau Chemical between 1985 and 1996 as an interim remediation measure. The extraction system at Wausau Chemical consisted of a series of shallow wells at the south end of the Wausau Chemical property. Groundwater was treated by air stripping. This system was not part of the ROD or the CD. Operation of the system ceased in 1996.

Final Remedial Action

The final remedial action at the Site consisted of two soil vapor extraction (SVE) systems to address the source areas and groundwater extraction and treatment utilizing existing municipal production wells and an extraction well. A Consent Decree addressing the September 1989 final ROD was entered in U.S. District Court in January 1991. The contractor for the Wausau PRP group completed the RD in June 1993.

Source Area Remediation

Soil Remediation

Contaminated soil and groundwater leachate were addressed by the former soil vapor extraction systems –one at the east bank and one at the west bank. Soil remedial objectives include the following: 1) elimination of any excess groundwater leachate, 2) prevention of direct contact, and 3) ingestion and inhalation human health risks by treatment of contaminated soils. Soil clean up levels for the Site were determined using a groundwater leachate model in order to eliminate additional risks for groundwater contamination.

Source area remediation was accomplished by the installation of SVE systems at Marathon Electric (West Bank) and Wausau Chemical (East Bank) in January 1994. Off-gas treatment was provided by vapor phase carbon. Construction for the final Site remedy began in October 1993 with the installation of the two separate SVE systems. Source area remediation was accomplished by the installation of SVE systems at Marathon Electric (West Bank) and Wausau Chemical (East Bank). The SVE systems began operation in January 1994. One system was located in the vicinity of the closed landfill on the west side of the Wisconsin River, and included two extraction wells. The second SVE system was located on Wausau Chemical property on the east side of the river, and originally included four wells. Two additional extraction wells were later added to the east side SVE system. As discussed below in more detail, U.S EPA and WDNR approved the completion of the soil remedy for both areas at the Wausau Groundwater Site. However, effective deed restrictions are required for the East Bank and West Bank areas and a maintenance plan should be formalized for the areas. Both SVE systems consisted of the extraction wells, piping manifolds, a water knock out tank, a blower, and controls. Also, off-gas treatment was provided by vapor phase carbon. The SVE wells were screened from five feet below grade to the water table, and the off-gas systems consisted of two activated carbon canisters with a sampling port in between.

Soil Remediation at Wausau Chemical - East Bank

The SVE system at the south loading dock (aka drum storage area) on the Wausau Chemical property is also known as the East Bank system. It operated from 1994 to 2001. The SVE system was necessary to remediate the source area contamination that was contributing to a VOC plume in the groundwater. The PRPs submitted a Mid-Point of Operations Report for the SVE systems in October 1995. After confirmatory soil samples were taken to assure soil clean up levels were achieved, U.S. EPA approved in April 1996 a shut down of the SVE system on the west side of the Wisconsin River, and the two northern SVE wells on the east side of the river. Operation of four SVE wells in the southern portion of the system on the east side of the river continued at that time, although volatile organic soil contamination had decreased substantially in that area. In 1997, a draft SVE System closure report was submitted by the PRPs. However, U.S. EPA and WDNR expressed concern that these several areas had elevated levels relative to the area as a whole. The system continued to operate until 2001. The PRPs sent a letter requesting permanent

shut down of the SVE system in March 2002. U.S. EPA and WDNR requested confirmation soil and groundwater sampling by the contractor, which was completed and reported in March 2004. After discussions between the WDNR and U.S. EPA, it was decided that final closure of the SVE system would be granted once a deed restriction was implemented and recorded against the Wausau Chemical property imposing industrial property controls. The WDNR issued a closure letter in April 1996 stating the conditions required for final closure including maintenance of the concrete barrier and implementation and recording of a deed restriction advising of the presence of residual contamination. On April 26, 2007, Marathon County recorded a deed restriction for the Wausau Chemical property. On August 29, 2007, the PRPs requested final closure of the SVE system and completion of the source area remediation. The U.S. EPA and WDNR approved final closure of the East Bank source remediation system in September 2007. U.S. EPA approved the request in the letter dated September 26, 2007. A requirement of the closure was an annual inspection of the paved areas surrounding the Wausau Chemical property, as described in the Pavement Cover and Building Maintenance Plan. The purpose of the inspection is to inspect the integrity of the paved areas of the property and make recommendations as needed to minimize rainwater infiltration and prevent direct human contact with soils. In September 2008, the SVE wells and soil gas probes that had composed the soil gas extraction and monitoring system for the East Bank SVE system were abandoned according to WDNR requirements. At the same time, the fifteen shallow groundwater extraction wells at the south side of the Wausau Chemical property were also abandoned.) Both the recorded deed restrictions and Pavement cover and Building Maintenance Plan still must be reviewed by U.S. EPA and WDNR. Copies of the abandonment forms for the SVE wells, gas probes and groundwater extraction wells can be found in the annual reports.

Soil Remediation at the former Wausau City Landfill West Bank

The SVE system operated from 1994 to 1996 on the former Wausau City Landfill at the Marathon Electric property is known as the West Bank system. The SVE system at Marathon Electric operated until April 1996, when the West Bank source remediation was approved as complete. After confirmatory soil samples were taken to assure soil clean up levels were achieved, U.S. EPA approved shut down in April 1996 of the SVE system on the west side of the Wisconsin River, and the two northern SVE wells on the east side of the river. Operation of four SVE wells in the southern portion of the system on the east side of the river continued at that time, although volatile soil contamination had decreased substantially in that area. The East Bank SVE system was modified in 1996 and continued to operate. In January 2001, the East Bank system was shut down while evaluation for final closure occurred. The East Bank source remediation was approved by U.S. EPA as complete in 2007. These actions are discussed further below in this report. The SVE system at Marathon Electric operated until April 1996, when the West Bank source remediation was approved as complete. WDNR approved the closure of the West Bank SVE system in 2006.

Ground water and Surface Water Remediation and Monitoring

Purpose of Groundwater Monitoring and Ground Water Remediation

Annual monitoring and performance reports prepared by the PRPs indicate that levels of groundwater contamination continue to decrease in general. The objectives of groundwater monitoring at the Wausau Site are to monitor the containment of the contaminant plume and the long-term improvement in groundwater quality. For the purpose of evaluation, groundwater monitoring at Wausau has been divided into two areas, the East Bank and the West Bank of the Wisconsin River, corresponding to the two original source areas. The river forms a natural hydraulic division of the Site. There are three active groundwater extraction wells designed to contain and remove VOC contaminated groundwater. Two of the extraction wells are on the West Bank, (CW6 and EW1) and one is on the East Bank (CW3) (see Figure 1.2). The two existing municipal production wells are wells designated as CW3 and CW6) and one additional extraction well was installed at Marathon Electric (i.e., EW1). The City of Wausau's treatment plant, including the air strippers, is located on the East Bank. Air strippers treat the water at the Wausau water treatment plant treat water from the municipal supply wells. The extraction well EW1 is located along the West Bank. The City of Wausau's groundwater treatment system, including air strippers, services the municipal wells for the system. Water from EW1 is also treated by aeration, by water flowing over riprap on the riverbank, before being discharged to the Wisconsin River.[6] Results demonstrating compliance with these requirements are provided to U.S. EPA and WDNR on a quarterly basis as discussed below.

As noted above, the river forms a natural hydraulic division of the Site. Photographs, as presented below, were taken during the 2009 FYR inspection show the view from across the Wisconsin River.

Excess human health risks due to contaminated groundwater are being addressed by the groundwater remedies at the Site. Risks due to contaminated soil and groundwater leachate were

---

6 Approval was given by U.S. EPA to Marathon Electric in July 1995 to divert a portion of the extracted water for use in the manufacturing building heat exchanger equipment, before discharge over the rip rap to the Wisconsin River.

addressed by the soil vapor extraction system. The groundwater extraction well on the West Bank at the Marathon Electric property is required to operate at approximately 800 gpm. Approval was given by U.S. EPA to Marathon Electric in July 1995 to divert a portion of the extracted water for use in the manufacturing building heat exchanger equipment before discharge over the rip rap to the Wisconsin River. The City of Wausau's groundwater treatment system, including the aeration by an air stripper, serves the municipal water supply to the City of Wausau. The water is treated by aeration via 1) air strippers at the Wausau water treatment plant that treat water from the municipal supply wells and 2) passive aeration of water from EW1 by pumping the water over riprap on the riverbank before the water is discharged to the Wisconsin River.

As part of the final remedy, the City of Wausau was required to operate CW3 and CW6 at rates which enhance the removal of VOCs from the groundwater plumes utilizing the existing City air strippers. Extracted water must be treated to acceptable health-based levels (in accordance with the Safe Drinking Water Act standards) prior to distribution to the residents. A final inspection for the final remedy was completed by U.S. EPA in June 1994.

The pumping rates for the three extraction wells were originally defined in the CD. In the Groundwater Flow Model report (CRA, May 1993), CRA established a range of pumping rates that would maintain capture of the groundwater plume. Then, in an August 4, 1995 letter, the U.S EPA approved a pumping configuration range from that report for the three extraction wells.

Those pumping rates are:

- CW3 (East Bank) 65 hours per week at 1,200 gallons per minute (gpm) to 100 hours per week at 1,100 gpm;
- CW6 (East Bank): 85 hours to 100 hours per week at 1,400 gpm; and
- EW1 (West Bank at the Marathon Electric property): 800 to 900 gpm continuously.

These extraction and treatment systems continue to operate to the present time.

C. Systems Operations/ Operations and Maintenance

As noted, the operating systems currently consist of the extraction wells and subsequent aeration, air stripping treatment systems operating at the City of Wausau water utility plant and the groundwater monitoring systems. The remedy components are maintained and monitored according to the approved plans. Groundwater monitoring occurs at regular intervals according to the approved plans.

From 1993 through 2000 groundwater monitoring was conducted according to the Monitoring Program Plan (CRA, 1994). The Monitoring Program Plan consisted of a complex system of monthly, quarterly, semiannual, and annual monitoring. In June 2000, the Groundwater Monitoring Plan replaced the Monitoring Program Plan as the approved groundwater-monitoring program. The Groundwater Monitoring Plan consists of annual monitoring well sampling and quarterly sampling of EW1. The Groundwater Monitoring Plan requires an annual report on the

activities occurring the previous calendar year.

Groundwater and surface water remedial objectives for the groundwater treatment system and extraction well at the Wausau Groundwater Superfund Site are the attainment of U.S. EPA primary and secondary drinking water maximum contaminant levels (MCLs), attainment of the Wisconsin groundwater standards, and the elimination of any excess lifetime cancer risks by utilizing groundwater treatment. Soil remedial objectives include the elimination of human health risks by treatment of contaminated soils. Soil clean up levels for the Wausau Site were determined using a groundwater leachate model in order to eliminate additional risks for groundwater contamination.

Groundwater monitoring at this Site is a combination of hydraulic and water quality monitoring designed to verify that the groundwater extraction wells are containing the contaminant plume and that groundwater quality is improving because of past source remediation and VOCs from the aquifer. Groundwater remediation at a site like Wausau Groundwater Contamination Site is a long-term process that cannot be readily measured on a short-term basis using water quality data alone. Because of the time necessary to achieve groundwater remediation, containment of contaminated groundwater is the primary measurable and achievable short-term objective. Actual remediation of the groundwater is a slower process that is more difficult to measure using field data on a short-term basis. Accordingly, water quality data is measured annually on a long-term basis to show the downward trend of VOC concentrations in groundwater. Significant VOC reductions are measured over a period of years.

Groundwater and surface water remedial objectives for the groundwater treatment system and extraction well at the Wausau Groundwater Superfund Site are the attainment of U.S. EPA primary and secondary drinking water maximum contaminant levels (MCLs), attainment of the Wisconsin Water Quality Standards per NR 140, and the elimination of any excess lifetime cancer risks by containing and treating the groundwater. The Groundwater Monitoring Plan was developed to monitor compliance with cleanup standards for the groundwater at the Site. The groundwater cleanup standards for the Site are the U.S. EPA maximum drinking water MCLs and the State ESs and PALs.

Contaminant of Concern	MCL (µg/L or ppb)	Wisconsin NR 140 Enforcement Standards (ESs)	Wisconsin NR 140 Preventative Action Limits (PALs)
Trichloroethylene (TCE)	5	5	0.5
Tetrachloroethylene (PCE)	5	5	0.5
cis-1,2-Dichloroethylene (DCE)	70	7	0.7
Vinyl chloride	2	2	0.02

The Site Specific VOC – List is as follows: Acetone, Benzene, Carbon tetrachloride, Chloroform, 1,1-Dichloroethene, cis-1,2-Dichloroethene, Ethylbenzene, Methylene chloride, Tetrachloroethene, Toluene, 1,1,2-Trichloroethane, Trichloroethene, Vinyl chloride and Xylenes

In June 2009, the PRP's contractor, CRA submitted their annual report to U.S. EPA and WDNR. (As of this writing, the 2009 annual report has not yet been submitted). The report documents that approximately 410,120,000 gallons of water were extracted and treated by the West Bank extraction well (EW1) at Marathon Electric. The extraction well pumped at an average flow rate of 787 gallons per minute during 2008 and at an average rate of 792 gallons per minute while the pump was running. Through regular maintenance of the well screen and pump at EW1, the pumping rate has been maintained within the U.S. EPA-approved rate of 800 to 900 gpm over the eighteen year period that it has been operating. However, the attainable flow rate continues to slowly decline, likely due to plugging of the pore spaces in the surrounding sand pack and aquifer material. The PRPs' contractor, CRA, has suggested that the 800 gpm flow rate is not a critical lower limit relative to achieving sufficient groundwater capture at EW1. The PRPs will continue monitoring the performance of EW1 to ensure that it continues operating at its optimal attainable rate. U.S. EPA and the WDNR are evaluating the situation and will be discussing it further with the PRPs. This issue does not currently affect the protectiveness of the remedy.

D. Institutional Controls

Institutional Controls (ICs) are required to ensure the protectiveness of the remedy. 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).

Although the RODs imply that ICs would be necessary to protect the integrity of the remedy and minimize potential for exposure, along with the active remedial action, the requirement is not clear. As a follow-up to this review, U.S. EPA will review the RODs more thoroughly and decide whether the remedy requires further clarification.

The Consent Decree that was entered in January of 1991 requires that Notices of the CD be filed in the chain of title, with the Office of the Register of Deeds, Marathon County for each parcel of the Site owned by the Settling Defendants, including parcels owned by the Wausau Water and Sewerage Utilities, where physical components of the remedial action will be/are located, and those parcels where source areas of contamination are located. These areas include the parcels owned by the City of Wausau and Marathon Electric Manufacturing Corporation which comprise the Old City/Marathon Electric Landfill, the parcels which comprise the Wausau Chemical Corporation property, the parcel(s) of land upon which the interim operable unit extraction well described in the Interim ROD and RD/RA Work Plan will be located, and the parcels upon which City Well (CW) 3 and CW6 are located. The CD also states that those areas of the Facility where

notices shall be filed may be freely alienated provided that the U.S. and the State receive notice of such alienation and a copy of the CD is given to the grantee. Last, the CD states that any deed, title or other instrument of conveyance regarding a parcel of the Facility described above shall contain a notice that the parcel is the subject of this Consent Decree, setting forth the name of the case, case number, the court having jurisdiction herein, the address of the Clerk of the Court for the court having jurisdiction herein and a notation that a copy of the Consent Decree may be obtained by contacting the Clerk of the Court, or the City Clerk, City Hall, Wausau, Wisconsin.

Although not clearly specified in the ROD, based on a review of the current site conditions, and a review of the documentation in the file, it is apparent that ICs are necessary to ensure long-term protectiveness. Areas that do not support UU/UE and for which institutional controls are required are noted in the Table below.

Table 2 : Institutional Controls Summary Table

Media, Engineered Controls, & Areas that Do Not Support UU/UE Based on Current Conditions	IC Objective	IC instrument
Former Loading Dock at Wausau Chemical Company Property - Area of Soil treated to industrial cleanup standards.	Commercial/ Industrial Use only; prohibit residential use; prohibit well installation	Deed Restriction in place (see Attachment 4; under review)
Landfill on Marathon Electric Property – two parcels; Area of Soil treated to industrial cleanup standards. Parcels 291-2907-252-0990 and 291-2907-252-0997.	Commercial / Industrial Use only; prohibit residential use; prohibit well installation	Deed Restriction (planned)
Groundwater at Former Loading Dock at Wausau Chemical Company Property (see Figure 4).	Prohibit groundwater use.	- Wellhead Protection Ordinance - Chapter 23.54 (under review) - Wausau Municipal Code Chapter 19.30 (under review- See Attachment 5); - Deed Restriction planned
***Groundwater* at former landfill on Marathon Electric property** (see Figure 4).	Prohibit groundwater use until cleanup standards are achieved	- Wellhead Protection Ordinance - Chapter 23.54 (under review) - Wausau Municipal Code Chapter 19.30 (under review- See Attachment 5); - Deed Restriction in place on Marathon Electric Property (under review)
Groundwater – current area that exceeds groundwater cleanup standards. (See Figure 4).	Prohibit groundwater use until cleanup standards are achieved	Wausau Municipal Code Chapter 19.30 (under review)
Other remedy components	Prohibit interference with remedy components	(requirement under review)

*Maps which depict the current conditions of the site and areas which do not allow for UU/UE will be developed as part of the required IC evaluation activities and work plan.

Status of ICs and Follow-up Actions Required

A deed restriction titled *Declaration of Restriction* was implemented on April 13, 2007. The restrictions were put in place on two parcels at Wausau Chemical as a condition by WDNR to close out the source/soil remediation phase of the project on the east bank of the river.

The existing Wausau Municipal Code outlines a Wellhead Protection ordinance in Chapter 23.54, and also addresses a Private Water Well ordinance in Chapter 19.30. The City has authority to deny site plan applications that include groundwater wells under Wausau's City Code. The City has authority to regulate installation of groundwater wells and to require abandonment of existing groundwater wells.

Initial IC evaluation activities have revealed that additional steps must be taken to evaluate the effectiveness of the existing ICs and determine whether additional ICs are required. An IC study and work plan will be requested from the PRPs. To ensure that effective ICs are implemented, monitored, maintained and enforced, IC evaluation activities shall be conducted to ensure effectiveness of ICs and long-term stewardship of the Site. A work plan will be submitted to plan for evaluating existing controls and deed notices, proposing to prepare and record covenants consistent with Wisconsin law, and proposing to implement a long-term stewardship plan.

Current Compliance: Based on inspections and interviews, U.S. EPA is not aware of Site or media uses which are inconsistent with the stated objectives of the ICs. The groundwater restrictions (i.e., ordinance) appear to be functioning as intended. The existing deed restriction also appears to be functioning as intended. Even though no ICs have been implemented on the former Wausau dump, no inconsistent uses were noted during the recent inspection or through other avenues.

Long-Term Stewardship: Long-term protectiveness at the site requires compliance with land and groundwater use restrictions. Long-term protectiveness at the Site requires compliance with the prohibitions to assure the remedy continues to function as intended. Planning for long-term stewardship is required which involves assuring effective procedures are in place to properly maintain, monitor, and enforce the ICs along with monitoring of the groundwater. Long-term stewardship will ensure effective ICs are maintained, monitored and enforced and that the remedy continues to function as intended with regard to the institutional controls. A Long-Term Stewardship Plan (LTS) shall be developed (or the O&M plan updated) that includes procedures to ensure long-term institutional controls stewardship such as regular inspection of institutional controls at the Site and certification to U.S. EPA that the institutional controls are in place and are effective. Additionally, use of a communications plan and use of a one-call system should be explored for long-term stewardship.

V. Progress Since Last Five-year Review

The previous FYR found the remedy to be protective of human health and the environment. The existing treatment systems continue to operate to ensure that the contamination in the groundwater will not expand or impact any receptors. The air strippers at the City of Wausau municipal utility are well maintained and monitored. The City air strippers for CW3 and CW6 continue to treat water in the deep aquifer on both the east and west side of the river. VOC groundwater contamination above clean up standards is still evident at both CW3 and CW6, but these levels are significantly lower than those of previous years. The groundwater extraction well on the Marathon Electric property continues to operate at approximately 800 gpm. Although significant reductions in groundwater contamination are evident over the years on the west side of the river, it is expected that the extraction well will continue to operate for the foreseeable future as concentrations in portions of the deep aquifer are well above clean up standards.

The third Five-year Review was completed in June 2005 and several issues were noted then. The following Issues and Recommendations were identified in the last Five-year Review.

Second Five-year Review Recommendations and Follow-up Actions

Issues	Recommendations Follow-up Actions	Party Responsible	Oversight Agency	Mile-stone Date	Affects Protective-ness (Y/N) Current, Future
Property deed restriction	Provide deed restriction for agency review	Wausau Groundwater Group/CRA	U.S. EPA/WDNR	2005/ As soon as possible	N, N
Monitor groundwater system	Continue Site monitoring program	Wausau Group/ CRA	U.S. EPA/WDNR	2005/ ongoing	N, N
EW1 monitoring	Continue monitoring EW1	Wausau Group/ CRA	U.S. EPA/WDNR	2005/ ongoing	N, N
Inspection Site Issues					
Well WC4A lock	Provide lock	Wausau Group/ CRA	U.S. EPA/WDNR	2005/ ASAP	N, N
Well WC5	Repair or replace	Wausau	U.S.	2005/	N, N

bumper	bumper	Group/ CRA	EPA/WDNR	ASAP	
W52/W52A depression	Fill depression and repair concrete	Wausau Group/ CRA	U.S. EPA/WDNR	2005/ ASAP	N, N
Unmarked dented well casing	Abandon or repair well casing	Wausau Group/ CRA	U.S. EPA/WDNR	2005/ ASAP	N, N

Follow-ups from the last (Third) Five-year Review

The following recommendations and follow-up actions address the issues which were identified during the five-year review and Site inspection:

1) **Review Wausau Chemical property deed restriction produced by responsible party.**

The deed restriction for the Wausau Chemical property was produced by the responsible party in 2007; that deed restriction is under review.

2) **Operation and maintenance annual monitoring should continue on the groundwater treatment system to assure Site plume containment and treatment.**

Annual maintenance and monitoring have continued.

3) **Extraction well EW1 monitoring (currently quarterly) should continue to assure Wisconsin River permit requirements are met.**

Monitoring of EW1 has continued.

4) **Lock needs to be provided for monitoring well WC4A by responsible party contractor.**

Lock was provided for well WC4A. The repairs were done on November 21 and 22, 2005. Documentation was provided by PRPs' contractor and verified in five-year review inspection.

5) **WC5 bumper needs to be repaired or replaced by responsible party contractor.**

Bumper for WC5 was provided. The repairs were done on November 21 and 22, 2005. Documentation was provided by PRPs' contractor and verified in five-year review inspection.

6) **W52/W52A depression area and damaged concrete need to be repaired by responsible party contractor.**

W52/W52A depression area and damaged concrete was repaired. The repairs were done on November 21 and 22, 2005. Documentation was provided by PRPs' contractor and verified in five-year review inspection.

7) **Severely dented and rusted unmarked well casing in back Wausau Chemical parking lot needs to be abandoned or repaired by responsible party contractor.**

Well was abandoned. Documentation provided by PRPs' contractor and verified in five-year review inspection.

These issues were promptly resolved as was documented in the monthly progress reports.

VI. Five-Year Review Process

A. Administrative Components

The Wausau Groundwater Five-year Review was led by Sheri L. Bianchin, U.S. EPA Remedial Project Manager for the Site. Ms. Bianchin also prepared the report with assistance from Gary Edelstein, State Project Manager from the Wisconsin Department of Natural Resources (WDNR), representative for the support Agency, and the PRPs' contractor, CRA. The review was conducted from September 2009 until April 2010 and the components included: community involvement, document review, data review and site inspection of the facility, monitoring network, treatment facilities and the utility.

B. Community Involvement

An advertisement notice announcing the five-year review process was placed for public viewing in the Wausau Daily Herald newspaper on November 9, 2009. See Attachment 1.
Community relations ongoing at the Wausau Groundwater Site include responding to questions as needed, and communicating the information that is derived from the comprehensive sampling program currently being carried out to assure that human health and the environment continue to be protected, and that the contaminants are contained and treated by the Site remedy. The completed report will be available in the Site information repository and on the U.S. EPA website for public view.

C. Document Review

U.S. EPA reviewed several site-related documents and reports for this Site. A list of documents reviewed in preparation of this report is included in Attachment 2.

D. Data Review and Assessment

Below is information regarding the Soil and Groundwater Remediation data and activities since the last FYR.

