Five-Year Review Report

Third Five-Year Review Report

for

Moss-American Superfund Site

Milwaukee

Milwaukee County, WI

April, 2010

PREPARED BY:

U.S. Environmental Protection Agency
Region 5
Chicago, IL

Approved by:

Richard C. Karl
Director
Superfund Division

Date: 3-29-10

Five-Year Review Report

Table of Contents

Tables

Figures

Attachments

List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
BTEX	Benzene, Toluene, Ethyl Benzene, and/or Xylene(s)
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminants of Concern
CPAH	Carcinogenic Polycyclic Aromatic Hydrocarbon(s)
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Difference
ICs	Institutional Controls
LTTD	Low Temperature Thermal Desorption
MCL	Maximum Contaminant Level
MA	Management Assistance
NCP	National Contingency Plan
NPL	National Priorities List
NR	Wisconsin Natural Resources Rule Citation
O&M	Operation and Maintenance
PAH	Polycyclic Aromatic Hydrocarbon(s)
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RCL	Residual Cleanup Level
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SDWA	Safe Drinking Water Act
SSC	State Superfund Contract
UU/UE	Unlimited Use/Unrestricted Exposure
VOC	Volatile Organic Compound
WDNR	Wisconsin Department of Natural Resources

Executive Summary

The United States Environmental Protection Agency ("EPA" or the "Agency"), Region 5, conducted the third five-year review of the remedy implemented at the Moss-American Superfund Site in Milwaukee, Wisconsin. It was conducted under Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP). The review examined significant site developments over the past five years, including operation of the groundwater treatment system, the effectiveness of institutional controls in place, and completion of all response activities at the site.

In September 2005, EPA determined that the remedy selected for this site remained protective of human health and the environment. Based on the Agency's current review, the remedy continues to function as intended and is currently protective of human health and the environment in the short term. Contaminated soils and sediments have attained cleanup goals, and there is no current human exposure to contaminated groundwater. ICs, in the form of deed restrictions, have been recorded to limit the use of the former wood treating site and along the floodplain downstream of the plant. Long term protectiveness requires achievement of groundwater cleanup standards and reviewing current ICs to ensure all necessary ICs are in place and are effectively maintained, monitored, and enforced.

Wood treating operations using creosote were conducted at the Moss-American site from approximately 1921 to 1976. Previous owners included the T. J. Moss Tie Company, Kerr-McGee (who changed the site name to Moss-American), and Kerr-McGee Chemical (KMC). In 1983, the facility was proposed for inclusion on the National Priorities List (NPL) pursuant to Section 105 of CERCLA. The site was placed on the final NPL in 1984.

Remedial investigation findings indicated that most of the soil contamination was associated with former creosote processing areas such as application areas, near former settling ponds, and in the vicinity of treated wood storage areas, where applied substances dripped to the ground. A class of contaminants known as polycyclic aromatic hydrocarbons, or PAHs, constituted the primary contaminants of concern at the site. In addition to soils contamination, site groundwater and sediments downstream of the site were also found to be contaminated with the same contaminants found in the soil.

EPA selected a remedy for the site as documented in the Record of Decision (ROD) signed on September 27, 1990. On December 30, 1991, the United States lodged a consent decree (the CD) with the Federal District Court for the Eastern District of Wisconsin in Milwaukee. The CD, which was signed by EPA, KMC, and the State of Wisconsin required KMC to implement the Remedial Design and Remedial Action (RD/RA) set forth in the ROD. The Court entered the CD in March 1996 after EPA resolved certain past costs claims with Union Pacific Railroad and the County of Milwaukee.

Amendments to the September 1990 ROD were made in April 1997 (Explanation of Significant Differences or ESD), September 1998 (ROD Amendment), and November 2007 (ESD).

While the Moss-American site consists of one overall operable unit, work was completed in a series of phases, each predominantly dealing with a given environmental media. From 1995-1998, extraction wells were operated to collect and remove free product creosote, which would otherwise have interfered with both groundwater and site soil remediation attempts. The funnel and gate system for remediating contaminated groundwater was installed in 1999-2000. Thermal desorption soil treatment efforts were conducted from mid-2001 to early 2002. Finally, remediation of contaminated sediments in the Little Menomonee River began in the late summer of 2002 and was completed in November 2009. Following completion of the sediment remediation work, a preliminary construction completion report (PCOR), signifying construction of all response activities have been substantially completed, was issued on November 25, 2009.

The next five-year review will be conducted five years after completion of this review.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: **Moss-American Superfund Site**		
EPA ID *(from WasteLAN)*: **WID039052626**		
Region: 5	**State: WI**	**City/County: Milwaukee (both city and county)**
SITE STATUS		
NPL status: **X** Final □ Deleted □ Other (specify)		
Remediation status (choose all that apply): □ Under Construction **X** Operating **X** Complete		
Multiple OUs?* □ YES **X** NO	**Construction completion date:** 11 / 25 / 2009	
Has site been put into reuse? **X**YES □ NO		
REVIEW STATUS		
Lead agency: **X**EPA □ State □ Tribe □ Other Federal Agency _____		
Author name: Ross del Rosario		
Author title: RPM	**Author affiliation: EPA – Region 5**	
Review period:** 07 / 09 / 2009 to 04 /10 / 2010		
Date(s) of site inspection: 10 /09 /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) **X**3 (third) □ Other (specify) _____		
Triggering action: □ Actual RA Onsite Construction at OU #____ □Actual RA Start at OU#____ □ Construction Completion **X**Previous Five-Year Review Report □ Other (specify)		
Triggering action date *(from WasteLAN)*: 09 / 20 / 2005		
Due date *(five years after triggering action date)*: 09 / 20 / 2010		

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

Five-Year Review Summary Form, cont'd.

Issues:

1. The funnel and gate groundwater treatment system may not be optimally capturing the groundwater contamination.
2. Compliance with effective ICs must be ensured by reviewing ICs and long-term stewardship procedures in place and planning additional steps, as needed.

Recommendations and Follow-up Actions:

1. **Optimization of funnel and gate system**: In spite of improvements to the groundwater quality at the site, review of groundwater data indicates continuing exceedances of groundwater cleanup standards at particular wells within the treatment zone of the funnel and gate system. The groundwater flow patterns will need to be evaluated to determine if all the contaminated groundwater is flowing through the system and being treated by air sparging.

2. **Completion of IC Plan**: EPA will review all IC instruments in place for this site, conduct additional IC evaluation activities, including long-term stewardship procedures, and determine their effectiveness. EPA will also plan steps, as needed, to ensure that effective ICs are in place and maintained, monitored, and enforced.

Protectiveness Statement(s): The remedy is functioning as intended and is protective of human health and the environment in the short term. Long term protectiveness requires achievement of groundwater cleanup standards; and the recording, monitoring and compliance of institutional controls. Current ICs will be reviewed, along with additional IC evaluation activities, to ensure that effective ICs are in place and maintained, monitored, and enforced.

Date of last Regional review of Human Exposure Indicator (from WasteLAN): **05/28/09**

Human Exposure Survey Status (from WasteLAN): **Current Human Exposure Under Control**

Date of last Regional review of Groundwater Migration Indicator (from WasteLAN): **05/28/09**

Groundwater Migration Survey Status (from WasteLAN): **Contaminated GW Migration Under Control**

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

Five-Year Review Report

I. Introduction

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

The Agency is preparing this five-year review report 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 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 such levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The United States Environmental Protection Agency (EPA), Region 5, conducted the five-year review of the remedy implemented at the Moss-American Superfund Site in Milwaukee, Wisconsin. This review was conducted by the Remedial Project Manager (RPM) for the entire site from July 9, 2009 through January 2010. This report documents the results of the review. EPA conducted a site inspection on October 9, 2009 as part of this review (see Attachment 1). During the inspection, the PRP provided relevant information to EPA, including an explanation on how the groundwater treatment system is currently being operated. The PRP also provided EPA groundwater data from 2000 through March 2009.

This is the third five-year review for the Moss-American Site. The triggering action for this review is the September 20, 2005 second five-year review report. This review examined significant site developments over the past five years, including operation of the groundwater treatment system, the effectiveness of institutional controls in place, and completion of all response activities at the site.

Presently, hazardous substances in the form of site-related contaminants in the site groundwater are above cleanup goals. In addition, soils contaminated above residential use standards below the surface remain on the Moss-American site, precluding unlimited use and unrestricted exposure (UU/UE).

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
Initial discovery of problem or contamination	**1971 (During Earth Day activity)**
Pre-NPL responses	**1970's (State-enforced removal of creosote-contaminated soil and sediment)**
NPL inclusion proposal	**September 8, 1983**
NPL finalization	**September 21, 1984**
RI/FS Negotiations	**Began 8/15/1985; ended 9/30/1985**
RI/FS field investigation	**Began 9/30/1985. RI report completed January 9, 1990; FS report completed May 24, 1990**
Proposed Plan	**Issued May 29, 1990**
Record of Decision	**Signed September 27, 1990**
Remedial Design/Remedial Action (RD/RA) Consent Decree	**Entered March 29, 1996**
Explanation of Significant Difference (ESD)	**Signed 4/29/1997**
ROD Amendment	**Signed 9/30/1998**
ESD	**Signed November 28, 2007**
Remedial Design Elements	**Free product - final design approved 5/19/1995** **Funnel/gate - design approved 9/29/1999** **Low Temperature Thermal Desorption (LTTD) (soils) - design approved 3/8/2000. Sediment - Segment 1 - final design approved 9/5/2002** **Sediment - Segments 2/3 - final design approved 2/25/2004** **Segments 4/5 – final design approved 3/13/09**
Remedial Action Construction - Groundwater Remedial Action Construction - Soils	**Funnel/gate installed Nov. 1999- June 2000** **LTTD work conducted May 2001- Jan. 2002**
First Five Year Review Report Second Five Year Review Report	**Signed September 18, 2000** **Signed September 20, 2005**
Site Inspection (for third review)	**Performed October 9, 2009**
Prefinal Inspection (to confirm construction activities have been completed)	**Completed November 20, 2009**
PCOR	**Signed November 25, 2009**
Third Five Year Review Report	**Signed April , 2010**

III. Background

Physical Characteristics

The Moss-American site is located in the northwestern section of the City of Milwaukee (see Figure 1). The 88-acre site is comprised of a former wood treating facility plus several miles of the Little Menomonee River and its adjacent floodplain soils. The wood treating, using creosote, was conducted on land bounded roughly by the intersection of Brown Deer and Granville Roads on the west, and Brown Deer and 91st Street on the east. With the cessation of wood treating operations, 23 acres of site land are now owned by the Union Pacific Railroad (railroad), which, until very recently, used this land as an automobile/light truck loading and storage area. Recent business conditions curtailed most of the vehicle storage/transfer function. Industrial site zoning and usage of this portion of the site remain intact. Milwaukee County (the county) owns the remainder of the land comprising the former wood treating facility, approximately 65 acres. The Little Menomonee River flows approximately 5 miles to its confluence with the Menomonee River. Land along the floodplain corridor is owned primarily by the City of Milwaukee, the County, and to a much lesser extent, private owners.

Land and Resource Use

Wood treating operations using creosote were conducted from approximately 1921 to 1976. Past site aerial photos show that land usage patterns have changed considerably with the passage of time. Photos from the 1930s to the 1950s show the wood treating plant operating in a relatively sparsely populated setting, where several farms surrounded the manufacturing operation. From the 1960s to the present, residential and commercial use of nearby property has increased considerably, and agricultural and farming operations have been phased out almost completely (see Figure 2). Industrial parks and multi-lane highways also traverse the site setting. County-owned land along the river corridor now features recreational hiking and bicycle trails. These features have had a direct bearing on site soil cleanup standards and sediment management at the site.

Heavy commercial traffic presently surrounds the former wood treating facility. Retail establishments such as restaurants, home supply centers, auto dealerships, and repair shops dominate the nearby landscape. While the area is zoned primarily for commercial use, there is a heavy density of residential properties, with a sprinkle of recreational areas (e.g., parks) that abut the commercial district, typical of a large metropolitan area. The Milwaukee metropolitan area, which includes the city and Milwaukee County, has a population of about 1.5 million people. The city itself is the 19th largest city in the U.S., with a population of about 600,000 (2000 census data). According to the 2000 census, the city's population is about 50% Caucasian, 37% African-American, and 12% Hispanic. The city's average household size is about 2.5, with median household income of about $32,200. This compares with the metropolitan and national figures of $54,390 and $52,029, respectively.

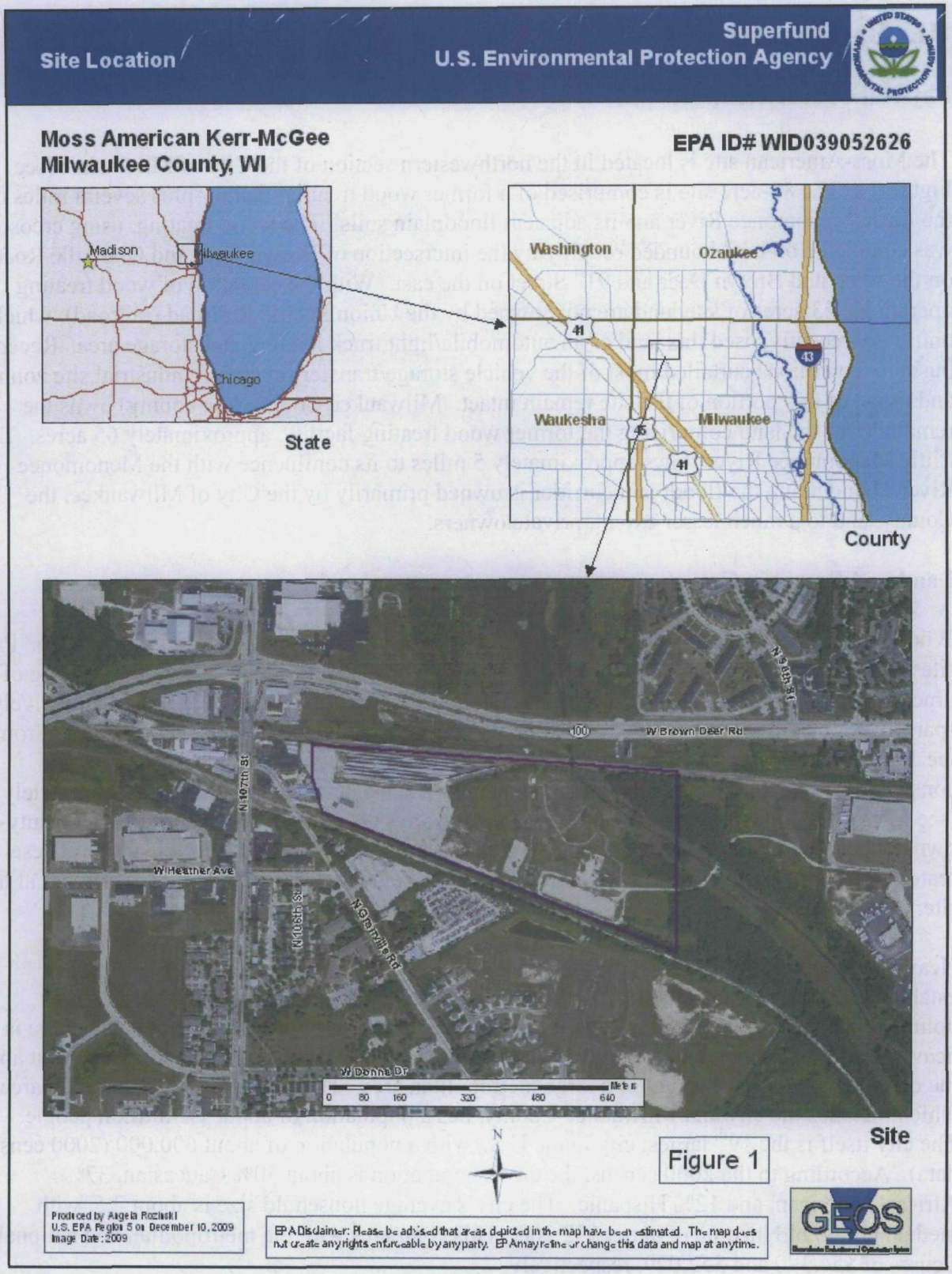
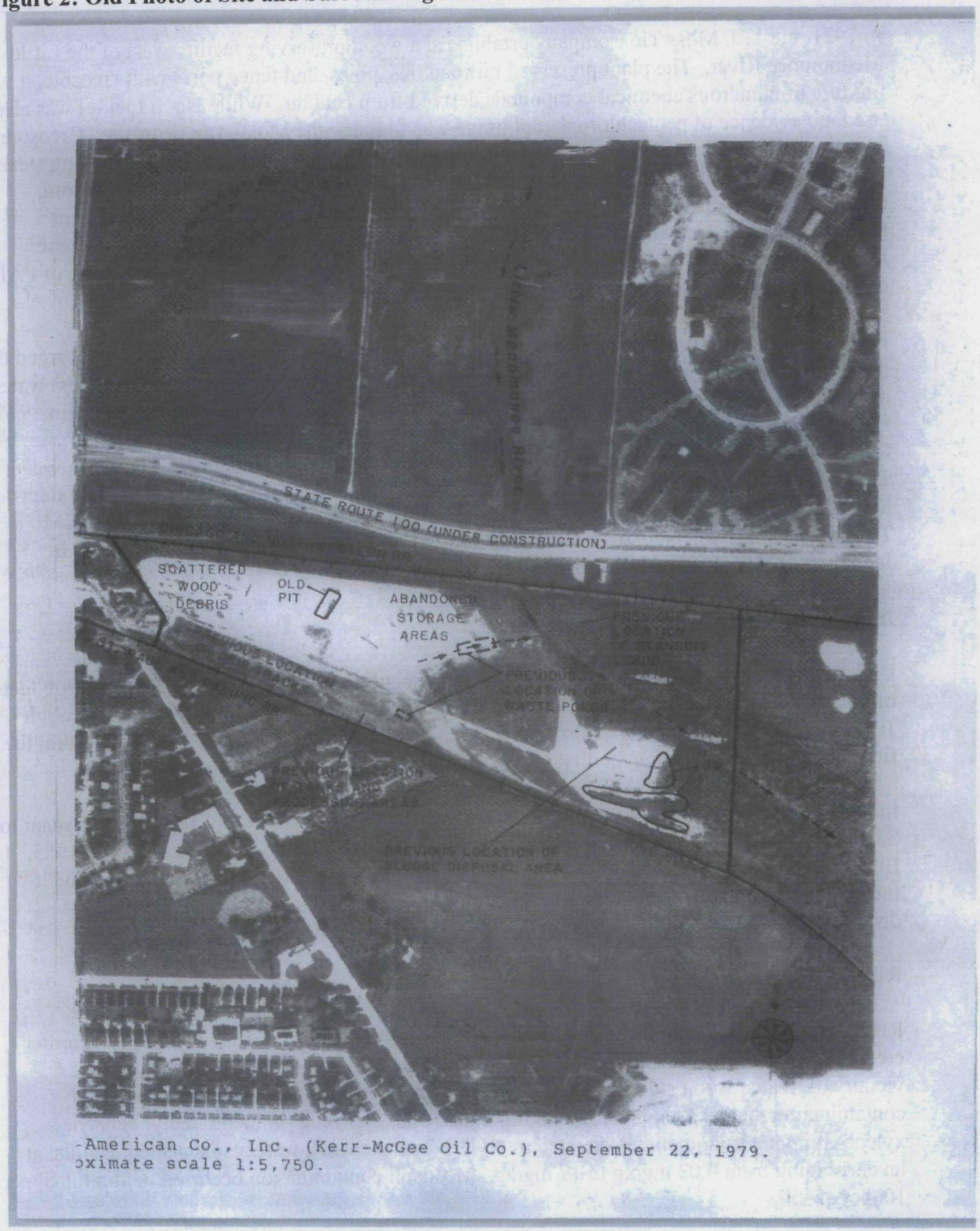

Site Location
Superfund
U.S. Environmental Protection Agency
Moss American Kerr-McGee
Milwaukee County, WI
EPA ID# WID039052626
Madison
Milwaukee
Chicago
State
Washington
Ozaukee
Waukesha
Milwaukee
41
43
45
County
W Brown Deer Rd
N 107th St
W Heather Ave
N 106th St
W Donna Dr
Meters
0 80 160 320 480 640
Site
N
Figure 1
Produced by Angela Roznicki
U.S. EPA Region 5 on December 10, 2009
Image Date: 2009
EPA Disclaimer: Please be advised that areas depicted in the map have been estimated. The map does not create any rights enforceable by any party. EPA may refine or change this data and map at anytime.
GEOS

Figure 2: Old Photo of Site and Surrounding Area



-American Co., Inc. (Kerr-McGee Oil Co.), September 22, 1979.
oximate scale 1:5,750.

History of Contamination

In 1921, the T. J. Moss Tie Company established a wood preserving facility west of the Little Menomonee River. The plant preserved railroad ties, poles, and fence posts with creosote, a mixture of numerous chemical compounds derived from coal tar. While No. 6 fuel oil was also used, no evidence of pentachlorophenol usage was found at the Moss-American site. Creosote plant operations often contain storage facilities for creosote and fuels, a boiler for making steam, heating the creosote and applying the creosote to the wood, areas for unloading and storing incoming timbers, rail cars for transporting the creosote, and a drying area for subsequent storage. Creosote is the major source of a class of contaminants called polycyclic aromatic hydrocarbons (PAHs) which are the main driver of risk at this site. Potential for release of PAHs existed throughout the storage, application, and drying processes.

From 1921 to 1971, the facility discharged wastes to settling ponds that ultimately discharged to the Little Menomonee River. These discharges ceased when the plant diverted its process water discharge to the Milwaukee sanitary sewerage system. Production at the facility ceased in 1976.

Kerr-McGee purchased the facility in 1963 and changed the facility's name to Moss-American. The name was changed again in 1974 to Kerr-McGee Chemical Corporation - Forest Products Division. In 1998, the name of this company changed to Kerr-McGee Chemical LLC (KMC). Tronox assumed ownership of the site in 2006 when it was spun off from Kerr-McGee. In January 2009, Tronox filed for Chapter 11 bankruptcy.

Initial Response

Under a State order, KMC cleaned out eight former settling ponds and dredged about 1,700 feet of river to remove creosote-contaminated soil and sediment. In the period from 1972 through 1973, three different dredging efforts were conducted in the Little Menomonee River within the first mile downstream of the facility.

In 1983, the facility was proposed for inclusion on the National Priorities List (NPL) pursuant to Section 105 of CERCLA. The site was placed on the final NPL in September 1984. In 1985, EPA initiated a negotiation period with potentially responsible parties (PRPs) to determine if they would conduct the Remedial Investigation/Feasibility Study (RI/FS). When those discussions did not result in a settlement, EPA conducted the RI/FS.