Soil Remediation Areas

East Bank Source (Soil) Remediation System - Wausau Chemical

The U.S. EPA and WDNR approved final closure of the East Bank source remediation system in September 2007. A requirement of the closure was an annual inspection of the paved areas surrounding the Wausau Chemical property, as described in the Pavement Cover and Building Maintenance Plan. The purpose of the inspection is to inspect the integrity of the paved areas of the property and make recommendations as needed to minimize rainwater infiltration and prevent direct human contact with soils. The April 2009 inspection found the pavement to be in good condition. No cracks in the pavement were noted. In August 2009, the entire paved area was repaved with new asphalt. The street adjacent to the west side of the property, North River Drive, was also repaved by the City of Wausau.

A photograph depicting the current condition of the parking lot is shown below.

West Bank Source (Soil) Remediation System - former Wausau City Landfill

As discussed above, the SVE system operated from 1994 to 1996 on the former Wausau City Landfill at the Marathon Electric property, known as the West Bank system.-WDNR approved the closure of West Bank SVE system in 2006. In August 2007, the PRPs sent documentation of the completion of the source area remediation. U.S. EPA approved the request in the letter dated September 26, 2007, U.S. EPA agreed that SVE was no longer necessary and the deed restriction was required for the former landfill (i.e., dump). However, it was documented that a deed restriction was also needed for the former Wausau City Landfill on the Marathon Electric

property. Also, a maintenance plan for that area must be formalized.

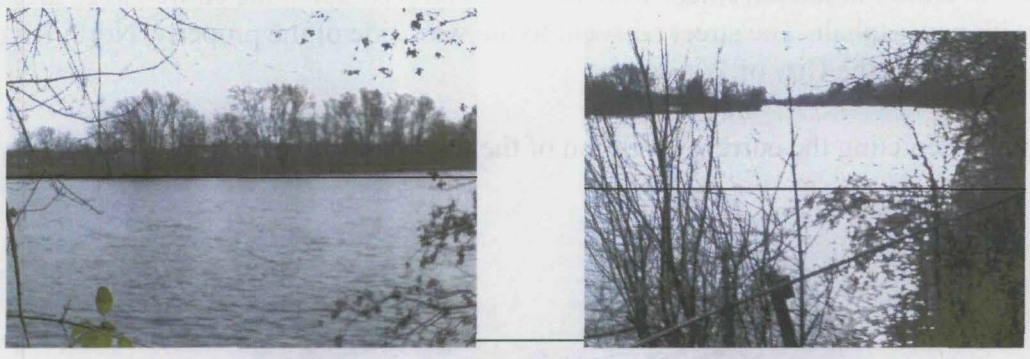
Ground Water and Surface Water Remediation and Monitoring

Annual monitoring and performance reports of the ground water and surface water prepared by the PRPs indicate that levels of groundwater contamination continue to decrease in general. The objectives of groundwater monitoring at the Wausau Site are to monitor the containment of the contaminant plume and the long-term improvement in groundwater quality.

Evaluation of Groundwater Data

For the purpose of evaluation, groundwater monitoring at Wausau has been divided into two areas, the East Bank and the West Bank of the Wisconsin River, corresponding to the two original source areas. The river forms a natural hydraulic division of the Site.

Photographs from the FYR inspection, shown below, depict the view from across the Wisconsin River.



There are three active groundwater extraction wells designed to contain and remove VOC-contaminated groundwater. Two of the extraction wells are on the West Bank, (CW6 and EW1) and one is on the East Bank (CW3) (see Figure 1.2).

Ground water and Surface Water Monitoring

Groundwater monitoring at this Site is a combination of hydraulic and water quality monitoring designed to verify that the groundwater extraction wells are containing the contaminant plume and that groundwater quality is improving because of past source remediation and removal of VOCs from the aquifer. Groundwater remediation at a site like Wausau is a long-term process that cannot be readily measured on a short-term basis using water quality data alone. Because of the time necessary to achieve groundwater remediation, containment of contaminated groundwater is the primary measurable and achievable short-term objective. Actual remediation of the groundwater is a slower process that is more difficult to measure using field data on a short-term basis. Accordingly, water quality data is measured annually on a long-term basis to show the downward trend of VOC concentrations in groundwater. Significant VOC reductions

are measured over a period of years. This analysis is described below.

Excess human health risks due to contaminated groundwater are being addressed by the groundwater remedies at the Site. Annual water sampling is conducted in accordance with the Groundwater Monitoring Plan with the following exceptions. As reported in the 2000 Annual Monitoring Report, two monitoring wells (WC2 and W51A) are no longer monitored because they were abandoned in 2000 due to damage. Also, as approved by the U.S. EPA and Wisconsin Department of Natural Resources (WDNR) WDNR through the 2002 Annual Monitoring Report, the analysis of bis(2-ethylhexyl)phthalate at C4S and W53A was discontinued in 2003. Monitoring of EW1 is completed quarterly in January, April, July, and October in accordance with the Groundwater Monitoring Plan.

The groundwater extraction well on the west bank at the Marathon Electric property is required to operate at approximately 800 gpm. Approval was given by U.S. EPA to Marathon Electric in July 1995 to divert a portion of the extracted water for use in the manufacturing building heat exchanger equipment, before discharge over the rip rap to the Wisconsin River. The City of Wausau's groundwater treatment system including the aeration by an air stripper serves the municipal water supply to the City of Wausau.

The objectives of groundwater monitoring at the Site are to monitor the containment of the contaminant plume and the long-term improvement in groundwater quality. The Site Specific VOC List is as follows: Acetone, Benzene, Carbon tetrachloride, Chloroform, 1,1-Dichloroethene, cis-1,2-Dichloroethene, Ethylbenzene, Methylene chloride, Tetrachloroethene, Toluene, 1,1,2-Trichloroethane, Trichloroethene, Vinyl chloride and Xylenes. Groundwater and surface water remedial objectives for the groundwater treatment system and extraction well at the Wausau Groundwater Superfund Site are the attainment of U.S. EPA primary and secondary drinking water standards termed the maximum contaminant levels (MCLs), attainment of the Wisconsin Water Quality Standards per NR 140, and the elimination of any excess lifetime cancer risks by containing and treating the groundwater. The Groundwater Monitoring Plan was developed to monitor compliance with cleanup standards for the groundwater at the Site. The groundwater cleanup standards for the Site are MCLs, and the State Enforcement Standards (ESs) and Preventative Action Limits (PALs). The most common COCs and the corresponding cleanup level is listed below.

Contaminant of Concern	Federal MCL (µg/L or ppb)	Wisconsin NR 140 ESs (µg/L or ppb)	Wisconsin NR 140 PALs (µg/L or ppb)
Trichloroethylene (TCE)	5	5	0.5
Tetrachloroethylene (PCE)	5	5	0.5
cis-1,2-Dichloroethylene (DCE)	70	7	0.7

Vinyl chloride	2	2	0.02

From 1993 through 2000 groundwater monitoring was conducted according to the Monitoring Program Plan (CRA, 1994). The Monitoring Program Plan consisted of a complex system of monthly, quarterly, semiannual, and annual monitoring. In June 2000, the Groundwater Monitoring Plan replaced the Monitoring Program Plan as the approved groundwater- monitoring program. The Groundwater Monitoring Plan consists of annual monitoring well sampling and quarterly sampling of EW1. The Groundwater Monitoring Plan requires an annual report on the activities occurring the previous calendar year.

Annual Reports

In June 2009, the PRPs' contractor, CRA submitted their 2008 annual report to U.S. EPA and WDNR. The 2009 annual report was submitted in March 2010.

In 2008, approximately 410,120,000 gallons of water were extracted and treated by the West Bank extraction well (EW1) at Marathon Electric. The extraction well pumped at an average flow rate of 787 gallons per minute during 2008 and at an average rate of 792 gallons per minute while the pump was running. In 2009, approximately 346,897,000 gallons of water were extracted and treated by the West Bank extraction well (EW1) at Marathon Electric. The extraction well pumped at an average flow rate of 650 gallons per minute during 2009. The pumping rate at EW1 is currently maintained above 600 gpm. Through regular maintenance of the well screen and pump at EW1, the pumping rate has been maintained within the U.S. EPA-approved rate of 800 to 900 gpm over the eighteen year period that it has been operating. However, the attainable flow rate continues to slowly decline, likely due to plugging of the pore spaces in the surrounding sand pack and aquifer material. The PRPs' contractor, CRA, has suggested that the 800 gpm flow rate is not a critical lower limit relative to achieving sufficient groundwater capture at EW1. The PRPs will continue monitoring the performance of EW1 to ensure that it continues operating at its optimal attainable rate. U.S. EPA and the WDNR are evaluating the situation and will be discussing it further with the PRPs. This issue does not currently affect the protectiveness of the remedy. The extraction rate is lower than the minimum required by the U.S. EPA. The PRP Group has requested permission to lower the extraction rate at EW1 which is discussed further below.

Table 4.1 presents the laboratory results for monitoring well samples collected in October 2009. The data indicate that, in general, the plumes are stable or decreasing in size and concentration. Figure 4.1 presents the total chlorinated VOC (CVOC) data and CVOC concentration contours that illustrate the plume configuration based on the October 2009 data.

West Bank

The primary CVOC found in the West Bank groundwater is trichloroethene (TCE),

which was detected at 10 of the 13 West Bank wells. The degradation product, cis-1,2-dichloroethene (C12DCE), was detected at three locations with relatively low concentrations. Vinyl chloride (VC) was detected in one well on the West Bank. Monitoring wells with TCE concentrations greater than the MCL of 5 µg/L included R2D, R3D, R4D, and W53A. The MCL for TCE was also exceeded in the samples from the two extraction wells, EW1 and CW6 (see Table 4.1).

In the portion of the plume north of extraction well EW1, CVOCs are located in the deeper portions of the aquifer. Wells north of EW1 that exceeded the MCL for TCE included R2D, R3D, R4D, and CW6. In the southern portion of the plume, in the vicinity of the old landfill, CVOCs are located in the shallower portions of the aquifer at relatively lower concentrations. MW53A is the only location south of EW1 that exceeded the MCL for TCE. No other CVOC concentrations exceeded the MCL on the West Bank.

In general, the West Bank plume concentrations decreased in 2009 compared to 2008 results. As illustrated on Figure 4.1, the extent and magnitude of the contaminant plume continues to decline. Previous Annual Monitoring Reports have described the migration of a relatively high concentration slug of CVOCs towards extraction well EW1. The slug of CVOCs began in the vicinity of R2D, near the flow divide between EW1 and CW6, in 1993, and has been slowly moving towards EW1. The 2009 CVOC data indicate that this slug continues to move south toward EW1 (see Figure 4.1). Historical data for R2D, R3D, and R4D are presented below.

Total CVOCs (µg/L)

Year	***R2D***	***R3D***	***R4D***
1993	3635	4	1016
1994	2130	11	1019
1995	152	5	720
1996	1600	2	540
1997	720	5	65/65
1998	320	580	52/58
1999	110	1200	33
2000	45	1800	58
2001	17	1500	13/13
2002	15	1200	36
2003	10	980	39/37
2004	11	899	51
2005	7.5	400	56/57
2006	8.2	480/500	42
2007	9.9	280	1.3
2008	6.5	180	13
2009	7.2/7.4	92	22.4/23.4

As shown above, concentrations at R3D continued to decrease in 2009. R4D, which is

closer to EW1, showed an increase in concentrations, indicating that the slug of higher concentrations is passing through that area as it is contained and removed by EW1. In the far north portion of the plume, within the capture area of City production well CW6 (see Figure 4.1), the total CVOC concentration in CW6 and W55 (exclusively TCE) has steadily declined since 2000. The 2009 concentrations are essentially unchanged from 2008. This area of the plume appears to be stable with gradually decreasing TCE concentrations.

In the southern portion of the West Bank plume, under the old landfill, CVOC concentrations decreased significantly relative to 2008. The total CVOC concentration at W53A decreased to 9.82 µg/L in 2009, compared to 39 µg/L in 2008. Total VOC concentrations at C4S, and WSWD were less than 1 µg/L and no CVOCs were detected at W54.

PRP Group has requested permission to lower the extraction rate at EW1 based on the following factors:

1. The potential pumping rate has declined due principally to plugging of the pore spaces in the surrounding sand pack and aquifer material.
2. Aquifer concentrations have declined dramatically since EW1 began pumping 15 years ago. The influent concentrations at EW1, CW3 ,and CW6 are similar and relatively low (< 10 ug/L) and the old landfill adjacent to Marathon Electric is no longer a significant source of VOC impacts.
3. A lower EW1 pumping rate could shift the stagnation zones between EW1, CW3, and CW6, thus achieving aquifer cleanup goals more quickly.

The request is currently under consideration by U.S. EPA and WDNR.

Production Wells

CW3 and CW6 operated as required in 2009 with minimal shutdowns or repairs. CW3 and CW6 operated on alternate schedules at rates that exceeded the operating requirements established by the U.S. EPA approval letter dated August 4, 1995. CW3 operated for an average of 78.4 hours per week with an average pumping rate of 1,341 gpm, exceeding the requirements of 65 hours per week at 1,200 gpm. CW6 operated for an average of 88.5 hours per week with an average pumping rate of 1,666 gpm, exceeding the requirement of 85 hours per week at 1,400 gpm.

Ground Water Remediation Progress

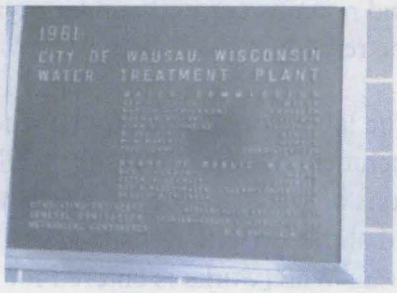
The objective of the groundwater monitoring program at the Site is to ensure containment of one of the contaminant plumes, and ensure that the groundwater quality is improved. Approximately 30 ground water well locations are sampled and monitored in the program each year for VOCs.

Extraction well EW1 near Marathon Electric is also sampled quarterly for several of the primary VOCs and the flow rate is routinely monitored to ensure that the desired flow rate of

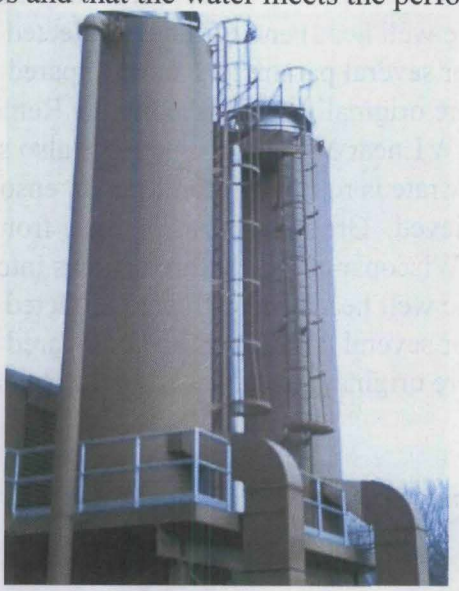
approximately 800 gpm is achieved. Groundwater is pumped from EW1 and treated by flowing over riprap on the bank of the Wisconsin River before it flows into the river. Water influent (collected from the spigot at the well head) and effluent (collected from the end of the spillway) concentrations are presented for several parameters and compared to the surface water discharge limits for EW1. The limits were originally established in the Remedial Action Plan when EW1 was installed extraction well EW1 near Marathon Electric is also sampled quarterly for several of the primary VOCs and the flow rate is routinely monitored to ensure that the desired flow rate of approximately 800 gpm is achieved. Groundwater is pumped from EW1 and treated by flowing over riprap on the bank of the Wisconsin River before it flows into the river. Water influent (collected from the spigot at the well head) and effluent (collected from the end of the spillway) concentrations are presented for several parameters and compared to the surface water discharge limits for EW1. The limits were originally established in the Remedial Action Plan when EW1 was installed.

Photograph depicting the discharge point are shown below.

Additionally, as mentioned, the extracted water is treated by air stripping at the City of Wausau's Utility. Photos depicting the Water Utility and air stripping towers are shown below.



Water is monitored at the City of Wausau Water Utility to ensure that the air strippers are efficiently removing the VOCs and that the water meets the performance standards. .



The operation and maintenance and periodic ground water sampling mentioned below, as required by Wausau Groundwater Consent Decree, have been completed and reported at the Site through the end of 2009. The 2008 Annual Monitoring Report was submitted in June 2009; the 2009 Annual Report was submitted in March 2010. These reports contain several recommendations. Those recommendations, which are presented below, have been under discussion among with the U.S. EPA, WDNR and PRPs and remains currently under review. None of the issues identified affect the protectiveness of the remedy.

These tests are of the treated water as it leaves the plant. The laboratory report from a recent round of VOC tests for the water utility is included as Attachment 6. Site 200 is for wells 6, 10, and 11 - Site 300 is for wells 3, 7, and 9 - those combinations of wells are run for a few hours before the sample is collected. The test results can be found at the WDNR website at http://www.dnr.state.wi.us/org/water/dwg/data.htm if Wausau Waterworks is entered for the name.

Although significant reductions in groundwater contamination are evident at the Site, it is

expected that extraction well EW1 and the treatment system at the City of Wausau's treatment plant will operate for the foreseeable future.

For the 2008 annual monitoring event, the water table contour map is presented in on Figure 2.1. The findings are that the East Bank and West Bank contours are consistent with flow patterns observed in previous years. The flow patterns are controlled by the operation of EW1 and the City production wells. Under natural conditions, groundwater would flow toward and discharge to the Wisconsin River and its tributary, Bos Creek. Under existing conditions, however, groundwater flows toward EW1 and the production wells. The operation of EW1 has created groundwater flow divides between the west and east City well fields and has isolated the former landfill source of contaminated groundwater from the production wells.

Tables 4 and 5 (attached) from the Annual Report presents the laboratory results for monitoring well samples collected in October 2008 and 2009. The data indicate that, in general, the plumes are stable or decreasing in size and concentration. Total chlorinated VOC data, included in Table 4.1 and presented ion Figure 4.1, illustrates the plume configuration based on the 2008 and 2009 data.

Evaluation of Groundwater Data from West Bank

As mentioned, the primary VOCs found in the plume on the west bank of the Wisconsin River were trichloroethane (TCE) and its degradation compounds cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride. The degradation product cis-1,2-dichloroethene (C12DCE) was detected at three locations with relatively low concentrations. Vinyl chloride was detected in one well on the West Bank. Monitoring wells with TCE concentrations greater than the MCL of 5 µg/L include R2D, R3D, R4D, and W53A. The MCL for TCE was also exceeded in the samples from the two extraction wells; EW1 and CW6 (see Table 4.1).

In the portion of the plume north of extraction well EW1, chlorinated volatile organic compounds (CVOCs) are located in the deeper portions of the aquifer. Wells north of EW1 that exceeded the MCL for TCE (R2D, R3D, R4D, and CW6) are screened in the deeper portion of the aquifer. In the southern portion of the plume, in the vicinity of the old landfill, CVOCs are located in the shallower portions of the aquifer at relatively lower concentrations. MW53A, which also exceeded the MCL for TCE, is screened in the shallower portion of the aquifer south of EW1.

In general, the West Bank plume concentrations decreased in 2008 compared to 2007 results. Most of the monitoring wells on the West Bank had total CVOC concentrations in 2008 lower than their 2007 concentrations. However, looking at trends in the monitoring data over time suggests that it is likely that there is migration of a relatively high concentration slug of CVOCs towards extraction well EW1. The slug of CVOCs began in the vicinity of R2D, near the flow divide between EW1 and CW6 in 1993, and has been slowly moving towards EW1. The 2008 data indicate that this slug continues to move south toward EW1 (see Figure 4.1).

Groundwater Flow Divide and CVOC Migration

In the vicinity of R3D, there is a groundwater flow divide between the capture zones of CW6 and EW1. Depending on the pumping schedule at CW6, groundwater flow in this area may be to the north toward CW6 when it is pumping, but to the south toward EW1 when CW6 is not pumping. The net effect is that the movement of groundwater in the flow divide area is much slower or stagnant. To address the slug of CVOCs, the PRPs have made several recommendations which involve modifying the pumping rates and adjusting the pumping scenarios. One suggestion is to lower the pumping rate at CW6. The proposal states that since this area contains relatively higher concentrations of CVOC, a decrease in the average pumping rate at CW6 could accelerate CVOC migration toward EW1 by moving the divide closer to CW6 and increasing the hydraulic gradient toward EW1. This could be accomplished with a moderate reduction in the average pumping rate of CW6 that would still achieve its performance standard of creating a hydraulic barrier between the CVOC plume and the other City wells in the West well field. Hence, pumping of CW6 could potentially be reduced up to 40 percent (708 gpm to 420 gpm weekly average) while maintaining the hydraulic containment performance standard. U.S. EPA and WDNR are discussing these modifications with the PRPs.

Evaluation of Groundwater Data from East Bank

East Bank

East Bank well data are presented in Table 4.1. While tetrachloroethene (PCE) was the original contaminant on the East Bank, the presence of TCE, C12DCE, and vinyl chloride at concentrations that equal or exceed the PCE concentration in most wells indicates an active natural biodegradation process.

For example, at E22A, E23A, and E37A, the C12DCE concentrations were higher than the PCE and TCE concentrations combined. Six East Bank wells had PCE concentrations that exceeded the MCL of 5 µg/L (out of eight detections). The highest PCE concentration was 1,100 µg/L at WC3B. Three wells (E37A, E22A, and E23A) had C12DCE concentrations that exceeded the MCL of 70 µg/L; five wells (E22A, E23A, E37A, IWD, and WC3B) had TCE concentrations that exceeded the MCL of 5 µg/L; and four wells (E22A, E37A, WC3B, and WW6) had VC concentrations that exceeded the MCL of 2 µg/L.

The areal extent of the East Bank contaminant plume remained relatively stable in 2009 (see Figure 4.1). However, concentrations within the plume were generally higher. Total CVOC concentrations from 2004 through 2009 for key East Bank wells are shown below:

Well	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*
WC3B	10.2	1.4	18	4.2	1.5	1,460/565.27
WC5A	10.1	12	8.4	1.8	2.8	12.1
E24A	2.6	1.6	3.7	1.1	1	13
E22A	9.2	ND	14	10	ND	231.9
E37A	16.4	17	8.5	34	460	77.35
E23A	15.2	66	47	130	260	154
WW6	10.1	28	78	35	12	29.97
CW3	7.2	7.2	4.6	4.8	6.4	4.48
IWD	8.9	6.6	13	11	4.4	7.3

The concentrations of TCE, C12DCE, and vinyl chloride from 2007 through 2008, and the CVOC concentrations at CW3 remained steady. Concentrations at the edge of the plume have remained relatively constant. As shown above, the CVOC concentration at E24A has remained below 3.7 µg/L since 2002. CVOC concentrations at E22A have been near 10 µg/L since 2002, with the exception of 2005 and 2008, when no CVOCs were detected. CVOC concentrations at MW10A, MW10B, and WW4 (see Figure 4.1) have been below the detection limit since 2001. The island well, IWD, had a generally increasing TCE concentration beginning in 2000 that stabilized in 2007 at 11 µg/L, and decreased to 4.4 µg/L in 2008. The aquifer at IWD appears to have been impacted by West Bank contaminants based on the depth and the composition (TCE only). Most likely, prior to operation of extraction well EW1, CW3 captured some groundwater from the West Bank and caused it to migrate beneath the river towards the east side. There is likely a low concentration remnant of the West Bank contaminants in a relatively stagnant area between the capture zones of EW1 and CW3. This remnant will move slowly toward one side or the other, depending on the pumping rates and pumping patterns of EW1 and CW3.

The most significant change in the contaminant plume occurred at WC3B where the total CVOC concentration for the October 2009 sample was 1,460 µg/L. WC3B is located at the south end of the Wausau Chemical building. Construction for a building addition included a 4-foot deep excavation for footings that was directly adjacent to WC3B. The excavation was open for approximately 6 weeks during August and September 2009. Also, the pavement in that area was removed for a while prior to being replaced with new pavement. During August 2009 Wausau received more than 6-inches of rainfall, which likely flushed some remnant contamination from the shallow soils and carried it down to the water table. The entire southern portion of Wausau Chemical property is now capped by new concrete and asphalt, hence the potential for additional

7 WC3B was resampled on January 12, 2010, to confirm the October, 2009 result.

leaching of contaminants has been eliminated. WC3B was resampled in January 2010 to confirm the October 2009 result and the CVOC concentrations had already declined by more than 60 percent (1,460 µg/L to 565.2 µg/L). This suggests that the CVOC mass at WC3B is not significant or persistent and should continue to dissipate as the groundwater migrates down-gradient to the north where it is contained and removed by City Well CW3. Variability within the plume was also demonstrated at E23A and E37A, where CVOC concentrations were significantly lower compared to 2008 data, and at E22A, where concentrations increased from "ND" to 231.9 µg/L in one year. These changes in CVOC concentrations are probably due to ongoing movement of contaminant slugs as they migrate toward CW3. Although individual monitoring well concentrations generally have not shown a clear downward trend from 2008 to 2009, the CVOC concentrations at CW3 remained steady.

CVOC concentrations at the island well, IWD, have been stable over the last six years. The aquifer at IWD appears to have been impacted by West Bank contaminants based on the depth and the plume composition (TCE only). Prior to operation of EW1, CW3 captured some groundwater from the West Bank and caused it to migrate beneath the river towards the east side. There is a low concentration remnant of the West Bank contaminants in a relatively stagnant area between the capture zones of EW1 and CW3.

This remnant will move slowly toward one side or the other, depending on the pumping rates and pumping patterns of EW1 and CW3. The 2009 concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) at monitoring well FVD5 were consistent with historical data. The aromatic compounds found in this well are related to the Wausau Energy property and appear to be independent of the Wausau NPL site remediation process.

Pumping from EW1

The 2009 influent and effluent laboratory results for EW1 are presented in Table 4.2 TCE was the primary VOC detected. C12DCE was also detected in samples from all sampling events, but its concentration was less than 1 µg/L. Influent concentrations of TCE remained steady, ranging from 6.5 µg/L to 8.9 µg/L. Influent concentrations of TCE remained steady, ranging from 6.5 µg/L to 8.9 µg/L. The influent concentration has shown a steady decrease over the past several years. The effluent concentrations indicate that the EW1 treatment system removes about 50 percent of the VOCs in the extracted groundwater.

The effluent concentrations indicate that the EW1 treatment system removes about 50 percent of the CVOCs in the extracted groundwater. The results of the effluent samples were compared to surface water discharge limits for discharge to the Wisconsin River, as calculated by the WDNR. Those discharge limits were presented in the "Remedial Action Plan, Groundwater Extraction, Treatment, and Discharge System", (CRA, 1990). None of the discharge limits were exceeded during 2009. EW1 influent and effluent sampling results are also reported quarterly.

Hydraulic Capture

Hydraulic capture of the contaminant plume is demonstrated by the water table contours illustrated ion Figure 2.1. The water table contours indicate that groundwater flow in the contaminated portions of the Site is toward the three extraction wells (CW3, CW6, and EW1) as supported by the data. At nested well locations, the water table elevations for shallow and deep wells are similar, indicating horizontal flow and hydraulic containment of the shallow and deeper portions of the aquifer. Figure 4.1 also demonstrates that hydraulic containment of the contaminants was maintained through 2009.

The PRPs' Conclusions and Recommendations

The PRPs have reported the following conclusions (based on the 2008 data), with which U.S. EPAU.S. EPA concurs:

• The Marathon Electric extraction well (EW1) and the two City production wells (CW3 and CW6) continue to capture the CVOC plume as evidenced by analysis of the hydraulic data and the chemical data.

• The East Bank CVOC plume exhibited variability but generally higher concentrations compared to 2008. However, the areal extent of the plume remained stable. CVOC concentrations increased in the source area probably due to the disruption of the pavement cap on the south side of Wausau Chemical. There is considerable evidence of natural attenuation of the East Bank plume.

• The CVOC plume on the West Bank continues to decrease in its extent and magnitude. The high concentration slug of CVOCs near R3D decreased in concentration, and likely indicates continued migration towards EW1. CVOC concentrations decreased significantly in the plume south of EW1 under the old landfill. It appears that the plume is shallower and less concentrated under the old landfill than it is north of EW1.

• Four West Bank monitoring wells (W53A, R2D, R3D, and R4D) and the two West Bank pumping wells (EW1 and CW6) had TCE concentrations greater than the MCL of 5 µg/L.

• Three wells (E37A, E22A, and E23A) had C12DCE concentrations that exceeded the MCL of 70 µg/L; five wells (E22A, E23A, E37A, IWD, and WC3B) had TCE concentrations that exceeded the MCL of 5 µg/L; and four wells (E22A, E37A, WC3B, and WW6) had vinyl chloride (VC) concentrations that exceeded the MCL of 2 µg/L.

• EW1 removed approximately 347,000,000 gallons of water in 2009 at an average pumping rate of 650 gallons per minute. The well was shut down for one period of less than two hours in December to clean the filter screen. EW1 removed approximately 410,120,000 gallons of water in 2008 at an average pumping rate of 787 gallons per minute. The well was shut down for 51 hours in February to update the pump motor controls and for periods

of less than 3.5 hours on seven other occasions for minor maintenance and electrical outages. EW1 operated at an average rate of 792 gpm while the pump was running.

• The EW1 treatment system removed approximately 50 percent of the CVOCs from the extracted groundwater. The effluent concentrations from the treatment system were far below the established discharge limits.

• The City production wells operated as scheduled and generally within the requirements established in the Groundwater Flow Model Report. However, production at CW6 has been declining.

• In 2008, the SVE wells and soil gas probes that had composed the East Bank soil gas extraction and monitoring system at Wausau Chemical were abandoned. The interim groundwater remediation system at Wausau Chemical from 1985 to 1996 was also abandoned at that time.

• During the annual inspection of the pavement and building barrier at Wausau Chemical in 2008, some minor cracks were noted in the pavement next to the building. These were filled with asphalt. The annual inspection of the pavement and building barrier at Wausau Chemical was performed in April 2009. The inspection found the pavement to be in good condition. No cracks in the pavement were noted. In August 2009 the entire paved area was repaved with new asphalt. The street adjacent to the west side of the property, North River Drive, was also repaved by the City of Wausau.

The PRPs' Recommendations Are Currently Under Consideration

The PRPs have made the following recommendations, with which U.S. EPA and WDNR are considering:

• Continue monitoring in 2009 should continue as described in the Groundwater Monitoring Plan with slight modifications discussed in previous reports. WC2 and W51A have been eliminated from the monitoring schedule because of abandonment (as described in the 2000 Annual Monitoring Report). Analysis of bis(2-ethylhexyl)phthalate was eliminated (as recommended in the 2002 Annual Monitoring Report).

• Continue discussions with USEPA and WDNR to re-evaluate the pumping requirements for EW1 and CW6 of the groundwater extraction system.

• EW1 is only able to achieve approximately The PRPs recommends a 600 gpm for the EW1 pumping rate that that due to declining pumping capacity. Despite ongoing maintenance, the EW1 pumping rate continues to decline slowly, likely due to plugging of the pore spaces in the surrounding sand pack and aquifer material. The current U.S. EPA-approved pumping rate for EW1 is 800 to 900 gpm. The original performance criteria for EW1 specified that the well should pump sufficient groundwater to create groundwater flow divides beneath the river to the east and

beneath Bos Creek to the north. Groundwater modeling performed in 1993 indicated that pumping rates of 500 gpm and greater met the performance criteria. The PRP suggest that offers that the 800 gpm flow rate is not a critical lower limit relative to achieving sufficient groundwater capture at EW1.

• The current U.S.EPA-approved pumping schedule for CW6 requires a minimum average pumping rate of 708 gpm (85 hours per week at 1,400 gpm) on a weekly basis. In the annual reports, the PRPs have reported that the production from CW6 has been declining the past few years. After well rehabilitation was completed (April 2008), CW6 operated at a higher capacity for some time but then it declined again. The PRPs have the opinion that that the pumping of CW6 could be reduced by 20 percent from the current U.S.EPA-approved rate to a weekly average of 5,700,000 gallons (565 gpm weekly average) while maintaining the hydraulic containment performance standard. In fact, the PRPs have offered that a 20 percent reduction in the minimum average pumping rate of CW6 is recommended as it will maintain the hydraulic containment and potentially increase the hydraulic gradient between R3D and EW1. Groundwater modeling in 1993 indicated that a CW6 minimum pumping rate of 4,200,000 gallons per week (420 gpm weekly average) was sufficient to contain the CVOC plume. The City will continue to operate CW6 at pumping rates above this minimum average to meet City water supply demands.

As mentioned, these recommendations discussed above are currently under consideration by U.S. EPA and WDNR. These recommendations along with the goal of optimizing the system performance will be the subject of discussions in the coming months.

E. Site Inspection

The most recent visit and site meeting was performed on November 13, 2009. A copy of the participants list is attached here as Attachment 3. Sheri L. Bianchin and Michelle Kerr of U.S. EPA were present during the inspection in order to inspect the Site for this Five-Year review and assess remedy performance. The purpose of the inspection was to assess the current conditions at the Site and to inspect the monitoring wells that remain at the Site along with the treatment systems. The Five-year Review checklist was completed during the inspection, no major concerns were noted. See Attachment 4- Five-year Review Inspection Checklist. A walk around the Site showed no signs of any vandalism. The wells and treatment systems were in good working order. No significant issues were identified during the inspection. However several minor concerns were identified; the locks for Wells E24 and WC3B were missing. The As noted on the Five-year review checklist, with several minor repairs necessary (i.e., locks for wells # E 24 and WC4). PRPs have already repaired both of them. Well E-24 was repaired on November 17, 2010 and Well W3CB was repaired on January 8, 2010.

Additionally, to address U.S. EPA concerns that any well issues be timely identified and resolved. the PRPs agreed to amend the Groundwater Monitoring Plan (CRA, June 2000) to include a well inspection checklist as part of the annual monitoring event. The checklist will include monitoring well condition, well ID, and lock. See photographs below depicting before and after repair showing evidence that lock has been repaired on well E-24.

U.S. EPA also inspected the City of Wausau utility system. The City of Wasuau's water treatment plant, including the air strippers, is located on the east bank. These were inspected during the inspection. Air strippers at the Wausau water treatment plant treat water from the municipal supply wells. It was determined that the air strippers and control panels are well maintained. As mentioned below, the utility tests the water on a regular basis to ensure that the treatment continues to be effective. The treated water is tested as it leaves the plant. (Site 200 for wells 6, 10, and 11 and Site 300 for wells 3, 7, and 9 - those combinations of wells are run for a few hours before the sample is collected). A copy of the recent test results are attached to this report (see Attachment 6). The results for all the tests can be found on the WDNR's website at http://www.dnr.state.wi.us/org/water/dwg/data.htm (i.e., Utility ID # 73701023).

In conclusion, U.S. EPA has determined that all other remedy components are functioning as designed to ensure the protectiveness of the remedy.

Third Five-year Review- Issues and Recommendations

During the Third FYR inspection, minor issues and recommendations were found. Those were identified as the following:

1) Monitoring well WC4A needs to have a lock placed on it.

2) Monitoring well WC5 had a bumper that was broken and falling over.

3) W52/W52A were located in a depression area and the concrete was starting to break up.

4) An unmarked rusted well casing in the back Wausau Chemical parking lot was severely dented.

These issues were promptly resolved as was documented in the monthly progress reports.

VII. Technical Assessment

The following questions address the protection of human health and the environment through of the remedy at the Wausau Groundwater Superfund Site.

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

Implementation of Institutional Controls and Other Measures: The 1988 and 1989 Wausau Groundwater RODs required utilizing the City of Wausau's existing municipal wells and treatment plant and an additional treatment plan to meet the cleanup goals. Therefore, groundwater contamination will remain for some time to come. ICs are needed to ensure that no one is exposed to contamination.

The Wausau Municipal Code outlines a Wellhead Protection ordinance in Chapter 23.54, and also addresses a Private Water Well ordinance in Chapter 19.30. These controls remain in place with the City of Wausau, in order to protect the remedy and restrict groundwater use. The effectiveness of these governmental control ICs is currently under review.

A property deed restriction was implemented by the responsible party contractor to address the completion of the soil remedy on the Wausau Chemical facility property. The restrictions included ensuring no inappropriate uses occur at the Wausau Chemical property to ensure protection of human health and the environment, and to protect the remedy. This instrument is under review. Additionally, ICs are needed for the former landfill at the Marathon Electric facility.

Remedial Action Performance: The remedial action components included in the Wausau Groundwater 1988 and 1989 RODs have been implemented. Construction and operation of a treatment system for the municipal groundwater municipal system, installation of a groundwater extraction well located in the west bank contaminant plume, and construction and operation of a soil vapor extraction (SVE) system have all been completed in accordance with approved work plans. The Preliminary Close-Out Report signifying construction completion was finalized in March 1994.

System Operations/O&M: The City of Wausau's treatment plant with air strippers regularly operates as an integral part of the City's municipal groundwater system. The extraction well on the west bank discharges into the Wisconsin River under an approved permit. It originally operated at 1600 gpm, but was later reduced to 800 gpm based on groundwater modeling. This extraction well continues to operate at 800 gpm. The soil vapor extraction system began operating in January 1994. The west bank SVE system

was shut down in April 1996. The east bank SVE system was shut down in January 2001.

Cost of System Operations/O&M: Current annual O&M costs at the Wausau Groundwater Site are primarily contributed to operation, maintenance, reporting and management of the Site groundwater treatment systems. The estimated annual costs are approximately $100,000. Other costs involve U.S. EPA and WDNR project manager time and travel related to the Site, and unexpected Site construction or maintenance.

Opportunities for Optimization: Final completion and approval of the soil remedy at the Wausau Groundwater Site will formalize the shut down of all SVE wells. As a result, there would not be any need for further operation and maintenance sampling associated with the soil portion of the Site remedy. The groundwater monitoring program was modified and optimized in 2000, which created a reduction in the number of wells and constituents being sampled.

Early Indicators of Potential Remedy Issues: There have been no indicators of significant potential remedy issues in relation to the Wausau Groundwater Site since the last Five-Year review in 2005. The Site groundwater treatment system should operate for the foreseeable future since contaminant levels are still above remedial action cleanup standards.

Question B: Are the assumptions used at the time of remedy selection still valid? Yes.

Changes in Standards and To Be Considered: The following standards were identified as applicable or relevant and appropriate requirements (ARARs) in the ROD and previous FYRs for the Site, and were reviewed for changes that could affect protectiveness:
- Safe Drinking Water Act MCLs;
-Resource Conservation and Recovery Act (RCRA) hazardous and solid waste disposal and storage regulations;
- Clean Water Act (CWA);
- Department of Transportation (DOT) hazardous materials rules;
- State of Wisconsin requirements for soil, groundwater, surface water and air compliance;- City of Wausau Municipal Code requirements

Standards outlined in the 1988 and 1989 Wausau Groundwater RODs and 1989 and 1991 Consent Decrees are still valid at the Site.

Changes in Exposure Pathways: No new exposure pathways have been discovered at the Wausau Groundwater Site since the last Five-Year review.

Changes in Toxicity and Other Contaminant Characteristics: Toxicity and other factors for contaminants of concern have not changed since the last Five-Year review.

Changes in Risk Assessment Methodologies: Risk assessment methodologies used at the Wausau Groundwater Site since the last Five-Year review have not changed, and do not call into question the protectiveness of the remedy.

Expected progress towards meeting RAOs: The remedy performance is progressing as expected, and it is anticipated to continue to do so. Groundwater monitoring is following the procedures contained in the remedial action work plan and the Site O&M plan.

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

No other information has become available that might call into could question the remedy for Wausau Groundwater Site. The Site remedy remains protective of human health and the environment.

Technical Assessment Summary

According to the data reviewed and the results of the Site inspection, the remedy is functioning as intended by the Site RODs. There have been no changes in the physical conditions of the site that would impact the protectiveness of the remedies. U.S. EPA determined in the last Five-Year review that proper and enforceable ICs were not in place at the site. which impacts long-term protectiveness of the site remedies. While progress has been made in this regard, there is more work to be done in the next year. Progress will be reported in the next Five-Year review. Also, several minor issues were noted during the Five-Year review inspections which have already been resolved. Last, U.S. EPA will consider whether a remedy revision is necessary to clarify that the remedial action objectives will not achieve unlimited use /unrestricted exposure for the soils and that ICs are required for groundwater until the water performance standards are met to ensure long-term protectiveness.

VIII. Issues

Issues that were discovered during the Five-Year review process and the Wausau Groundwater Site inspection are noted in Table 5 below.

Table 5: Identified Issues

Five-year Review Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
The decision documents do not specifically state whether	N	Y

the performance standards will allow for UU/UE and whether ICs are required to ensure long-term protectiveness. This must be further reviewed.		
Effective ICs must be implemented, monitored, maintained and enforced.	N	Y
Pumping rate at EW-1 has been declining. O&M Plan should be reviewed and modified to include soils area and inspection procedures for wells.	N	Y
Consideration should be given to modifying pumping rates and other options to ensure protectiveness, enhance remedy efficiency and optimization	N	Y

IX. Recommendations and Follow-up Actions

The following recommendations and follow-up actions address the issues which were identified during the Five-Year review:

Table 6: Recommendations and Follow-up Actions

Issues	**Recommendations Follow-up Actions**	**Party Responsible**	**Oversight Agency**	**Mile-stone Date**	**Affects Protectiveness (Y/N) Current, Future**
The decision documents do not specifically state whether the performance standards will allow for UU/UE and whether ICs are required to ensure long-term protectiveness. This must be further reviewed.	The U.S. EPA will review remedy requirements in the RODs and clarify if necessary.	U.S. EPA / WDNR	U.S. EPA / WDNR	01/2011	N, Y
Ensure effective ICs are	Conduct IC evaluation	Wausau PRP Group	U.S. EPA / WDNR	12 / 2010	N, Y

implemented, monitored, maintained and enforced.	activities and submit an IC work plan for review and approval including long-term stewardship procedures				
O&M Plan should be modified to include soils area and inspection procedures for wells.	Submit modified O&M Plan to include soils area with residual contamination and inspection procedures for wells.	Wausau PRP Group	U.S. EPA / WDNR	09/ 2010	N, Y
Pumping rate at EW-1 has been declining.	A work plan shall be submitted to the agencies to rehabilitate EW-1 to address declining pumping rate.	Wausau PRP Group	U.S. EPA / WDNR	08/2010	N.Y
Consideration should be given to optimizing and modifying pumping rates and other options to ensure enhancing protectiveness, enhance remedy efficiency, while ensuring long-term effectiveness and optimization	Review proposal submitted by PRPs	U.S. EPA / WDNR	U.S. EPA / WDNR	09/2010	N, Y

X. Protectiveness Statements

The completion of the current Five-Year review confirms that the Wausau Groundwater Superfund Site remedial action remains protective of human health and the environment in the short-term, and there are no known exposure pathways that could result in unacceptable health risks. The remedy was implemented at two (2) OUs which required removal and treatment of VOC volatile organic carbon (VOC) contamination from soils, and capture and treatment of VOCs in groundwater. The remedy for the OUs was documented in 1) an interim action Record of Decision (ROD) dated 1988 and 2) a Final ROD dated 1989. The components of the remedy selected in the 1988 and 1989 Wausau Groundwater Site RODs have been implemented under the 1989 and 1991 Consent Decrees. The objectives of the remedy included elimination of the continued sources of groundwater contamination identified at the former City landfill / Marathon Electric property and the Wausau Chemical property. Prevention of exposure to contaminants present in the three groundwater contaminant plumes identified, and performance of actions to ensure that groundwater is remediated. The response actions outlined for the interim action ROD included installation of an extraction well and construction and operation of a treatment system for removal of contaminants as well as formalizing an operation, maintenance, and monitoring program. The additional remedial components required in the Operable Unit 2 ROD included utilizing soil vapor extraction (SVE) systems to remove volatile contaminants from soils at each of the identified source areas, and groundwater remediation utilizing the City's municipal wells, and air strippers for removal of contaminants from plumes affecting the wells, as well as monitoring of the groundwater and soil.

Currently, the City of Wausau's water treatment plant regularly operates as an integral part of the City's municipal water treatment system to ensure protectiveness of the City's drinking water supply. Groundwater extraction well EW1 on the West Bank of the Wisconsin River continues to operate under an approved permit, and is monitored under the ongoing Site operation and maintenance monitoring program. All threats at the site have been addressed through the operating ground water treatment systems, and the soil vapor treatment of site soils. The West Bank soil vapor extraction (SVE) system was shut down in April 1996 and the East Bank SVE system was shut down in January 2001 after U.S. EPA and Wisconsin Department of Natural Resource agreed the requisite requirements were met.

Based upon the Five-Year review, the following protectiveness determinations have been made.

OU 1 Protectiveness

The OU1 remedy is protective of human health and the environment in the short-term. However, long-term protectiveness requires follow-up actions, as indicated further below, including implementation of ICs and preparation of a long-term stewardship plan and updating of the O&M plan.

OU 2 Protectiveness

The OU2 remedy is protective of human health and the environment in the short term. However, long-term protectiveness requires follow-up actions, as indicated further below, including addressing the declining pumping rate at EW1, implementation of ICs and preparation of a long-term stewardship plan and updating of the O&M plan.

Site Wide Protectiveness

The remedy is protective in the short term as all immediate risks have been addressed. Additional work is needed to ensure long-term protectiveness. Long-term protectiveness of the groundwater requires continued operation and maintenance of the remedial components including the groundwater monitoring system and extraction well EW1 and the City's municipal groundwater treatment plant as an integral part of the groundwater treatment for the Site. The O&M plan must be reviewed to ensure that the former SVE treatment areas with residual contamination are subject to effective monitoring and maintenance procedures. The requirements for ICs for the soils area with residual contamination must be reviewed along with the requirement for ground water ICs. Since it is highly unlikely that Site groundwater cleanup standards will be met during the next five years, operation of the groundwater treatment systems should be continued for the foreseeable future. Long-term protectiveness also requires compliance with effective groundwater ICs until the attainment of the groundwater standards. The soil portion of the Wausau Groundwater Site remedy is essentially complete, and is documented in the Site file. However, maintenance and monitoring plans must be finalized for those areas. Additionally, long-term protectiveness requires compliance with effective ICs for the soils. Compliance with effective ICs will be ensured by implementing effective ICs which must be maintained, monitored and enforced, by developing long-term stewardship procedures, as well as maintaining the site remedy components. To that end, evaluation of the necessity and types of ICs required is underway by U.S. EPA. The U.S. EPA will then require the PRPs to conduct additional IC evaluation activities and submit an IC work plan to including ensuring that effective restrictive covenants are implemented and that long-term stewardship procedures are in place to ensure effectiveness, enforceability and long-term stewardship. A review of the need for a clarification of the remedy relative to the need for ICs , such as in an Explanation of Significant Differences (ESD), will also be conducted by U.S. EPA. Last, the declining pumping rate at EW1 must be addressed by the PRPs along with exploring remedy optimization opportunities. These steps are necessary to ensure that the remedy continues to function as intended and to ensure long-term protectiveness.

XI. Next Review

The Wausau Groundwater Superfund Site requires ongoing five-year reviews. The next review will be scheduled to be completed in 2015, and will be completed no later than five years from the completion date of this report. The completion date of the current Five-Year Review is the signature date shown on the cover attached to the front of this report.

Tables, Figures and Attachments for

Fourth Five-Year Review Report (2010)

for

Wausau Groundwater Contamination Site

Marathon County, Wisconsin

Tables

1 - Chronology of Site Events *(contained in report)*
2 - IC Summary Table *(contained in report)*
3 - Potential Exposure Pathway Table from RI/FS
4.1 - Laboratory results for monitoring well samples collected in October 2008
4.2 - EW1- Effluent laboratory results for 2008
4.3 - Monitoring Well laboratory Results for 2009
5 - Identified Issues *(contained in report)*
6 - Recommendations and Follow-up Actions *(contained in report)*

Figures

1 - Regional Location Map
1.1 - Site Location
1.2 - Site Plan Layout - View 1
1.3 - Site Plan Layout - View 2
2 - Total Chlorinated VOCs in Groundwater (10/08)
3 - Water Table Contours- 2009
4 - Total Chlorinated VOCs in Groundwater (10/09)

Attachments

1 - Newspaper Advertisement Announcing Five-Year Review Start (11.9.2009)
2 - List of Reviewed Documents
3 - List of Participants on Five-year Review Inspection
4 - Deed Restrictions implemented on Wausau Chemical Property
5 - Excerpt from Wausau Municipal Code – Title 19;Chapter 19.30
6 - VOC analytical results in water effluent at the Wausau Water Supply (October 2009)

Attachments for

Fourth Five-Year Review Report (2010)

for

Wausau Groundwater Contamination Site

Marathon County, Wisconsin

hursdays.

Yonke, Merrill, and Sharon (Matthew) Grimm, Athens. He is a 2005 graduate of Wausau West High School.

◆ Army National Guard Pfc. Elizabeth A. Ermeling has graduated from basic combat training at Fort Jackson, Columbia, S.C.