RI/FS Results

RI findings indicated that, for site soils, most of the contamination was associated with former creosote processing areas such as application areas, near former settling ponds, and in the vicinity of treated wood storage areas, where some applied substances had dripped. PAH contamination ranged as high as 32,000 mg/kg in soils. Benzene - toluene - ethyl benzene - xylene compounds (sometimes denoted as "BTEX" substances), were also detected in soils, at levels ranging from 0.02 mg/kg to 17 mg/kg. Most soil contamination occurred within the upper 10 feet of soil.

The RI indicated free product liquids associated with site groundwater. Contaminants, consisting chiefly of PAHs and BTEX compounds, occurred principally in shallow monitoring wells. Little or no groundwater contamination was detected deeper than 20 feet below ground surface. The main plume of groundwater contamination appeared to occur in the central portion of the former processing area, in a band approximately 600 feet across (see Figure 2). Shallow groundwater at the site was believed to be discharging into the Little Menomonee River. Sediment samples from the Little Menomonee River were collected and analyzed at intervals running from a point near Brown Deer Road to the confluence of the Little Menomonee River with the Menomonee River, located some 5.5 to 6 miles downstream from the former creosote processing facility. While there was considerable variation in sample results, at least 12 sediment samples exceeded 100 mg/kg or greater of carcinogenic PAH (CPAH) compounds. The background level of CPAH was initially set at 18 mg/kg, but this value was refined in a subsequent study to 15 mg/kg.

Basis for Taking Action

A baseline human health and ecological risk assessment was conducted as part of the RI effort for the Moss-American site. Major site contaminants fell into the chemical groups of PAHs and BTEX compounds. PAHs are a primary component of creosote blends; and have been associated with lung, stomach, and skin cancers. The PAH compound structure is a complex of connected hexagonally shaped rings. Carcinogenicity has been associated with some of the more complex 4 and 5 ring PAH compounds; benzo[a]pyrene is one such example. As for the BTEX compounds, benzene has been associated with occurrences of leukemia, while toluene and xylenes appear to cause depression of the human central nervous system.

According to the RI risk assessment, risk from exposure to site sediments varied in each of the stream "segments" downstream from the former creosote processing area. The term "segment" denotes area between major east-west highway bridges over the river at approximately one to one and a quarter mile intervals. Sediment exposure risks to humans were higher in segments 1, 2, and 3 - on the order of 10^{-4} excess carcinogenic risk due to CPAH exposure. In river segments 4 and 5, the excess carcinogenic risk dropped to 5 and 3 times 10^{-5}, respectively. Based on human exposure alone, exposure to CPAHs in sediment presented excess risk at the upper (10^{-4}) range of EPA's acceptable risk range (10^{-6} to 10^{-4}). However, sediments also presented an unacceptable risk to aquatic habitat. While not viewed as an "applicable or relevant and appropriate requirement", or ARAR, at the time of risk assessment, literature cited by WDNR indicated that 3 mg/kg of CPAHs in sediment should be a "to be considered" value for acceptable long-term aquatic habitat protection.

IV. Remedial Actions

Remedy Selection

EPA selected a remedy for the site, as documented in the ROD signed on September 27, 1990. The remedy included measures to address contaminated site soils, Little Menomonee River sediments, and site groundwater. Remedy components included:

- Excavation of highly contaminated site soils and treatment in a bioslurry vessel;

- Disposal and cover of treated contaminated soils and lesser contaminated soils onsite, and re-vegetation of the excavated areas. Fencing and institutional controls are also required to minimize potential dermal contact. Institutional controls, in the form of deed restrictions, were further discussed in the 1998 ROD Amendment (see below);

- Removal and off-site disposal of highly contaminated sediments from the Little Menomonee River, creation of a new channel in the vicinity of the Little Menomonee River and then diverting flow into the new channel, and filling the dewatered existing channel with soils created from new channel excavation; and

- Collection and treatment of contaminated site groundwater, presumably using a biological treatment system.

Remedial action goals were to reduce risks posed by CPAHs in soils to below 10^{-4} and establish 6.1 mg/kg CPAHs as the acceptable treatability variance. For sediments, the new channel would ensure exposure to below 3 mg/kg CPAHs in sediment for acceptable long-term exposure to CPAHs in the aquatic habitat. Removing the worst of the contaminated sediments in the existing channel, calculated at a value of 388 mg/kg of CPAHs or higher, would help minimize migration potential from the old channel to the new. Groundwater remediation goals were to prevent migration of contaminated site groundwater into the Little Menomonee River, and to attain concentrations in NR 140 of the Wisconsin Administrative Code for contaminants of concern at the site. Groundwater contaminants were PAHs and BTEX compounds.

Scope of Remedial Action Objectives (RAOs)

The overall remedial action objectives for the specific media addressed in the ROD were:

1. *On-site soils*: Minimize threats to human health and the environment from on-site contaminants via direct contact, inhalation, or ingestion and to prevent further contaminant migration into the groundwater and subsequently to the river.

2. *Contaminated sediment in the Little Menomonee River*: Minimize direct contact or ingestion of contaminants in sediment; minimize acute and chronic effects on aquatic life from contaminants; and minimize migration of contaminants downstream to the Menomonee River; and

3. *Groundwater*: Prevent release of contaminants through the surficial groundwater aquifer to the Little Menomonee River surface water or sediment and remove contaminants from groundwater such that concentrations don't exceed applicable State groundwater standards.

Cleanup Goals: Because no chemical-specific ARARs have been defined for CPAHs, the concentration level that correlates to the 1×10^{-4} risk level (6.1 ppm) was selected as the

contaminant-specific goal for the soil cleanup goal. To meet the sediment RAOs, a new channel for the river will prevent contact with, or ingestion of, contaminated sediment by human or aquatic life. The target concentrations and volume of sediment removed in the old channel as part of the rechannelization efforts was also based on a risk level of 1×10^{-4}, corresponding to 388 ppm CPAHs in sediment. In addition, in areas where sediment was excavated in lieu of rerouting the river (mostly in the downstream portion of the river), sediments exceeding the calculated CPAH background level (15 mg/kg) were removed. Groundwater cleanup levels for the contaminants of concern were based on preventive action levels (PALs) established in NR 140 of the Wisconsin Administrative Code. PALs were derived primarily to inform the regulatory agency of potential groundwater contamination problems and are applicable both to controlling new releases as well as to restoring groundwater quality contaminated by past releases of contaminants. Table 2 below shows the cleanup goals for contaminants of concern for the site:

Table 2– Groundwater Cleanup Goals

Contaminant of Concern	Cleanup Concentration (ug/L or ppb)
Anthracene	600
Benzo(a)pyrene	0.02
Benzo(b)fluoranthene	0.02
Chrysene	0.02
Fluoranthene	80
Fluorene	80
Napthalene	10
Pyrene	50
Benzene	0.067
Toluene	68.6
Ethylbenzene	272
Xylene	124

Following issuance of the ROD, EPA entered into discussions with potentially responsible parties (PRPs). On December 30, 1991, the United States lodged a consent decree (CD) with the Federal District Court for the Eastern District of Wisconsin in Milwaukee. The CD, which was signed by EPA, the State of Wisconsin and KMC, required KMC to implement the Remedial Design and Remedial Action (RD/RA) set forth in the ROD. The County of Milwaukee and the Union Pacific Railroad (formerly known as the Chicago and Northwestern Railroad) submitted comments on the CD. The County of Milwaukee filed objections to the decree and sought to intervene in the proceeding in 1992. EPA responded to the comments and objections in its 1993 Motion to Enter. Subsequently, the County withdrew its objections in February 1996, after reaching an agreement with EPA on past costs. Eventually, the decree was entered by the Court in March 1996.

Amendments to the ROD

April 1997 ESD: In April 1997, EPA signed, with WDNR concurrence, an Explanation of Significant Difference (ESD) concerning site contaminated groundwater collection and treatment. Predesign results indicated that, compared to groundwater management originally described in the ROD, a funnel and gate system may offer certain advantages. While exhibiting certain heterogeneity, soils at the Moss-American site generally are relatively fine-grained, resulting in slow groundwater movement. As a result, there would be adequate time for contaminant treatment as water is directed through a gate. Design information indicated that, once optimum nutrient/air dosages were established, groundwater contaminants at the Moss-American site could undergo effective aerobic degradation.

September 1998 ROD Amendment: EPA issued a ROD amendment in September 1998 which changed the soil treatment technology to low temperature thermal desorption (LTTD). Originally, the 1990 ROD envisioned soils treatment using bioslurry technology. Pilot testing done by the PRP indicated reasonably good soils treatment of the lighter 2-3 linked hexagonal ring sized fractions of the PAH contaminants in soil using bioslurry technology, but saw a reduction in treatment efficiency for the 4-6 ring PAH compounds. Consequently, it was determined that a change to LTTD from bioslurry technology was appropriate.

The 1998 ROD Amendment also incorporated more recently developed State cleanup standards for soil related contaminants. It allowed for non-residential direct contact cleanup exposure scenarios if appropriate deed restrictions were secured.

The ROD Amendment withdrew a waiver of State liner/leachate provisions, but provided for a Corrective Action Management Unit (CAMU).

Based on review of groundwater monitoring network analyses and related soils data, the ROD Amendment also added some contaminants of concern, such as naphthalene.

The ROD Amendment also addressed compliance with NR 700 which requires protection of groundwater from site contaminants that pose a threat as a source of groundwater contamination. The ROD amendment provided for groundwater protection from residual contaminant levels (RCLs) in the soil where attainment of groundwater preventive action limits was not being realized. Groundwater protection component RCLs were provided for naphthalene, fluorene, benzo(a)pyrene, toluene, xylene(s), ethylbenzene, and benzene. The ROD Amendment also provided for protection from soil contamination from direct contact under industrial exposure scenarios. The ROD amendment also considered floodplain portions that might be affected by soil remediation technology, as well as possible recreational usage of portions of the site.

2007 ESD: In November 2007, EPA issued another ESD, acknowledging that rerouting of Reach 4/5 would not be necessary or efficient to achieve site cleanup goals. Instead, EPA selected intermittent dredging of hot spot areas of contaminated sediments, along with off-site disposal of the contaminated sediments for Reach 4/5.

Remedial Design

Predesign Studies/Activities

While the ROD viewed the site as one overall operable unit, there were several work components. The approved Statement of Work (SOW), which was part of the RD/RA Consent Decree, called for of at least 20 predesign tasks, including certain pilot tests, to advance site knowledge in key areas. Among other things, these areas included such items as investigating lower cost CPAH analytical procedures on rapid turn-around basis; refining background quantification levels of CPAHs in site soils and sediments; evaluating alternative river alignments; studying river floodplain hydraulics; using visual criteria in identifying creosote in sediment residues; evaluating dredging techniques; pilot testing soil washing; and bioslurry treatment and techniques.

Free Product Extraction Measures ("Worst First"): Based on the November 1994 predesign results, EPA asked KMC to give initial priority to removing the free product. The predesign report indicated that free product materials in extractable quantities were concentrated in an area of approximately one acre south of Brown Deer Road and west of the Little Menomonee River. In 1995, KMC undertook design, construction and installation of a free product removal system. The free product was mostly concentrated at a depth of 6 to 12 feet below the ground surface, composed primarily of a mixture of creosote and #6 fuel oil, which was used during past site operations. This mixture has a greater specific gravity than water, and due to its relatively insoluble nature, constituted a dense non-aqueous phase liquid, or DNAPL. DNAPLs tend to complicate and prolong groundwater remediation efforts.

The following list describes the quantity of liquids recovered during the primary years of operation of the free product recovery system:
1996 - 3100 gallons
1997 - 7500 gallons
1998 - 1080 gallons
1999 - 900 gallons

KMC estimated that, on average, 10% of the extracted liquids were creosote, while 90% were contaminated groundwater.

In the fall of 1999, the free product recovery system was dismantled, as construction of the funnel and gate groundwater collection and treatment system began.

Groundwater Treatment System Design

In 1998, KMC finalized the design for the groundwater collection/treatment portions of the cleanup project, and the agencies indicated design approval subject to certain conditions. The funnel and gate system was considered innovative technology and involved placing more porous soils to preferentially direct groundwater flow and introducing air/oxygen, microbes, and nutrients, if necessary, to enhance biological degradation of organic contaminants within

groundwater. The PAH content of the groundwater consisted mostly 2-3 ring PAH compounds, and were expected to be successfully treated by a biological approach.

The funnel and gate system called for three tiers of two gates each, where treatment occurred. The westernmost line was placed near the boundary line between railroad and county property. Another line ran roughly parallel to the Little Menomonee River, just west of the river. Velocity of groundwater flow through the gates should be low enough so as to allow for sufficient treatment. In order to help prevent free-product migration into the treatment gates, engineered sumps on the upgradient side of the gate were installed.

A network of upgradient and downgradient monitoring wells were incorporated in the design of the system for performance monitoring purposes. Parameters to undergo periodic evaluation included BTEX compounds and PAHs, particularly the carcinogenic longer-chain varieties.

Site Soils Treatment Design

The most highly contaminated soils at the Moss-American site were to undergo treatment utilizing low temperature thermal desorption (LTTD). Soils subjected to thermal desorption treatment included all soils that:

- Contained free product;
- Exceeded a total carcinogenic polynuclear aromatic hydrocarbon level of 78 mg/kg;
- Exceeded groundwater residual contaminant levels (RCL) of 2.9 mg/kg for ethylbenzene; 1.5 mg/kg for toluene; 4.1 mg/kg for xylene(s); 5.5 ug/kg for benzene; 48 mg/kg for benzo(a)pyrene; and 100 mg/kg for fluorine; and
- Exceeded 100 mg/kg for naphthalene.

The groundwater RCL for naphthalene is 0.4 mg/kg. However, KMC demonstrated to the agencies that over 96% of the naphthalene loading in site soils was associated with areas having over 100 mg/kg of naphthalene. However, if groundwater monitoring indicates high levels of naphthalene levels in groundwater, the agencies reserve the right to require stricter naphthalene contaminated soil cleanup.

Design documentation estimated that between 42,000 to 66,000 tons of contaminated soils would require thermal desorption treatment. The quantity of soil actually treated more than doubled. In all, some 137,000 tons of contaminated soils were treated.

Sediments Management Design

There were five stream "segments" or "reaches" along the Little Menomonee River, from the former creosote operations facility to the confluence with the Menomonee River. Each "segment" or "reach" was about 6000-7000 feet in length. The RD was developed on a segment-by-segment basis. This allowed for lessons learned from the construction of earlier segments in the design of later segments.

Remedy Implementation

Groundwater Remediation: Quality assurance documents for the groundwater system installation were finalized in 1999. In November 1999, field construction began. Primary installation steps included:

- Install temporary structural sheet piling;
- Excavate treatment gate areas;
- Dismantle wells/piping associated with the free product recovery system;
- Prepare a blend of clean sand and other clean soils for gate backfill;
- Grade gate areas after backfill;
- Replace temporary sheet piling with permanent Waterloo sheet piling;
- Construct on site treatment building;
- Drill new injection wells for introduction of nutrient, air/oxygen, and/or microbe sources in to the gate areas to enhance groundwater contaminant degradation;
- Drill new monitoring wells to help determine gate performance and supplement existing monitoring wells to judge aquifer response in attaining goals; and
- Install piping runs to convey nutrients from the treatment building to the individual gates.

KMC completed most of the construction in April 2000.

Soil Treatment: The purpose of the thermal desorption was not to actually "burn" the contaminated soils, but to heat them above the boiling points of the contaminants so that these were driven off the soil particles. Once successfully treated, soils were returned to their place of excavation. However, the volume of the treated, and now uncompacted, soil exceeded the original volume estimate. Additional volumes of treated soils were stockpiled. Some of these soils were later graded in place; other treated soils were used as fill in old river channel.

Sediment Work: Sediment management activity at the Moss-American site involved dredging in localized areas, creating new stream channel in relatively clean soil areas, diverting current stream flow into the new channel areas, dewatering the original channel, removal of contaminant sediments from the original channel, and filling the original channel segments with clean cuttings from new channel excavation.

Reach 1 remediation work was conducted from October 2002 to January 2003. Over 16,000 cubic yards of sediments were excavated and disposed of off-site during this phase of the project. Sediment remediation work involving Reaches 2 and 3 was performed in two phases. Phase 1 work was performed from March 1, 2004 to July 16, 2004. Phase 2 activities began on September 13, 2004, and continued until December 30, 2004. The remediation of Reaches 2 and 3 accomplished the following: (1) 9000 feet of new channel length was created; (2) 8060 feet of previous river channel was filled in; (3) 2515 feet of river channel was dredged instead of rerouted to meet sediment cleanup objectives; and (4) 8563 cubic yards of highly contaminated sediments were excavated and disposed of off-site.

After Tronox stopped work on Reach 4/5, EPA decided to complete the remaining sediment remediation on the river through a Fund-lead remedial action. Contaminated sediments above

background levels were excavated in the 4,300-foot section on this stretch of the river. In all, over 5,500 cubic yards of contaminated sediment were removed and disposed of off-site. This work was completed on November 19, 2009. The Agency subsequently issued a preliminary construction completion report (PCOR) on November 25, 2009 to document completion of all response actions at the site (see Attachment 4).

Institutional Controls

ICs are non-engineered instruments, such as administrative and/or legal controls, that help minimize the potential for exposure to contamination and protect the integrity of the remedy. Compliance with ICs is required to assure long-term protectiveness for any areas which do not allow for UU/UE.

Decision Document:

ICs are required as part of the remedy. The basis for requiring ICs as part of the remedy is found in the 1990 ROD, which called for fencing the area and placing deed restrictions to prevent the site from future development. This requirement was primarily driven to further reduce the likelihood of exposure to the contaminated soil at the former wood preserving plant. The 1996 CD described in greater detail what those deed restrictions entailed. Specifically, Appendix 6 of the CD stipulated the following restrictions applicable to the entire Moss American site:

1. Any use of the site that interferes with implementation of the response action, impairs the effectiveness of any work performed, or damage any component of the remedy constructed pursuant to the ROD, Consent Decree, or SOW, is prohibited;

2. The installation, construction, or removal of any buildings, wells, piping, roads, ditches, or any structures is prohibited, except as approved by EPA and consistent with the Consent Decree and ROD; and

3. Applicable laws and regulations governing wetland and floodplain habitats shall be complied with.

In addition to the site-wide restrictions specified above, Appendix 6 of the CD described additional restrictions that applied only to the former wood preserving facility. Specifically, such restriction applied to those areas of the former wood preserving facility that contained trenches, collection basins, or treatment systems and in those areas where the cover was constructed. These additional restrictions are as follows:

1. Use of groundwater in these areas is prohibited;

2. There shall be no residential use of the former wood preserving plant property;

3. Activities involving people are prohibited on those portions of the site described above, except as part of implementing and maintaining the remedial action called for in the ROD and CD; and

4. Penetration of the installed cover is prohibited, including but not limited to any excavation, drilling, mining, piercing, digging, or boring.

Following entry of consent decrees with EPA for past cost in 1996, both the county and railroad recorded deed restrictions incorporating language largely identical to what was contained in Appendix 6 of the CD, prohibiting activities that may interfere with the cleanup of the site, preventing any construction/installation/removal of buildings, pipes, roads or other structures on property without approval by EPA, prohibiting the consumption or use of groundwater at the former wood preserving site, and prohibiting excavating, drilling, piercing, digging, or boring of the soil cover. In 2000, the ICs for the former wood preserving plant property were updated by the county and railroad to reflect the intended uses of specific areas of the site: 1) recreational throughout the floodplain areas of the river and 2) industrial for the non-floodplain portions of the former wood preserving plant. These updated ICs were consistent with the 1998 ROD Amendment providing for industrial use of the former wood treating site, thereby allowing worker direct contact with contaminated soil cleaned to non-residential standards, as long as appropriate institutional controls were in place and applied (see Attachment 5).

Evaluation of Current Conditions, Current ICs, and IC Activities Underway:

EPA will need to prepare an IC plan to evaluate the effectiveness of the current ICs since the last five-year review was conducted in September 2005. One of the issues identified in the last review was to determine if current ICs were adequate, protective, placed on the appropriate properties, enforceable, and run with the land. The last review left unanswered questions whether other interests in site property (e.g., pre-existing easements) need to be subordinated, whether title commitments are needed, and whether there are properties at the site that do not have restrictions in place.

Following the 2005 five-year review, EPA asked Tronox to review and address the IC issue (see Attachment 6). In response to EPA's request, Tronox provided additional information to the Agency regarding ownership of the various parcels of the 88-acre site and whether each parcel had a deed restriction or other IC tied to it. Tronox also provided copies of effective recorded deed restrictions. Tronox further responded to EPA in a letter dated March 31, 2008 that it believed that adequate institutional controls are in place and that no changes in land use have occurred since its initial investigation on the matter in March 2006, with the exception that the railroad property not being used, although it remains fenced and patrolled by railroad security.

Currently, there are 4 deed restrictions in place, covering the following areas of the site:

1. Areas of the former wood preserving plant currently owned by the railroad;
2. Areas of the former wood preserving plant, not on the floodplain, owned by the county;
3. Areas of the former wood preserving plant, located along the floodplain, owned by the county; and
4. The floodplain areas along the Little Menomonee River, owned by the county, starting outside of the former wood preserving plant and stretching all the way to the confluence with the Menomonee River.

The deed restriction for the floodplain portion of the former wood preserving plant limits usage to recreational. The other two deed restrictions related to the former wood preserving plant, except the floodplain portion, limit the land to industrial use. The deed restriction applicable to the river floodplain outside of the former wood preserving plant are located primarily along a public parkway (Little Menomonee River Parkway) and is limited to recreational use. They were not updated to utilize the new Wisconsin IC authorities, however. As part of an IC review, these parcels of land will need to be investigated to determine if ICs are necessary to ensure the public is protected and that the remedy remains effective.

While it appears the 4 deed restrictions are adequate in minimizing the potential for nearby residents from being exposed to site-related contaminants and protect the integrity of the remedy, a preliminary review found that a few sections of the site are currently not covered by some form of IC. Specifically, 2 parcels owned by the City of Milwaukee and a parcel located on a residential lot, both just south of the former wood preserving plant, do not have any type of IC. As part of an IC review, these parcels of land will need to be investigated to determine if ICs are necessary to ensure the public is protected and that the remedy remains effective. As mentioned above, EPA will prepare an IC Plan to complete IC evaluation activities and determine if additional IC work is necessary, including long-term stewardship.

Current Compliance:

Compliance with ICs is required to ensure long-term protectiveness. Based on recent inspections and interviews, there are no known IC compliance issues at the site. While the non-floodplain portion of the site can be used for industrial purposes, recent inspections of the property revealed no such activities were occurring. A representative from the railroad told EPA it has no plans to resume the railroad/freight activities on its portion of the property.