She is the daughter of Lori Ermeling, Merrill, and granddaughter of Virginia Ermeling, Wausau. Ermeling is a 2009 graduate of Merrill High School.

◆ Army National Guard

daughter of Michelle Bell, Birnamwood, and Craig Bell, San Angelo, Texas.

Igl is a 2008 graduate of Central High School, San Angelo.

◆ Navy Seaman Brandon Woller, son of Tammy and Timothy Woller, Merrill, completed U.S. Navy basic training at Recruit Training Command, Great Lakes, Ill.

Woller is a 2005 graduate of Merrill Senior High School, and a 2009

School.

◆ LTJG Jonathan Sydow received his Navy Wings of Gold and was designated a Naval Aviator at the Naval Air Station in Corpus Christi, Texas, on Sept. 18. His wings were presented by his parents,

Michlig of Mosinee.

UWMC to host

— Wausau Daily Herald

EPA Begins Review of Wausau Ground Water Contamination Site Wausau, Wisconsin

U.S. Environmental Protection Agency is conducting a five-year review of the Wausau Ground Water Contamination Superfund site at the northern end of Wausau (S24 & 25 T29N R7E). 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 fourth five-year review of the site.

EPA's cleanup of contaminated ground water (underground supply of fresh water) consisted of a carbon filter system to filter pollutants, air strippers to remove harmful chemicals, and a pump-and-treat system to extract and clean polluted ground water. Soil vapor extraction systems that were used to clean up soil contamination are no longer needed and have been turned off.

More information is available at the Marathon County Public Library, 300 N. First Street, and at www.epa.gov/region5/sites/wausau. The review should be complete before June 30, 2010.

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

Patti Krause
Community Involvement Coordinator
312-886-9506
krause.patricia@epa.gov

Sheri Bianchin
Remedial Project Manager
312-886-4745
bianchin.sheri@epa.gov

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

ATTACHMENT 1

ATTACHMENT 3

NPL ~~Site~~ Inspection 11/13/09

Five Year Review

Sheri Bianchin/EPA	bianchin.sheri@epa.gov	312-886-4745
Jason Twadelle/CRA	jtwadelle@craworld.com	651-639-0939 Ext 305
Lee Bergmann/RBC	lee.bergmann@regalbeloit.com	715-675-8104
Dave Erickson	Dave.Erickson@ci.Wausau.Wi.us	715-261-6536
Rob Flashinski	rflashinski@wausauchemical.com	715-842-2255 x 310
Michelle Kerr	kerr.michelle@epa.gov	312-886-8961
RYAN NESBITT	WATER PLANT OPERATER	715-241-6688

Attachment 2
Documents Review For the Five-year Review
Wausau Groundwater Contamination Site

Documents reviewed in preparation of this Five-Year Review Report include the following:

1) Five-year Review Reports, Wausau Groundwater Site, 7/10/00 and 06/30/05.

2) RD/RA Consent Decrees, Wausau Groundwater Site, January 1991 & September 1989

3) Record of Decisions, Wausau Groundwater Site, September 1989 & December 1988

4) Wausau Groundwater Site file, and Operation & Maintenance documents

5) Annual Reports Submitted by CRA

6) Quarterly Reports Submitted by CRA

7) ARARs

ATTACHMENT 4

CONESTOGA-ROVERS
& ASSOCIATES

1801 Old Highway 8 Northwest, Suite 114, St. Paul, Minnesota 55112
Telephone: 651-639-0913 Facsimile: 651-639-0923
www.CRAworld.com

August 29, 2007

Reference No. 003978-20

Mr. Jeff Gore
UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY
77 West Jackson
Chicago, Illinois 60604

Ms. Eileen Kramer
WISCONSIN DEPARTMENT OF
NATURAL RESOURCES
1300 W. Clairemont, Box 4001
Eau Claire, Wisconsin 54702

Dear Mr. Gore and Ms. Kramer:

Re: Final Closure of SVE System/Completion of Source Area Remediation
Wausau Chemical Property
Wausau Water Supply NPL Site

With this letter, the Wausau Water Supply Potentially Responsible Party (PRP) Group requests final closure of the Soil Vapor Extraction (SVE), source remediation, system at the Wausau Chemical property. All the requirements for closure have now been met, including the recording of a deed restriction. A copy of the signed and recorded deed restriction for the Wausau Chemical property is attached for your records.

The SVE system at Wausau Chemical began operation in January 1994 to remediate source area contamination that was contributing to a volatile organic compounds (VOC) plume in the groundwater. During the next three years the SVE system operated as agreed to by the Wausau PRP Group, the United States Environmental Protection Agency (USEPA), and the Wisconsin Department of Natural Resources (WDNR), including modifications to the SVE system in 1996.

The SVE system at Wausau Chemical was also known as the East Bank system. A second SVE system also began operating on the West Bank in 1994 to remediate a separate source area. That system was granted closure in 1996.

In 1997, a SVE System Closure Report was submitted to the USEPA and WDNR. The Closure Report documented reductions in soil VOC concentrations that met the statistical remediation requirements previously established by the USEPA and WDNR. However, the USEPA and WDNR expressed concern about two locations with soil VOC concentrations that were elevated relative to the area as a whole.

The East Bank SVE system continued to operate until 2001, when it was shut off pending final agreement with the USEPA and WDNR regarding specific requirements for permanent closure. Subsequent soil sampling in 2001 at the two locations of concern showed that continued operation of the SVE system had resulted in further decreases in soil VOC concentrations.

To verify that the residual VOCs in soil were not continuing to substantially contribute to the existing groundwater plume, the WDNR requested quarterly groundwater sampling of two monitoring wells located at and just down gradient of the East Bank source area. This sampling was intended to supplement annual groundwater monitoring events. Quarterly groundwater monitoring of the two wells was completed in 2003. The results confirmed the continuing decline in groundwater concentrations documented by the annual monitoring events.

After further review and discussion, the WDNR and USEPA agreed to grant final closure of the SVE system and the East Bank source area once a deed restriction was placed on the Wausau Chemical property. That deed restriction has now been recorded and a copy is attached for your records.

Please reply with a letter confirming your approval of the final closure of the East Bank SVE system and completion of source area remediation for the Wausau Water Supply Site.

Sincerely,

CONESTOGA-ROVERS & ASSOCIATES

Jason Twaddle

JT/plh/45
Enc.

ATTACHMENT A

RECORDED DEED RESTRICTION

STATE OF WISCONSIN - MARATHON COUNTY
RECORDED
04/26/2007 2:24:45 PM
MICHAEL J. SYDOW, REGISTER OF DEEDS

DOC# 1475599

Document Number | DEED RESTRICTION

Michael J. Sydow

Declaration of Restriction

In Re:
James E. Cherwinka Trust

Parcel 1:

Part of the Northwest quarter (NW1/4) of the Northwest quarter (NW1/4) of Section twenty-five (25), Township twenty-nine (29) North, Range seven (7) East, in the City of Wausau, County of Marathon, State of Wisconsin, described as follows:

Beginning at a point on the South line of Wausau Avenue 227.75 feet West of the West line of Second Street; thence South perpendicular to the South line of Wausau Avenue, 70 feet; thence West, parallel with and 70 feet South of the South line of Wausau Avenue, 147.60 feet, more or less, to a point which is 15 feet Northwesterly of railroad siding track; thence Southwesterly on a curve parallel to and 15 feet distant Northwesterly from the center line of said railroad siding track, to a point 458 feet West of the West line of Second Street; thence North to the South line of Wausau Avenue at a point which is 458 feet West of the West line of Second Street; thence East along the South line of Wausau Avenue 230.25 feet, more or less, to the point of beginning.

Recording Area

Name and Return Address Pd Cle 25-env

James E. Cherwinka Trust
c/o Attorney James E. Wiederhoeft
Fowler and Wiederhoeft LLP
702 North Blackhawk Avenue
Madison, Wisconsin 53705-5326
and
Wausau Chemical Corp.
2001 North River Drive
Wausau, Wisconsin 54401

291-2907-252-0990 NW NW
291-2907-252-0997 NW NW
Parcel Identification Numbers (PIN)

Parcel 2:

Part of the Northwest quarter (NW1/4) of the Northwest quarter (NW1/4) of Section twenty-five (25), Township twenty-nine (29) North, Range seven (7) East, in the City of Wausau, Marathon County, State of Wisconsin, described as follows:

Commencing at a point on the South line of Wausau Avenue, 227.75 feet West of the West line of Second Street; thence South perpendicular to South line of Wausau Avenue, 70 feet; thence West parallel with and 70 feet South of the South line of Wausau Avenue, 147.60 feet, more or less, to a point which is 15 feet NW'ly of railroad siding track, thence SW'ly on a curve parallel to and 15 feet NW'ly from the center line of said railroad siding track

to a point, said point being 131 feet South of the South line of Wausau Avenue; thence at an azimuth of 180°, 23.05 feet to a point, said point being the P.C. of a reverse curve to the right; thence SW'ly 224.05 feet along a curve having the following data, radius 675.11 feet, tangents 112.97 feet, I angle 19°, long chord 222.85 feet, curve length 224.05 feet, degree of curvature 8° 28.8', to a point said point being the point of reverse curvature; thence SW'ly 166.90 feet along a curve to the left having the following data, radius 615.11 feet, tangents 120.77 feet, long chord 237.02 feet, curve length 238.5 feet, curvature 9° 18.6', I angle 22° 13' to a point, which point is the point of beginning of the excepted parcel hereafter described; thence at an azimuth of 87° 06' a distance of 273.95 feet to a point, said point being 50 feet perpendicular to and West of the center line of the main line track of the C. M. St. P. & P. R. R.; thence at an azimuth of 10° 40' a distance of 532.32 feet parallel with and 50 feet West of the center line of said railroad tracks to a point, said point being on the South line of Wausau Avenue and 155.60 feet West of the West line of Second Street; thence West along the South line of Wausau Avenue 72.15 feet to the point of beginning; excepting therefrom the following parcel; beginning at the point designated in the foregoing description as the point of beginning of the excepted parcel; thence N 83° 46' 30" E, 99.6 feet; thence NE'ly, parallel with the centerline of the railroad siding track of the Chicago, Milwaukee, St. Paul & Pacific Railroad, 181.1 feet; thence Northwesterly, at a right angle, 89.6 feet; thence SW'ly, along the East boundary of River Drive, and along the West line of the parcel conveyed in the foregoing description, 197 feet, more or less, to the point of beginning.

130916

The above Parcels 1 and 2 are part of Parcel 1 of Certified Survey Map No. 12726 recorded in the office of the Register of Deeds for Marathon County, Wisconsin, in Volume 55 of Certified Survey Maps on page 44, a copy of which is attached hereto as Exhibit A. The above Parcels 1 and 2 are also identified as PIN 291-2907-252-0990.

And

Wausau Chemical Corporation

Part of the Northwest quarter (NW1/4) of the Northwest quarter (NW1/4) of Section twenty-five (25), Township twenty-nine (29) North, Range seven (7) East, in the City of Wausau, Marathon County, State of Wisconsin, designated as the excepted parcel, described as follows:

Commencing at a point on the South line of Wausau Avenue, 227.75 feet West of the West line of Second Street; thence South perpendicular to South line of Wausau Avenue, 70 feet; thence West parallel with and 70 feet South of the South line of Wausau Avenue, 147.60 feet, more or less, to a point which is 15 feet NW'ly of railroad siding track, thence SW'ly on a curve parallel to and 15 feet NW'ly from the center line of said railroad siding track to a point, said point being 131 feet South of the South line of Wausau Avenue; thence at an azimuth of 180°, 23.05 feet to a point, said point being the P.C. of a reverse curve to the right; thence SW'ly 224.05 feet along a curve having the following data, radius 675.11 feet, tangents 112.97 feet, I angle

19°, long chord 222.85 feet, curve length 224.05 feet, degree of curvature 8° 28.8', to a point said point being the point of reverse curvature; thence SW'ly 166.90 feet along a curve to the left having the following data, radius 615.11 feet, tangents 120.77 feet, long chord 237.02 feet, curve length 238.5 feet, curvature 9° 18.6', I angle 22° 13' to a point, which point is the point of beginning of the excepted parcel hereafter described; thence at an azimuth of 87° 06' a distance of 273.95 feet to a point, said point being 50 feet perpendicular to and West of the center line of the main line track of the C. M. St. P. & P. R. R.; thence at an azimuth of 10° 40' a distance of 532.32 feet parallel with and 50 feet West of the center line of said railroad tracks to a point, said point being on the South line of Wausau Avenue and 155.60 feet West of the West line of Second Street; thence West along the South line of Wausau Avenue 72.15 feet to the point of beginning; excepting therefrom the following parcel; beginning at the point designated in the foregoing description as the point of beginning of the excepted parcel; thence N 83° 46' 30" E, 99.6 feet; thence NE'ly, parallel with the centerline of the railroad siding track of the Chicago, Milwaukee, St. Paul & Pacific Railroad, 181.1 feet; thence Northwesterly, at a right angle, 89.6 feet; thence SW'ly, along the East Boundary of River Drive, and along the West line of the parcel conveyed in the foregoing description, 197 feet, more or less, to the point of beginning.

The above description is a part of Parcel 1 of Certified Survey Map No. 12726 recorded in the office of the Register of Deeds for Marathon County, Wisconsin, in Volume 55 of Certified Survey Maps on page 44. See Exhibit A. This parcel is also identified as PIN 291-2907-252-0997.

STATE OF WISCONSIN)
)ss
COUNTY OF MARATHON)

WHEREAS, the James E. Cherwinka Trust and Wausau Chemical Corporation are the owners of the above-described property.

WHEREAS, James E. Cherwinka died on October 18, 2005. The James E. Cherwinka Trust is the successor in interest to James E. Cherwinka in connection with said above-described property.

WHEREAS, one or more historical tetrachloroethylene discharges have occurred on this property, and as of November 7, 2001, soil samples collected on this property contained tetrachloroethylene at concentrations of 1.0 mg/kg at grid point 19-4 at a depth of eight feet and 0.67 mg/kg at grid point 35-7 at a depth of four feet, trichloroethylene at a concentration of 0.43 mg/kg at grid point 35-7 at a depth of four feet and cis-1,2-dichloroethylene at a concentration of 0.13 mg/kg at grid point 35-7 at a depth of four feet, all as shown on Figure 1.

WHEREAS, the existing building and pavement on the property provide a partial barrier, minimizing infiltration, and the depth of the remaining contaminants prevents direct contact with the residual soil contamination.

WHEREAS, sampling data on and about the property has demonstrated soil cleanup adequately protective of groundwater quality; however, residual soil contamination remains on the property.

WHEREAS, it is the desire and intention of the property owners to impose on the property restrictions that will make it unnecessary to conduct further soil remediation activities on the property at the present time.

NOW THEREFORE, the owners hereby declare that all of the property described above is held and shall be held, conveyed or encumbered, leased, rented, used, occupied and improved subject to the following limitation and restrictions:

1. Construction or installation of any water supply well on the property is prohibited pursuant to this deed restriction.

2. Plowing or cultivation of agricultural crops on the property is prohibited pursuant to this deed restriction.

3. The existing Wausau Chemical Corporation building shown on Exhibit B makes complete remediation of soils beneath the building impractical. If the existing building is removed or modified, the property owner shall conduct an investigation to determine the degree and extent of soil contamination beneath the building. To the extent that soil contamination is found at that time, the Wisconsin Department of Natural Resources shall be immediately notified and the soil contamination shall be managed in accordance with applicable statutes and rules. If currently inaccessible soil contamination near or beneath the building is excavated in the future, the soil must be sampled and analyzed, may be considered solid or hazardous waste if residual contamination remains and must be stored, treated and disposed in compliance with applicable statues and rules.

4. The existing pavement forms a barrier that will be maintained in accordance with the maintenance plan entitled "Pavement Cover and Building Barrier Maintenance Plan, Wausau Chemical Corporation", dated October 17, 2006. The existing pavement will minimize the infiltration of water which prevents additional groundwater contamination. The existing pavement shall be maintained on the property in the locations shown on Exhibit B. Such existing pavement shall not be removed without the approval of the Wisconsin Department of Natural Resources.

5. If construction or installation of buildings, structures or other improvements occur on grid points 19-4 or 35-7 shown on Exhibit B, then the affected soils at grid points 19-4 or 35-7 shall be sampled and managed in accordance with applicable statutes and rules.

6. The property shall be used only for industrial purposes.

This restriction is hereby declared to be a covenant running with the land and shall be fully binding upon all persons acquiring the above-described property whether by descent, devise, purchase, or otherwise. This restriction inures to the benefit of and is enforceable by the Wisconsin Department of Natural Resources, its successors or assigns. The Department, its successors or assigns, may initiate proceedings at law or in equity against any person or persons

who violate or are proposing to violate this covenant, to prevent the proposed violation or to recover damages for such violation.

Any person who is or becomes owner of the property described above may request that the Wisconsin Department of Natural Resources or its successor issue a determination that one or more of the restrictions set forth in this covenant is no longer required. Upon the receipt of such a request, the Wisconsin Department of Natural Resources shall determine whether or not the restrictions contained herein can be extinguished. If the Department determines that the restrictions can be extinguished, an affidavit, attached to a copy of the Department's written determination, may be recorded by the property owner or other interested party to give notice that this deed restriction, or portions of this deed restriction, are no longer binding.

By signing this document, Rhona Vogel asserts that he or she is duly authorized to sign this document as a Trustee of the James E. Cherwinka Trust.

IN WITNESS WHEREOF, the owner of the property has executed this Declaration of Restrictions, this 13 day of April, 2007.

Signature: Rhona Vogel
Printed Name: Rhona Vogel
Trustee, James E. Cherwinka Trust

Subscribed and sworn to before me
this 13 day of April, 2007

Lynn Heick
Notary Public, State of Wisconsin
My commission Expires 7/22/07

By signing this document, Jeff Cherwinka asserts that he or she is duly authorized to sign this document as an officer of Wausau Chemical Corporation.

IN WITNESS WHEREOF, the owner of the property has executed this Declaration of Restrictions, this 19 day of April, 2007.

Signature: Jeff Cherwinka
Printed Name: Jeff Cherwinka
Officer of Wausau Chemical Corporation

Subscribed and sworn to before me
this 17th day of April, 2007

Notary Public, State of Wisconsin
My commission 08-05-07

This document was drafted by Michael Best & Friedrich LLP and Conestoga-Rovers and Associates, Inc.

X:\CLIENTB\094167\0001\A1844250.1

DOC# 1475699

12726

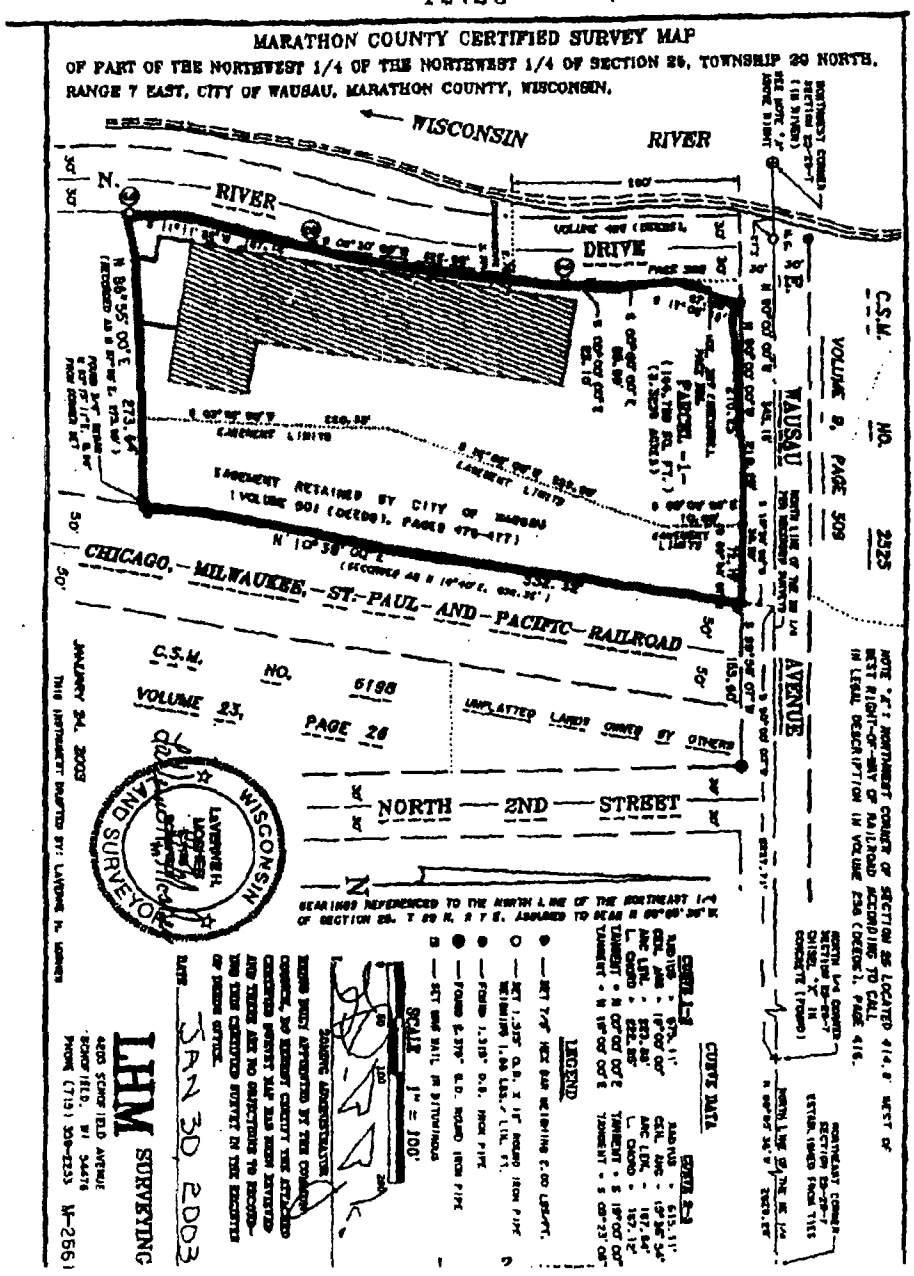


EXHIBIT A

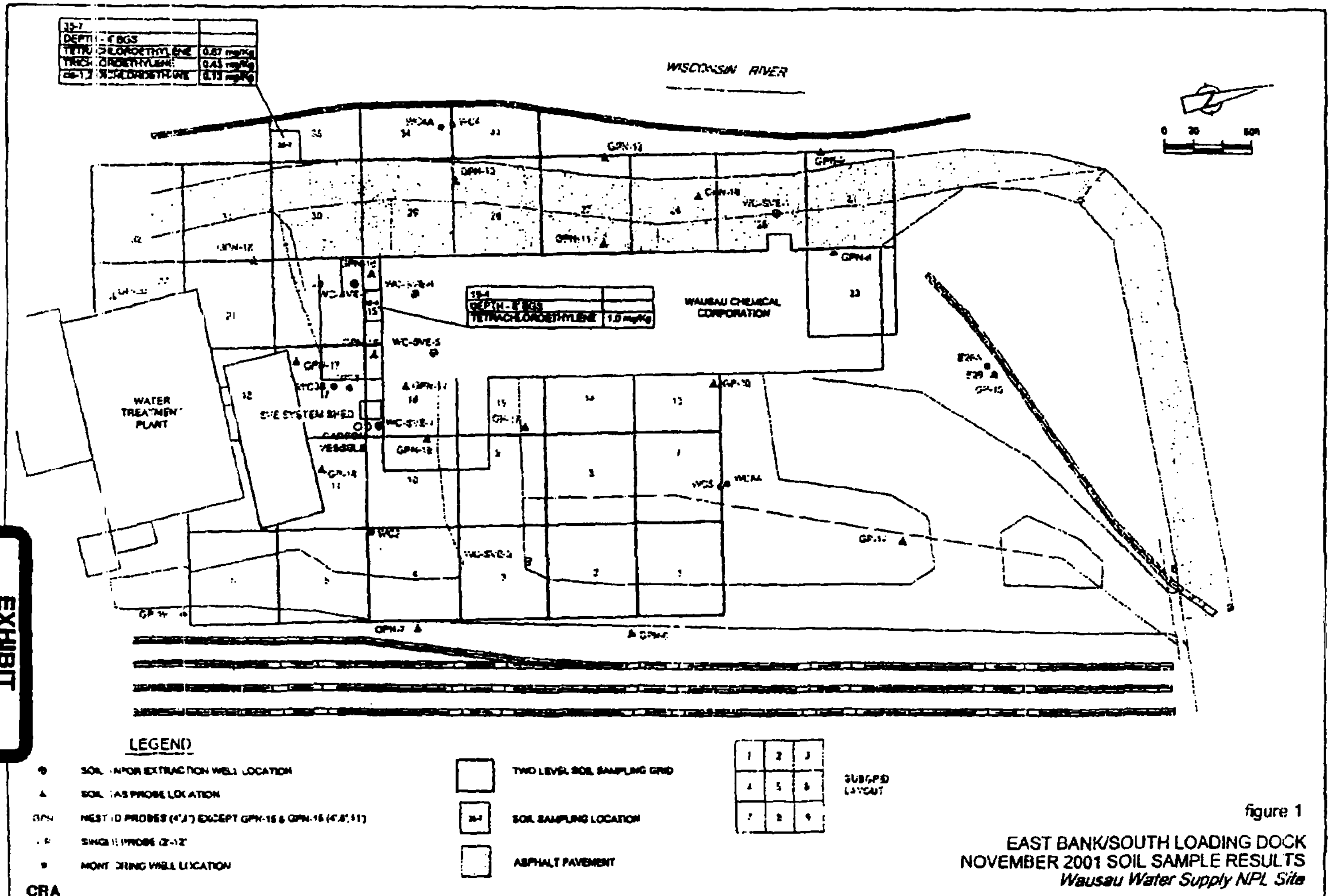


figure 1

EAST BANK/SOUTH LOADING DOCK
NOVEMBER 2001 SOIL SAMPLE RESULTS
Wausau Water Supply NPL Site

ATTACHMENT 5

Title 19

PLUMBING

Chapters:

Chapter 19.04

STATE CODE—STATE LICENSE

Sections:

19.04.010 State plumbing code adopted. Chapter 145 of the Wisconsin Statutes and all future amendments thereto and Comm 25 and Comm 81–87 of the Wisconsin Administrative Code (WAC), and all future amendments and official bulletins thereto are adopted and, by reference, made a part of this title with the same force and effect as though set out in full in this title. Failure to comply with any of the provisions of the statutes or administrative rules, regulations and bulletins constitutes a violation of this title, subject to the forfeitures provided herein. Copies of the statutes and administrative rules, regulations and bulletins adopted in this title shall be kept on file in the office of the plumbing inspector in the city hall. (Ord 61.5113 §1, 2001, File No. 01-0518; Ord. 61-4380 §1(part), 1978.)