Long-term Stewardship:

Long-term protectiveness requires compliance with effective ICs to ensure that the remedy continues to function as intended. Long-term protectiveness will be assured by conducting IC evaluation activities, including long-term stewardship procedures. Long-term stewardship will assure that effective ICs will be maintained, monitored and enforced. A long-term stewardship plan shall be developed (or O&M plan updated) to include procedures to ensure long-term IC stewardship such as regular inspection of ICs at the site and annual certification to U.S. EPA that ICs are in place and effective. EPA will also explore developing a communications plan and using the State's one call system. This will be addressed in the IC Plan.

Table 3 - Institutional Controls Summary Table

Media, Engineered Controls, & Areas that do not support UU/UE based on current conditions	IC Objective	Title of Institutional Control Instrument Implemented
Former Wood Treating Site – **Soil** Floodplain portion (County-owned)	By limiting usage to recreational use along the river floodplain, it is unnecessary to remediate soil contamination on the property to residential soil cleanup standards and will allow for implementation of the selected floodplain remedy described in the 1990 ROD.	Title: *Deed Restriction and Notice to Future Purchasers.* Recorded in Milwaukee County Register's Office on June 30, 2000. Reference No. 79313111. Enforceable by EPA, WDNR, and their successors or assigns. Prohibits 1) Excavating or grading of land surface 2) penetrating existing cap(s)/cover(s) 3) Filling on covered areas 4) Construction, installation, or removal of a building, pipe, road, or any structure with a foundation that would sit on the cover 5) Plowing for agricultural cultivation 6) Extraction of gw for consumption or any purpose other than gw monitoring 7) Any activity that may damage any constructed remedy or impair its effectiveness. Limited to recreational use.
Former Wood Treating Site – **Soil** Non-floodplain property owned by the county	Prohibits non-industrial use. Amended from 1996 deed restriction as result of 1998 ROD Amendment and compliance with State law.	Title: *Deed Restriction and Notice to Future Purchasers.* Recorded in Milwaukee County Register's Office on June 30, 2000. Reference No. 79313110. Enforceable by EPA, WDNR, and their successors or assigns. Limited to industrial use.
Former Wood Treating Site – **Soil** Non-floodplain property owned by the railroad	Prohibits non-industrial use. Amended from 1996 deed restriction as a result of 1998 ROD Amendment and compliance with State law.	Title: *Deed Restriction and Notice to Future Purchasers.* Limited to industrial use. Enforceable by EPA, WDNR, and their successors or assigns
Floodplain downstream from former Wood Treating Site – **Soil**	Prohibits any installation, construction, or removal of structures around areas remediated during response action (i.e., areas rerouted). Prohibits use of area for any activity that may damage or impair the response action.	Title: *Amended Declaration of Restriction on Use of Real Property* Recorded in Milwaukee County Register's Office on June 30, 2000. Reference No. 7931309.
Former Wood Treating Site – **Groundwater**	Prohibits consumption or other uses of groundwater. Note: No one in the area currently is using groundwater. Residents are connected to city water. According to the RI, the contaminated shallow	Title: *Amended Declaration of Restriction on Use of Real Property* Recorded in Milwaukee County Register's Office on June 30, 2000. Reference No. 7931309. Enforceable by EPA, WDNR, and their successors or assigns

Media, Engineered Controls, & Areas that do not support UU/UE based on current conditions	IC Objective	Title of Institutional Control Instrument Implemented
	groundwater does not have adequate capacity as a drinking water source.	
Groundwater – Downstream from former wood treating site (focus on 3 parcels of land not owned by the county)	Prohibit groundwater use until cleanup standards are achieved.	(Need is under review)
Surface Water Site-wide	Ensure no inappropriate uses	(Need is under review)
Other Remedy Components	Ensure no interference with remedy components	(Need is under review)

System Operation and Maintenance

A groundwater treatment system, consisting of the funnel and gate system, air sparging, and a network of monitoring wells, is currently in operation. Groundwater samples from selected monitoring wells were collected on a quarterly and semiannual basis by the PRP and results were provided to EPA and the State as required in the SOW.

Groundwater-related items for which a frequent maintenance schedule is most needed consists of air filters for blowers, V-belts for motors, and blower motor mufflers for noise suppression. Also, minor oiling and lubrication is required monthly. All such blower device maintenance was recorded in a log book. If no other activity other than lubrication was performed, the log book notation simply says "blower maintenance". If another item was needed - such as air filter, V-belt, noise muffler replacement, etc., a brief notation to this effect was noted. The PRP keeps some parts within the treatment building; other routine items were available within one day. There is some capability within the system that, if one blower motor is down, one of the remaining motors can cross-feed air injection into other air lines normally served by the motor down for servicing.

O & M Costs

This is an enforcement-lead site and actual O & M cost information has not been fully provided by the PRP to EPA. However, Tronox has verbally provided the Agency with rough estimates of its annual costs since groundwater treatment system was put in operation around 2001. Annual

O & M costs are estimated to be approximately $150,000. This figure is not expected to deviate significantly year to year.

Groundwater Remediation Results to Date

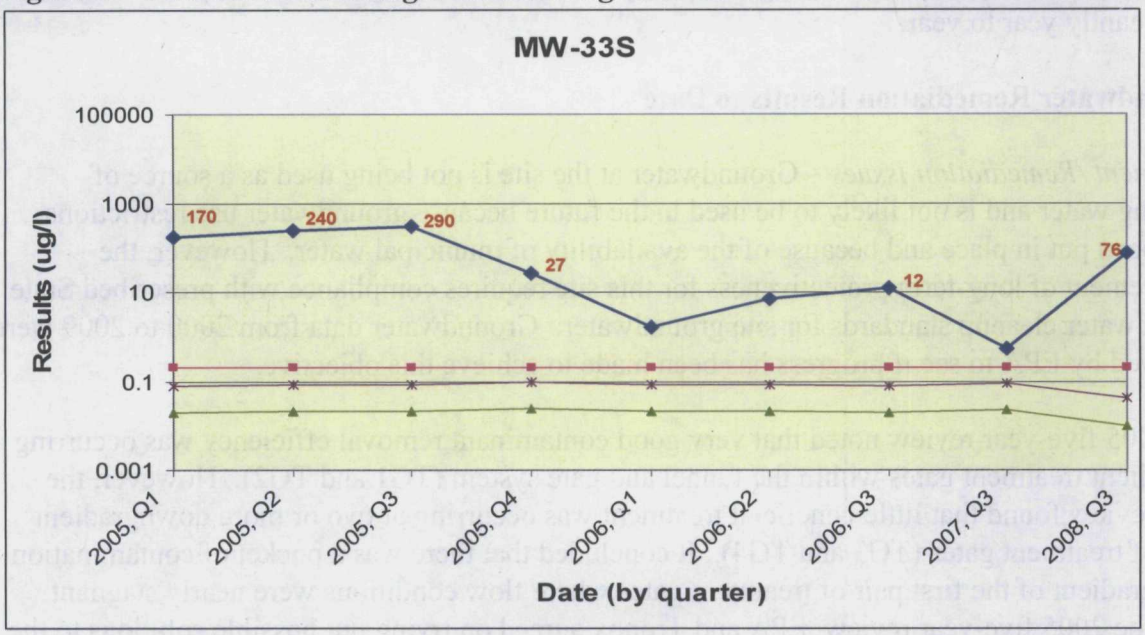
Treatment /Remediation Issues – Groundwater at the site is not being used as a source of drinking water and is not likely to be used in the future because groundwater use restrictions have been put in place and because of the availability of municipal water. However, the achievement of long-term protectiveness for this site requires compliance with prescribed State groundwater cleanup standards for site groundwater. Groundwater data from 2000 to 2009 were reviewed by EPA to see if progress has been made to achieve this objective.

The 2005 five-year review noted that very good contaminant removal efficiency was occurring at upgradient treatment gates within the funnel and gate system (TG1 and TG2). However, the 2005 review found that little beneficial treatment was occurring at two or more downgradient pairs of treatment gates (TG3 and TG4). It concluded that there was a pocket of contamination downgradient of the first pair of treatment gates where flow conditions were nearly stagnant. After the 2005 five-year review, EPA and Tronox agreed on trying out possible solutions to the problem, including 1) planting poplar trees near the final gate pairs, thereby serving as "natural pumps" to draw water towards this area; 2) inducing flow towards the final gate pairs, either by extracting water near those gates or injecting it back near the MW-33s/34s vicinity; and 3) installing another treatment gate near the zone of elevated contamination. This latter recommendation was subsequently dropped due to concerns that it would allow untreated groundwater to discharge directly to the river. Neither of the first two options were implemented.

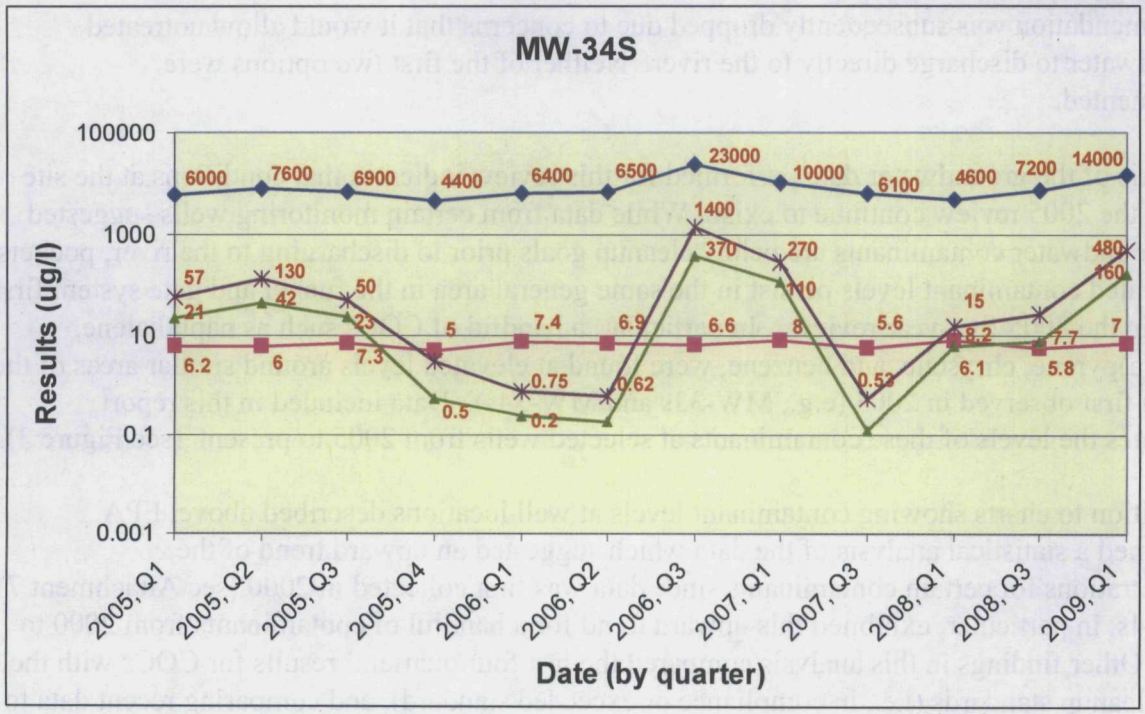
Analysis of the groundwater data performed for this review indicates that conditions at the site during the 2005 review continue to exist. While data from certain monitoring wells suggested that groundwater contaminants are below cleanup goals prior to discharging to the river, pockets of elevated contaminant levels persist in the same general area in the funnel and gate system first noted in the 2005 five-year review. In particular, a handful of COCs such as naphthalene, benzo(a)pyrene, chrysene, and benzene, were found at elevated levels around similar areas of the system first observed in 2005 (e.g., MW-33s and MW-34s). Data included in this report illustrates the levels of these contaminants at selected wells from 2005 to present (see Figure 3).

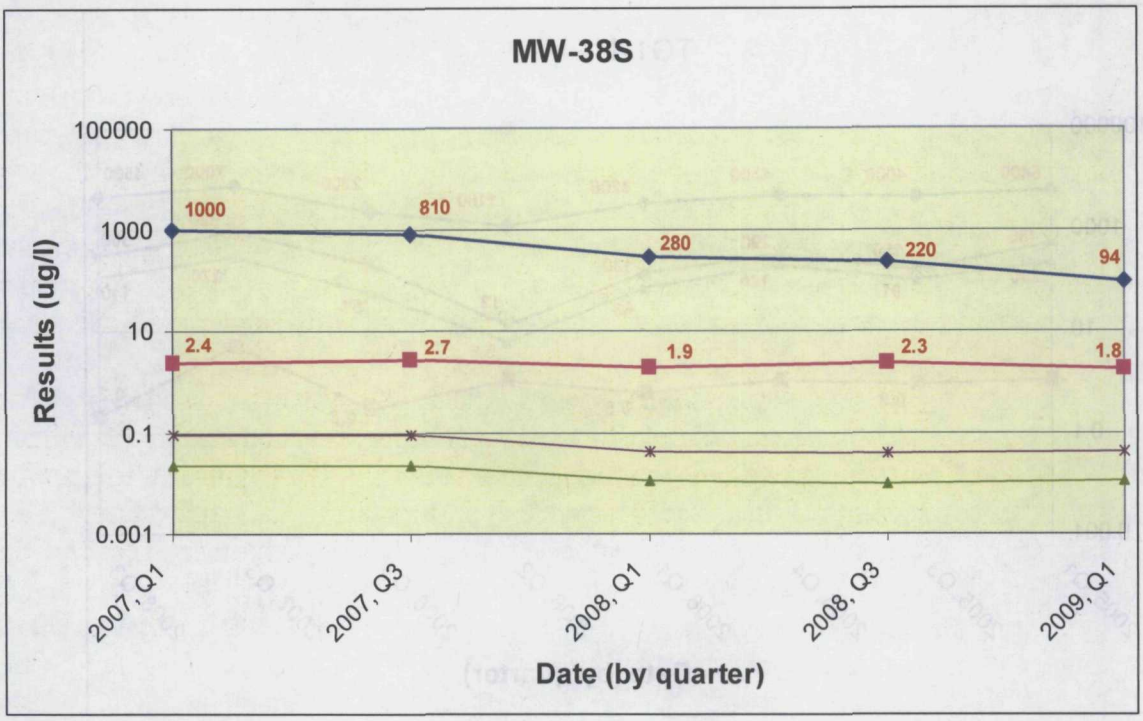
In addition to charts showing contaminant levels at well locations described above, EPA performed a statistical analysis of the data which suggested an upward trend of the concentrations for certain contaminants since data was first collected in 2000 (see Attachment 7). MW-34s, in particular, exhibited this upward trend for a handful of contaminants from 2000 to 2008. Other findings in this analysis compared the last four quarters' results for COCs with the State cleanup standards (i.e., in compliance or exceeded standard), and comparing recent data to the baseline interval, defined as the 2000-2002 dataset in this case (i.e., better, no change, or worse than the baseline). This information indicates that the downgradient funnel and gate systems may not be optimally operating.

Figure 3 – Selected monitoring wells showing contaminant levels from 2005 to Present



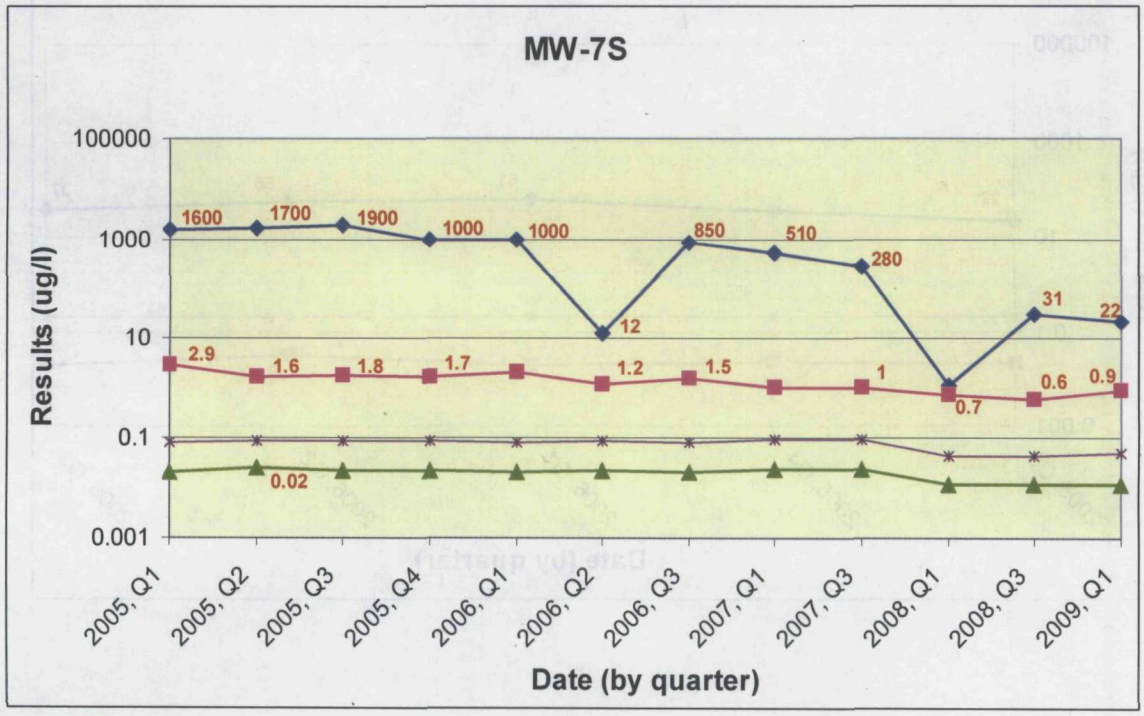
Detected Exceedance Values labeled in red

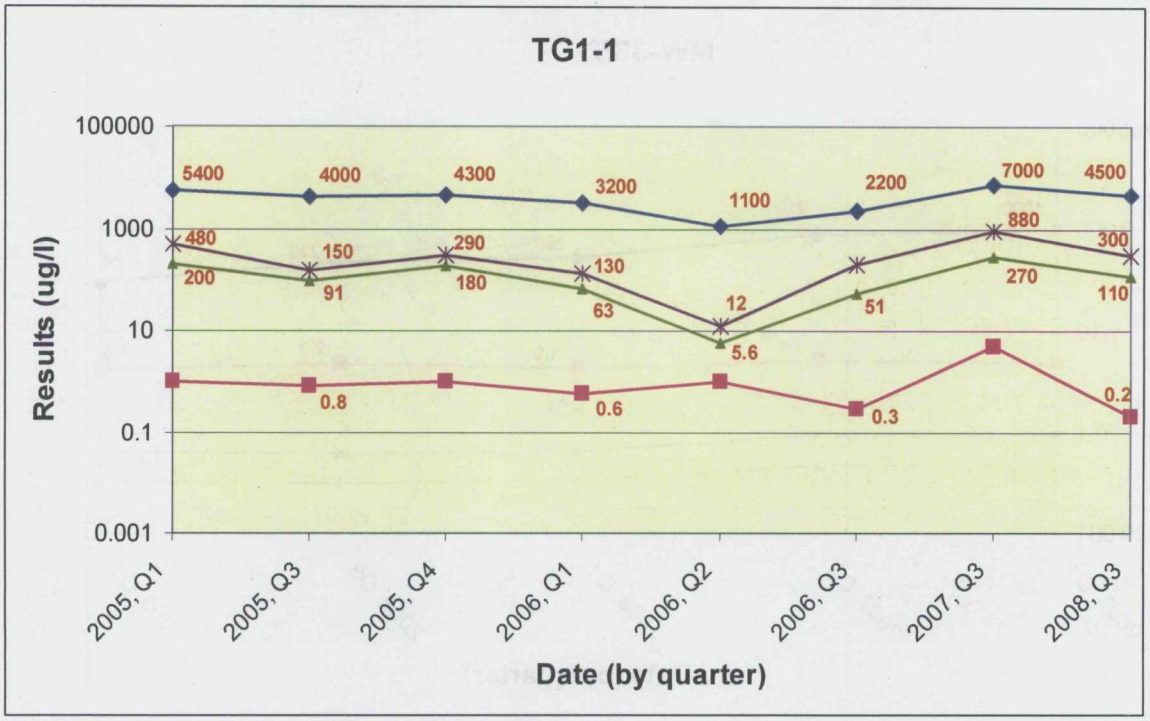




Naphthalene
Benzene
Benzo(a)pyrene
Chrysene

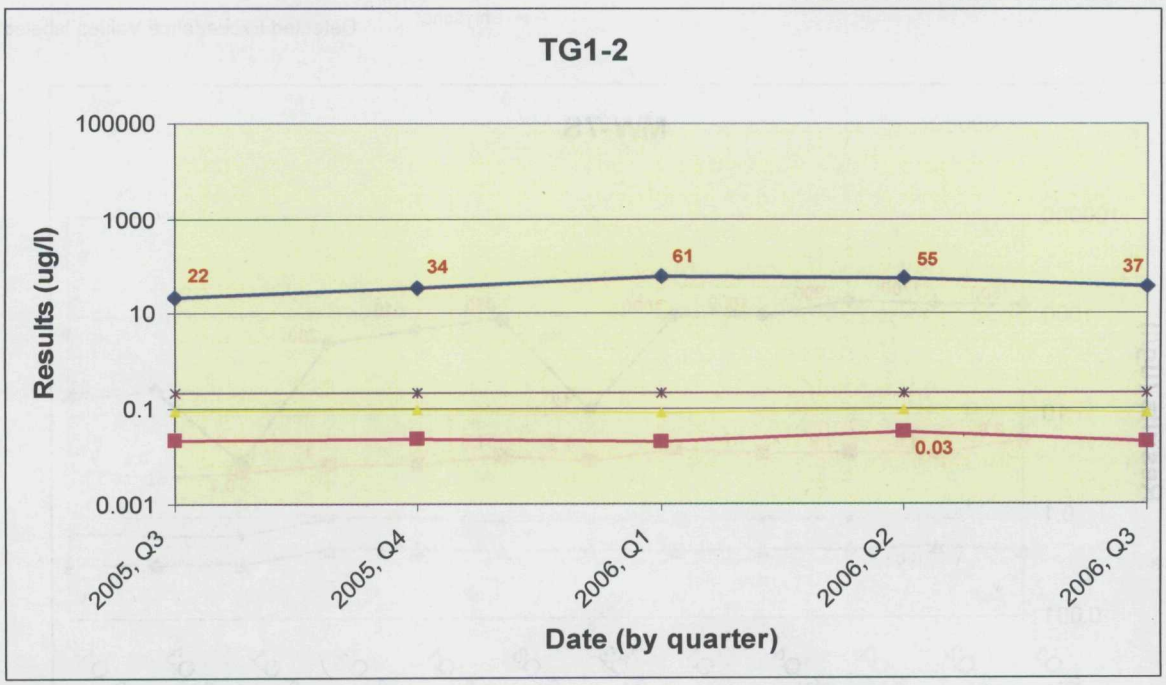
Detected Exceedance Values labeled in red





Naphthalene
Benzene
Benzo(a)pyrene
Chrysene

Detected Exceedance Values labeled in red



V. Progress Since the Last Review

This is the third five-year review report for the Moss-American site. Significant site developments over the past five years included the filing for Chapter 11 bankruptcy by Tronox in January 2009 and the completion of the final component of the RA in November 2009 by EPA as a Fund-lead activity.