19.04.020 State license required. No person shall engage in or work at plumbing as defined in Chapter 145 of the Wisconsin Statutes without complying with that chapter. (Ord. 61-4380 §1(part), 1978.)

19.04.030 Conflict of provisions. Where a conflict exists between this title and the WAC, Revisions or Official Bulletins, the provisions of WAC, its Revisions or Official Bulletins shall prevail, except where an ordinance has been adopted after the effective date of the conflicting WAC provision. (Ord. 61-4380 §1(part), 1978.)

Chapter 19.08

PLUMBING INSPECTOR

Sections:

19.08.010 Inspector. There shall be one or more plumbing inspectors. (Ord. 61-4380 §1(part), 1978.)

19.08.020 Permits. The inspector or authorized agent shall take applications and issue permits to qualified applicants. (Ord. 61-4380 §1(part), 1978.)

19.08.030 Registration of plumbers. (a) The plumbing inspector shall keep on file a registration of all master, journeyman and apprentice plumbers engaged in the plumbing trade in the city.

(b) The registration shall include the name, address, license number, and current receipt number. In addition, apprentices shall state year of apprenticeship and the shop to which indentured. Master and journeyman registration shall state "contracting plumber or maintenance plumber" and place of employment. (Ord. 61-4380 §1(part), 1978.)

19.08.040 Manufactured products. When requested by the manufacturer or another municipality, the inspector is authorized to make inspections of plumbing installations manufactured for shipment out of the city. (Ord. 61-4380 §1(part), 1978.)

19.08.050 Records. The inspector shall prepare suitable applications, keep a daily log of all office transactions, and file with the common council a monthly report of such transactions. (Ord. 61-4380 §1(part), 1978.)

Chapter 19.12

PERMITS

Sections:

19.12.010 Installation permit. No person shall install or cause to be installed any plumbing or drainage unless a permit therefor has been issued by the plumbing inspector, and no plumbing shall be used until it has been inspected and approved by the inspector. No permit fee shall be refunded and no permit shall be transferable. (Ord. 61-4380 §1(part), 1978.)

19.12.020 When required. A permit shall be obtained:

(a) To perform any clearwater drainage or plumbing work as defined in Chapter 145 of the Wisconsin Statutes, the Wisconsin Administrative Code (WAC), or this title;

(b) To abandon a water or sewer system before a wrecking or moving permit shall be issued by the city;

(c) For the installation, replacement, or relocation of any water conditioning unit. Only the original installation of exchange regeneration service type units require a permit;

(d) For the installation, replacement, or relocation of any domestic water heating unit;

(e) For construction of any water distribution system from a source other than city water mains;

(f) For the connection of any dispensing unit to water and/or waste pipes;

(g) For the connection of any injection equipment intended to inject or otherwise insert any chemical, soap, or other material of any kind whatsoever into any water distribution pipe;

(h) For the water and/or waste connection for each water-cooled air conditioner or water-cooled motor of humidifier;

(i) For the installation of all inside roof leaders or downspouts;

(j) For new or reconstructed sanitary sewer lateral or storm drains;

(k) For new or reconstructed water service extension from water main to curb stop or to building;

(l) For the installation of any sump pump or ejector;

(m) For the discharge point of any subsoil or footing drain. The storm sewer or catch basin or sump will not require an additional permit at the discharge point;

(n) When inspection is requested, except for inspection of plumbing work to be shipped out of the city;

(o) A permit will be required for the replacement of all plumbing fixtures;

(p) The requirements of section 19.48.010 of this title shall not apply to licensed and registered maintenance plumbers obtaining permits for plumbing work within the complex of their employer's business enterprises. Section 19.48.010 shall apply to any work performed in a public right-of-way;

(q) Permits may be applied for by licensed master plumbers and qualified home owners pursuant to Chapter 145 of the Wisconsin Statutes, either or both of whom may be prosecuted for the failure to obtain the permit prior to the commencement of the job. (Ord. 61-4654 §(part), 1988; Ord. 61-4380 §1(part), 1978.)

19.12.030 Fees. (a) The following permit and inspection fees shall be paid at the time a permit is issued:

New or reconstructed water service extension from curb stop two inches or less, each one hundred feet or fraction thereof	$11.00
For each additional inch in diameter	$7.25
New or reconstructed sanitary building sewer extension from main, curb or lot line, any size, each one hundred feet or fraction thereof	$11.00
New or reconstructed building or area storm sewer extension from main, curb or lot line, any size, each one hundred feet or fraction thereof	$11.00
New or reconstructed sanitary or storm building drains, any size, each one hundred feet or fraction thereof	$11.00
For each fixture or fixture connection	$7.25
Private sewer and water mains, any size, each one hundred feet or fraction thereof	$11.00
Water conditioners, replacement or relocation	$10.50
Water heaters, replacement or relocation	$10.50

Dispensing equipment connection, replacement or relocation	$10.50
Water distribution system from source other than city water mains	$10.50
Fire protection sprinkler system	$10.50
Below surface lawn sprinkler system	$10.50
Sumps or catch basins (sanitary and clearwater)	$7.25
Sump pump or ejectors (sanitary and clearwater)	$7.25
Inside roof leaders or downspouts (each roof terminal)	$7.25
Subsoil drain discharge point	$7.25
Private water well (five-year permit—issued by Wausau Water Works	$60.00
Private sewage disposal system	$37.00
Swimming pool	$37.00
Reconstruction of any part of the building drain, soil waste and vent pipe, downspouts, or water distribution piping. No permit will be required where permit is issued for additional fixtures, connected appliances and appurtenances or the relocation or replacement of existing units	$10.50
Water distribution and drain piping for manufacturing processes, each one hundred fee or fraction thereof	$11.00
To abandon water or sewer system when wrecking or moving a building	$37.00
To abandon a private well and/or septic system	$37.00
Inspect and attest to plumbing installed for shipment out of the city	$37.00
Minimum fee charged for all permits	$37.00
Reinspection fee	$55.00
Failure to obtain permit prior to commencement of work	double fees

(b) Fixtures, appliances and appurtenances shall include but not be limited to: water closets, wash basins, bathtubs, shower stalls, urinals, service sinks, sinks, dishwashers, garbage grinders, disposals, laundry tubs, floor drains, site drains, drinking fountains, bar connections, soda fountains, water-cooled refrigerators, ice cube machines, dental cuspidors, all type water heaters, water-cooled motor connections, all water conditioning units, sumps, drain tile receivers, footing or subsoil drain discharge point, inside roof drains, catch basins, yard drains, grease and oil separators, pumps and ejectors, water or waste connection to machines, water or waste connection

to any appliance, buried lawn sprinklers, drink dispensers, swimming pools, water-cooled air conditioner and connections, mobile home connections, fire protection installation, private sewage disposal, water wells and injection equipment. (Ord. 61-5353 §4, 2007, File No. 00-1134; Ord. 61-5314 §4, 2006, File No. 00-1134; Ord. 61-5276 §4, 2005, File No. 00-1134; Ord. 61-5243 §1(part), 2004, File No. 00-1134; Ord. 61-5218 §1(part), 2003, File No. 00-1134; Ord. 61-5159 §1(part), 2002, File No. 02-0131; Ord. 61-5094 §1, 2000, File No.00-1134; Ord. 61-5066 §1, 2000; Ord. 61-5020 §1, 1999; Ord. 61-5018 §1(part), 1998; Ord. 61-4962 §1(part), 1996; Ord. 61-4875 §1(part), 1994; Ord. 61-4726 §2(part), 1990; Ord. 61-4654 §1(part), 1988; Ord. 61-4599 §1, 1986; Ord. 61-4380 §1(part). 1978.)

19.12.040 Application. (a) An application for a permit shall be made to the plumbing inspector or a designee before any work is started.

(b) The application shall state the property owner's name, address, and the land description where the work is to be done. It shall include the size and material of the water and sewer service pipes to the building and the kind and number of fixtures, appliances and appurtenances to be installed together with a statement that the owner and applicant will be bound by and subject to the rules and regulations of this chapter. Diagrams and notarized statements that may be considered necessary to ensure a complete and legal plumbing installation may be required as part of the application. (Ord. 61-4380 §1(part), 1978.)

19.12.050 Restrictions on issuance.* (a) No plumbing or sewer permit, with the exception of water and sewer laterals for street improvements, shall be granted until a building permit has been issued by the building inspector.

(b) No plumbing, clearwater drainage, or sewer permit will be issued to any person who is in noncompliance with an order of the electrical, building, or plumbing inspector.

(c) If any work is commenced without a permit first having been obtained therefor, the permit fee shall be twice the usual fee. Payment of any fee required by this chapter shall not relieve any person of the forfeitures that may be imposed for violation of this title. (Ord. 61-4380 §1(part), 1978.)

19.12.060 Expiration. Permits will automatically expire:

(a) When work ceases for a period of sixty days without good and reasonable cause;

(b) Upon cancellation or expiration of insurance required by section 19.48.010 of this title;

(c) Expire on completion of work for which it was issued. (Ord. 61-4380 §1(part), 1978.)

---

* For other restrictions see also sections 19.28.030, 19.32.010, 19.32.020, 19.36.020(b) and 19.44.040(a) of this title.

Chapter 19.16

INSPECTIONS

Sections:

19.16.010 When required. The plumbing inspector's jurisdiction includes but is not limited to:

(a) The entire building sanitary sewer and storm drainage, before backfilling, form the main sewer or other disposal terminal to the building; including connections at point of discharge; private sewage disposal systems; water wells and water service from curb box or approved well installation into the building;

(b) The building drain, and branches thereof under tests as prescribed. Such inspection shall be made before any part of the drain is covered;

(c) The soil waste vent pipes and the water distribution piping known as "roughing in" shall be inspected under test before it is enclosed or covered;

(d) All clearwater drains, interior downspouts, or roof leaders, subsoil or footing drain connection points, water-cooled air conditioners and connections, area and parking lot drainage;

(e) All devices of any kind connected to the water distribution pipe shall be inspected;

(f) Plumbing installations after fixtures, appliances and appurtenances have been tested and the installation is ready for use. The final inspection shall be made with the water supply serving the system turned on. (Ord. 61-4380 §1(part), 1978.)

19.16.020 Notice for inspection. (a) It shall be the responsibility of the person in whose name the permit is issued, to notify the inspector's office in person, by telephone or in writing when work is ready for test and inspection. If the inspection is not made the next full working day after the notice is given, the work may be covered and continued.

(b) Notice must be given before 2 p.m. to trigger the next full working day rule. (Ord. 61-4380 §1(part), 1978.)

19.16.030 Covering the work. (a) No part of any plumbing or clearwater drainage system shall be covered until it has been inspected and approved. If any part is covered before being inspected and approved, it shall be uncovered at the direction of the inspector.

(b) When the inspector approves of work, a tag shall be attached to either the building permit or to the work itself, and no plumbing or clearwater drainage work shall be covered until such tag is in place.

(c) Upon request, the owner or plumber shall be furnished with a certificate or letter indicating that an inspection has been made and showing whether the installation has been approved or disapproved. Violations or condemnation notice shall be issued by letter stating the reason. (Ord. 61-4380 §1(part), 1978.)

19.16.040 Report of existing unsanitary conditions. Reports that plumbing in any building is contrary to this chapter or is of faulty construction, liable to breed disease or sickness, or is a menace to health shall be made to the county health officer. (Ord. 61-4380 §1(part), 1978.)

19.16.050 Violation. The plumbing inspector or designee shall investigate all reports of improper or defective plumbing or drainage. If such investigation discloses violation of this title, the inspector shall notify the owner or tenant of such premises by registered mail or personal service to correct any such improper or defective installation within thirty days. Any person failing to comply with such notice shall be subject to the penalty provided in Chapter 19.52 of this title. (Ord. 61-4380 §1 (part), 1978.)

19.16.060 Certificate of occupancy. Upon completion of the plumbing work pursuant to the permit, the person doing the work shall notify the plumbing inspector, who shall inspect the work. If approved, the inspector shall issue a certificate of occupancy which shall contain the date of such inspection and a resume of the inspection. No such certificate shall be issued unless the plumbing work is in strict conformity with the rules and regulations set forth in this title. (Ord. 61-4380 §1(part), 1978.)

Chapter 19.20

SEWERS

Sections:

19.20.010 Separate drains for each building. Every building shall have a separate and independent connection with a public main sanitary sewer, private sewage disposal system, or private main sanitary sewer. A private main sanitary sewer shall conform to standard specifications of the city for public sewers and shall be approved by the plumbing inspector and city engineer. Manholes shall be located not less than twenty-five feet from any building. (Ord. 61-4380 §1(part), 1978.)

19.20.020 Material, joints and connections. All building sanitary and storm sewer piping extending from a public sewer or other disposal terminal to within three to five feet of the outside foundation walls shall be of material, joints and connections approved in the Wisconsin Administrative Code (WAC). The disposal terminal shall be described as the end of the sewer service lateral or private sewage disposal system; in the event no lateral has been installed, it shall be the city sewer main. A building sanitary or storm sewer connection to a private or public main sanitary or storm sewer shall conform to sections 19.20.050 and 19.20.070 of this chapter. (Ord. 61-4380 §1(part), 1978.)

19.20.030 Size. The size of building sewers shall be determined by the provisions of WAC. (Ord. 61-4380 §1(part), 1978.)

19.20.040 Draining of waters into sanitary sewers. The downspout or roof drain of any building, any air conditioner, or other clearwater cooling device, any cistern overflow, or any groundwater drain shall not be connected to any sanitary sewer, nor shall rain or surface water be drained directly or indirectly into any sanitary sewer:

(a) Disconnection. The owner of any building or land wherein there is a violation of the provisions of this section shall cause the violation to be corrected within six months after being notified in writing by the plumbing inspector, whose duty it shall be to enforce this section.

(b) Drainage. All drainage of waters enumerated in this section shall be made either directly into a storm sewer or into a public street or alley beyond the curb line, subject to the approval of the plumbing inspector. No person shall permit the drainage of water across any sidewalk or public area so as to cause or tend to cause any hazard or danger to pedestrians or users thereof. (Ord. 61-4380 §1(part), 1978.)

19.20.050 Connection to sewer mains. No person shall make a connection of any kind to a public sanitary or storm sewer, or replace or reconstruct any sanitary or storm sewer lateral without a permit from the plumbing inspector. Connections to any sanitary or storm sewer main pipe shall be done by city employees or their designees. Connections to manholes shall be performed privately with inspection by city employees. (Ord. 61-4778 §1(part), 1992; Ord. 61-4428 §1, 1979; Ord. 61-4380 §1(part), 1978.)

19.20.060 Location. The plumbing inspector, with the cooperation of the water and sewerage utilities, shall keep a proper sewer connection record in a book, card index, or plat provided for that purpose showing the location of the lot, the master plumber proposing to lay the sewer or drain, and of the exact location of the public sewer to each drain or sewer so laid. Information concerning the sizes, location and depth of public and private sewers or drains and the position of the branch, junction and appurtenances will be furnished by the water and sewerage utilities. All reasonable care will be taken to ensure the correctness of such information, but such correctness will not be guaranteed under any circumstances. When in accordance with the measurements furnished, the junction is not found within three feet of the point designated, an approved Y or T fitting shall be used and such connection shall be made under the direction of the plumbing inspector or designee in accordance with 19.20.050 of this Chapter. (When sewer laterals are not in the same trench as the water lateral, the installer of the lateral shall report to the utility the location of the lateral referenced from permanent points, i.e., property corners, manholes, hydrants, etc. In all cases, when the lateral is installed for future use a two-inch by four-inch board shall be placed at the end of the lateral to reach the ground surface, clearly marking the location of the pipe.) (Ord. 61-4778 §1(part), 1992; Ord. 61-4380 §1(part), 1978.)

19.20.070 Connection requirements. (a) Size. The connection shall be of the saddle type. The fitting used in the connection shall be made in such a manner as to ensure that no protrusion of the fitting into the main sewer pipe will result. The connector shall fit perfectly the contour of the inside of the sewer and shall be sufficiently designed to fit the particular size main sewer pipe into which the connection is made. The hole shall be of such size to provide one-eighth inch clearance between the outside of the fitting and the hole. The space so provided shall be completely filled with cement grout. The space between the shoulder of the fitting and the face of the main sewer pipe shall be one-eighth inch thick and this space shall be completely filled with cement grout. The connection shall be encased in concrete.

(b) Fitting. The fitting shall be of cast iron, concrete, vitrified clay, asbestos cement, plastic, bituminous fibre pipe, or other approved materials, and shall be capable of receiving the type of pipe used for the building sewer lateral.

(c) Fees. All taps will be billed on time and material basis. In cases, whereby the utility is inspecting the installation a flat fee of twenty-five dollars will be assessed in addition to the normal permit fees. (Ord. 61-4778 §1(part), 1992; Ord. 61-4428 §§2, 3, 4, 1979; Ord. 61-4380 §1(part), 1978.)

19.20.080 Drain ends protected. The ends of all sanitary sewer pipes not immediately connected shall be securely closed with a plug so as to prevent the introduction of sand, earth or drainage from an excavation. The ends of all sewer laterals installed for future use shall be sealed with a plug or cap of the same material as the lateral. (Ord. 61-4380 §1(part), 1978.)

19.20.090 Prohibited location. No water or sewer lateral, water service, or building sewer shall extend over or through any property description except the property served. Access shall be through a public right-of-way. (Ord. 61-4380 §1(part), 1978.)

19.20.100 Defective or inferior pipe prohibited. No person shall connect with any public sewer any pipe that is cracked, damaged, or of any inferior make or quality. Should any person furnish pipe of an inferior make or quality to connect with a public sewer, the master plumber shall refuse to install the same and shall immediately notify the plumbing inspector, who shall require that necessary change be made so as to conform with this chapter. (Ord. 61-4380 §1(part), 1978.)

19.20.110 Old pipe or drain. Whenever necessary to disturb a drain or sewer in actual use, the same shall not be obstructed nor discontinued without special permission of the plumbing inspector; and it is unlawful to make any new connections with or extensions to any old drain without permission of the plumbing inspector. (Ord. 61-4380 §1 (part), 1978.)

19.20.120 Use of sewers. No person shall deposit in any sewer or drain, garbage, gasoline, tar, grease, waste oil, rags, or other substances likely to cause obstruction, nuisance, or explosion therein, or to do any act which may cause injury thereto. Any person who violates any provisions of this section shall, in addition to the penalty prescribed in this chapter, be liable to the city for the cost of removing such obstruction and of repairing injury resulting therefrom. This section is in addition to and shall be read with Chapter 13.62 of this code. (Ord. 61-4380 §1(part), 1978.)

19.20.125 External Grease Interceptors. External grease interceptors shall be installed and maintained for all new restaurants, large kitchen operations, fast food establishments, etc. Existing businesses under extensive remodeling and where grease problems have been documented, the plumbing inspector may require installation of exterior grease interceptors as a condition of a plumbing permit. (Ord. 61-5121 §1, 2001, File No. 01-0615.)

19.20.130 Shoring of trenches. Whenever there is danger of caving, the sides of all trenches shall be supported with adequate sheeting and braces to comply with Industrial Commission Regulations, Ind. 6.01-6.02-6.03-6.06-6.12-6.21, WAC, a copy of which shall be on file in the city clerk's office. (Ord. 61-4380 §1(part), 1978.)

19.20.140 Backfilling (a) The backfilling of all trenches to a depth of twelve inches over the pipe shall comply with WAC, and shall be the direct responsibility of the plumbing inspector.

(b) The remainder of the backfilling of that portion of trenches within the public right-of-way, to the property side of the sidewalk line, shall be the responsibility of the excavating contractor and shall be as follows:

(1) The remainder of the backfilling, after foundations are prepared, with proper procedures as detailed in WAC, may consist of clay type soils with proper moisture content for maximum compaction, drying or wetting soils as needed and with mechanical compaction at time of back-filling. Backfilling shall be mechanically compacted in layers not to exceed eight inches in depth. The contractor shall have a vibratory-type compactor on the job site, in operating condition, before starting to backfill with clay type soils. Other backfill materials shall be limited to granular soil materials or rocky substances not exceeding one cubic foot in volume. Rocks shall be entirely enveloped by fine material. Compaction shall be to a minimum of ninety-five percent Proctor Density. Sandy soil shall have optimum moisture when mechanically compacted.

(2) Backfilling for pipe sewers may be done immediately after the placing by hand of fine backfill. Such backfilling may be carried on from the top of the trench by mechanical means, or by dumping directly from trucks, or by hand. The backfill in no case shall be dropped from such height or in such volume that its impact upon the sewer structure will cause damage.

(3) Trenches, where excavated material is sandy or granular, or where, at the option of the inspector, sandy or granular material is specially imported for backfill purposes, compaction may be obtained by jetting. Sandy or granular material shall pass a four-inch square sieve and shall not contain more than five percent of material which will pass a #200 sieve. It shall be of such character as to readily compact with water and shall permit excess water to pass through it quickly. Soils jetted shall be compacted to a minimum of ninety-five percent Proctor Density;

(A) The hose shall have a minimum diameter of two inches, and the pipe nozzle a minimum diameter of one and one-half inches and a minimum length of four feet. A hydrant regulating valve shall be provided by the contractor so that the hydrant, if one is used, can be fully opened while jetting is proceeding.

(B) During the jetting operations, the nozzles shall be inserted as deeply into the backfill as is possible without damaging the sewer structure or its foundation. The insertions shall be made at intervals of five feet or less and maintained unless the backfilling is saturated. Depressions caused by flooding shall be backfilled until there is no further settlement. Where city water is not available, mechanical compaction shall be used.

(Ord. 61-4380 §1(part), 1978.)

19.20.150 Maintenance. No person shall file any claim against the city for costs or damages for any repairs, replacements, or interrupted service of any sewer lateral. It shall be the responsibility of the owner of the property being served by any sewer lateral to maintain the entire lateral from a point including the connection to the sewer main and extending through the entire public right-of-way to the property line. (Ord. 61-4380 §1 (part), 1978.)

Chapter 19.24

CONNECTION TO WATER MAIN[2]

Sections:

19.24.010 Permit required. No connection to any public water main shall be made without a permit from the plumbing inspector. All such work shall be executed in compliance with city ordinances, laws and regulations of the state, or by any agency thereof. (Ord. 61-4380 §1 (part), 1978.)

19.24.020 Separate water service. Every building shall have a separate and independent connection with a public water main where provided in a public right-of-way abutting the property. (Ord. 61-4380 §1(part), 1978.)

19.24.030 Material. The underground water service pipe from the curb stop or a private water supply system to any building shall be of type "K" copper water tube or ductile iron water main. On a case by case basis, the plumbing inspector may consider other types of piping for underground water service pipe. Thawing of this type of piping will solely be the responsibility of the property owner or tenant. (Ord. 61-5119 §1, 2001, File No. 01-0613; Ord. 61-4380 §1(part), 1978.)

19.24.040 Size. The water service or building supply pipe to any building shall be sized in accordance with Wausau water utility regulations. (See 13.16.070 of this code.) The minimum size shall be one inch.

Water services accommodating future uses on existing vacant property shall be sized for the maximum land use of the property. The land use is to be determined by the Wausau municipal zoning ordinance in effect at the time of the installation of the water services. (Ord. 61-4380 §1(part), 1978.)

19.24.050 Valve controls. Service controls equal in size to the service piping shall include a valve shutoff at the main, a curb stop or valve at the curb, or privately-owned pump, and a gate, ball, or plug valve inside the foundation wall of each building where the meter is installed. A gate, ball, or plug valve equal to or larger than the meter size shall be provided on the outlet side of the

---

[2] For compulsory connection, see Chapter 13.16 of this code.

meter. Service piping of one and one-half inches or over shall have a full size bypass around meter. (Ord. 61-4380 §1 (part), 1978.)

19.24.060 Authority to control water service. No plumber shall turn on, or leave turned on, any water service curb stop after the completion and trial of his work, which for any reason has been turned off by the water department. No unauthorized individual shall turn water on or off after it has been turned on or off from the given service. (Ord. 61-4380 §1(part), 1978.)

19.24.070 Compulsory connection to water. When notified, the owner of any building intended for human habitation or occupancy abutting on any street, alley, or other thoroughfare in which a public water main has been extended and is available for service, shall cause to be made a water supply connection thereto, and shall abandon any existing source of water except as may be permitted by special permit signed by the plumbing inspector. In all cases connection to public water supply will occur within one year after public water becomes available. If abandonment of private wells are an explicit condition of DNR approval for new construction of sanitary sewers per Wisconsin Administrative Code requirements, the Wausau sewerage utility will ensure the proper abandonment of private wells at no expense to the property owner. This will only apply to private wells within fifty feet of sixteen-inch or larger sanitary sewers which are constructed in the future. In these cases the property owner will be required to make immediate connection to the public water supply at his own expense as defined per this section in order to permit the timely abandonment of the private wells. Property owners affected by this provision will be notified no less than ninety days prior to this requirement. (See also Chapter 13.16 of this code.) (Ord. 61-4544 §4, 1984; Ord. 61-4380 §1(part), 1978.)

Chapter 19.30

PRIVATE WATER WELLS

Sections:

19.30.010 Purpose. This chapter regulates the construction and continued use of private wells within the city where public water service is provided. This chapter is also intended to prevent contamination of groundwater and to protect public health, safety and welfare by assuring that unused, unsafe or noncomplying wells or wells which may serve as conduits for contamination or wells which may be illegally cross-connected to the public water system are properly abandoned. (Ord. 61-4738 §1(part), 1991.)

19.30.020 Definitions. For the purpose of this chapter:

(a) "Municipal water system" means Wausau Water Works.

(b) "Noncomplying" means a well or pump installation which does not comply with the provisions of Chapter NR 812, Wisconsin Administrative Code, in effect at the time the well was constructed, a potential contamination source was installed, the pump was installed or work was done on either the well or pump installation.

(c) "Pump installation" means the pump and related equipment used for withdrawing water from a well including the discharge piping, the underground connections, pitless adapters, pressure tanks, pits, sampling faucets and well seals or caps.

(d) "Unsafe" means a well or pump installation which produces water which is bacteriologically contaminated or contaminated with substances exceeding the standards of Chs. NR 109 or 140, Wisconsin Administrative Code, or for which a health advisory has been issued by the Department of Natural Resources.

(e) "Unused" means a well or pump installation which is not in use or does not have a functional pumping system.

(f) "Well" means an excavation or opening into the ground made by digging, boring, drilling, driving, or other methods for the purpose of obtaining groundwater for consumption or other use.

(g) "Well abandonment" means the filling and sealing of a well according to the provisions of Ch. NR 812, Wisconsin Administrative Code. (Ord. 61-5126 §1(part), 2001, File No. 01-0833; Ord. 61-4738 §1(part), 1991.)

19.30.030 Private well permit. The plumbing inspector may grant a permit to a private well owner to operate a well for a period not to exceed five years, providing conditions of this code and other applicable state and health requirements are met. An owner may request an initial or renewal of a private well permit on an application form provided by Wausau Water Works. The permit request must clearly state the purpose of the well and ensure the following conditions have been met:

(a) The well and pump installation meet or are upgraded to meet the requirements of Ch. NR 812, Wisconsin Administrative Code;

(b) The well has been tested and verified bacteriologically safe as required by Wisconsin Administrative Code NR 811.10(2). The lab reports shall be attached to the permit application in cases of renewals;

(c) There are no cross-connections between the well and pump system and the municipal water system;

(d) The permit application for existing wells shall be reviewed by the utility director or environmental engineer prior to the permit issuance by the plumbing inspector. Requests for permits for new private water supply wells to be constructed within the city limits should be reviewed by the commission. (Ord. 61-5126 §1(part), 2001, File No. 01-0833; Ord. 61-5021 §1, 1999; Ord. 61-4738 §1(part), 1991.)

19.30.040 Private well abandonment. All wells located on premises served by the municipal water system shall be abandoned in accordance with the terms of this code and Ch. NR 812, Wisconsin Administrative Code, by August 31, 1991, or no later than one year from the date of connection to the municipal water system, whichever occurs last, unless a private well permit has been obtained by the well owner from the city as specified by this code.

All wells abandoned under the jurisdiction of this code or rule shall be abandoned according to the procedures and methods of Ch. NR 812, Wisconsin Administrative Code. All debris, pump, piping, unsealed liners and any other obstructions which may interfere with sealing operations shall be removed prior to abandonment.

An abandonment report form, supplied by the Department of Natural Resources, shall be submitted by the well owner to Wausau Water Works and the Department of Natural Resources within ten days of the completion of the well abandonment. (Ord. 61-5126 §1(part), 2001, File No. 01-0833; Ord. 61-4738 §1(part), 1991.)

19.30.050 Penalties. Any well owner violating any provision of this chapter shall upon conviction be punished by forfeiture of not less than twenty dollars nor more than one hundred dollars and the cost of prosecution. Each day of violation is a separate offense. If any person fails to comply with this chapter for more than ten days after receiving written notice of the violation, the

municipality may impose a penalty and cause the well abandonment to be performed and the expense to be assessed as a special tax against the property. (Ord. 61-4738 §1(part), 1991.)

Chapter 19.32

SWIMMING POOLS

Sections:

19.32.010 Public—Permit required. Before commencing the installation of a public swimming pool, a permit authorizing plumbing, mechanical and drainage work shall be obtained from the plumbing inspector. The application for a permit shall be accompanied by plans and specifications together with written approval from the State Board of Health, copies of which shall be filed with the plumbing inspector. (Ord. 61-4380 §1(part), 1978.)

19.32.020 Private—Permit required. Before commencing the installation of a private residential swimming pool, a permit authorizing plumbing, mechanical and drainage work shall be obtained from the plumbing inspector. The application for a permit shall be accompanied by plans and specifications showing the following in sufficient detail:

(a) Pool dimensions and volume of water in gallons;

(b) Type and size of filter system, filtration and backwash capabilities;

(c) Pool piping layout, showing pipe sizes, valves and type of materials;

(d) The rated capacity and head at filtration and backwash flows of the pool pump in gallons per minute with size and type of motor;

(e) Location and type of waste water disposal system. (Ord. 61-4380 §1(part), 1978.)

Chapter 19.36

INDIVIDUAL SEWAGE DISPOSAL SYSTEMS

Sections:

19.36.010 Allowable use. Individual sewage disposal systems may be constructed where no public sewage system is available or likely to become available within a reasonable time. (Ord. 61-4380 §1(part), 1978.)

19.36.020 Permit required—Restrictions. (a) Permit to construct an individual sewage disposal system shall be obtained from the plumbing inspector.

(b) No permit to construct a private sewage disposal system shall be granted without written approval from the board of public works and the water and sewerage utility commission. (Ord. 61-4380 §1(part), 1978.)

19.36.030 Applications for permits. Applications for permits shall be in writing and include the following:

(a) Name and address of applicant;

(b) Legal description of property;

(c) Percolation test as required in Sections H62 and H65 of the Wisconsin Administrative Code;

(d) Complete plan of the proposed facility showing the location and size of all proposed disposal facilities, location of water supplies, buildings and lot lines. (Ord. 61-4380 §1(part), 1978.)

19.36.040 Construction. The entire disposal system shall comply with Section H62 of the Wisconsin Administrative Code. (Ord. 61-4380 §1(part), 1978.)

19.36.050 Minimum size lots. Under the absorption field requirements, it is apparent that in some areas individual sewage disposal systems cannot be used unless more than one lot is made available for this purpose, or alternate lots are held vacant until such time as public sewer systems have been installed, at which time additional construction on the remaining lots could be permitted. (Ord. 61-4380 §1(part), 1978.)

19.36.060 Industrial and commercial establishments. Individual sewage disposal systems as defined in this chapter involving septic tanks and absorption field shall be permitted for industrial and commercial establishments. Private disposal systems for such uses shall be by design of a competent registered engineer specializing in sanitation, plans for the installation having been approved by state and local authorities. (Ord. 61-4380 §1(part), 1978.)

19.36.070 Sewer system available. Private systems for sewage disposal shall be discontinued within one year after public sewers become available. The building sewer shall be discontinued from the old system and be reconnected with the public sewer. All abandoned septic tanks and seepage pits shall have the contents removed and shall be immediately filled with sand, gravel, or similar material. (Ord. 61-4380 §1(part), 1978.)

Chapter 19.40

CROSS-CONNECTION TO WATER SERVICE

Sections:

19.40.010 Cross-connection regulations—Municipal code. See Chapter 13.13 of this code. (Ord. 61-4666 §1(part), 1989.)

19.40.020 Enforcement authority. The plumbing inspector has the full authority and responsibility to enforce Chapter 13.13 of this code and the State Plumbing Code with reference to cross-connections. (Ord. 61-4666 §1(part), 1989.)

19.40.030 State provisions adopted. The city adopts by reference the State Plumbing Code of Wisconsin, Chapter ILHR 82 of the Wisconsin Administrative Code concerning cross-connections. (Ord. 61-4666 §1(part), 1989.)

Chapter 19.44

SPECIAL PROVISIONS

Sections:

19.44.010 Connections to water distribution system. No valve or connection of any kind shall be tapped into the wall of any domestic water pipe, nor shall any saddle type of connection device be used except on a valved branch provided for this purpose. (Ord. 61-4380 §1(part), 1978.)

19.44.020 Trailer wastes. No person shall discharge the effluent from any trailer privy or disposal collector used in trailers for human habitation into any plumbing fixture not specifically designed for the reception of such effluent. (Ord. 61-4380 §1(part), 1978.)

19.44.030 Abandoned water and sewer service. Before a building is moved or demolished, the water services and building sewers shall be located at the property line. The water service and sewer shall be sealed off in the presence of the plumbing inspector. The plugs or seals shall not be covered until an approval has been given by the plumbing inspector. (Ord. 61-4380 §1(part), 1978.)

19.44.040 Parking lots and surface drains. (a) All parking lots shall meet the requirements of Chapter 15.52 of this code, and shall be provided with adequate yard drainage. Where a storm sewer is available and the lot is greater than seven thousand five hundred square feet in area, the lot shall be provided with interior yard drainage and shall be connected to the storm sewer. In all cases, drainage shall be to a terminal designated and approved by the city engineer and the plumbing inspector.

(b) The size of the storm sewer serving a parking lot shall be determined by the area to be drained and be approved by the city engineer.

(c) Catch basins and grate areas shall be to the standards of the city specifications. (Ord. 61-4739 §1, 1991; Ord. 61-4380 §1(part), 1978.)

19.44.050 Catch basins and receptacles. All storm or clearwater drain pipes that must be left open to drain basement areas, yards, gardens or other places shall be connected with suitable catch basins of brick, vitrified clay pipe, concrete or other suitable substance, the bottom of which

shall not be less than one-half foot below the bottom of the outlet pipe. Every such catch basin or receptacle shall be placed inside the lot line of the lot or lots to be drained. The installation of such basins or connections shall have the approval of the plumbing inspector and city engineer. (Ord. 61-4380 §1(part), 1978.)

19.44.060 Subsoil or footing drains. Where footing or subsoil drains are installed without or within the walls or footings of any building, they shall be discharged to an accessible catch basin not less than eighteen inches deep and twelve inches in diameter. The rim of such catch basin shall terminate not less than two inches above the basement floor and shall be located not less than ten feet from any building drain or branch. No catch basin will be required when footing or subsoil drains can be discharged to the storm sewer, a seepage pit or to the ground surface by gravity; provided, that the discharge point is within the property boundaries or to a public gutter and that no hazard or nuisance is created. (Ord. 61-4380 §1(part), 1978.)

19.44.070 Catch basin ejectors. When there are indications that indoor catch basins receiving the discharge of subsoil drains will discharge indirectly to the sanitary sewer, a sump pump, or ejector shall be installed to elevate the contents of the basin to a proper discharge point. (Ord. 61-4380 §1(part), 1978.)

19.44.080 Sump pumps. All sump pumps installed for the purpose of discharging clear waters from foundation drains and ground infiltration and where the building is not serviced by gravity shall either discharge into an underground conduit leading to a drainage ditch, gutter, dry well, or shall discharge onto the ground at least one foot or more out from the building and above permanent grade in such manner as not to create a nuisance. No sump discharge shall be allowed to flow on or across a public sidewalk. The discharge pipe shall not be reduced in size from the discharge opening left by the manufacturer. The discharge pipe from the pump opening to the outside of the building shall be rigidly secured. (Ord. 61-4380 §1 (part), 1978.)

19.44.090 Roof drains. Roof drains may discharge on the ground, provided such discharge does not create a nuisance. (Ord. 61-4380 §1(part), 1978.)

19.44.100 Mobile home and trailer camp regulations. (a) Mobile home parks shall be served by a private main sanitary sewer connected to the municipal sanitary sewer system. The connection from an individual mobile home to the private main sanitary sewer shall be adequately trapped and vented to conform with regulations set forth by state and local authorities.

(b) The size of the water service for a mobile home and trailer camp shall be determined by the number of units served and shall conform to the recommendations of the municipal water department superintendent, and the plumbing inspector. (Ord. 61-4380 §1(part), 1978.)

[INTENTIONALLY BLANK]

Chapter 19.48

INSURANCE

Sections:

19.48.010 Required. Before permits are issued, each master plumber shall have in full force and effect public liability insurance in the amount of one hundred thousand dollars for each injury, three hundred thousand dollars personal injury for each accident and one hundred thousand dollars property damage and Workmen's Compensation insurance. Certificates of such insurance shall be filed with the city clerk, together with a statement by the insurance company, showing that such policies will not be canceled without extending ten days' written notice to the city clerk. No permits shall be lawfully issued and no plumbing work shall be installed or worked on unless such policies are in full force and effect. (Ord. 61-4380 §1(part), 1978.)

19.48.020 Exceptions. The requirements of section 19.48.010 of this chapter shall not apply to installed plumbing manufactured for shipment out of the city, to property owners or to licensed and registered maintenance plumbers obtaining permits for plumbing work within the complex of their employers business enterprise only. Section 19.48.010 shall apply to any work performed in a public right-of-way. (Ord. 61-4380 §1(part), 1978.)

Chapter 19.52

PENALTIES

Sections:

19.52.010 Penalty for violation. Any person who violates any provision of this title shall be subject to a penalty as provided in section 1.01.110 of this code. Each violation and each day on which a violation of any provision of this title occurs or continues shall constitute a separate offense. (Ord. 61-4380 §1(part), 1978.)

ATTACHMENT 6

SIEMENS

September 29, 2009

City of Wausau
407 Grant Street
Wausau, WI 54403

Attn: Richard Boers

REPORT NO.: 0909255 **PROJECT NO.: PWS# 73701023**

Please find enclosed the analytical report, including the Sample Summary, Sample Narrative and Chain of Custody for your sample set received September 14, 2009.

All analyses were performed in accordance with NELAC Standards using approved methods as indicated on this report.

If you have any questions about the results, please call. Thank you for using Siemens Water Technologies for your analytical needs.

Sincerely,

Siemens Water Technologies

James R. Salkowski

James Salkowski
Lab Director
Enviroscan Analytical™ Services

ELECTRONICALLY REPORTED
TO WIS DNR 9 / 29 / 09

I certify that the data contained in this report has been generated and reviewed in accordance with the Siemens Water Technologies Quality Assurance Program. Exceptions, if any, are discussed in the sample narrative. Samples will be retained for 30 days from the date of this report, then disposed in an appropriate manner. Siemens Water Technologies Corp. reserves the right to return samples identified as hazardous. Release of this Final Report is authorized as verified by the following signature.

Reviewed by: _____

Certifications:
Wisconsin 737053130
Minnesota 055-999-302
Illinois 100317

ACCREDITED IN ACCORDANCE WITH ACLASS

Siemens Water Technologies Corp.
301 West Military Road
Rothschild, WI 54474
Tel: 800-338-7226
Fax: 715-355-3221
www.siemens.com/enviroscan

The total number of pages in this report, including this page is 13.

SIEMENS

SAMPLE SUMMARY

Lab Id	Client Sample Id	Date/Time	Matrix
0909255-01	Entry pt 300	09/14/09 07:30	Drinking Water
0909255-02	Entry pt 200	09/14/09 12:30	Drinking Water
0909255-03	Distribution - The Plaza	09/14/09 13:00	Drinking Water
0909255-04	Distribution - Van Ert Electric	09/14/09 13:15	Drinking Water
0909255-05	Trip Blank	09/14/09 00:00	Water
0909255-06	Trip Blank	09/14/09 00:00	Water

SIEMENS

City of Wausau
407 Grant Street
Wausau, WI 54403

Attn: Richard Boers

PROJECT NO. : PWS# 73701023
REPORT NO. : 0909255
DATE REC'D : 09/14/09 13:55
REPORT DATE : 09/29/09 10:42
PREPARED BY : JRS

Sample ID: Entry pt 300 | Matrix: Drinking Water | Sample Date/Time: 09/14/09 7:30 | Lab No. : 0909255-01

	USEPA MCL ( )	Results	Units	LOD	LOQ	Dilution Factor	Qualifiers	Date Analyzed	Analyst
EPA 300.0 - Total									
Total Nitrate as N	(10)	0.79	mg/L	0.10	0.33	1		09/14/09 20:00	BMS
EPA 524.2									
1,1,1,2-Tetrachloroethane	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
1,1,1-Trichloroethane	(200)	ND	ug/L	0.50	1.70	1		09/16/09	MPM
1,1,2,2-Tetrachloroethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,1,2-Trichloroethane	(5)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,1-Dichloroethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,1-Dichloroethylene	(7)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,1-Dichloropropylene	-	ND	ug/L	0.80	2.70	1		09/16/09	MPM
1,2,3-Trichloropropane	-	ND	ug/L	1.00	3.30	1		09/16/09	MPM
1,2,4-Trichlorobenzene	(70)	ND	ug/L	0.50	1.70	1		09/16/09	MPM
1,2-Dichlorobenzene	(600)	ND	ug/L	0.80	2.70	1		09/16/09	MPM
1,2-Dichloroethane	(5)	ND	ug/L	0.30	1.00	1		09/16/09	MPM
1,2-Dichloropropane	(5)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,3-Dichlorobenzene	-	ND	ug/L	0.20	0.67	1		09/16/09	MPM
1,3-Dichloropropane	-	ND	ug/L	0.20	0.67	1		09/16/09	MPM
1,3-Dichloropropylene (Total)	-	ND	ug/L	0.40	1.33	1		09/16/09	MPM
1,4-Dichlorobenzene	(75)	ND	ug/L	0.80	2.70	1		09/16/09	MPM
2,2-Dichloropropane	-	ND	ug/L	1.00	3.30	1		09/16/09	MPM
2-Chlorotoluene	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
4-Chlorotoluene	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
Benzene	(5)	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Bromobenzene	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
Bromodichloromethane	(80)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Bromoform	(80)	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Bromomethane	-	ND	ug/L	1.00	3.30	1		09/16/09	MPM
Carbon Tetrachloride	(5)	ND	ug/L	0.30	1.00	1		09/16/09	MPM
Chlorobenzene	(100)	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Chloroethane	-	ND	ug/L	0.70	2.30	1		09/16/09	MPM
Chloroform	(80)	5.65	ug/L	0.20	0.67	1		09/16/09	MPM
Chloromethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
cis-1,2-Dichloroethylene	(70)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Dibromochloromethane	(80)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Dibromomethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Ethylbenzene	(700)	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Methylene Chloride	(5)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Styrene	(100)	ND	ug/L	0.10	0.50	1		09/16/09	MPM

SIEMENS

City of Wausau
407 Grant Street
Wausau, WI 54403

Attn: Richard Boers

PROJECT NO. : PWS# 73701023
REPORT NO. : 0909255
DATE REC'D : 09/14/09 13:55
REPORT DATE : 09/29/09 10:42
PREPARED BY : JRS

Sample ID: **Entry pt 300** Matrix: **Drinking Water** Sample Date/Time: **09/14/09 7:30** Lab No. : **0909255-01**

	USEPA MCL ( )	Results	Units	LOD	LOQ	Dilution Factor	Qualifiers	Date Analyzed	Analyst
EPA 524.2 Continued									
Tetrachloroethene	(5)	ND	ug/L	0.30	1.00	1		09/16/09	MPM
Toluene	(1000)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
trans-1,2-Dichloroethylene	(100)	ND	ug/L	0.50	1.70	1		09/16/09	MPM
Trichloroethene	(5)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Vinyl chloride	(0.2)	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Xylenes, (Total)	(1000)	ND	ug/L	1.00	1.00	1		09/16/09	MPM

SIEMENS

City of Wausau
407 Grant Street
Wausau, WI 54403

Attn: Richard Boers

PROJECT NO. : PWS# 73701023
REPORT NO. : 0909255
DATE REC'D : 09/14/09 13:55
REPORT DATE : 09/29/09 10:42
PREPARED BY : JRS

Sample ID: **Entry pt 200** Matrix: **Drinking Water** Sample Date/Time: **09/14/09 12:30** Lab No. : **0909255-02**

	USEPA MCL ( )	Results	Units	LOD	LOQ	Dilution Factor	Qualifiers	Date Analyzed	Analyst
EPA 300.0 - Total									
Total Nitrate as N	(10)	0.51	mg/L	0.10	0.33	1		09/14/09 20:14	BMS
EPA 524.2									
1,1,1,2-Tetrachloroethane	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
1,1,1-Trichloroethane	(200)	ND	ug/L	0.50	1.70	1		09/16/09	MPM
1,1,2,2-Tetrachloroethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,1,2-Trichloroethane	(5)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,1-Dichloroethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,1-Dichloroethylene	(7)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,1-Dichloropropylene	-	ND	ug/L	0.80	2.70	1		09/16/09	MPM
1,2,3-Trichloropropane	-	ND	ug/L	1.00	3.30	1		09/16/09	MPM
1,2,4-Trichlorobenzene	(70)	ND	ug/L	0.50	1.70	1		09/16/09	MPM
1,2-Dichlorobenzene	(600)	ND	ug/L	0.80	2.70	1		09/16/09	MPM
1,2-Dichloroethane	(5)	ND	ug/L	0.30	1.00	1		09/16/09	MPM
1,2-Dichloropropane	(5)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,3-Dichlorobenzene	-	ND	ug/L	0.20	0.67	1		09/16/09	MPM
1,3-Dichloropropane	-	ND	ug/L	0.20	0.67	1		09/16/09	MPM
1,3-Dichloropropylene (Total)	-	ND	ug/L	0.40	1.33	1		09/16/09	MPM
1,4-Dichlorobenzene	(75)	ND	ug/L	0.80	2.70	1		09/16/09	MPM
2,2-Dichloropropane	-	ND	ug/L	1.00	3.30	1		09/16/09	MPM
2-Chlorotoluene	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
4-Chlorotoluene	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
Benzene	(5)	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Bromobenzene	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
Bromodichloromethane	(80)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Bromoform	(80)	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Bromomethane	-	ND	ug/L	1.00	3.30	1		09/16/09	MPM
Carbon Tetrachloride	(5)	ND	ug/L	0.30	1.00	1		09/16/09	MPM
Chlorobenzene	(100)	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Chloroethane	-	ND	ug/L	0.70	2.30	1		09/16/09	MPM
Chloroform	(80)	7.30	ug/L	0.20	0.67	1		09/16/09	MPM
Chloromethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
cis-1,2-Dichloroethylene	(70)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Dibromochloromethane	(80)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Dibromomethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Ethylbenzene	(700)	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Methylene Chloride	(5)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Styrene	(100)	ND	ug/L	0.10	0.50	1		09/16/09	MPM