The protectiveness statement from the September 2005 five-year review states the remedy was functioning as intended and was expected to be protective upon completion of the remedy. Long-term protectiveness required achievement of groundwater and sediment cleanup standards; and the recording, monitoring, and compliance with ICs. Issues identified in the 2005 five year review, and the status of their resolution follows.

Issue 1: More efficient operation of the funnel and gate system. EPA believed that the treatment capacity of the last two gates was underutilized. The gradient in this area of the aquifer was very slight, such that it was some time before contaminated groundwater near MW-33/34 reached the final gate pairs.

Status: Unresolved. EPA and Tronox are continuing discussions regarding optimizing the groundwater treatment system. Specifically, the parties need to determine how to address the continuing presence of elevated levels of COCs within a particular area of the funnel and gate system. Various options on how to fix the problem were discussed, but the parties need to decide which option they will implement to fix the problem.

Issue 2: Optimizing the groundwater monitoring network. Tronox first raised the issue of modifying /streamlining the existing groundwater monitoring network to EPA. The Agency indicated that it was aware of developing guidance in this area and was cognizant of the need to made adjustments towards "long-term monitoring optimization".

Status: Resolved. EPA agreed to modify the monitoring well network. EPA accepted Tronox's proposal in a correspondence dated March 29, 2007, to eliminate 22 monitoring wells from the network and add two new wells in the system (see attached). Some of the wells are being monitored on a semiannual basis, while some are monitored annually.

Issue 3: Present and future ICs need to be evaluated and executed to ensure protectiveness of the remedial action. Whether the present ICs are adequate, protective, in effect on the appropriate properties, enforceable, and run with the land, needs to be determined.

Response: Unresolved. Tronox contacted the county and railroad; and secured the services of an environmental real estate attorney, title company, and surveyor to address IC- related issues (e.g., land ownership, restrictions, liens, encumbrances, easements, covenants, etc.). Tronox provided EPA the following: (1) copies of deed restrictions recorded by the county and railroad; (2) information on land use from the railroad; and (3) information on who owned various parcels that make up the 88-acre site (62 separate properties with individual tax identification numbers). In its March 31, 2008 letter to EPA, Tronox indicated that appropriate ICs were in place and effective at the site and that no changes to land use have occurred. The site continues to be

fenced and security has been provided by railroad police. Tronox also mentioned that a county official verbally indicated that no changes in the parkway portion of the site have occurred, either in use or ownership. Tronox mentioned in the letter that it intended to remind the county of the need to verify this finding in the future.

Tronox will need to review all the information gathered since the last five-year review and prepare an IC plan. EPA may perform this task if Tronox is unable to do it as a result of the terms and conditions of a future reorganization plan it is currently negotiating with the federal government.

Issue 4: Uncontaminated strip of land along Brown Deer Road.

Status: Unresolved. The PRP has indicated that inclusion of this strip of land in the definition of the site was not appropriate and that EPA should have this portion of the site deleted from the NPL. The PRP has no use for the property and has spent considerable money maintaining it. If possible, the PRP would like to sell this property.

EPA has had discussions with the PRP and a prospective purchaser since 2008 regarding this strip of land. Available data from this part of the site indicate that it was not associated with former wood treating operations. EPA has recommended that the prospective purchaser exercise due diligence if it intends to purchase the property in the future. The State will also need to be involved in discussions on this issue. This issues merits attention, but is not a protectiveness issue for the site.

Issue 5: Well casing construction should be such that such wells do not serve as conduits for surface water infiltration.

Status: Resolved. Modifications to the existing groundwater monitoring program described in the March 29, 2007 correspondence from the PRP provides for elimination of these wells from the groundwater monitoring network. The monitoring wells were abandoned in accordance with the State's regulations on groundwater monitoring well requirements, Chapter NR 141.

VI. Five-Year Review Process

Administrative Components

The State was notified in a letter dated July 9, 2009 of the initiation of the third five-year review for the Moss American site (see Attachment 9). Subsequent to the letter to the State, EPA informed Tronox via email and phone that such work has been initiated. Thomas Wentland served as principal contact for the State, while Keith Watson served that role for Tronox during this review. Beginning around July 2009, the RPM began work on the various components of the review, which included the following:

- Community notification
- Document Review
- Data Review

- Site Inspection/Interview(s)
- Five-year review report preparation and review

Community Notification and Involvement

Community-related activities undertaken for this five-year review effort were initiated when the RPM contacted the community involvement coordinator (CIC) to indicate intent to begin this work in July 2009. Subsequently, the CIC prepared a public notice announcing the initiation of the review and soliciting site information and concerns from the community. This notice appeared in the Milwaukee Journal Sentinel on October 14, 2009 (see Attachment 10).

In general, community interest regarding the Moss American site over the past five years has been minimal. In the past, community interest has been similarly low-key. For further information and a pictorial history of recent activity at the site, the following EPA website can be visited: http://www.epa.gov/Region5/sites/mossamerican/index.htm.

Document Review

Key documents reviewed included the following: 1) ROD and subsequent amendments to it; 2) RD/RA CD; 3) the SOW contained in the RD/RA CD; 4) Wis. Admin. Code State's NR 140 regarding groundwater standards; 5) the September 2005 five-year review report; and 6) Various PRP correspondences relating to issues and recommendations described in the previous five-year review. The comprehensive list of documents is included as Attachment 11.

Data Review

With completion of sediment remediation work in November 2009, the remedial cleanup goals for contaminated soil and sediment have now been attained. Onsite groundwater quality is the only remaining cleanup goal that has not been achieved at this time. Consequently, this medium is the focus of the data review. All available groundwater data generated since 2000 was collected by EPA and analyzed to discern relevant statistical trends and progress towards achieving cleanup goals for the COCs in groundwater.

The groundwater data reviewed included quarterly, semiannual, and annual data collected by Tronox, in accordance with the groundwater monitoring program contained in the approved SOW, subsequently revised on March 29, 2007. The current monitoring program is primarily focused on monitoring groundwater entering/leaving the treatment gates (TG- series of wells) and in the area within the funnel and gate system where a zone of elevated levels of COCs continues to persist (around MW-34s). Table 4 summarizes the current monitoring wells being monitored, the monitoring frequency at each particular well, and the contaminants analyzed.

Table 4 – Groundwater Monitoring Program

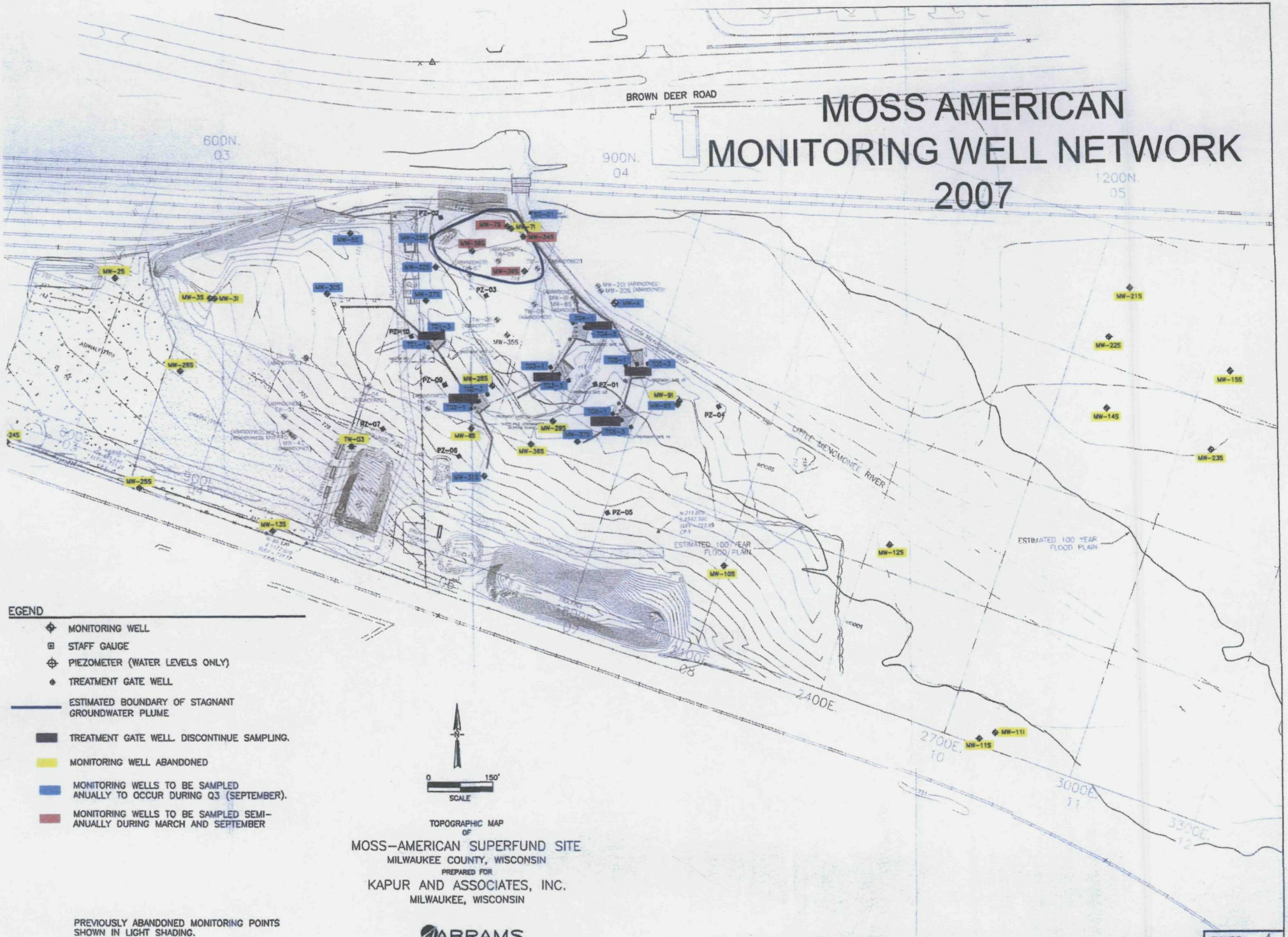
Well Designation	Description	Frequency of Monitoring/Contaminants Analyzed
MW-7s, MW-34s, MW-38s, and MW-39s	Monitoring wells located in zone of stagnation within the funnel and gate system. MW-38s and MW-39s are new wells installed in 2006-2007, intended to monitor contaminant concentration in an area where phytoremediation was being planned.	To be sampled semiannually during March and September. CPAH and BTEX will be analyzed.
MW-5s, MW-9s, MW-27s, MW-30s, MW-31s, MW-32s, MW-33s, and MW-37s	Revised set of monitoring wells surrounding the funnel and gate system. 22 other wells further upgradient or screened below confining layer were abandoned.	To be sampled on an annual basis during September. CPAH and BTEX will be analyzed.
TG1-1, TG1-3, TG2-1, TG2-3, TG3-1, TG3-3, TG4-1, TG4-3, TG5-1, TG5-3, TG6-1, and TG6-3	Revised group of treatment gates that will be sampled. The middle gate from Gates 1-6 were abandoned because contaminant levels showed consistent downward trend at these gates or because contaminants were not detected in these gates.	To be sampled on an annual basis during September. CPAH and BTEX will be analyzed.
SG-01, MW-A	SG-01 is a staff gauge located, along with MW-A, on the other side of the Little Menomonee River from the funnel and gate system	To be sampled on an annual basis during September. CPAH and BTEX will be analyzed.

Figure 4 illustrates the current monitoring well network, as revised in the March 29, 2007 report from Tronox.

Site Inspection

As part of the five-year review, EPA conducted a site inspection on October 9, 2009. The Agency was assisted by representatives from WDNR and Tronox, along with an EPA contractor who took notes and pictures during the inspection (see Attachment 1). The inspection team spent a considerable amount of time examining the current groundwater treatment system and its various components, and visited other parts of the former wood treating facility. The team also spent time inspecting the temporary haul roads/gravel piles along Reaches 1-3 that are going to

MOSS AMERICAN MONITORING WELL NETWORK 2007



EGEND

- MONITORING WELL
- STAFF GAUGE
- PIEZOMETER (WATER LEVELS ONLY)
- TREATMENT GATE WELL
- ESTIMATED BOUNDARY OF STAGNANT GROUNDWATER PLUME
- TREATMENT GATE WELL. DISCONTINUE SAMPLING.
- MONITORING WELL ABANDONED
- MONITORING WELLS TO BE SAMPLED ANUALLY TO OCCUR DURING Q3 (SEPTEMBER).
- MONITORING WELLS TO BE SAMPLED SEMI-ANUALLY DURING MARCH AND SEPTEMBER

PREVIOUSLY ABANDONED MONITORING POINTS SHOWN IN LIGHT SHADING.

N

0 150'

SCALE

TOPOGRAPHIC MAP
OF
MOSS-AMERICAN SUPERFUND SITE
MILWAUKEE COUNTY, WISCONSIN
PREPARED FOR
KAPUR AND ASSOCIATES, INC.
MILWAUKEE, WISCONSIN

ABRAMS
AERIAL SURVEY CORPORATION
124 NORTH LARCH LANSING, MI 48912
PO Box 19008 LANSING, MI 48901-9008

FIGURE 4

WESTON SOLUTIONS
750 E. Bunker Ct.
Suite 500
Vernon Hills, Illinois
60061

LONG TERM MONITORING PROGRAM MODIFICATIONS
MOSS-AMERICAN SITE
Milwaukee, Wisconsin

be addressed in the near future. Finally, the inspection team observed the sediment excavation work at Reach 4/5. At the conclusion of the inspection, the parties agreed that the issue with continuing elevated levels of COCs within a section of the funnel and gate system (near MW-34s) needs to be addressed. Photographs taken of the site and surrounding area were taken around the time the inspection took place (see Attachment 12).

Interviews

As part of the site inspection, the RPM interviewed Tronox's site manager on October 16, 2009. A summary of what was discussed is noted in the attached inspection report.

VII. Technical Assessment

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

Yes. There is considerable contaminant removal occurring as groundwater migrates through the treatment gates. This suggests that, as a whole, the system is working as intended. However, elevated contaminant levels at a particular location within the funnel and gate system continue to persist. This is evident in the trend analysis performed for this review, which showed that elevated contaminant levels are primarily concentrated in a few adjacent wells (MW-33s and 34s). An optimization study will be needed to fine-tune the system to resolve this problem.

Site soils and contaminated sediment in the river have attained cleanup goals. Access controls, in the form of a locked perimeter fence and security, warning signs, and presence of site security personnel are in place. Deed restrictions prohibiting use of groundwater for consumption, limiting site use to industrial/commercial, and prohibiting disturbing the land with contaminated materials above health-based limits are in place and effective.

Long-term protectiveness requires compliance with effective ICs. Current ICs will be reviewed and additional IC evaluation activities will be conducted to ensure that effective ICs are in-place and are maintained, monitored and enforced. An IC plan will be developed in the near future to evaluate the ICs in place at this site.

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

Yes. Exposure assumptions, toxicity data, cleanup goals, and RAOs used at the time of remedy selection are still valid today. The 1998 ROD amendment recognized that areas at the former creosote plant are predominantly industrial in nature, and that cleanup levels to industrial/commercial levels are appropriate provided land use is restricted to industrial use and restrictions are implemented and maintained by the site property owners. There are deed restrictions currently in effect that enforce this. Also, there is a deed restriction on what activities are prohibited along the floodplain outside of the former wood treating facility. No changes to land use are expected in the foreseeable future. An IC plan will be developed in the near future to evaluate the ICs in place at this site. ICs will continue to be used in an appropriate manner and to protect the integrity of the remedy.

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

No. There is no new information to suggest that the selected remedy in place is not protective. There have been no changes in the physical condition of the site since the last five-year review. No new exposure pathways or receptors have been identified that would call into question the protectiveness of the remedy.

Technical Assessment Summary

This five-year review found the remedy implemented at Moss American to be functioning as intended by the ROD and subsequent amendments to this decision document. Exposure assessments, toxicity data, and RAOs used at the time of remedy selection are still valid and have been addressed by the cleanup. The groundwater treatment system continues to demonstrate that contamination is being reduced as groundwater migrates through the treatment gates, as planned. There is no new information to suggest that the selected remedy in place is not protective of human health and the environment.

An optimization study of the groundwater treatment system needs to be undertaken to address the presence of elevated levels of contaminants in a localized area of the system. Also, an IC plan needs to be developed to ensure effective ICs are in place and that long-term protectiveness of the site will be maintained until and after all RAOs are met.

VIII. Issues

Table 5: Issues

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
1. The funnel and gate groundwater treatment system may not be optimally capturing the groundwater contamination.	No	Yes
2. There is no IC Plan to ensure all necessary site Institutional Controls are in place and effective in the long term.	No	Yes

IX. Recommendations and Follow-up Actions

Table 6: Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
1. The funnel and gate groundwater treatment system may not be optimally capturing the groundwater contamination.	**Conduct optimization study to determine solution to elevated levels of COCs in local area of funnel & gate**	**PRP**	**EPA**	**04/15/2012**	**No**	**Yes**
2. There is no IC Plan to ensure all necessary site Institutional Controls are in place and effective in the long term.	**Develop IC plan to determine if ICs in effect are protective**	**PRP**	**EPA**	**04/15/2012**	**No**	**Yes**

X. Protectiveness Statement

The remedy at the Moss American Superfund Site currently protects human health and the environment in the short term. Contaminated soils and sediments have attained cleanup goals, and there is no current human exposure to contaminated groundwater. ICs, in the form of deed restrictions, have been recorded to limit the use of the former wood treating site and along the floodplain downstream of the plant. Long-term protectiveness will require achieving groundwater cleanup standards and compliance with effective ICs. In addition, current ICs will be reviewed and additional IC evaluation activities will be conducted to ensure that effective ICs are in place, maintained, monitored, and enforced.

Although current data suggests site groundwater is meeting cleanup standards prior to discharging to the Little Menomonee River, there are areas within the funnel and gate that have elevated COC levels. To address this concern, an optimization study will be performed on the system to develop a solution to remediate the elevated COC levels at those locations.

XI. Next Review

The next five-year review will be completed within five years of this review.

ATTACHMENT 1

Inspection Report

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site name: Moss American NPL Site	**Date of inspection: October 9, 2009**
Location and Region: Milwaukee, WI (R5)	**EPA ID: WID039052626**
Agency, office, or company leading the five-year review: U.S. EPA – Region 5, assisted by WDNR	**Weather/temperature: 44°F Partly cloudy, wind speed approx. 6 mph**

Remedy Includes: (Check all that apply)

☐ Landfill cover/containment
X Access controls
X Institutional controls
X Groundwater pump and treatment (**Funnel & Gate/Air Sparge**)
☐ Surface water collection and treatment
X Other__Soil – Low-temp. thermal desorption, Sediment – Rerouting & Excavation
☐ Monitored natural attenuation
☐ Groundwater containment
☐ Vertical barrier walls

Attachments: X Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ____Tom Graan_(Weston)_____ _____Sr. Project Manager _____10/9/09
Name Title Date
Interviewed X **at site** ☐ at office ☐ by phone Phone no. _____
Problems, suggestions; ☐ Report attached _Interviewed PRP contractor primarily on operation of gw treatment system. Discuss need for backup blower, look at temporary haul roads along Reaches 1-3 that need to be removed, access to site once the stream crossing is removed, and potential to do additional treatment on a localized area within the funnel and gate system (which has exceedances of State gw standards, although gw stds. are being met prior to gw discharging to the sw.

2. **O&M staff** __Not required to be onsite _____ _____
Name Title Date
Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
Problems, suggestions; ☐ Report attached _____

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

Agency __WDNR_____
Contact ___Tom Wentland_____ _____Site Manager_ _____ 920-892-8756
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _State contact went on 5-year inspection and pointed out the temporary access roads that need to be removed. He also participated in on-site discussions with PRP contractor and RPM on various issues (see #1 above) relevant to the site.

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

10/16 – Spoke to PRP site manager (Keith Watson of Tronox) primarily on status of gw treatment system (funnel and gate & air sparging), institutional controls in place, and future actions that need to be taken to get the site out of NPL listing (e.g., address localized area within funnel and gate system that has exceedances of State gw standards). RPM was provided information on gw quality during the conversation. Also, there was discussion on possible improvements to the gw treatment system.

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

1. **O&M Documents**

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

Remarks_____

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

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

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	xN/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	xN/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	xN/A
☐ Other permits_____	☐ Readily available	☐ Up to date	xN/A

Remarks_____

5. **Gas Generation Records** ☐ Readily available ☐ Up to date xN/A
Remarks_____

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date xN/A
Remarks_____

7. **Groundwater Monitoring Records** xReadily available ☐ Up to date ☐ N/A
Remarks_____

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date xN/A
Remarks_____

9. **Discharge Compliance Records**
☐ Air ☐ Readily available ☐ Up to date xN/A
☐ Water (effluent) ☐ Readily available ☐ Up to date xN/A
Remarks_____

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date xN/A
Remarks_____

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house XContractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other_____

2. **O&M Cost Records**
☐ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate___$150,000_(Est. from PRP) Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: _Costs for operating the gw system (about $150K) appear reasonable.

V. ACCESS AND INSTITUTIONAL CONTROLS XApplicable ☐ N/A

A. Fencing - There is fencing around the perimeter of the former wood treating site.

1. **Fencing damaged** ☐ Location shown on site map XGates secured ☐ N/A
Remarks_Walk through of the site did not reveal any major damage to the fencing around the site

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks_Gates/fencing appear to be in good order._____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**
Site conditions imply ICs not properly implemented ☐ Yes xNo ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes xNo ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) _____
Frequency _____
Responsible party/agency PRP has provided evaluation on effectiveness of deed restrictions put in place by county and railroad.
Contact _Keith Watson (Tronox)____ ___Project Manager _____ _____
Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☐ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ☐ No ☐ N/A
Other problems or suggestions: ☐ Report attached

2. **Adequacy** xICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks__Deed restrictions placed by the county and the railroad are in effect._

D. General

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

2. **Land use changes on site** ☐ N/A
Remarks_____

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

VI. GENERAL SITE CONDITIONS

A. Roads x Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A
   Remarks_Roads in and out of the site were in good condition and traffic along it were generally normal.

B. Other Site Conditions

Remarks: Site may need some mowing during the growing season. Also,

VII. LANDFILL COVERS ☐ Applicable X N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

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

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

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

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

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

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

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent_____
☐ Ponding ☐ Location shown on site map Areal extent_____
☐ Seeps ☐ Location shown on site map Areal extent_____
☐ Soft subgrade ☐ Location shown on site map Areal extent_____
Remarks_____

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

B. Benches ☐ Applicable X N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

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

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

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

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

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

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

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

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

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

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

D. Cover Penetrations ☐ Applicable X N/A

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

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

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

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

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

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

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

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

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

F. Cover Drainage Layer ☐ Applicable X N/A

1. **Outlet Pipes Inspected** ☐ Functioning X N/A
Remarks_____

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

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

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

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

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

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

H. Retaining Walls ☐ Applicable X N/A

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

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

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

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

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

☐ Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____

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

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

VIII. VERTICAL BARRIER WALLS ☐ Applicable X N/A

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

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

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

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

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

Remarks: Facility does not use extraction wells._Instead, it uses a "funnel and gate" system.