SIEMENS

City of Wausau
407 Grant Street
Wausau, WI 54403

Attn: Richard Boers

PROJECT NO. : PWS# 73701023
REPORT NO. : 0909255
DATE REC'D : 09/14/09 13:55
REPORT DATE : 09/29/09 10:42
PREPARED BY : JRS

Sample ID: **Entry pt 200** Matrix: **Drinking Water** Sample Date/Time: **09/14/09 12:30** Lab No. : **0909255-02**

	USEPA MCL ( )	Results	Units	LOD	LOQ	Dilution Factor	Qualifiers	Date Analyzed	Analyst
EPA 524.2 Continued									
Tetrachloroethene	(5)	ND	ug/L	0.30	1.00	1		09/16/09	MPM
Toluene	(1000)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
trans-1,2-Dichloroethylene	(100)	ND	ug/L	0.50	1.70	1		09/16/09	MPM
Trichloroethene	(5)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Vinyl chloride	(0.2)	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Xylenes, (Total)	(1000)	ND	ug/L	1.00	1.00	1		09/16/09	MPM

SIEMENS

City of Wausau
407 Grant Street
Wausau, WI 54403

Attn: Richard Boers

PROJECT NO. : PWS# 73701023
REPORT NO. : 0909255
DATE REC'D : 09/14/09 13:55
REPORT DATE : 09/29/09 10:42
PREPARED BY : JRS

Sample ID: **Distribution - The Plaza** Matrix: **Drinking Water** Sample Date/Time: **09/14/09 13:00** Lab No. : **0909255-03**

	USEPA MCL ( )	Results	Units	LOD	LOQ	Dilution Factor	Qualifiers	Date Analyzed	Analyst
EPA 524.2									
Bromodichloromethane	(80)	0.47	ug/L	0.40	1.30	1	J	09/16/09	MPM
Bromoform	(80)	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Chloroform	(80)	7.78	ug/L	0.20	0.67	1		09/16/09	MPM
Dibromochloromethane	(80)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
TTHM in Water, (Summation)	(80)	8.25	ug/L	0.40	1.30	1		09/16/09	MPM

SIEMENS

City of Wausau
407 Grant Street
Wausau, WI 54403

Attn: Richard Boers

PROJECT NO. : PWS# 73701023
REPORT NO. : 0909255
DATE REC'D : 09/14/09 13:55
REPORT DATE : 09/29/09 10:42
PREPARED BY : JRS

Sample ID: **Distribution - Van Ert Electric** Matrix: **Drinking Water** Sample Date/Time: **09/14/09 13:15** Lab No. : **0909255-04**

	USEPA MCL ( )	Results	Units	LOD	LOQ	Dilution Factor	Qualifiers	Date Analyzed	Analyst
EPA 524.2									
Bromodichloromethane	(80)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Bromoform	(80)	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Chloroform	(80)	6.40	ug/L	0.20	0.67	1		09/16/09	MPM
Dibromochloromethane	(80)	ND	ug/L	0.40	1.30	1		09/16/09	MPM
TTHM in Water, (Summation)	(80)	6.40	ug/L	0.40	1.30	1		09/16/09	MPM

SIEMENS

City of Wausau
407 Grant Street
Wausau, WI 54403

Attn: Richard Boers

PROJECT NO. : PWS# 73701023
REPORT NO. : 0909255
DATE REC'D : 09/14/09 13:55
REPORT DATE : 09/29/09 10:42
PREPARED BY : JRS

Sample ID: **Trip Blank** Matrix: **Water** Sample Date/Time: **09/14/09 0:00** Lab No. : **0909255-05**

	USEPA MCL ( )	Results	Units	LOD	LOQ	Dilution Factor	Qualifiers	Date Analyzed	Analyst
EPA 524.2									
1,1,1,2-Tetrachloroethane	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
1,1,1-Trichloroethane	-	ND	ug/L	0.50	1.70	1		09/16/09	MPM
1,1,2,2-Tetrachloroethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,1,2-Trichloroethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,1-Dichloroethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,1-Dichloroethylene	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,1-Dichloropropylene	-	ND	ug/L	0.80	2.70	1		09/16/09	MPM
1,2,3-Trichloropropane	-	ND	ug/L	1.00	3.30	1		09/16/09	MPM
1,2,4-Trichlorobenzene	-	ND	ug/L	0.50	1.70	1		09/16/09	MPM
1,2-Dichlorobenzene	-	ND	ug/L	0.80	2.70	1		09/16/09	MPM
1,2-Dichloroethane	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
1,2-Dichloropropane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
1,3-Dichlorobenzene	-	ND	ug/L	0.20	0.67	1		09/16/09	MPM
1,3-Dichloropropane	-	ND	ug/L	0.20	0.67	1		09/16/09	MPM
1,3-Dichloropropylene (Total)	-	ND	ug/L	0.40	1.33	1		09/16/09	MPM
1,4-Dichlorobenzene	-	ND	ug/L	0.80	2.70	1		09/16/09	MPM
2,2-Dichloropropane	-	ND	ug/L	1.00	3.30	1		09/16/09	MPM
2-Chlorotoluene	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
4-Chlorotoluene	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
Benzene	-	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Bromobenzene	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
Bromodichloromethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Bromoform	-	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Bromomethane	-	ND	ug/L	1.00	3.30	1		09/16/09	MPM
Carbon Tetrachloride	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
Chlorobenzene	-	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Chloroethane	-	ND	ug/L	0.70	2.30	1		09/16/09	MPM
Chloroform	-	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Chloromethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
cis-1,2-Dichloroethylene	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Dibromochloromethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Dibromomethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Ethylbenzene	-	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Methylene Chloride	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Styrene	-	ND	ug/L	0.10	0.50	1		09/16/09	MPM
Tetrachloroethene	-	ND	ug/L	0.30	1.00	1		09/16/09	MPM
Toluene	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
trans-1,2-Dichloroethylene	-	ND	ug/L	0.50	1.70	1		09/16/09	MPM

SIEMENS

City of Wausau
407 Grant Street
Wausau, WI 54403

Attn: Richard Boers

PROJECT NO. : PWS# 73701023
REPORT NO. : 0909255
DATE REC'D : 09/14/09 13:55
REPORT DATE : 09/29/09 10:42
PREPARED BY : JRS

Sample ID: **Trip Blank** Matrix: **Water** Sample Date/Time: **09/14/09 0:00** Lab No. : **0909255-05**

	USEPA MCL ( )	Results	Units	LOD	LOQ	Dilution Factor	Qualifiers	Date Analyzed	Analyst
EPA 524.2 Continued									
Trichloroethene	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Vinyl chloride	-	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Xylenes, (Total)	-	ND	ug/L	1.00	1.00	1		09/16/09	MPM

SIEMENS

City of Wausau
407 Grant Street
Wausau, WI 54403

Attn: Richard Boers

PROJECT NO. : PWS# 73701023
REPORT NO. : 0909255
DATE REC'D : 09/14/09 13:55
REPORT DATE : 09/29/09 10:42
PREPARED BY : JRS

Sample ID: **Trip Blank** Matrix: **Water** Sample Date/Time: **09/14/09 0:00** Lab No. : **0909255-06**

	USEPA MCL ( )	Results	Units	LOD	LOQ	Dilution Factor	Qualifiers	Date Analyzed	Analyst
EPA 524.2									
Bromodichloromethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
Bromoform	-	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Chloroform	-	ND	ug/L	0.20	0.67	1		09/16/09	MPM
Dibromochloromethane	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM
TTHM in Water, (Summation)	-	ND	ug/L	0.40	1.30	1		09/16/09	MPM

SIEMENS

Qualifier Descriptions

J	Estimated concentration below laboratory quantitation level.

Definitions

LOD = Limit of Detection (Dilution Corrected)
LOQ = Limit of Quantitation (Dilution Corrected)
ND = Not Detected
COMP = Complete
SUBCON = Subcontracted analysis
mv = millivolts
pci/L = picocuries per Liter
mL/L = milliliters per Liter
mg = milligram

When the word "dry" follows the units on the result page the sample results are dry weight corrected.

LODs and LOQs are dry weight corrected for all soils except WI GRO, EPA 8021 and WI DNR/EPA 8260B methanol and WI DNR methylene chloride preserved soils being reported to the State of Wisconsin.

ug/l = Micrograms per Liter = parts per billion (ppb)
ug/kg = Micrograms per kilogram = parts per billion (ppb)
mg/l = Milligrams per liter = parts per million (ppm)
mg/kg = Milligrams per kilogram = parts per million (ppm)
NOT PRES = Not Present
ppth = Parts per thousand
* = Result outside established limits.
mg/m3 = Milligrams per meter cubed
ng/L = Nanograms per Liter = Parts per trillion(ppt)
> = Greater Than

State of Wisconsin Methanol Soils for WI GRO, WI DNR/EPA 8260B and EPA 8021 are reported to the LOQ.

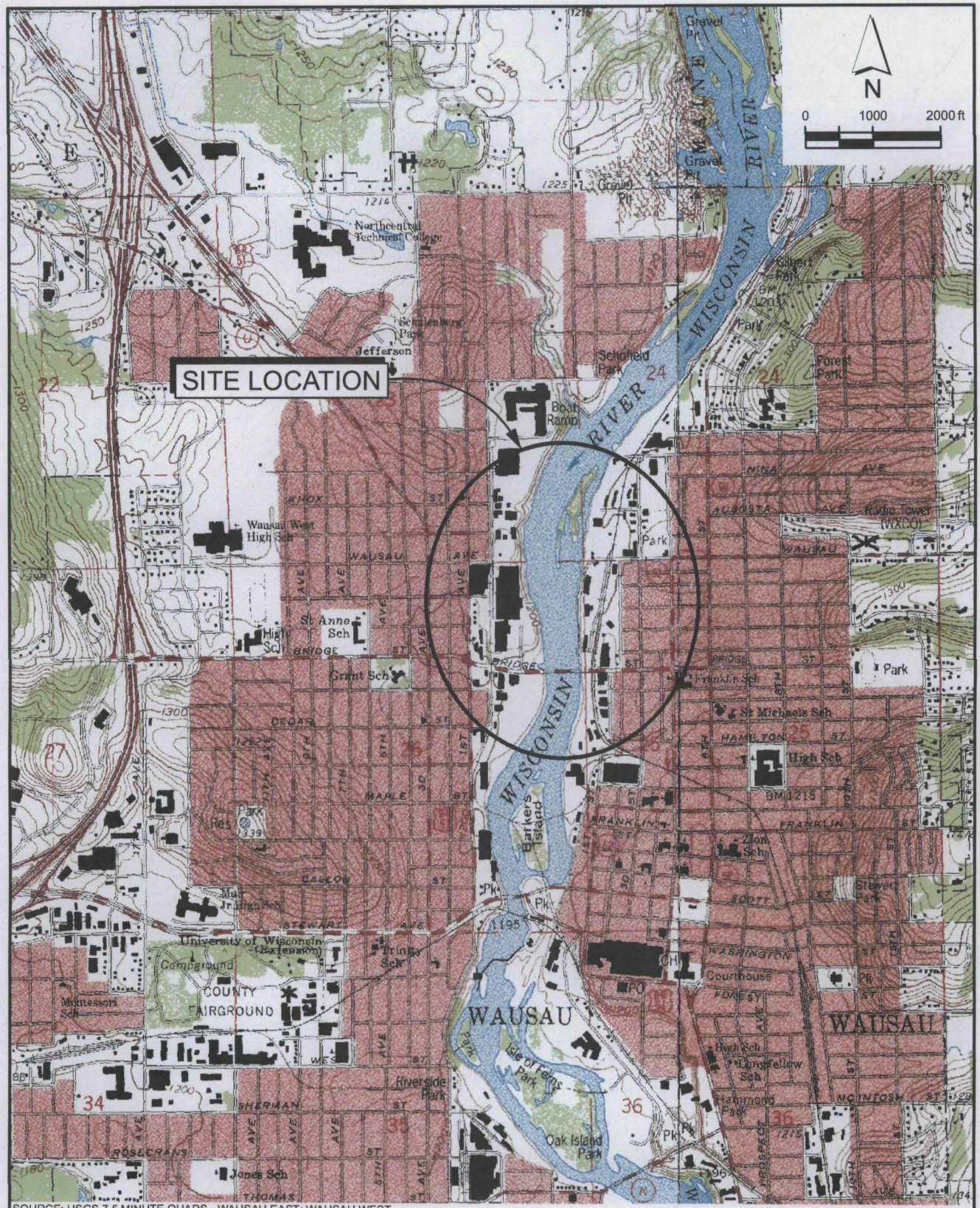
Figures for

Fourth Five-Year Review Report (2010)

for

Wausau Groundwater Contamination Site

Marathon County, Wisconsin



SOURCE: USGS 7.5 MINUTE QUADS - WAUSAU EAST; WAUSAU WEST

figure 1.1

SITE LOCATION
WAUSAU WATER SUPPLY NPL LOCATION
Wausau, Wisconsin

003978-00(027)GIS-SP001 APR 29/2009

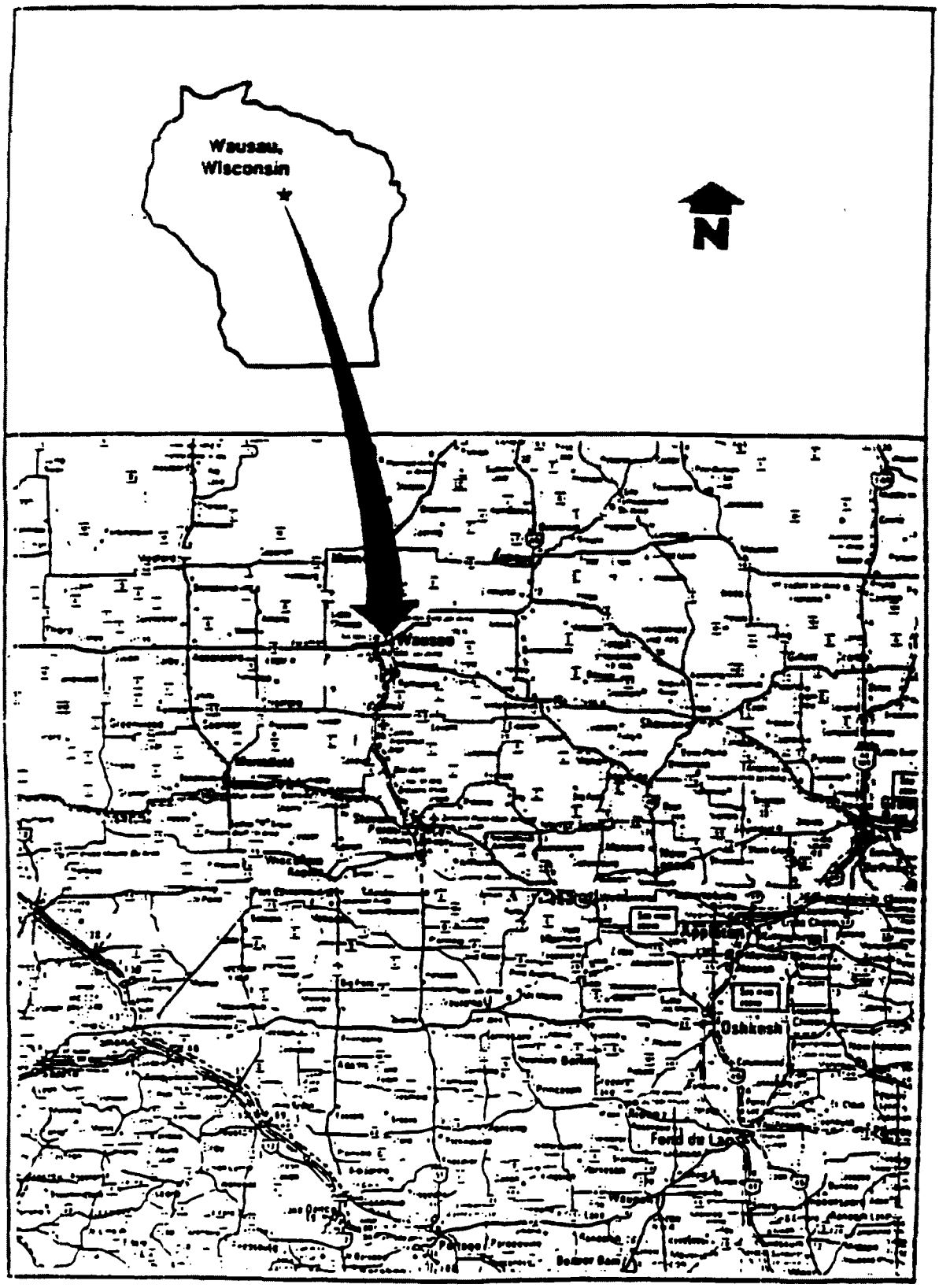


FIGURE 1 REGIONAL LOCATION MAP

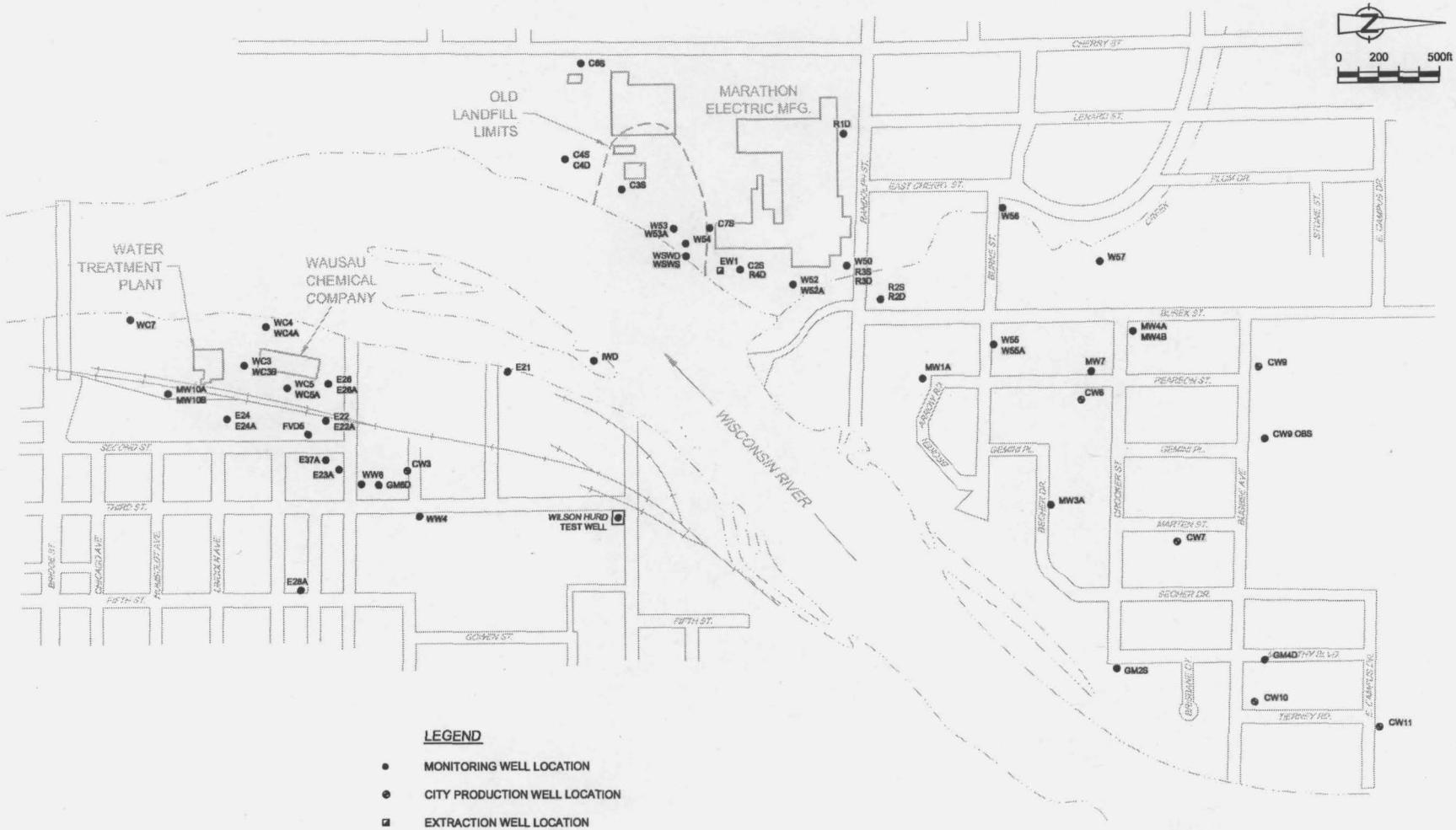


figure 1.2

SITE PLAN
WAUSAU WATER SUPPLY NPL SITE
Wausau, Wisconsin
View 1

SOURCE: RMT INC. FIGURE 1, 5/14/87.