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks_____

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____

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

1. **Collection Structures, Pumps, and Electrical**
☐ Good condition ☐ Needs Maintenance
Remarks__Uses 3 air blowers located in the gw treatment system. _____

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

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____

C. Treatment System ☐ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☐ Air stripping ☐ Carbon adsorbers
☐ Filters_____
☐ Additive (*e.g.*, chelation agent, flocculent)_____
XOthers___**Air Sparging using a funnel and gate to bring contaminated gw to treatment zone**
☐ Good condition ☐ Needs Maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
XEquipment properly identified
☐ Quantity of groundwater treated annually_____
☐ Quantity of surface water treated annually_____
Remarks_____

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

3. **Tanks, Vaults, Storage Vessels**
☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
Remarks__**Holding tank inside gw treatment building not being used**_____

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

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

6. **Monitoring Wells** (pump and treatment remedy)
☐ Properly secured/locked **X** Functioning ☐ Routinely sampled **X** Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks_____

D. Monitoring Data

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

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

D. Monitored Natural Attenuation

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

X. OTHER REMEDIES

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

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

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

GW treatment systems appear to be operating and functioning as designed. According to PRP contractor, gw cleanup standards are being met prior to discharging to the river, but there are some exceedances of the standards (both PALs and ESs) within the treatment zone (primarily at MW-4, MW-34s, TG1-1, and MW-33s)

B. Adequacy of O&M

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

Implementation of O & M appears to be adequate, but there's question on who will be operating the gw treatment system after 2010 due to the ongoing bankruptcy of the PRP.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. **Given the continuing exceedances of certain contaminants of concern at various locations within the treatment zone within the funnel and gate system, there is possibility for treatment optimization. EPA will work with the State and PRP on deciding what steps or strategies can be taken to address the exceedances.**

ATTACHMENT 2

State Superfund Contract

SUPERFUND STATE CONTRACT (SSC) Amendment # 1

Between the United States Environmental Protection Agency and the Wisconsin Department of Natural Resources

For Remedial Action at the Moss American National Priorities List Site Milwaukee County, Wisconsin

1. **General Authority**

This State Superfund Contract ("Contract") is entered into pursuant to Section 104(a)(1), (c)(2), and (c)(3) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA"), 42 U.S.C. §§ 9601 et seq., as amended; the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300 ("NCP"); other applicable Federal regulations including 40 C.F.R. Part 35, Subpart O, and 40 C.F.R. Part 31, and Wis. Stat. § 292.31(7).

2. **Purpose**

The purpose of SSC Amendment #1 between the United States Environmental Protection Agency ("EPA") and the Wisconsin Department of Natural Resources ("WDNR"), on behalf of the State of Wisconsin ("State"), is to amend the estimated cost for remediating Reach 4/5 of the Little Menomonee River at the Moss American Superfund Site ("Site"), CERCLIS ID WID000802827, located in Milwaukee County, Wisconsin. The initial SSC, signed on June 25, 2009, contained cost estimates for remediating Reach 4/5 of the river. The original cost estimate was $1,200,000. Based on recent information, the revised cost for remediating Reach 4/5 is now estimated at $3,200,000. WDNR's share of the costs for this portion of the work has been revised accordingly to $320,000. Also, the project schedule under Appendix B of this document has been revised to reflect more current estimates on completion of milestones. All other provisions contained in the June 25, 2009 SSC remain the same.

SSC Amendment #1 sets forth the responsibilities of EPA as lead agency and WDNR as support agency for the remedial action to be implemented at Reach 4/5 of the Site. It also obtains the necessary CERCLA assurances for the remedial action at the Site, pursuant to Sections 104(c)(3), 104(c)(9), and 104(j) of CERCLA and documents the State's involvement in the remedial action cleanup process pursuant to Section 121(f) of CERCLA and 40 C.F.R. Part 300.515(g).

3. **Effective Date**

This Contract shall become effective upon execution by both EPA and WDNR and shall remain in effect until terminated in accordance with Paragraph 23 below.

4. **Designation of Primary Contacts and their Responsibilities**

A. EPA has designated Ross del Rosario as the Remedial Project Manager ("RPM") for this Contract. The RPM can be reached at (312) 886-6195, via fax at (312) 692-2905, or via electronic mail at delrosario.rosauro@epa.gov. The mailing address is U.S. EPA Region 5, Mail Code: SR-6J, 77 W. Jackson Boulevard, Chicago, Illinois 60604. The designated RPM may be changed by letter to the State without amending this Contract.

B. The WDNR has designated Thomas Wentland to serve as State Project Manager ("SPM") for this Contract. The SPM can be reached at (920) 892-8756, via fax at (920) 892-6638, or via electronic mail at thomas.wentland@wisconsin.gov. Whenever a written notice, report, or other document is required to be sent to the WDNR, it will be directed to Mr. Wentland unless otherwise instructed by WDNR. The mailing address is WDNR – Southeast District/Plymouth Service Center, 1155 Pilgrim Road, Plymouth, WI 53073. The designated SPM can be changed by letter to the EPA without amending this Contract.

C. The RPM and the SPM may make project changes that do not substantially alter the scope of the remedial actions.

D. In the event of disputes between EPA and WDNR concerning the work to be performed under the Contract, the RPM and SPM will attempt to resolve such disputes promptly. If disputes cannot be resolved at this level within 7 work days, the problem will be referred to the supervisors of these persons for further EPA/WDNR consultation. This supervisory referral and resolution process will continue, if necessary, to the level of Secretary of WDNR and the Superfund Division Director, EPA, Region 5. If an agreement still cannot be reached, the dispute will jointly be referred to the Assistant Administrator for Solid Waste and Emergency Response of EPA for final determination.

5. **Negation of Agency Relationship**

Nothing contained in this Contract shall be construed to create, either expressly or by implication, the relationship of agency between EPA and WDNR. EPA (including its employees, agents, and contractors) is not authorized to represent or act on behalf of the State in any matter relating to the subject matter of this Contract, and the State (including its employees, agents, or contractors) is not authorized to represent or act on behalf of EPA in any matter relating to this Contract.

APPENDIX B

PROJECT SCHEDULE and DELIVERABLES (Estimated)

Milestone	Estimated Date
Approval of Reach 4/5 Remediation Work Plan	Completed (March 4, 2009)
EPA Contract Award	July 24, 2009
Mobilization	See approved Work Plan
Completion of Tasks in Approved Work Plan	September 15, 2009
Pre-Final Inspection	September 18, 2009
Final Inspection (Construction Completion)	September 25, 2009

D. Technical Support at Public Meetings

EPA's contractor shall participate in public meetings, as identified by the RPM, which may be held or sponsored by EPA to explain activities at or concerning the Site.

The State shall be fully responsible for all operation and maintenance (O&M) tasks after one year of EPA being responsible for O&M at the site under this Contract.

SSC COST ESTIMATE SUMMARY (rounded)

Estimated RA cost (100% Design):	$3,200,000
Total State Cost Share:	$320,000

Items included in estimated RA cost above:

Remedy costs + mobilization:	$2,900,000
Change Order Reserve at 15%:	(Included)
Construction Management:	150,000
Project Management:	150,000
Contractor Overhead, fees	(Included)

Appendix A

SCOPE OF WORK FOR REMEDIAL ACTION AT THE

Reach 4/5 Site
Milwaukee, Wisconsin

I. Objective

EPA, under its ERRS contract, shall conduct the remedial action at the Moss American Superfund Site ("Site"), Milwaukee, Wisconsin, as identified in the September 13, 1990, Record of Decision ("ROD") for this Site. Specifically, remediation involves the excavation, removal, and off-site disposal of contaminated sediments at Reach 4/5 of the Little Menomonee River. Implementation of the remedial action at the Site shall be in accordance with EPA Superfund Remedial Action Guidance, the ROD, and any additional guidance provided by EPA and this Scope of Work (SOW).

II. Description of the Remedial Actions

The standards and specifications as contained in the approved remediation work plan for Reach 4/5 shall be implemented by an EPA contractor. Work to be completed includes the following major components:

A. Site preparation measures such as utility surveys and the clearing of vegetation, fences, and other structures necessary to implement the remedy;

B. Excavation of PAH-contaminated soil with off-site disposal in approved facilities;

C. Restoration of all excavated areas to grade, as necessary.

III. Scope

EPA's contractor shall be responsible for:

A. Award and management of the contract(s) to implement the remedial action.

B. Construction Contract Management

EPA's contractor shall manage the construction to ensure compliance with all contract requirements and to assure that oversight and monitoring is provided in coordination with the RPM.

C. Project Completion and Closeout

EPA's contractor will assist EPA in conducting the final inspection and certification of the completed remedial action in accordance with the Work Assignment.

In WITNESS WHEREOF, the parties hereto have executed this Contract in two (2) copies, each of which shall be deemed an original.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Richard C. Karl — Date 8-26-09

Richard C. Karl, Director
Superfund Division
EPA Region 5

STATE OF WISCONSIN

Matthew J. Frank — Date 10/9/09

Matthew J. Frank, Secretary
Wisconsin Department of Natural Resources

and the State have satisfied their cost-share payment of the 90/10 split supra as specified above, for Reach 4/5. EPA will not use overpayment by the State to satisfy obligations at another site. In the event that the payment terms above do not cover the cost of the remedial action, EPA will bill the State for the State cost share as referenced in Cost Share Payment, Paragraph 15.C. Final reconciliation of all remedial actions, by EPA, shall follow the acceptance of the remedy by both the EPA and the WDNR and is not contingent upon deletion of the Site from the NPL.

28. **Conclusion of the SSC**

This Contract is concluded when:

A. Response activities in accordance with the schedule contained in the approved work plan for Reach 4/5 of the Site have been satisfactorily completed and payments have been made, as specified in Paragraph 15 above;

B. The Financial Management Officer (FMO) has a final accounting of all project cost, including change orders and contractor claims, pursuant to Reconciliation Provision, Paragraph 27 above; and

C. All State cost share payments have been submitted to EPA [see 40 C.F.R. Part 35.6805(i)(5)].

29. **Attachments and Amendments**

Appendix A – Record of Decision (September 13, 1990)

Appendix B – Final Design Submittal, Reach 4 and 5 Area of Interest, Little Menomonee River, Moss-American Superfund Site (March 4, 2009)

C. If either EPA or WDNR recovers monies from the PRP, these funds shall reduce the total Fund-financed expenditures for the remedial actions that require cost share. This reduction in the cost share amount shall not alter the cost share percentage set forth in Paragraph 15 above.

25. **Termination of Contract**

A. The parties of this Contract may enter into a termination agreement which may establish, among other things, the effective date for the termination of this Contract, the basis for settlement of termination costs, and the amount and date of any sums due either party. Reconciliation costs will include all project costs incurred as well as any close-out costs.

B. The EPA Financial Management Office performs the final reconciliation of costs and prepares the Reconciliation and Termination Agreement after it has been determined that all technical requirements under the SOW have been completed and close-out of the Contract has been requested by the EPA State Project Officer. The final reconciliation of costs shall be performed even if the State uses a CERCLA credit to pay its cost share.

C. If at any time during the period of this Contract, performance of either all or part of the work described in the approved work plan is voluntarily undertaken, or undertaken for any other reason by persons or entities not party to this Contract, this Contract will be modified or terminated as appropriate to allow these actions and reconcile the payment of any cost share under the percentage set forth in Paragraph 15. Upon modification or termination, the parties to this agreement shall be relieved from further duties to perform those actions undertaken by persons or entities not party to this Contract.

26. **Amendments**

This Contract and any attachments hereto constitute the entire agreement between the parties. No amendment to this Contract shall take effect until approved by WDNR and EPA in writing.

27. **Reconciliation Provision**

This Contract shall remain in effect until the financial settlement of project costs and final reconciliation of response costs (including change orders, claims, overpayment, reimbursements, etc.) has been completed. Pursuant to 40 C.F.R. § 35.6805(k), EPA

B. **Remedial Action Report**

EPA will provide WDNR with an electronic and hard copy of the draft remedial action report ("RA Report") for review upon satisfactory completion of the final inspection. WDNR shall review and comment on the draft RA Report in accordance with paragraph 11 of this Contract. EPA shall produce the final RA Report in accordance with paragraph 11 and provide WDNR with an electronic and hard copy for review and approval.

C. **Acceptance**

WDNR shall send written notice to EPA that it has approved the final RA Report and that it accepted the remedial actions. After EPA receives WDNR's written notice of acceptance of the remedial actions, EPA shall send to WDNR written notice of EPA acceptance of the completed project.

22. **NPL Deletion**

Pursuant to 40 C.F.R. Part 300.435(e), EPA agrees to gain the concurrence of WDNR before deleting the Site from the National Priorities List.

23. **Enforcement**

This Contract does not constitute a waiver of EPA's or WDNR's rights to bring an action against any person or persons for liability under Section 106 or 107 of CERCLA, or any other statutory provision or common law.

24. **Cost Recovery**

A. EPA and WDNR agree that they will cooperate in and coordinate efforts to recover their respective costs of response actions taken at the Site. EPA and WDNR also agree that neither agency shall enter into a settlement with or initiate a judicial or administrative proceeding against a PRP for the recovery of such sums, except after having given notice in writing to the other agency 60 days prior to the date of proposed settlement or commencement of the proposed judicial or administrative proceedings.

B. Neither party to this Contract shall attempt to negotiate or collect reimbursement of any costs of the remedial actions on behalf of the other party.

17. **CERCLA Assurances: 20-Year Waste Capacity Assurance**

WDNR assures the availability of hazardous waste treatment or disposal facilities for the next 20 years after the effective date of this Contract, pursuant to CERCLA Section 104(c)(9), in accordance with and as provided in the Waste Capacity Assurance Plan approved by the EPA.

18. **CERCLA Assurance: Off-Site Storage, Treatment, or Disposal**

EPA and WDNR agree that off-site disposal of hazardous substances will be required, per the approved work plan, and will assure that all off-site disposal will be undertaken in conformance with Sections 104(c)(3)(B) and 121(d)(3) of CERCLA.

19. **CERCLA Assurance: Real Property Acquisition**

EPA and WDNR agree that no real property acquisition will be required under this work.

20. **CERCLA Assurance: Operation and Maintenance (O&M)**

EPA, in accordance with CERCLA, shall undertake all operation and maintenance (O&M) activity required for the remedial action at Reach 4/5 for a one year term. WDNR agrees to undertake all O&M activities required under the remedial action at Reach 4/5 after the one year period is completed. EPA agrees to send WDNR a written notice 90 days before the initial one year O&M period is complete.

21. **Acceptance of Remedial Action**

The RPM will coordinate with the SPM concerning the acceptance of the remedial actions by WDNR. The remedial actions shall be considered acceptable only if they are complete.

A. **Pre-Final and Final Inspections**

EPA and WDNR (the RPM and SPM) shall conduct a pre-final inspection of the remedial actions upon completion of construction activities specified in the approved work plan for Reach 4/5. EPA, in consultation with WDNR, shall produce a "punch list" of unresolved items. After all punch list items are resolved, EPA and WDNR (the RPM and SPM) shall conduct a final inspection to confirm that all outstanding punch list items have been completed.

on this Contract.

C. **Payment Terms**

i. EPA shall pay 90 percent of the total capital costs of the remedial actions described in the attached SOW. WDNR, on behalf of the State of Wisconsin, agrees that the State shall pay 10 percent of the total capital costs of the remedial actions described in the SOW.

ii. EPA shall send written notice (via fax, e-mail, or regular mail) toWDNR that EPA has initiated on-site remedial action work in accordance with the SOW and schedule herein. When the remedial actions described in the SOW are complete, EPA shall reconcile the final costs and shall send a written notice to WDNR as to the final cost of the remedial actions. Upon receipt of this written notice, WDNR agrees to send a letter within 90 days to EPA containing payment equal to 10% of the total cost of the remedial action. WDNR shall send the letter with payment to the following address:

U.S. Environmental Protection Agency
Superfund Payments
P.O. Box 979076
St. Louis, MO 63197-9000

If payment is going to be sent via express mail (e.g., FedEx) requiring a street address, please contact Ms. Natalie Pearson at (314) 418-4087.

Total WDNR payments shall not exceed the cost share amount identified in Paragraph 15(B) without an amendment to this Contract. Such payments shall be identified as payment for Moss American Reach 4/5 remediation work (Account number 05M7).

16. Emergency Response Activities

Any response activities, or emergency circumstances, shall not be restricted by the terms of this Contract, including removal, per NCP. However, remedial response activities may be suspended until the emergency activities are concluded, in which case, the response activities, cost share, or terms may be subject to amendment.

information. Absent notice of such claim, and with the exception of certain policy, deliberative, and enforcement documents which may be held confidential, EPA may make said information available to the public without further notice.

13. **Records Retention**

All financial and programmatic records, supporting documents, and statistical records, and other records related to the Site must be maintained for a minimum of ten years following the submission of the final Financial Status Report by EPA. If any litigation, claim, negotiation, audit, cost recovery, or other action involving the records has been started before the expiration of the ten-year period, the records must be retained until the completion of the action and resolution of all issues which arise from it, or until the end of the regular ten-year period, whichever is later. Microfilm copying shall be performed in accordance with all applicable State of Wisconsin records management and retention regulations which meet or exceed the technical regulations and records management procedures contained in 35 C.F.R. Part 1230 and EPA Order 2160, respectively.

14. **Statement of Intention to Follow EPA Policy and Guidance**

EPA and WDNR agree to adhere to all applicable or relevant and appropriate federal program requirements (policy and guidance) identified in the Administrative Record in addition to the requirements specified in CERCLA and the NCP.

15. **CERCLA Assurance: Cost Share Payment**

A. **Cost Share**

EPA and WDNR agree that the Site was privately operated during the time of the contaminant releases and, pursuant to Section 104(c)(3) and 104(d)(1) of CERCLA, the WDNR's cost share for the remedial action at the Site is 10 percent (%).

B. **Cost Estimate**

The estimated cost of remediating Reach 4/5 is $3,200,000. This estimate is derived from information provided by the responsible party and EPA's best professional judgment. It includes contingencies for change orders, which may or may not be invoked, and construction management services, but not remedial design costs.

Total costs to WDNR under the terms of this Contract shall not exceed $320,000. Project changes that increase the State's funding assistance for the remedial action above the amount set forth in this paragraph shall not be effective absent a written amendment

provided with this SSC (see Attachment B). The approved work plan includes a description of the design of the project-specific work to be undertaken for Reach 4/5 and the various components associated with work (e.g., site preparation, sediment removal, waste materials handling, sediment disposal, and habitat restoration). Minor adjustments to this work may be made by the authority of the RPM or SPM without formal amendment. Work changes that significantly and/or substantially increase or decrease the project costs, or which significantly alter the SOW, thereby affecting the State's ability to meet the conditions set out in this Contract, including cost-share requirements, shall necessitate amendment to this Contract.

10. **Project Start and Schedule**

A project schedule and milestones have been included in the approved work plan in Section 4. Technical specifications, including the general conduct of the work, construction progress, and schedules, have been outlined in the work plan accordingly. The project schedule outlined in Section 4 of the approved work plan may be adjusted in writing by the joint authority of the RPM and the SPM, without a formal amendment to this Contract, unless there is an extended delay to the schedule.

11. **EPA and WDNR Review**

EPA will provide both hard and electronic copies of documents generated under this Contract to WDNR. WDNR shall timely review and transmit written comments on documents provided under the SOW to EPA. EPA shall address any WDNR comments by incorporating them into the appropriate document or providing a written explanation to WDNR for each comment not incorporated. Specifically, all deliverable reviews shall not exceed 28 calendar days for draft documents and 14 calendar days for final documents unless agreed upon in writing by the RPM and SPM. The review time for major change orders shall be 7 calendar days.

12. **Records Access**

At EPA's request and to the extent allowed by State law, WDNR shall make available to EPA any information in its possession concerning the Site. At the State's request and to the extent allowed by Federal law, EPA shall make available to the State any information in its possession concerning the Site. The recipient of any records must comply with the requirements regarding records access described in 40 C.F.R. 31.42(e). The recipient of any records must also require its contractor(s) to comply with the requirements regarding records access described in 40 C.F.R. 31.36(i)(10). EPA shall not disclose information submitted by the State under a claim of confidentiality unless EPA is required to do so by Federal law and has given the State advance notice of its intent to release that

6. **Site Description**

A description of site, including Reach 4/5, is provided in the September 13, 1990 Record of Decision (ROD), which is attached (see Attachment A).

7. **Site Access**

A. WDNR shall use its own authority to secure access to the Site and adjacent properties, as well as the rights-of-way and easements necessary for EPA or its contractors to complete the remediation work for Reach 4/5 of the site, pursuant to this Contract. EPA may also secure access under its own authority and may request assistance from WDNR as necessary. As requested by EPA, WDNR shall also obtain or assist EPA in obtaining any permits that are necessary to satisfactorily complete the activities described in the remediation work plan for Reach 4/5 approved by EPA on March 4, 2009 (see Attachment B - "Final Design Submittal, Reach 4 and 5 Area of Interest, Little Menomonee River, Moss American Superfund Site, Milwaukee, Wisconsin")

B. Representatives of WDNR and EPA shall have access to the Site to review work in progress, and shall coordinate visits in advance with the RPM and SPM.

C. EPA shall not be responsible for any harm to any State representative or other person arising out of, or resulting from any act or omission by the State in the course of an on-site visit. The State shall not be responsible for any harm to any EPA representative, or other person arising out of, or resulting from any act or omission by EPA in the course of an on-site visit.

8. **Third Parties**

A. This Contract benefits only WDNR and EPA. It extends no benefits or rights to any third party not a signatory to this Contract.

B. EPA does not assume any liability to third parties with respect to losses due to bodily injury or property damages that exceed the limitations contained in the provisions of 28 U.S.C. Sections 1346(b) and 2671-2680. To the extent permitted by State law, the State does not assume liability to any third parties with respect to losses due to bodily injury or property damage.

9. **Site-Specific Work Plan**

As indicated above, an approved work plan for remediating Reach 4/5 of the Site is

ATTACHMENT 3

Prefinal Inspection

MOSS AMERICAN SUPERFUND SITE
MILWAUKEE, WISCONSIN
REMEDIAL ACTION ACTIVITIES
PRE-FINAL CONSTRUCTION COMPLETION CHECKLIST
NOVEMBER 2009

ITEM	DESIGN SPEC	DEFICIENCY	CORRECTED (Y/N)	ACCEPTED (Y/N)	COMMENTS
Reach 4/5 Sediments excavated	Removed per approved work plan and confirmed by 3rd-party surveys	None	N/A	Yes	Excavation completed 11/19/09.
Off-site disposal of all excavated Reach 4/5 sediments	Transport and dispose excavated sediments from Reach 4/5 to approved solid waste landfill	None. >95% excavated sediments disposed off-site.	N/A	Ongoing. Sediments being sent to approved SW landfill (Orchard Ridge LF)	Should be completed by 12/7/09.
Remove all temporary access roads at Reach 4/5	Per approved work plan	None. 70-80% completed as of 11/20/09	N/A	Ongoing. Reseed and matting Materials will be recycled	Reach 4/5 road removal should be completed by 12/7/09. Need to also remove access roads by Reaches 1-3 in spring 2010.
Restore all areas disturbed during work back to conditions prior to work	Per approved work plan	None. Approx. 70% completed as of 11/20/09	N/A	Ongoing	1. Remove boom/silt fence by 107th 2) Clean up bike trail by Appleton 3) Remove silt fence near WA #2 4) Remove earthen dam by WA #2
Reseed areas that were cleared/grubbed	Per approved work plan	None. Approx. 70% completed as of 11/20/09	N/A	Ongoing	Some seeded areas beginning to germinate
Demob at the site	Per approved work plan				Expect to demob by week of 12/7/09

U.S. EPA Remedial Project Manager: R. del Rosario Date: 11/20/09
Ross del Rosario

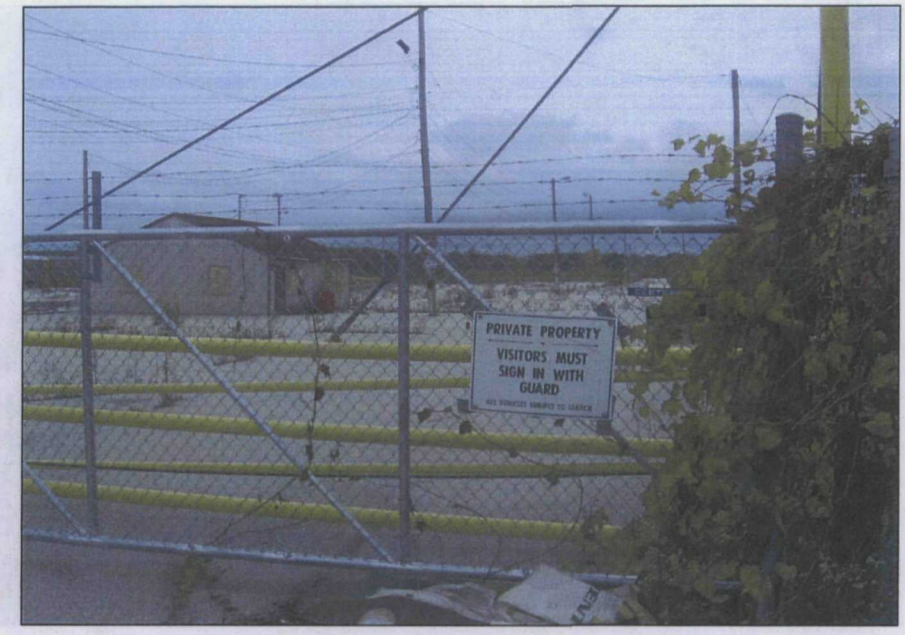
Moss American Site
Milwaukee, Wisconsin
Pre-Final Construction Completion Report

Work Area	Estimated Volume to be removed as per Work Plan (in Cubic Yards)				Average Depth of excavation (in feet)			Actual Sediment Volume* that was removed by U.S EPA (in Cubic Yards)	Is Actual Volume ≥ Estimated Volume (Y/N)	Acceptable? (Y/N)	Comment
	0-6"	6-15"	15-24"	Work Area Total	0-6"	6-15"	15-24"				
1	122.7	170.7	110.2	403.6	0.73	1.01	0.93	1286.7	Y	Y	Removal of additional creosote material found south of the Appleton Avenue bridge resulted in increase of actual sediment volume removed.
2	15.6	6.9	-	22.5	0.83	1.40		39.8	Y	Y	
3	11.3	16.9	-	28.2	0.50	0.91		32.7	Y	Y	
4	36.6	20.9	-	57.5	1.40	0.84		610.8	Y	Y	Removal of dark stained material found at work area #4 resulted in increase of actual sediment volume removed.
5	31.8	-	-	31.8	0.86	-		56.0	Y	Y	
6	5.8	-	-	5.8	0.75	-		9.0	Y	Y	
7	41.3	55.4	2.4	99.1	0.72	1.03	0.75	142.3	Y	Y	
8	85.0	-	-	85.0	1.15			202.1	Y	Y	
9	124.7	94.4	-	219.1	0.88	1.40		407.6	Y	Y	
10	87.2	24.6	-	111.8	1.20	1.12		253.8	Y	Y	
11	98.5	4.3	-	102.8	1.25	1.24		260.2	Y	Y	
12	65.0	31.5	-	96.5	0.89	1.01		163.3	Y	Y	
13	298.0	156.3	-	454.3	0.80	1.04		715.5	Y	Y	
14	65.7	13.8	-	79.5	0.77	0.72		117.7	Y	Y	
15	39.2	25.4	-	64.6	0.62	1.32		96.3	Y	Y	
16	77.8	25.0	-	102.8	0.76	1.20		162.6	Y	Y	
17	105.5	42.1	-	147.6	0.87	1.01		247.7	Y	Y	
18	120.4	75.3	-	195.7	0.83	0.82		289.6	Y	Y	
19	99.8	-	-	99.8	1.25			258.0	Y	Y	
20	79.2	-	-	79.2	1.01			164.7	Y	Y	
TOTAL	1611.1	763.5	112.6	**2487.2**	0.90	1.07	0.84	**5516.6**	Y	Y	

* Assumptions

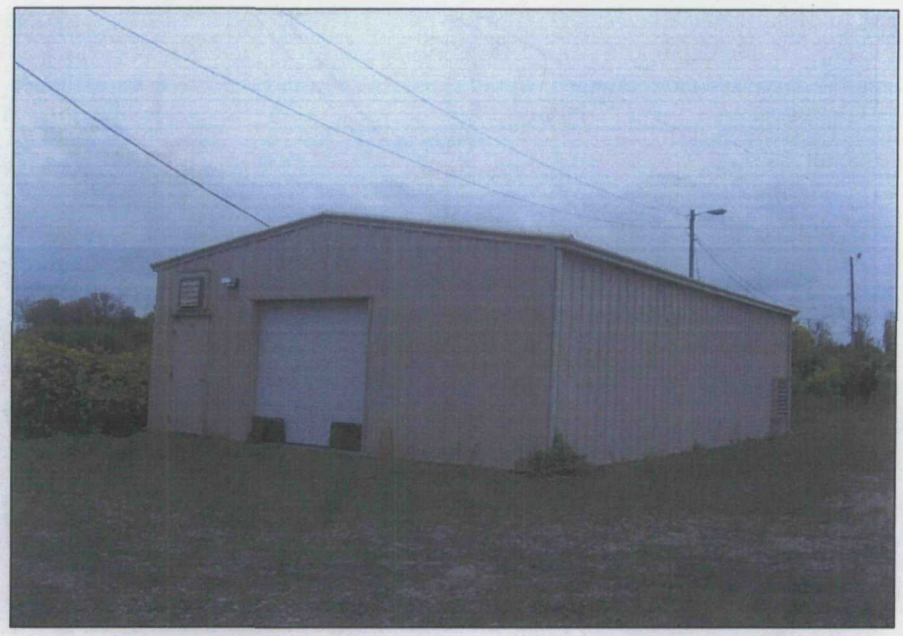
Actual Volume removed was calculated based on the actual depth excavated and the original excavation dimensions. Amount of saw dust and wood chips added to the sediment for drying were deducted from the amount of sediment shipped to the landfill to calculate the actual amount of sediment removed from the Little Menomonee River. Actual amount of sediment shipped out to landfill, in tons was converted into cubic yards using a conversion factor of 1.4 tons per cubic yard.

Moss American Site
Milwaukee, Wisconsin
Pre-Final Construction Completion Report



Photograph No.: 1 **Photographer:** Naren Babu **Date:** 10/09/2009
Subject: View of the former wood treating facility located at 8716 Granville Rd, Milwaukee, WI.

Photograph No.: 2 **Photographer:** Naren Babu **Date:** 10/09/2009
Subject: View of the former wood treating facility located at 8716 Granville Rd, Milwaukee, WI.



Photograph No.: 3 **Photographer:** Naren Babu **Date:** 10/09/2009
Subject: View of the groundwater treatment system building operated and maintained by Tronox.

Photograph No.: 4 **Photographer:** Naren Babu **Date:** 10/09/2009
Subject: View of the three units inside the groundwater treatment system building.

Photograph No.: 5 **Photographer:** Naren Babu **Date:** 08/25/2009
Subject: View of the water inflatable dam installed in the Little Menomonee River.

Photograph No.: 6 **Photographer:** Troy Thompson **Date:** 09/11/2009
Subject: Excavator removing contaminated sediments from the river at the southern segment of Reach 4/5.

Photograph No.: 7 **Photographer:** Naren Babu **Date:** 11/10/2009
Subject: Excavator removing contaminated sediments underneath Appleton Avenue bridge.

Photograph No.: 8 **Photographer:** Naren Babu **Date:** 10/28/2009
Subject: Disturbed areas along the Little Menomonee river during sediment removal were regraded, seeded and covered with coir mats for erosion control.

ATTACHMENT 4

PCOR

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

NOV 25 2009

REPLY TO THE ATTENTION OF:
S-6J

MEMORANDUM

SUBJECT: Preliminary Close Out Report
Moss American Superfund Site, Milwaukee, Wisconsin

FROM: Thomas R. Short Jr., Chief
Remedial Response Branch #2

TO: Richard C. Karl, Director
Superfund Division

The Moss American Superfund site is located in the northwestern section of the City of Milwaukee, Wisconsin. The site itself consists of the 88-acre former wood preserving facility and the 5-mile stretch of the Little Menomonee River (LMR) and its floodplain from the former plant and the river's confluence with the Menomonee River. Milwaukee County currently owns 65 acres of the land, primarily on the eastern portion of the facility, while the Union Pacific Railroad owns a 23-acre parcel comprising the western portion of the facility. From 1921 to 1971, the facility discharged wastes to settling ponds that ultimately discharged to the Little Menomonee River. Kerr-McGee purchased the facility in 1963 and changed the facility's name to Moss-American. The facility's name was changed again in 1974 to Kerr-McGee Chemical Corporation - Forest Products Division. In 1998, the name of this company changed to Kerr-McGee Chemical LLC (KMC). In 2005, KMC became Tronox, LLC.

State and national attention came to the site in 1971 when young people, engaged in Earth Day cleanup of the river, received chemical burns from a tarry substance while wading more than three miles downriver from the site. Sampling results indicated that the tarry substance was creosote and that the Moss American facility was the source of the contamination. Subsequently, under a State order, KMC cleaned out eight former settling ponds and dredged about 1,700 feet of river to remove creosote-contaminated soil and sediment. During 1972 to 1973, three different dredging efforts were conducted in the Little Menomonee River within the first mile downstream of the facility. The facility closed in 1976 and the eastern part of the property was acquired by Milwaukee County in 1978, while the Chicago and Northwestern Railroad (now Union Pacific Railroad) bought the western parcel in 1980.

In September 1984, the facility was listed on the National Priorities List (NPL), pursuant to Section 105 of CERCLA. Remedial investigation (RI) findings indicated that, for site soils, most of the contamination was associated with former creosote processing areas such as application areas, near former settling ponds, and in the vicinity of treated wood storage areas, where some drippage of applied substances can occur. A class of contaminants known as polycyclic aromatic hydrocarbons, or PAHs, constituted the primary contaminants of concern at the site. In addition to soils contamination, site groundwater and sediments downstream of the site were also found to be contaminated. A baseline risk assessment was conducted as part of the

RI effort for the Moss-American site. Exposure to chemicals of concern and other site-related contaminants in soil and sediment can occur through three exposure pathways: 1) direct contact; 2) direct or indirect ingestion; and 3) inhalation of suspended particles. According to the risk assessment, actual or present releases of hazardous substances from the site, if not addressed, presented an imminent and substantial endangerment to public health, welfare, or the environment.

After evaluation of public comment, EPA selected a remedy for the site as embodied in the Record of Decision (ROD) signed on September 27, 1990. The remedy consisted of components to deal with contaminated site soils, Little Menomonee River sediments, and site groundwater.

The selected remedy in the ROD consisted of the following components:

1. On-site soil

    a. Remove/treat contaminated soil from area of concern;
    b. Dispose treated soil/sediment on-site, cover, and revegetate; and
    c. Consolidate all treated soil residues/sediments in an on-site landfill.

2. Sediments from the Little Menomonee River

    a. Construct new channel for the river;
    b. Remove/treat highly contaminated soil from new channel;
    c. Cover old channel with soil from new channel, revegetate; and
    d. Restore and mitigate river corridor, habitat, wetland, and wooded areas.

3. Groundwater

    Construct a groundwater collection/treatment system that will function both separately and dependently with biological system.

The ROD was subsequently amended in April 1997 (ESD), September 1998 (ROD Amendment), and November 2007 (ESD).

The RD/RA was PRP-lead, except for the cleanup of Reach 4/5 of the Little Menomonee River. After declaring bankruptcy in January 2009, Tronox conveyed to EPA in March 2009 its intention to indefinitely suspend cleanup work at its Moss American facility. EPA, with concurrence from the State, decided to complete the cleanup at Reach 4/5 through a Fund-lead action. Work on Reach 4/5 was completed on November 19, 2009, signifying completion of construction. A prefinal inspection was conducted by EPA, with consultation from WDNR, on November 20, 2009 to ensure that all components of the remedy were constructed and in place. The inspection confirmed that the remaining contaminated sediments at Reach 4/5 were removed, which was the last response action needed to be completed at the site. All previous response actions completed (e.g, site groundwater system, consolidation of contaminated soils, sediment remediation on Reaches 1-3) were confirmed in a site inspection conducted as part of the 5-year review on October 9, 2009.

I recommend that you sign the Moss American site PCOR.

SUPERFUND PRELIMARY SITE CLOSEOUT REPORT
FINAL REMEDIAL ACTION
FOR
Moss-American Superfund Site
Milwaukee, Wisconsin

I. INTRODUCTION

This Preliminary Closeout Report (PCOR) documents the completion of construction activities for the Moss-American Superfund Site ("Site") in accordance with the United States Environmental Protection Agency's (EPA) OSWER Directive 9320.2-09 A-P. This was a potentially responsible party (PRP) lead remedial action, with the exception of the cleanup of the last segment of the Little Menomonee River (Reach 4/5). The cleanup at Reach 4/5 was performed under a Fund-lead action after the PRP declared Chapter 11 bankruptcy in January 2009 and subsequently indicated that it will not be able to meet the schedule outlined in the work plan for Reach 4/5 approved by EPA on March 4, 2009.

A prefinal inspection was conducted by EPA, with consultation from the Wisconsin Department of Natural Resources (WDNR), on November 20, 2009 to confirm all response actions required by the September 27, 1990 Record of Decision (ROD) and subsequent April 1997 Explanation of Significant Differences (ESD), September 1998 ROD Amendment, and November 2007 ESD have been completed. The prefinal inspection verified that all activities necessary to achieve the performance standards and site construction completion were completed. All construction was performed in accordance with approved remedial design plans and specifications.

EPA is the enforcement lead at this site and has been overseeing the activities performed by Tronox, LLC (PRP) under the March 29, 1996 Consent Decree (CD). The cleanup of Reach 4/5 of the Little Menomonee River was conducted as an EPA Fund-lead action.

II. SUMMARY OF SITE CONDITIONS

Site Description

The Moss American Superfund site is located in the northwestern section of the City of Milwaukee, Wisconsin. The address of the site is 8716 Grandville Road, Milwaukee, Wisconsin. The site itself consists of the 88-acre former wood preserving facility and the 5-mile stretch of the Little Menomonee River (LMR) and its floodplain from the former plant and the river's confluence with the Menomonee River. Milwaukee County currently owns 65 acres of the land, primarily on the eastern portion of the facility, while the Union Pacific Railroad owns a 23-acre parcel comprising the western portion of the facility. The site is located in a moderately populated suburban area of mixed light industrial, commercial, residential, and recreational use. Elevations at the site range from 714 to 750 feet.

The Little Menomonee River (LMR), portions of which are defined as part of the site, flows through the northeastern quadrant of former wood treating plant and continuing on through the Milwaukee County Parkway, to the confluence of the Menomonee River. The river is classified as suitable for intermediate (tolerant) fish and aquatic life. The State's regional planning commission estimated the population at around 2,036 persons per mile at the time the ROD was written. The land and resource use of the current site and area is not expected to change in the near future.

A soil survey performed by the county classified the developed areas of the site, west of the river, as: (1) loamy land; (2) land consisting of fill or cut; and (3) borrow areas. The wooded areas on both sides of the river consist of a poorly drained silty soil underlain by stratified lacustrine silt and very fine sand. The soil is moderately permeable with high available water capacity. Approximately one-quarter of the site is in the 100-year flood plain.

Groundwater flows at a rate of seven feet per year from west to east, discharging into the river at an average rate of 8,500 gallons per day. The site overlies a surficial, low-yield, Class II aquifer above a confining bed of dense silty clay till. The confining bed is a minimum of 40 feet thick and could be as thick as 120 feet. Below the confining bed lies the regional dolomite aquifer. The saturated thickness above the till is between 5 and 15 feet. The groundwater is currently not used as a source of drinking water; local residents are connected to a municipal system.

The river drains the entire site, running adjacent to the facility for about 2,000 feet. Typical base flow water depth of the river is 1 to 2 feet, with a corresponding width of about 20 feet. Flow rate is estimated at an average annual value of 10 to 17 cubic feet per second (CFS), with a peak rate of 330 – 770 CFS. The sediment is typically silt or clay in composition, soft in some and hard-packed in others.

Site History and Enforcement Activities

In 1921, the T. J. Moss Tie Company established a wood preserving facility west of the Little Menomonee River. The plant preserved railroad ties, poles, and fence posts with creosote, a mixture of numerous chemical compounds, derived from coal tar. Site creosote operations were conducted from approximately 1921 to 1976. From 1921 to 1971, the facility discharged wastes to settling ponds that ultimately discharged to the Little Menomonee River. Kerr-McGee purchased the facility in 1963 and changed the facility's name to Moss-American. The facility's name was changed again in 1974 to Kerr-McGee Chemical Corporation - Forest Products Division. In 1998, the name of this company changed to Kerr-McGee Chemical LLC (KMC). In 2005, KMC became Tronox, LLC.

State and national attention came to the site in 1971 when young people, engaged in Earth Day cleanup of the river, received chemical burns from a tarry substance while wading more than three miles downriver from the site. Sampling results indicated that

the tarry substance was creosote and that the Moss American facility was the source of the contamination.

Subsequently, under a State order, KMC cleaned out eight former settling ponds and dredged about 1,700 feet of river to remove creosote-contaminated soil and sediment. During 1972 to 1973, three different dredging efforts were conducted in the Little Menomonee River within the first mile downstream of the facility. The facility closed in 1976. The eastern part of the property was acquired by Milwaukee County in 1978, while the Chicago and Northwestern Railroad (now Union Pacific Railroad) bought the western parcel in 1980.

In September 1984, the facility was listed on the National Priorities List (NPL), pursuant to Section 105 of CERCLA. Remedial investigation findings indicated site soil contamination was associated with former creosote processing areas such as application areas, near former settling ponds, and in the vicinity of treated wood storage areas, where some drippage of applied substances can occur. A class of contaminants known as polycyclic aromatic hydrocarbons, or PAHs, constituted the primary contaminants of concern at the site. In addition to soils contamination, site groundwater and sediments downstream of the site were also found to be contaminated.

A baseline risk assessment was conducted as part of the RI effort for the Moss-American site. Exposure to chemicals of concern and other site-related contaminants in soil and sediment included three exposure pathways: 1) direct contact; 2) direct or indirect ingestion; and 3) inhalation of suspended particles. According to the risk assessment, actual or present releases of hazardous substances from the site, if not addressed, presented an imminent and substantial endangerment to public health, welfare, or the environment. Major site contaminants fall into such chemical groups as PAHs and the benzene, tolouene, ethylbenzene, and xylene (BTEX) compounds.

PAHs are a primary component of creosote blends, and in terms of health effects have been associated with lung, stomach, and skin cancers. PAH compound structure exhibits varying complexity of connected hexagonally shaped rings. Carcinogenicity has been associated with some of the more complex 4- and 5- ring PAH compounds; benzo[a]pyrene being an example. As for the BTEX compounds, benzene has been associated with occurrences of leukemia, while toluene and xylenes appear to cause depression of the human central nervous system.

In considering the types of personnel who might be exposed to site soils, and the levels of site contaminants within such soils, the risk assessment calculated a risk of 5×10^{-4} for casual site users. Potential users with more frequent instances of exposure would have faced higher risks. In considering exposure to site sediments, the RI risk assessment noted that risk varied somewhat in each of the stream "segments" (or reaches) moving downstream from the former creosote processing area. (Note - in this instance, the term "segment" denotes a major east-west highway bridge over the river at approximately one to one and a quarter mile intervals). Sediment exposure risks to humans tended to be higher in Segments (or Reaches) 1, 2, and 3 - on the order of 10^{-4} excess carcinogenic

risk due to CPAH exposure. In river Segments (Reaches) 4 and 5 (referred throughout this document as Reach 4/5), the excess carcinogenic risk dropped to 5 and 3 times 10^{-5}, respectively. Based on human exposure alone, exposure to CPAHs via sediment presented excess risk at the upper (10^{-4}) acceptable range of the risk range (10^{-6} to 10^{-4}) sought by EPA for remedial sites. However, when coupled with perceived risk to aquatic habitat, sediments presented an unacceptably high risk pathway. While not viewed as an "applicable or relevant and appropriate requirement", or ARAR, at the time of risk assessment compilation, literature cited by WDNR indicated that a level of 3 mg/kg of CPAHs in sediment would constitute acceptable long-term aquatic habitat protection. This value was considered in determining the sediment cleanup level.

After evaluation of public comment, EPA selected a remedy for the site as embodied in the ROD signed on September 27, 1990. The remedy consisted of components to deal with contaminated site soils, Little Menomonee River sediments, and site groundwater.

Following ROD development, EPA entered into discussions with potentially responsible parties. On December 30, 1991, the United States lodged a consent decree with the Federal District Court for the Eastern District of Wisconsin in Milwaukee. This Consent Decree, which was signed by EPA, the State of Wisconsin and KMC, required KMC to implement the Remedial Design and Remedial Action set forth in the ROD. Upon lodging of the CD, Milwaukee County objected to the settlement. The Court entered the Consent Decree in 1996, after EPA resolved its past costs claims with Union Pacific and the County of Milwaukee, and the County withdrew its objections to the Consent Decree.