003978-00(027)GN-SP002 Mar 11/2009

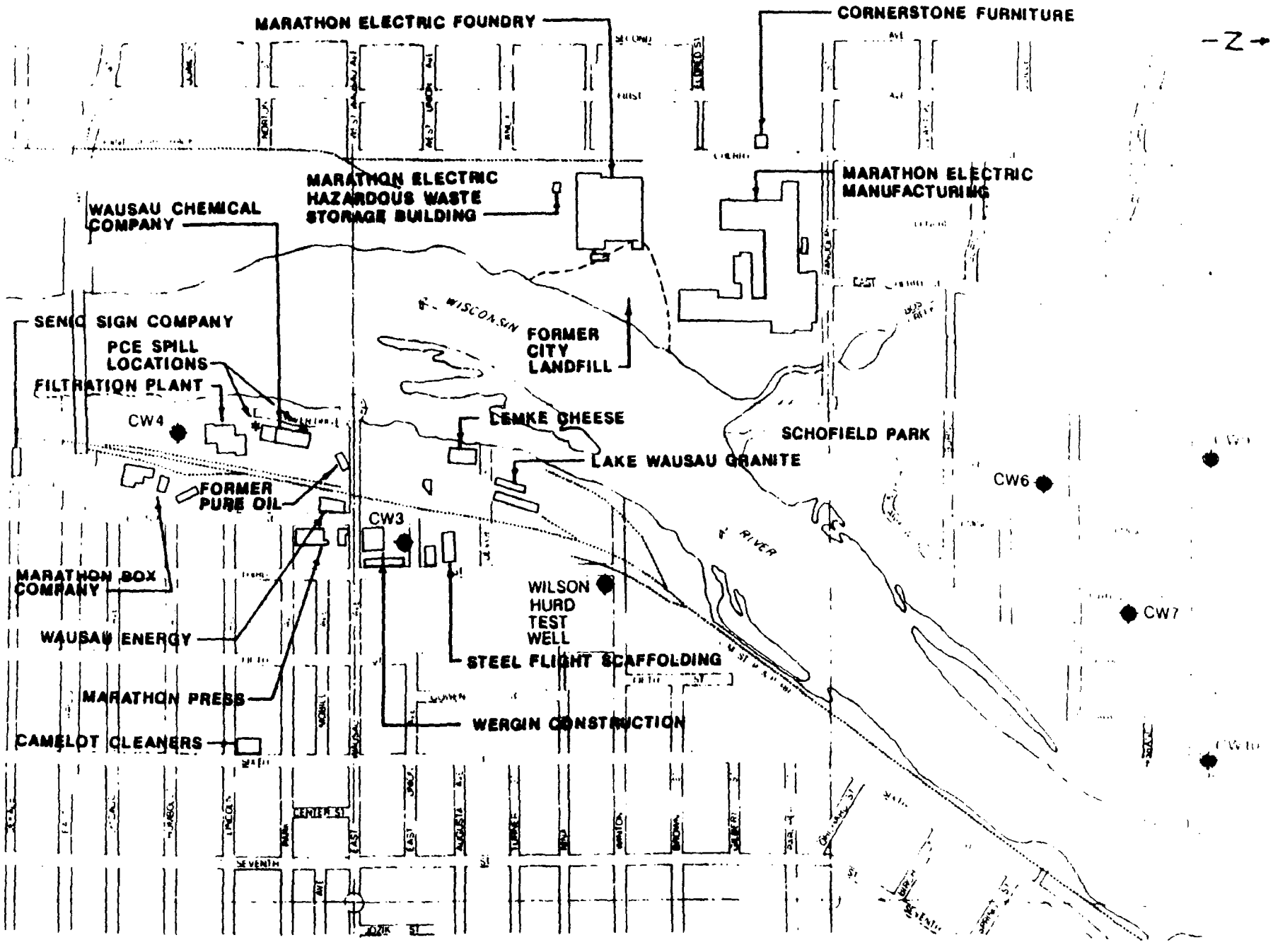
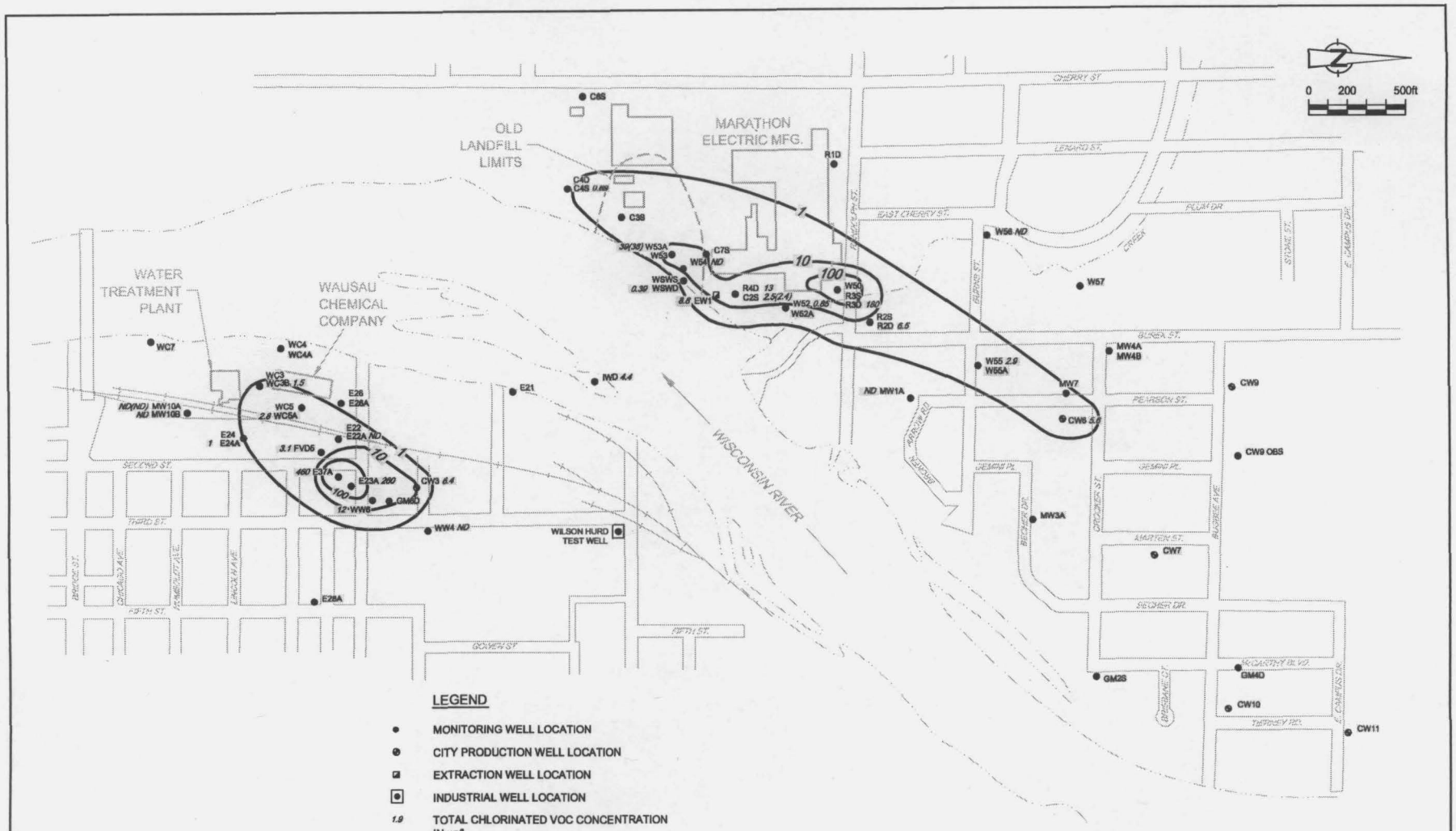


Figure 1 3
Site Plan Layout
View 2



LEGEND

- MONITORING WELL LOCATION
- CITY PRODUCTION WELL LOCATION
- EXTRACTION WELL LOCATION
- INDUSTRIAL WELL LOCATION
- 1.9 TOTAL CHLORINATED VOC CONCENTRATION IN ug/L
- ND NOT DETECTED
- ( ) DUPLICATE SAMPLE
- 10 TOTAL CHLORINATED VOC CONTOUR

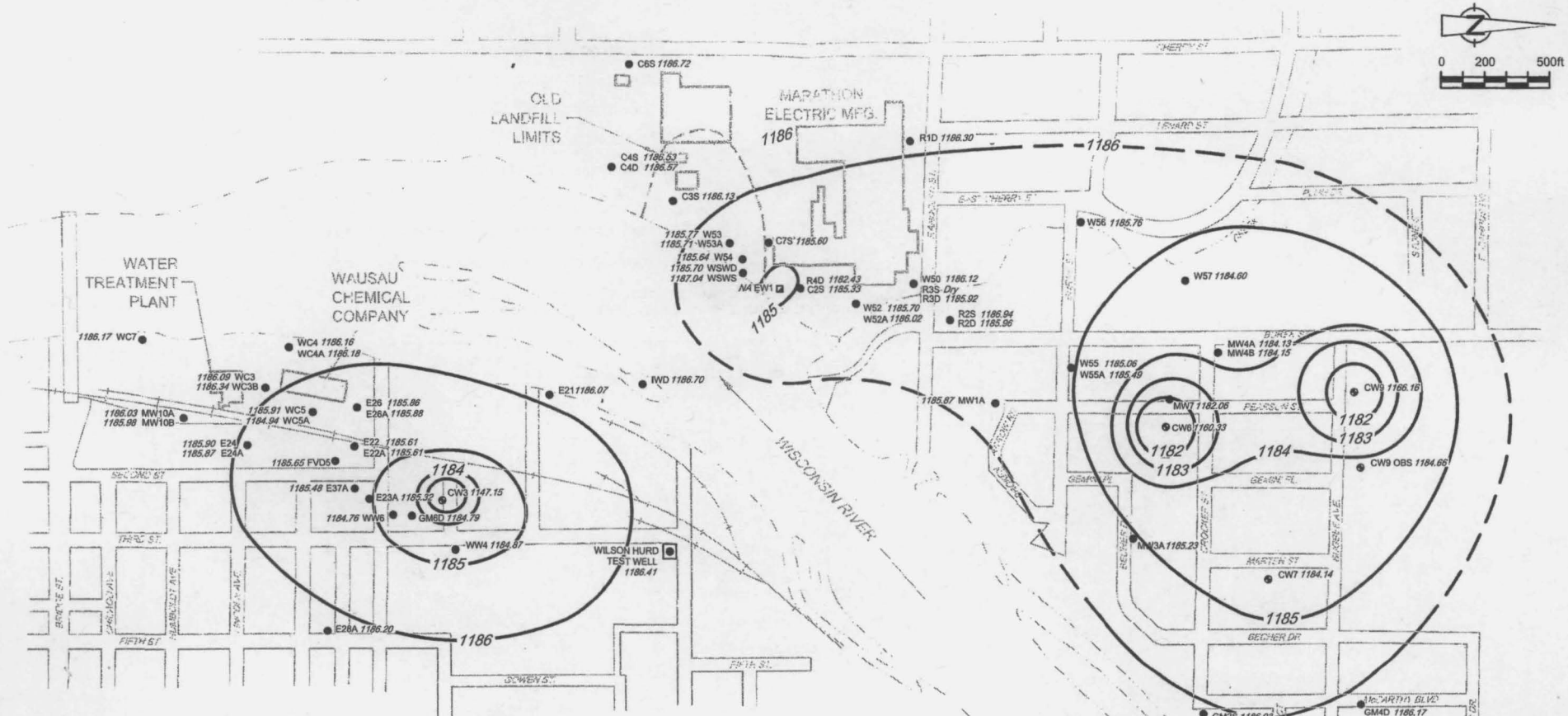
WHERE NO VALUE IS SHOWN, WELL WAS NOT SAMPLED

SOURCE: RMT INC. FIGURE 1, 5/14/87.

figure

TOTAL CHLORINATED VOCS IN GROUNDWATER (OCTOBER 2008)
WAUSAU WATER SUPPLY NPL SITE
Wausau, Wisconsin

003978-00(027)GN-SP004 May 20/2009



LEGEND

- MONITORING WELL LOCATION
- CITY PRODUCTION WELL LOCATION
- EXTRACTION WELL LOCATION
- INDUSTRIAL WELL LOCATION
- 1185.65 GROUNDWATER ELEVATION (NGVD)
- NA NOT APPLICABLE
- 1185 GROUNDWATER CONTOUR (NGVD)
- 1186 GROUNDWATER CONTOUR (NGVD) ASSUMED

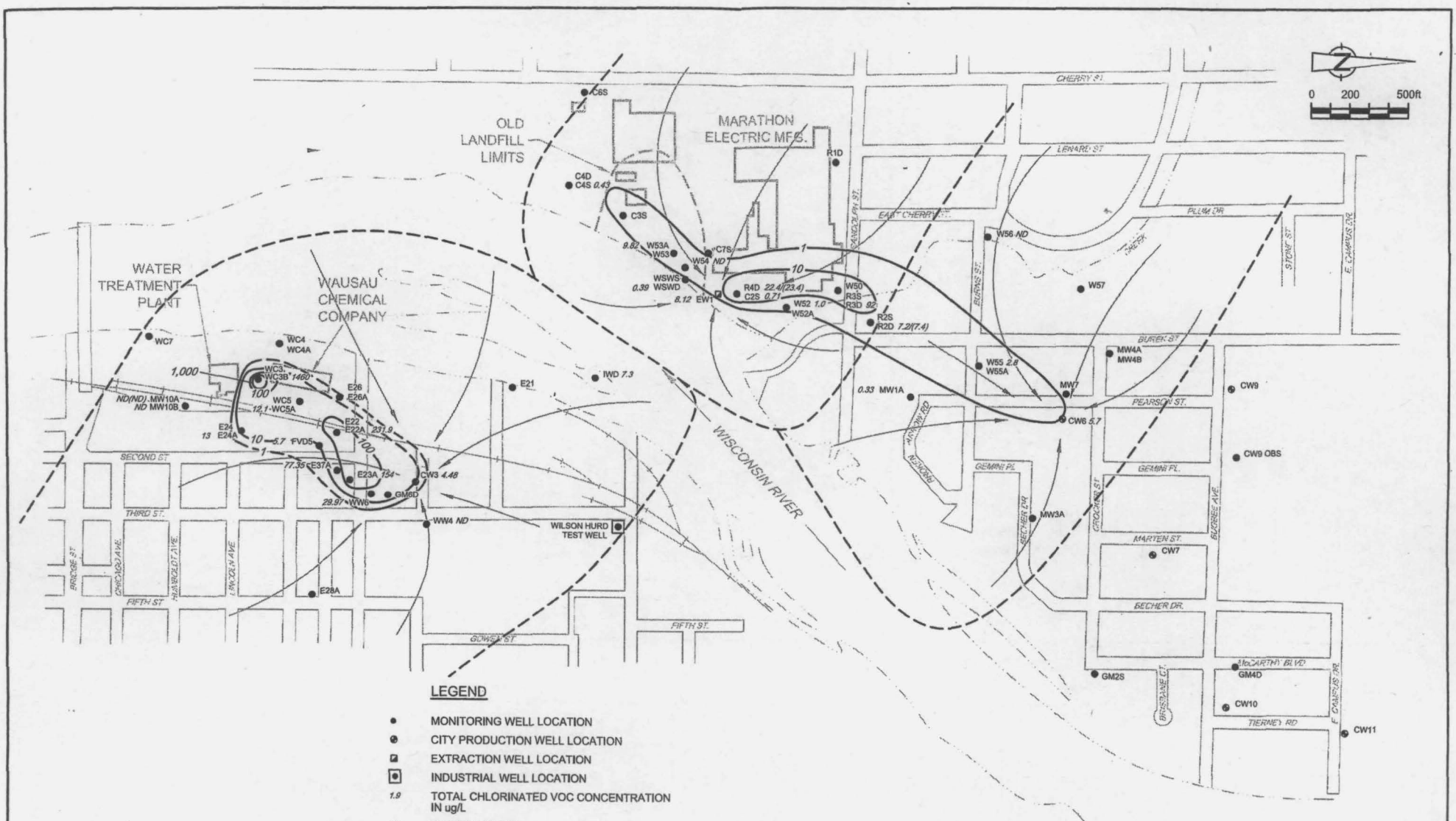
SOURCE: RMT INC. FIGURE 1, 5/14/87.

NOTE: EAST BANK WATER LEVELS MEASURED ON OCTOBER 26, 2009.
WEST BANK WATER LEVELS MEASURED ON OCTOBER 27, 2009.

figure 3

WATER TABLE CONTOURS (10/26-27/09)
WAUSAU WATER SUPPLY NPL SITE,
Wausau, Wisconsin

003978-00(028)GN-SP002 Feb 17/2010



SOURCE: RMT INC. FIGURE 1, 5/14/87.

figure 4

TOTAL CHLORINATED VOCs IN GROUNDWATER (OCTOBER 2009)
WAUSAU WATER SUPPLY NPL SITE
Wausau, Wisconsin

003978-00(028)GN-SP001 Feb 17/2010

Tables for

Fourth Five-Year Review Report (2010)

for

Wausau Groundwater Contamination Site

Marathon County, Wisconsin

TABLE 3
POTENTIAL EXPOSURE PATHWAYS
FEASIBILITY STUDY
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Environmental Medium	Exposure Point	Exposed Receptors	Routes Exposure	Pathway Complete?	Exposure Potential	Risk Quantified?
Groundwater	Municipal water supply	Wausau residents	Ingestion, inhalation, dermal absorption	Yes	Very low; air stripping has reduced contaminant concentrations to below detection limits	Yes
	Private well water	Wausau residents with private wells	Ingestion, inhalation, dermal absorption	No; currently no private wells in contaminated aquifer. However potential for future private wells exists	None; currently. Moderate; future private well users could be exposed to untreated water	Yes
Surface soils	Direct contact	Wausau residents	Dermal absorption, incidental ingestion	Not determined	Very low; not considered to be above background	No
Surface water and sediments, Bos Creek and Wisconsin River	Direct contact	Children playing in creek or river	Dermal absorption, incidental ingestion	No, contaminated water no longer discharged to Bos Creek	None	No
		Aquatic organisms, terrestrial wildlife	Bioconcentration, bioaccumulation	No, contaminated water no longer discharged to Bos Creek	None	No
Subsurface soils and landfill refuse	None; subsurface location minimizes contact potential	Wausau residents	Dermal absorption, incidental ingestion	No	None	No
	Direct contact	Remediation workers	Dermal absorption, incidental ingestion	Not determined	Very low, workers assumed to be utilizing protective gear	No
Air	Direct contact, volatilization from soils or landfill refuse	Wausau residents, company employees	Inhalation	No, significant volatilization not occurring	None	No
	Direct contact, emissions from air strippers	Wausau residents, company employees	Inhalation	Yes	Moderate dispersion of VOC emissions may expose Wausau residents and employees of companies near the sources	Yes

TABLE 4.1

MONITORING WELL LABORATORY RESULTS - 2008 (µg/L)
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Location	Date	MCL	Acetone --	Benzene 5	Ethylbenzene 700	Toluene 1000	Xylenes (total) 10000	Carbon tetrachloride 5	Chloroform --	1,1-Dichloroethene 7	Methylene chloride --	1,1,2-Trichloroethane 5	Tetrachloroethene 5	Trichloroethene 5	cis-1,2-Dichloroethene 70	Vinyl chloride 2	Total CVOCs --
East Bank																	
CW3	10/13/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	2.6	1.1	2.2	0.5 J	6.4
E22A	10/14/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	ND
E23A	10/14/08		< 50	< 5	< 5	< 5	< 5	< 5	< 5	1.2 J	< 5	< 5	110	14	130	5.9	260
E24A	10/14/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1	< 1	< 1	1
E37A	10/14/08		< 80	< 8	< 8	< 8	< 8	< 8	< 8	3.4 J	4.8 J	< 8	57	23	320	53	460
FVD5	10/14/08		< 91	86	240	18	960	< 9.1	< 9.1	< 9.1	7.8 J	< 9.1	3.1 J	< 9.1	< 9.1	< 9.1	3.1
IWD	10/14/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	4.4	< 1	< 1	4.4
MW10A	10/13/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	ND
MW10A	10/13/08	D	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	ND
MW10B	10/13/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	ND
WC3B	10/13/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.92 J	0.54 J	1.5
WC5A	10/13/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1.8	0.48 J	0.53 J	< 1	2.8
WW4	10/13/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	ND
WW6	10/13/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	5.4	1.1	3.5	1.6	12

TABLE 4.1

MONITORING WELL LABORATORY RESULTS - 2008 (µg/L)
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Location	Date	MCL	Acetone --	Benzene 5	Ethylbenzene 700	Toluene 1000	Xylenes (total) 10000	Carbon tetrachloride 5	Chloroform --	1,1-Dichloroethene 7	Methylene chloride --	1,1,2-Trichloroethane 5	Tetrachloroethene 5	Trichloroethene 5	cis-1,2-Dichloroethene 70	Vinyl chloride 2	Total CVOCs --
West Bank																	
C2S	10/15/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	2.5	< 1	< 1	2.5
C2S	10/15/08	D	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	2.4	< 1	< 1	2.4
C4S	10/15/08		3.8 J	1.1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.69 J	0.69
CW6	10/14/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	5.6	< 1	< 1	5.6
MW1A	10/14/08		< 10	< 1	< 1	0.39 J	0.82 J	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	ND
R2D	10/14/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	6.5	< 1	< 1	6.5
R3D	10/15/08		< 50	< 5	< 5	< 5	< 5	< 5	< 5	< 5	2.4 J	< 5	< 5	180	2.8 J	< 5	180
R4D	10/15/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	12	0.66 J	< 1	13
W52	10/15/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.85 J	< 1	< 1	0.85
W53A	10/14/08		< 10	< 1	< 1	< 1	< 1	0.91 J	0.85 J	< 1	< 1	< 1	< 1	26	11	< 1	39
W53A	10/14/08	D	< 10	< 1	< 1	< 1	< 1	0.87 J	0.89 J	< 1	< 1	< 1	< 1	26	10	< 1	38
W54	10/14/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	ND
W55	10/14/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	2.9	< 1	< 1	2.9
W56	10/15/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	ND
WSWD	10/14/08		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.39 J	< 1	< 1	0.39

Notes:

MCL - Maximum Contaminant Levels for drinking water published by the United States Environmental Protection Agency
Total CVOCs - Total chlorinated voloatile organic compounds.
D - Duplicate Sample
J - Estimated value, value is below the reporting limit
ND - All CVOCs are less than the reporting limit.
Shaded values exceed the MCL.

TABLE 4.2

EW1 LABORATORY RESULTS - 2008 (µg/L)
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Location	Date	Acetone	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Carbon tetrachloride	Chloroform	1,1-Dichloroethene	Methylene chloride	1,1,2-Trichloroethane	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl chloride
	MCL	--	5	700	1000	10000	5	--	7	--	5	5	5	70	2
Effluent	1/3/08	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	4.8	0.31 J	< 1
Effluent	4/1/08	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	4.9	0.34 J	< 1
Effluent	7/9/08	< 10	< 1	< 1	< 1 U	< 1 U	< 1	0.6 J	< 1	< 1	< 1	< 1	4.1	0.31 J	< 1
Effluent	10/8/08	< 10	< 1	< 1	< 1	< 1	< 1	1.6	< 1	< 1	< 1	< 1	4.2	0.25 J	< 1
Influent	1/3/08	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	9	0.46 J	< 1
Influent	4/1/08	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	6.7	0.47 J	< 1
Influent	7/9/08	< 10	< 1	< 1	< 1 U	< 1 U	< 1	< 1	< 1	< 1	< 1	< 1	9	0.49 J	< 1
Influent	10/8/08	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	8.4	0.43 J	< 1

Notes:

MCL - Maximum Contaminant Level for drinking water.
U - Estimated detection limit
J - Estimated value, value is below the reporting limit

TABLE 4.3

MONITORING WELL LABORATORY RESULTS - 2009
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Location	Date	MCL	Acetone --	Benzene 5	Ethylbenzene 700	Toluene 1,000	Xylenes (total) 10,000	Chloroform --	Carbon tetrachloride 5	Methylene chloride 5	1,1-Dichloroethene 7	1,1,2-Trichloroethane 5	Tetrachloroethene 5	Trichloroethene 5	cis-1,2-Dichloroethene 70	Vinyl chloride 2	Total Chlorinated VOCs --
East Bank																	
CW3	10/26/09		< 10	< 1	< 1	< 1	< 1	0.2 J	< 1	< 1	< 1	< 1	2	0.91 J	1.1	0.27 J	4.48
E22A	10/27/09		11 J	< 8	< 8	< 8	< 8	< 8	< 8	< 8	1.8 J	< 8	12	6.1 J	190	22	231.9
E23A	10/27/09		8.9 J	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	1.2 J	< 3.3	< 3.3	41	12	98	1.8 J	154
E24A	10/27/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	13	< 1	< 1	< 1	13
E37A	10/27/09		4.1 J	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	0.71 J	0.6 J	< 1.7	18	7.9	43	7.1	77.35
FVD5	10/27/09		30 J	61	370	36	1000	< 14	< 14	5.7 J	< 14	< 14	< 14	< 14	< 14	< 14	5.7
IWD	10/27/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	7.3	< 1	< 1	7.3
MW10A	10/26/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	ND
MW10B	10/26/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	ND
MW10B	10/26/09	D	1.5 J	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	ND
WC3B	10/26/09		< 330	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	< 33	1100	180	180	< 33	1460
WC3B	1/12/10	(1)	< 100	< 10	< 10	< 10	< 10	< 10	< 10	< 10	6.0 J	< 10	320	94	140	5.2 J	565.2
WC5A	10/26/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	8.6	2.1	1.4	< 1	12.1
WW4	10/26/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	ND
WW6	10/26/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.3 J	< 1	3.1	1.5	18	7.1	29.97

TABLE 4.1

MONITORING WELL LABORATORY RESULTS - 2009
WAUSAU WATER SUPPLY NPL SITE
WAUSAU, WISCONSIN

Location	Date		Acetone	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Chloroform	Carbon tetrachloride	Methylene chloride	1,1-Dichloroethene	1,1,2-Trichloroethane	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl chloride	Total Chlorinated VOCs
		MCL	--	5	700	1,000	10,000	--	5	5	7	5	5	5	70	2	--
West Bank																	
C2S	10/27/09		2.7 J	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.71 J	< 1	< 1	0.71
C4S	10/27/09		3.7 J	1.3	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.43 J	0.43
CW6	10/27/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	5.7	< 1	< 1 1	5.7
MW1A	10/28/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.33 J	< 1	< 1	0.33
R2D	10/28/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	7.2	< 1	< 1	7.2
R2D	10/28/09	D	< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	7.4	< 1	< 1	7.4
R3D	10/28/09		6.9 J	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	1.6 J	< 3.3	< 3.3	< 3.3	88	2.4 J	< 3.3	92
R4D	10/27/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	21	1.4	< 1	22.4
R4D	10/27/09	D	3.9 J	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	22	1.4	< 1	23.4
W52	10/27/09		2 J	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1	< 1	1.0
W53A	10/27/09		2.7 J	< 1	< 1	< 1	< 1	0.22 J	0.2 J	< 1	< 1	< 1	< 1	6	3.4	< 1	9.82
W54	10/27/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	ND
W55	10/28/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	2.8	< 1	< 1	2.8
W56	10/28/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	ND
WSWD	10/27/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.39 J	< 1	< 1	0.39
EW1	11/9/09		< 10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	7.7	0.42 J	< 1	8.12

Notes:

Units = mg/L
(1) - WC3B resample to confirm 10/26/09 result
MCL - Maximum Contaminant Levels for drinking water published by the United States Environmental Protection Agency
VOC - Volatile organic compound.
D - Duplicate Sample
J - Estimated value, below the reporting limit
ND - All CVOCs were less than the reporting limit.
Shaded values exceed the MCL.