In April 1997, EPA signed, with WDNR concurrence, an Explanation of Significant Differences (ESD) concerning site contaminated groundwater collection and treatment. The ESD allowed for groundwater treatment via a funnel and gate system. A funnel and gate system would redirect groundwater flow through use of sheet piling driven into a silty clay till confining soil layer underneath the contaminated aquifer. Sections of piling would be interconnected and sealed. Engineered soil media (gates) would be introduced so as to preferentially direct groundwater flow. Treatment would be accomplished by introducing air and nutrients in-situ in the zones of preferential groundwater flow so as to bring about the biological reduction of the groundwater contaminants.

In September 1998, EPA issued a ROD Amendment which dealt primarily with site soils. WDNR conditionally concurred with this amendment. The ROD Amendment provided for use of thermal desorption as a treatment technology to deal with more highly contaminated site soils. EPA now considers thermal desorption a presumptive remedy for wood preservative treatment sites. The ROD Amendment also incorporated more recently developed State cleanup standards for soil related contaminants. In addition, it allowed for non-residential direct contact cleanup exposure scenarios if appropriate deed restrictions were secured. The ROD Amendment withdrew a waiver of State liner/leachate provisions, but provided for a Corrective Action Management Unit (CAMU). Based on review of groundwater monitoring network analyses and related soils data, the ROD Amendment also added some contaminants of concern, such as naphthalene.

In November 2007, EPA issued another ESD, acknowledging that rerouting of Reach 4/5 would not be necessary or efficient to achieve site cleanup goals. Instead, intermittent dredging of hot spot areas of contaminated sediments, along with off-site disposal of the contaminated sediments, was conducted for Reach 4/5.

While the Moss-American site consists of one overall operable unit, work has been conducted in a series of phases, each dealing predominantly with a given environmental media. Both remedial investigation and pre-design efforts indicated the presence of free product in some wells. From 1995-1998, extraction wells were operated to collect and remove this free product creosote, which would otherwise have interfered with both groundwater and site soil remediation. The funnel and gate system was installed during 1999-2000. Thermal desorption soil treatment efforts were conducted from mid-2001 to early 2002. Sediment management efforts in Segment 1 began the late summer of 2002, and were completed by mid-winter of 2003. Sediment management remediation for stream Segments 2 and 3 (Reaches 2 & 3) began in early 2004, and were finished at the end of that year. A work plan for remediating Reach 4/5 of the river was conditionally approved by EPA on January 23, 2009, with final approval granted on March 4, 2009. According to the approved work plan for Reach 4/5, Tronox was required to start work on Reach 4/5 on April 13, 2009. On January 12, 2009, Tronox filed for Chapter 11 bankruptcy and informed EPA via email on March 31, 2009 that, on advice of its bankruptcy counsel, it would temporarily suspend work on Moss American. Subsequently, EPA decided to take over the cleanup of Reach 4/5 through a Fund-lead remedial action. The Fund-lead cleanup at Reach 4/5 started during the week of August 3, 2009 and work was substantially completed on November 19, 2009. A few housekeeping items still need to be completed (e.g., road cleaning, seeding, etc.) and these minor tasks will be completed within the next few weeks, prior to the EPA contractor demobilizing from the site.

Site Characteristics

Historical site aerial photos show that land usage patterns have changed considerably with the passage of time. Photos from the 1930s to the 1950s show the creosote plant operating in a relatively sparsely populated setting, where several farms surrounded the manufacturing operation. From the 1960s to the present, residential and commercial use of nearby property has increased considerably, and agricultural and farming operations have been almost completely phased out. Industrial parks and multi-lane highways also traverse the site setting. County owned land along the river corridor has featured installation of hiking and bicycle trails, so as to emphasize recreational opportunities. These features have had a direct bearing on site soil cleanup standards, and have influenced sediment remediation to combine natural resource recovery along with sediment cleanup goals.

Selected Remedy

The selected remedy (Alternative 3A) in the September 27, 1990 ROD consisted of the following components:

1. On-site soil

    a. Remove/treat contaminated soil from area of concern;
    b. Dispose treated soil/sediment on-site, cover, and revegetate; and
    c. Consolidate all treated soil residues/sediments in an on-site landfill.

2. Sediments from the Little Menomonee River

    a. Construct new channel for the river;
    b. Remove/treat highly contaminated soil from new channel;
    c. Cover old channel with soil from new channel, revegetate; and
    d. Restore and mitigate river corridor, habitat, wetland, and wooded areas.

3. Groundwater

    Construct a groundwater collection/treatment system that will function both separately and dependently with biological system.

Alternative 3A represented the best balance among the evaluation criteria and satisfied the statutory requirements for protectiveness, compliance with ARARs, cost effectiveness, and the use of permanent solutions and treatment to the maximum extent practicable. Changes to the original remedy were formalized in the 1997 ESD, 1998 ROD Amendment, and 2007 ESD, as described above. These remedial components also meet the remedial action objectives (RAOs) for the site for each media. The RAOs are:

Soil

- Minimize the threats to human health and the environment from on-site contaminants via the exposure pathways of direct contact, inhalation or ingestion, and
- To prevent further contaminant migration into the groundwater and subsequently into the river

Sediment

- Minimize direct contact or ingestion of contaminants in sediment, minimize acute and chronic effects on aquatic life posted by contaminants, and
- Minimize migration of contaminants downstream to the Menomonee River and ultimately to the Milwaukee area of concern as defined by the Regional draft Remedial Action (RA) Plan submitted to EPA by the WDNR

Groundwater

- Prevent release of contaminants through the surficial groundwater aquifer to the Little Menomonee River surface water or sediment and
- Remove contaminants from groundwater such that concentrations do not exceed those established in CH. NR 140 of the Wis. Adm. Code.

The 1998 ROD amendment allowed for containing and capping on the wood preserving plant property soils with carcinogenic PAHs of levels higher than the 1.9 mg/kg residential cleanup level, provided that deed restrictions to industrial or recreational exposure levels were obtained by KMC from the affected site property owner. The property owners are the Union Pacific Railroad and Milwaukee County. Such action was in keeping with more realistic land usage reforms as suggested by EPA. In July 2000, these property owners provided EPA with copies of deed restrictions restricting residential land usage on the Union Pacific property and on County property at the wood preservation plant. Hence, the industrial and recreational cleanup levels of 3.1 mg/kg and 15 mg/kg of total carcinogenic CPAH level, respectively, may be allowed for certain site areas if appropriate deed restrictions were placed on the property.

III. Demonstration of Cleanup of Activity QA/QC

A Construction Quality Assurance Plan (CQAP) was prepared in conjunction with the remedial design to address the activities necessary to ensure compliance with the remedy. The protocols contained in the CQAP were employed during construction to ensure that the engineered barrier was constructed in accordance with the ROD and RD plans and specifications. Details of the procedures used to ensure the quality of the construction work were in the approved CQAP.

The construction completion activities at the site were consistent with the ROD and the approved remedial design plans and specifications.

IV. Activities and Schedule for Site Completion

The following post-construction activities will be completed according to the schedule, below:

Activity	Estimated Completion Date	Responsible Organization
Pre-final Inspection	November 20, 2009	EPA/WDNR
PCOR	November 27, 2009	EPA
Third Five Year Review	April 2010	EPA
Final RA Report	May 2010	PRP
Final Closeout Report	September 2026	EPA
NPL Deletion	November 2026	EPA

V. Summary of Remediation Costs

ROD Estimate of Capital Costs and Annual Operation and Maintenance (O&M) Costs

The capital cost for the selected remedy was estimated in the ROD to be $25,000,000; with an annual O & M cost of $130,000. Total present worth cost was estimated in the ROD to be $26,000,000.

Construction Contract Award Amount

The Moss American Superfund site was primarily a PRP lead site, with the exception of the cleanup of Reach 4/5 of the Little Menomonee River, the last piece of response action. Tronox estimated that it spent approximately $40-50 million on total site clean up, prior to temporarily suspending work due to bankruptcy proceedings, and approximately an additional $150,000 annually for O & M. The estimated cost of cleaning up Reach 4/5, using Fund money, is $3,200,000. There is no associated O & M cost associated with this sediment excavation work in the river.

Five-Year Review

The remedy is functioning as intended and is expected to be protective. All immediate threats have been eliminated and there are no current exposures or threats to human health and the environment.

Pursuant to CERCLA Section 121(c), EPA must conduct statutory Five-Year Reviews since hazardous substances will remain at the site above health-based levels that allow for unlimited use and unrestricted exposures after completion of the remedial action. The ROD was signed on or after October 17, 1986; and the Remedial Action was selected under CERCLA §121. The first Five-Year Review was performed in September 2000, the second one completed in September 2005. The second five-year review recommended developing an IC Plan to evaluate the effectiveness of existing institutional controls. This follow-up action will be reviewed during the third five year review, which is scheduled for completion by April 2010.

Richard C Karl — 11-25-09

Richard C. Karl, Director
Superfund Division
U.S. Environmental Protection Agency

Date

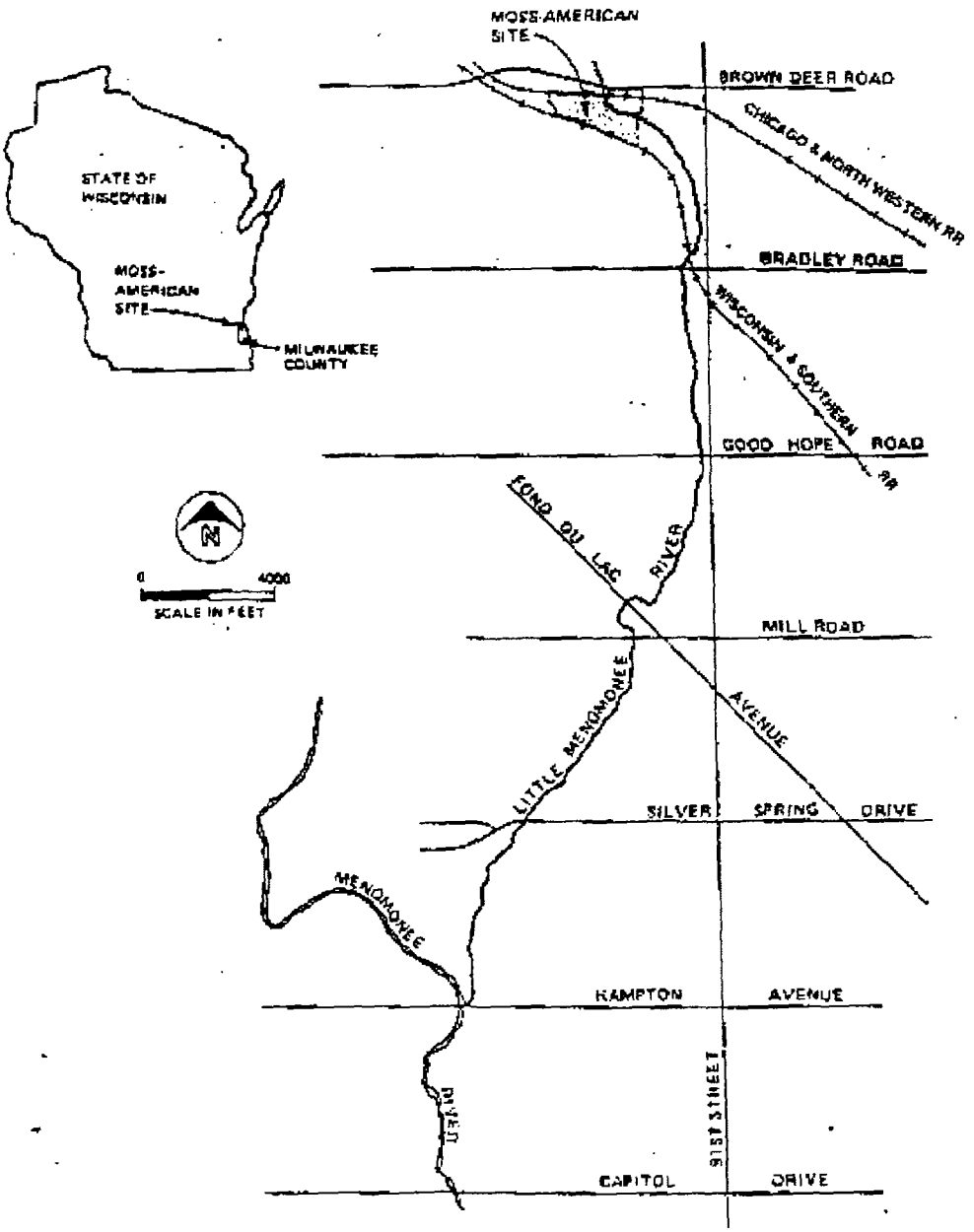


FIGURE 1
LOCATION MAP
MOSS-AMERICAN FS

HQ

Re: Revised draft Moss American PCOR
Steve Ridenour to: ROSAURO DELROSARIO 09/08/2009 07:41 AM

Hi Ross,

Thank you for addressing my comments in the draft PCOR. Good luck with finishing up the sediment work and finalizing this PCOR. Let me know if I can provide any assistance.

Thanks,

Steven M. Ridenour
Environmental Protection Specialist
Office of Superfund Remediation & Technology Innovation
Construction & Post-Construction Management Branch
Phone: (703) 603-8922
Email: ridenour.steve@epa.gov

ROSAURO DELROSARIO Steve, I revised the initial draft PCOR fo... 09/03/2009 05:09:07 PM

From: ROSAURO DELROSARIO/R5/USEPA/US
To: Steve Ridenour/DC/USEPA/US@EPA
Date: 09/03/2009 05:09 PM
Subject: Revised draft Moss American PCOR

Steve,

I revised the initial draft PCOR for Moss American per your comments and suggestions. For the most part, the additions came from the 2005 five-year review. Let me know if you're satisfied and I can clean up the document and have it ready for sign-off. Thanks.

Ross

[attachment "082709 MOSSAMERICAN-PCOR Ridenourjt.doc" deleted by Steve Ridenour/DC/USEPA/US]

SUPERFUND DIVISION
REMEDIAL RESPONSE BRANCH # 2
SECTION # 4

SITE: Mass American Superfund Site

ITEM: PCOR

RRB#1	INITIAL & DATE	**ORC**	INITIAL & DATE
1) RPM:	9/16/09	STAFF COUNSEL:	
2) SECTION CHIEF:	for John Tanaka 11/23/09	SECTION CHIEF:	
3) BRANCH CHIEF:	11/23/09	BRANCH CHIEF:	
4) DIVISION DIRECTOR:	11-25-09	REGIONAL COUNSEL:	
		** IF CONSULTATION HAS OCCURRED [ ]	

OTHERS: HQ Concurrence
Rec'd 9/8/09 (See attached)

DEPUTY REGIONAL ADMINISTRATOR: N/A

REGIONAL ADMINISTRATOR: N/A

RETURN TO: Ross DEL ROSARIO OR **SR-6J FOR MAILING,**

PHONE# : 6-6195 OR

COMMENTS: Need to incorporate prefinal inspection date (p.1) and date of ~~f~~ Completion of response action (p. 5)

KATRINA PLEASE SEND TO RECORDS CENTER AFTER it is SIGNED.

(EPA:JD:10/13/99)

ATTACHMENT 5

Deed Restrictions (4)

AMENDED DECLARATION OF RESTRICTION ON USE OF REAL PROPERTY

Document Title

Document Number

7931309

REGISTER'S OFFICE SS
Milwaukee County, WI

RECORDED AT 10:43 AM

06-30-2000

WALTER R. BARCZAK
REGISTER OF DEEDS

AMOUNT 40.00

Recording Area

Name and Return Address

Ted A. Warpinski
Friebert, Finerty & St. John, S.C
330 E. Kilbourn Ave., Suite 1250
Milwaukee, Wisconsin 53202

041-9994-100

Parcel Identification Number (PIN)

072-9998-110
072-9997-110-9
079-9997-111
109-9999-110
109-9994-121
116-9983-110
144-9988-110
144-9998-113
150-9999-110
151-9987-100
179-9989-100
179-9997-113
180-9997-110
183-9989-123
217-9986-100
217-9983-110
217-9988-100
217-9982-100

This information must be completed by submitter: document title, name & return address, and PIN (if required). Other information such as the granting clauses, legal description, etc. may be placed on this first page of the document or may be placed on additional pages of the document. Note: Use of this cover page adds one page to your document and $2.00 to the recording fee. Wisconsin Statutes 59.43(2)(b)

7991

AMENDED DECLARATION OF RESTRICTION ON USE OF REAL PROPERTY

Milwaukee County, a political subdivision of the State of Wisconsin, hereby declares and imposes the following restrictions on the real property located in the City and County of Milwaukee more particularly described on Exhibit A attached hereto.

RECITALS

WHEREAS, Milwaukee County is a political subdivision of the State of Wisconsin, organized and existing under the constitution and laws of the State of Wisconsin, acting through its Board of Supervisors and County Executive in exercising the powers conferred upon it by the state statutes now in effect of even date herewith;

WHEREAS, Milwaukee County is the owner of certain real property described in Exhibit A which comprises a portion of the Moss-American Superfund Site ("Site") and which is referred to in this instrument as the "property."

WHEREAS, the United States Environmental Protection Agency (U.S. EPA) has issued a Record of Decision (ROD) adopting a remedial action plan for the Moss-American Superfund Site which requires remedial actions to be undertaken on the property and the imposition of institutional controls to assure that the remedy is protective of human health and the environment;

WHEREAS, the United States District Court for the Eastern District of Wisconsin approved a Consent Decree entered into between the United States of America and Kerr-McGee Chemical Corporation concerning certain remedial measures to be taken at the Moss-American Superfund Site. Section V, paragraph 9, of the Consent Decree, the Statement of Work (SOW) attached thereto and Appendix 6 to the Consent Decree identify

the institutional controls that are necessary to effectuate and protect the remedial action of the Facility and to protect the public health or welfare or the environment at the Moss-American Superfund Site;

WHEREAS, in the lawful exercise of its powers, Milwaukee County desires to establish and secure the enforcement of uniform restrictions upon the use and development of the property to effectuate and protect the remedial actions selected by U.S. EPA for the Moss-American Superfund Site, and to protect the public health or welfare or the environment at the property; and

WHEREAS, Milwaukee County, through its Board of Supervisors, approved the execution of this instrument on November 2, 1995, File No. 82-812 and directed its duly authorized officials to execute, deliver and record the same;

WHEREAS, this instrument was originally recorded at Reel 3857, Images 480-494, which contained erroneous numbering on page 4 that is being corrected by this amended declaration of restriction; and

NOW, THEREFORE, by this instrument there are created, declared and established for the property the following restrictive covenants and requirements, which restrictive covenants and requirements shall, unless limited by or amended pursuant to the terms of this instrument: run with the land and remain in full force and effect in perpetuity from the date hereof, irrespective of any sale, conveyance, alienation or other transfer of any interest or estate in such lands.

I. RESTRICTIONS APPLICABLE TO ENTIRE PROPERTY

The following restrictions shall apply to the entirety of the Moss-American Superfund Site, including but not limited to the property described in Exhibit A, as discussed in this Section and in Section II below:

1. There shall be no use of property at the facility within the area of extent of contamination and all suitable areas in very close proximity to the contamination necessary for the implementation of the response action that interferes with any aspect of the Work performed or to be performed under the ROD, Consent Decree and/or SOW for the Moss-American Superfund Site, or any activity which may damage any remedial action component contracted or installed pursuant to the ROD, Consent Decree or SOW or otherwise impair the effectiveness of any work to be performed pursuant to the ROD, Consent Decree or SOW.

2. There shall be no installation, construction, or removal of any buildings, wells, pipes, roads, ditches or any other structures on property at the facility within the areal of extent of contamination and all suitable areas in very close proximity to the contamination necessary for the implementation of the response action except as approved by the United States Environmental Protection Agency as consistent with the Consent Decree and ROD.

3. Applicable laws and regulations governing wetland and floodplain habitats shall be complied with.

Restrictions 1 and 3 shall continue in perpetuity. Except as otherwise specified in Section II below, Restriction No. 2 will remain in full force and effect until U.S. EPA issues a Certification of Completion of Remedial Action under the Consent Decree; but will not remain in force for groundwater monitoring under Paragraphs 12.b.ii.(B) and (C) of the Consent Decree.

II. RESTRICTIONS APPLICABLE TO CERTAIN AREAS AT THE SITE

In addition to the restrictions specified in Section I above, the following restrictions shall apply to the Former Wood Preserving Plant property at the Moss-American Superfund Site, a legal description of which is attached as Exhibit B; those portions of the Moss-American Superfund Site containing trenches, collection basins or treatment systems required for the remedial action installed pursuant to Section II.B.5. of the SOW or pursuant to the treatment system defined in Section II.B.7. of the SOW; and those portions of the Moss-American Superfund Site where the landfill cover will be constructed pursuant to Section II.B.8. of the SOW:

4. There shall be no consumptive or other use of the groundwater underlying the Former Wood Preserving Plant property.

5. There shall be no residential use of the Former Wood Preserving Plant Property.

6. There shall be no use of those portions of the Moss-American Superfund Site containing trenches, collection basins or treatment systems required for the remedial action installed pursuant to Section II.B.5. of the SOW or pursuant to the treatment system defined in Section II.B.7. of the SOW, or those portions of the Moss-American Superfund Site where the landfill cover will be constructed pursuant to Section II.B.8. of the SOW that would allow the presence of humans on these parcels other than any presence necessary for implementation and maintenance of the remedial action under the ROD and Consent Decree.

7. There shall be no penetration of the cover installed pursuant to Section II.B.8. of the SOW, including but not limited to any excavation, drilling, mining, piercing, digging or boring.

With regard to the Former Wood Preserving plant property at the Moss-American Superfund Site, restrictions 4, 5 and 7 as well as restrictions 1 and 3 shall apply in perpetuity. Restrictions 2 and 6 will remain in full force and effect until U.S. EPA issues a Certification of Completion of Remedial Action under the Consent Decree; but will not remain in force for groundwater monitoring under Paragraphs 12.b.ii(B) and (C) of the Consent Decree.

With regard to portions of the Moss-American Superfund Site containing trenches, collection basins or treatment systems required for the remedial action installed pursuant to Section II.B.5. of the SOW or pursuant to the treatment system defined in Section II.B.7. of the SOW, restrictions 4, 5 and 7 as well as restrictions 1 and 3 shall apply in perpetuity. Restrictions 2 and 6 will remain in full force and effect unless and until U.S. EPA issues a Certification of Completion of Remedial Action under the Consent Decree; but will not remain in force for groundwater monitoring under Paragraphs 12.b.ii.(B) and (C) of the Consent Decree.

With regard to those portions of the Moss-American Superfund Site for which a landfill cover will be constructed pursuant to Section II.B.8. of the SOW, restrictions 4, 5 and 7 as well as restrictions 1 and 3 shall apply in perpetuity. Restrictions 2 and 6 will remain in full force and effect until U.S. EPA issues a Certification of Completion of Remedial Action under the Consent Decree; but will not remain in force for groundwater monitoring under Paragraphs 12.b.ii.(B) and (C) of the Consent Decree.

III. COPY OF RESTRICTIONS

A copy of these restrictions shall be provided to all successors, assigns and transferees of Milwaukee County.

IV. SEVERABILITY

If any provision of this Deed Restriction is held to be invalid by any court of competent jurisdiction, the invalidity of such provision shall not affect the validity of any other provisions hereof. All such other provisions shall continue unimpaired in full force and effect.

V. OTHER LAWS AND REGULATIONS

If any provision of this Declaration is also the subject of any law or regulation established by any federal, state or local government, including laws governing wetland and floodplain habitats, that limits the use of the Moss-American Superfund Site to a greater extent than the restrictions established under Sections I and II above, then that above law or regulation shall also apply.

VI. CERTIFICATION

The undersigned persons executing these Deed Restrictions on behalf of Milwaukee County represent and certify that they are duly authorized and have been fully empowered to execute and deliver these Deed Restrictions.

IN WITNESS WHEREOF, the said Owner of Record of the real property subject to these deed restrictions, the County of Milwaukee, State of Wisconsin, acting through

its duly authorized representatives, have caused these Deed Restrictions to be executed on this 21 day of June, 2000.

Approved by Corporation Counsel this 19 day of June, 2000:

Robert G. Ott

MILWAUKEE COUNTY

By: F. Thomas Ament
Title: County Executive

By: Mark Ryan
Title: County Clerk

STATE OF WISCONSIN)
)ss
COUNTY OF MILWAUKEE)

Before me, a notary public in and for said County and State, personally appeared F. Thomas Ament and Mark Ryan, representatives of Milwaukee County, and acknowledge the execution of the foregoing Deed Restrictions on the Moss American Inc. site for and on behalf of said Milwaukee County.

Witness my hand and notarial seal this 21 day of June, 2000.

My commission expires: Permanent

THIS DOCUMENT WAS PREPARED BY:
Ted A. Warpinski
Friebert, Finerty & St. John, S.C.
Two Plaza East - Suite 1250
330 East Kilbourn Avenue
Milwaukee, WI 53202

EXHIBIT A

PORTIONS OF THE MOSS AMERICAN SUPERFUND SITE OWNED BY THE COUNTY OF MILWAUKEE, WISCONSIN

The Site - Tax Key No. 041-9994-100

That part of the NE 1/4 and NW 1/4 of Sec. 8, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing 298.13 feet south of the NW corner of the NE 1/4 Section, thence easterly 1328.18 feet along the Southerly line of the C&N.W.R.R. right of way, then south 911.06 feet, then west 150 feet, then south 594.11 feet, then northwesterly along the northerly line of the State of Wisconsin right of way 866.69 feet, then northwest 1120.24 feet, then north 874.73 feet, then easterly 651.34 feet to the point of beginning, containing 51.365 acres of land more or less.

No. 2 - Tax Key No. 072-9998-110

That part of the SE 1/4 of Sec. 8, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Includes that part of said 1/4 section lying east of the State of Wisconsin R.R. right of way, excluding streets.

No. 3 - Tax Key No. 072-9997-110-9

That part of the SE 1/4 of Sec. 8, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing at the intersection of the south line of said 1/4 section with the westerly line of the State of Wisconsin R.R. right of way, then northwesterly along said right of way line to a point which is 900 feet north (measured at a right angle) of the south line of said 1/4 section, then west parallel with the south line of said 1/4 section 160 feet, then southwesterly to a point which is 900 feet west of the east line and 350 feet north of the south line of said 1/4 section, then south parallel with the east line of said 1/4 section 350 feet to the south line of said 1/4 section, then east along the south line of said 1/4 section to the beginning, excluding streets.

No. 4 - Tax Key No. 079-9997-111

That part of the NE 1/4 of Sec. 17, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing at the SE corner of said 1/4 section, then north to the westerly line of the State of Wisconsin R.R. right of way, then northwesterly along said right of way line to the north line of said 1/4 section, then west to a point 900 feet west of the NE corner of said 1/4 section, then southwesterly to a point in the east-west 1/8 line of said 1/4 section with said point being 275 feet northeasterly (measured at a right angle) of the centerline of North Granville Road, then southeasterly on a line 275 feet easterly of and parallel to the centerline of said road to the south line of said 1/4 section, then east to the beginning, excluding streets.

No. 5 - Tax Key No. 109-9999-110

That part of the SE 1/4 of Sec. 17, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing at the SE corner of said 1/4 section, then northerly 65.45 feet to a point of beginning, then north along the east line of said 1/4 section to the northeast corner of said 1/4 section, then westerly 895.16 feet along the north line of said 1/4 section, then southeasterly 34.13 feet to the northeasterly corner of parcel 1 on CSM No. 3583, then southeasterly along the easterly lines (in CSM Nos. 3583, 3719, 3862, 3165 and 3297) 1285.96 feet to the southeasterly corner of parcel 2 on CSM No. 3297, then southwesterly 200 feet to the east line of N. Granville Road, then southeasterly 372.65 feet along the east line of said street, then northeasterly 325.88 feet, then southerly 173.95 feet, then southwesterly 243.42 feet to the east line of said street, then southeasterly along the easterly line of said street to the point of beginning, excluding streets.

No. 5A - Tax Key No. 109-9994-121

That part of the SE 1/4 of Sec. 17, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing at the SE corner of said 1/4 section, then west 915.15 feet, then northeasterly 960 feet more or less, then northeasterly 260 feet, then southeasterly to the beginning, excluding streets.

No. 6 - Tax Key No. 116-9983-110

That part of the NE 1/4 of Sec. 20, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing at the NE corner of said 1/4 section, the west 915 feet, then southwesterly along the easterly line of Golden Gate subdivision to the south line of said 1/4 section, then east to a point 290 feet west of the SE corner of said 1/4 section, then northerly 333.72 feet more or less, then north 971.01 feet, then east 199.86 feet, then north 29 feet, then west 200.15 feet, then north 540.17 feet, then northerly 400.64 feet east, then east 205 feet more or less, then north to the beginning, excluding streets.

No. 7 - Tax Key No. 144-9988-110

That part of the SE 1/4 of Sec. 20, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing 1270 feet south of the north line and 1120 feet west of the east line of said 1/4 section, then south and southerly to the northwest corner of Block 1 of Melody Highlands, then southwesterly along west line of said Block 1 to the northeasterly right of way line of relocated State Trunk Highway 145, then northwesterly along said Highway 145 to west line of said 1/4 section, then north 286.79 feet to a point which is 796.43 feet south of NW corner of said 1/4 section, then east 45 feet, then north 796.43 feet to north line of said 1/4 section, then east 1965.80 feet, then south 317 feet more or less, then southwesterly to beginning.

No. 8 - Tax Key No. 144-9998-113

That part of the SE 1/4 of Sec. 20, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Including that part of said 1/4 section bounded by southwesterly line of State Highway 145, the north line of West Mill Road, the northeasterly line of West Fond du Lac Avenue, and a line commencing at the northeasterly line of West Fond du Lac Avenue and 247.42 feet southeasterly of the west line of said 1/4 section, then north 45 degrees, 27 minutes, 19 seconds and east 159.30 feet to the southwesterly line of State Highway 145.

No. 9 - Tax Key No. 150-9999-110

That part of the NW 1/4 of Sec. 29, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing at the NE corner of said 1/4 section, then south to the SE corner of said 1/4 section, then west to the SE corner of said 1/4 section, then north to the south line of west Lynx Avenue extended, then east to the east line of North 101st Street, then north to the south line of West Bender Road, then east to the east line of North 100th Street, then north to the north line of said 1/4 section, then east to the beginning, excluding streets and highways.

No. 10 - Tax Key No. 151-9987-100

That part of the NE 1/4 of Sec. 29, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing at the NW corner of said 1/4 section, then south along the west line of said 1/4 section to the northerly line of Parkway Hills Subdivision, then north 49 degrees, 20 minutes, 24 seconds east 575.87 feet, then north 16 degrees 2 minutes 24 seconds east 143.16 feet, then north 13 degrees 59 minutes 16 seconds east 757.16 feet, then north 11 degrees 32 minutes 16 seconds east 340 feet, then northeasterly to a point in the centerline of West Fond du Lac Avenue said point being 275 feet south and 44 degrees 16 minutes 51 seconds east of the point of intersection of the center line of said Avenue with the north line of said 1/4 section, then northwestern along the center line of said avenue 275 feet to the north line of said 1/4 section, then west along the north line of said 1/4 section 723.20 feet to the beginning (excluding the north 33 feet and northeasterly 33 feet for streets).

No. 11 - Tax Key No. 179-9989-100

That part of the SW 1/4 of Sec. 29, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing at the intersection of the northeasterly line of West Appleton Avenue and the north line of said 1/4 section, then southeasterly along said northeasterly line of West Appleton Avenue (548.10 feet, then 433.28 feet) then northwesterly 4.98 feet, then southeasterly 454 feet more or less to the northwesterly line of the C&NW R.R. right of way, then northeasterly along said northwesterly right of way line to the east line of said 1/4 section, then north 751.80 feet to the NE corner of said 1/4 section, then west along the north line of said 1/4 section to the beginning.

No. 12 - Tax Key No. 179-9997-113

That part of the SW 1/4 of Sec. 29, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing 60 feet north of the SW corner of said 1/4 section, then east 250 feet, then north 190 feet, then northeast 1325.58 feet, then northeast 435.64 feet, then northwesterly along the westerly line of West Appleton Avenue to the new SE line of West Bobolink Avenue, then west along the south line of the west line of the 1/4 section, then south to the beginning, excluding the C&NW R.R. right of way.

No. 13 - Tax Key No. 180-9997-110

That part of the SE 1/4 of Sec. 30, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing at the SE corner of said 1/4 section, then west 830 feet, then north 200 feet, then northeasterly 910.49 feet more or less to a point which is 920 feet north of the south line and 300 feet west of the east line of said 1/4 section, then north 150.77 feet more or less to the southeasterly right of way line of the C&NW R.R., then northeasterly along said southeasterly right of way line 310.54 feet more or less to the east line of said 1/4 section, then south along the east line to the beginning.

No. 14 - Tax Key No. 183-9989-123

That part of the NE 1/4 of Sec. 31, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing at the NE corner of said 1/4 section, then south 1252.30 feet, then west 200 feet, then south 680 feet, then northwesterly 205.92 feet, then west 175 feet, then south 360 feet, then west 147.92 feet, then southeasterly to the south line of said 1/4 section, then west 1433 feet, then northeasterly 574.96 feet, then northeasterly 508.01 feet, then northwesterly 232.87 feet to the center line of West Silver Spring Drive, then northeasterly and east along said center line to the beginning, excluding streets.

No. 15 - Tax Key No. 217-9986-100

That part of the SE 1/4 of Sec. 31, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Includes that part of said lands commencing at the NW corner of Lot 1, Block 1 Gerald E. Wichman Subdivision No. 1, then west parallel to the south line of said 1/4 section 112.21 feet more or less to the center line of the Little Menomonee River, then northerly along the center line of said river to the north line of said 1/4 section, then east to the east line the Prop Little Menomonee River Parkway, then south 200 feet, then south along a curve 784.19 feet, then southwesterly 957.19 feet to the SW corner of Block 8 in the Harvest Estates Subdivision, then southwesterly to the beginning.

No. 16 - Tax Key No. 217-9983-110

That part of the SE 1/4 of Sec. 31, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing at the south line and 1721.05 feet west of the SE corner of said 1/4 section, then northeasterly 458.22 feet, then west 112.70 feet, then southwesterly along the center line of the Little Menomonee River 193.12 feet to the easterly line of North Lover's Lane Road, then southeasterly along east line of said road to south line of said 1/4 section, then east to the beginning, excluding streets.

No. 17 - Tax Key No. 217-9988-100

That part of the SE 1/4 of Sec. 31, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing at the north line and 580 feet east of the NW corner of said 1/4 section, then east 483.13 feet to the center line of the Little Menomonee River, then southerly along said center line (439.28 feet, 190.16 feet, 175.33 feet, 154.21 feet, 166.64 feet, 172.32 feet, 202.12 feet, 269 feet, 433.94 feet and 251.62 feet) to the easterly line of N. Lovers Lane Road, then northwesterly along said easterly line (685.86 feet and 455.10 feet), then northeasterly 150 feet, then northwesterly 271.32 feet, then easterly 75 feet, then northwesterly 134 feet, then northeasterly 150.75 feet more or less, then north 272.14 feet, then northeasterly to the beginning.

No. 18 - Tax Key No. 217-9982-100

That part of the SE 1/4 of Sec. 31, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing 55 feet north of the SW corner of said 1/4 section, then north to the westerly line of N. Lovers Lane Road, then southerly along said westerly line to the north line of W. Hampton Avenue, then along said north line to the beginning.

EXHIBIT B

PORTIONS OF THE FORMER WOOD PRESERVING PLANT PROPERTY AT THE MOSS AMERICAN SUPERFUND SITE OWNED BY THE COUNTY OF MILWAUKEE, WISCONSIN

The Site - Tax Key No. 041-9994-100

That part of the NE 1/4 and NW 1/4 of Sec. 8, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing 298.13 feet south of the NW corner of the NE 1/4 Section, thence easterly 1328.18 feet along the Southerly line of the C&N.W.R.R. right of way, then south 911.06 feet, then west 150 feet, then south 594.11 feet, then northwesterly along the northerly line of the State of Wisconsin right of way 866.69 feet, then northwest 1120.24 feet, then north 874.73 feet, then easterly 651.34 feet to the point of beginning, containing 51.365 acres of land more or less.

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7931310

REGISTER'S OFFICE) SS
Milwaukee County, WI
RECORDED AT 10:43 AM
06-30-2000

WALTER R. BARCZAK
REGISTER OF DEEDS

AMOUNT 18.00

Document No.

DEED RESTRICTION
AND NOTICE

Declaration of Restrictions and Notice to Future Purchasers

In Re: The non-flood plain portions of the property that is described on Exhibit A in the City and County of Milwaukee, Wisconsin

STATE OF WISCONSIN)
) ss.
COUNTY OF MILWAUKEE)

Recording Area

Name and Return Address:

Ted A. Warpinski
Friebert, Finerty & St. John, S.C.
330 East Kilbourn Avenue, Suite 1250
Milwaukee, Wisconsin 53202

Tax Key No. 041-9994-100

WHEREAS, MILWAUKEE COUNTY, a political subdivision of the State of Wisconsin, is the owner of the above-described property.

WHEREAS, it is the desire and intention of the property owner to impose on the property restrictions which will make it unnecessary to remediate soil contamination on the property to the non-industrial soil cleanup standards that are found in ch. NR 720, Wis. Adm. Code, and which would allow the implementation of the selected cover systems.

WHEREAS, an Amended Record of Decision (Amended ROD) for the Moss-American Superfund Site, dated September 30, 1998, was issued by the U.S. Environmental Protection Agency which provides that if deed restrictions are recorded to limit the property's usage to an industrial use, an industrial usage exposure scenario would be applied to the property, and non-industrial soil cleanup standards would not have to be met for the property, and further provides that deed restrictions are required to provide for maintenance of the cover systems that are selected in the Amended ROD.

NOW THEREFORE, the owner hereby declares 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:

The property described above may not be used or developed for a residential, commercial, recreational, agricultural or other non-industrial use, unless (at the time that the non-industrial use is proposed) an investigation is conducted to determine the degree and extent of any remaining polycyclic aromatic hydrocarbon (PAH) contamination and benzene, toluene, ethylbenzene or xylene (BTEX) contamination

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and remedial action is taken as necessary to meet all non-industrial soil cleanup standards that are applicable at that time. If contaminated soil that remains on the property is excavated in the future, it will have to be sampled and analyzed and the treatment or disposal of the soil as a solid or hazardous waste may be necessary.

The following activities are prohibited unless prior written approval has been obtained from the U.S. Environmental Protection Agency and the Wisconsin Department of Natural Resources or their successors or assigns: (1) Excavating or grading of the land surface, or penetrating the cover or cap, on that portion of the property where a cover or cap has been placed (as approximately shown on attached Figure 1); (2) Filling on the covered or capped area; (3) Construction, installation or removal of a building, pipe, road or any other structure with a foundation that would sit on or be placed within the cover or cap; (4) Plowing for agricultural cultivation; (5) Extraction of groundwater for consumption or any purpose other than groundwater monitoring or remediation; (6) Any activity that does not comply with the Site's Health and Safety Plan, and (7) Any activity that may damage any remedial action component or interfere with or impair the effectiveness of the work performed under the ROD. In addition, the owner of the property shall allow reasonable access to the property so that others may inspect, maintain and repair the covered and capped areas, and all other engineering controls and other remedial action components.

The restrictions contained within this document inure to the benefit of and are enforceable by the U.S. Environmental Protection Agency and the Wisconsin Department of Natural Resources, their successors or assigns. The U.S. EPA or the Department, or their successors or assigns, may initiate proceedings at law or in equity against any person or persons who violate or are proposing to violate these restrictions, to prevent the proposed violation or to recover damages for such violation.

Any person who owns the property described above may request that the U.S. Environmental Protection Agency and the Wisconsin Department of Natural Resources or their successors issue a determination that one or more of the restrictions set forth in this document is no longer required. Upon the receipt of such a request, the U.S. Environmental Protection Agency and the Wisconsin Department of Natural Resources shall determine whether or not the restrictions contained herein can be extinguished. If they determine that the restrictions can be extinguished, an affidavit, attached to a copy of their written determinations, 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, the undersigned assert that they are duly authorized to sign this document on behalf of Milwaukee County.

IN WITNESS WHEREOF, the owner of the property has executed this Declaration of Restrictions, this 21 day of June, 2000.

Approved by Corporation Counsel
this 19 day of June, 2000:

Robert G. Ott

MILWAUKEE COUNTY

By: F. Thomas Ament
Title: County Executive

By:
Title: County Clerk

Subscribed and sworn to before me this
21st day of June, 2000.

Notary Public, State of Wis.
My Commission: is permanent

This document was drafted by the Wisconsin Department of Natural Resources.

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EXHIBIT A

PORTIONS OF THE MOSS AMERICAN SUPERFUND SITE OWNED BY THE COUNTY OF MILWAUKEE, WISCONSIN

The Site - Tax Key No. 041-9994-100

That part of the NE 1/4 and NW 1/4 of Sec. 8, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing 298.13 feet south of the NW corner of the NE 1/4 Section, thence easterly 1328.18 feet along the Southerly line of the C&N.W.R.R. right of way, then south 911.06 feet, then west 150 feet, then south 594.11 feet, then northwesterly along the northerly line of the State of Wisconsin right of way 866.69 feet, then northwest 1120.24 feet, then north 874.73 feet, then easterly 651.34 feet to the point of beginning, containing 51.365 acres of land more or less.

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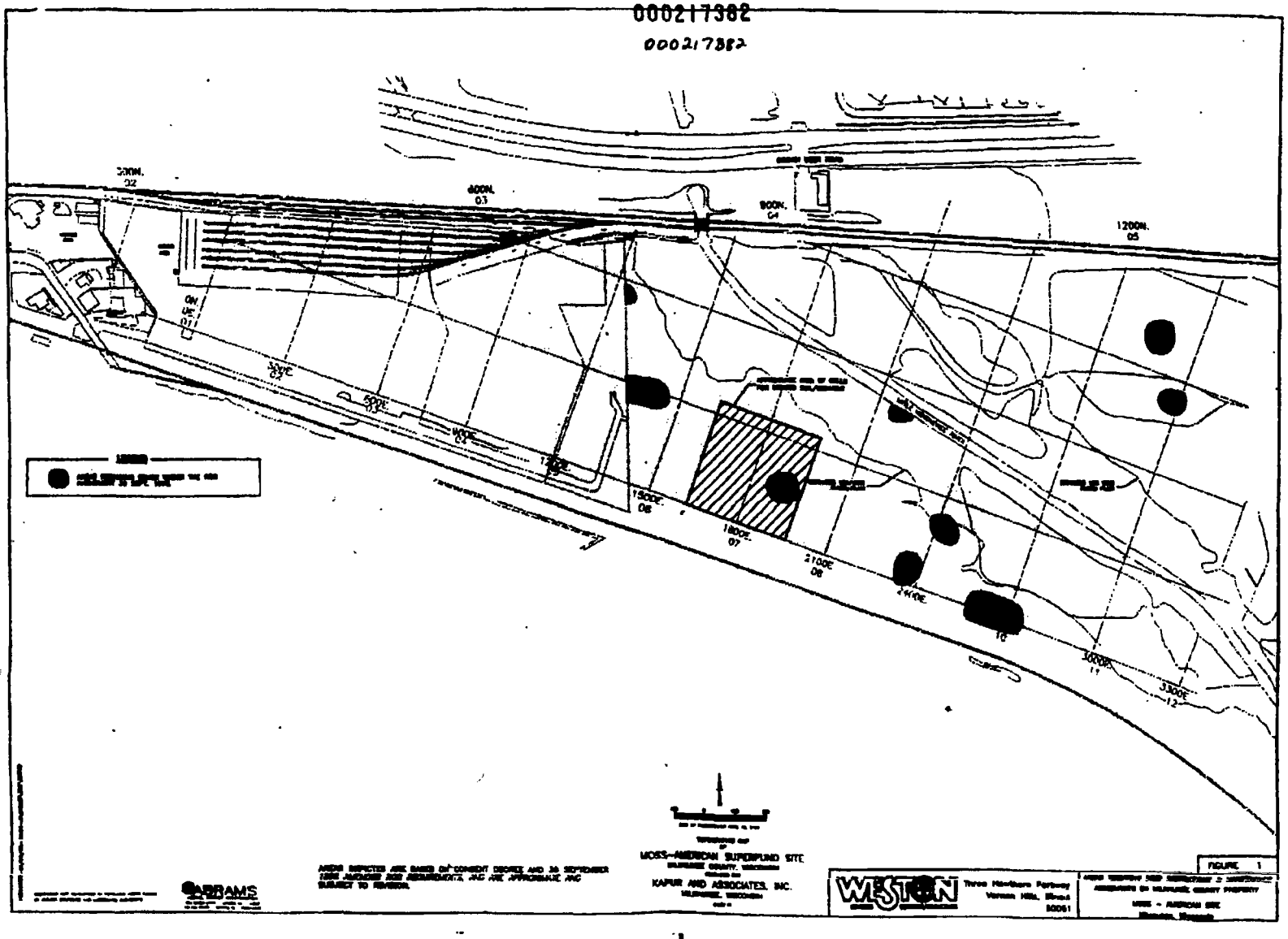

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7931311

REGISTER'S OFFICE) SS
Milwaukee County, WI
RECORDED AT 10:43 AM
06-30-2000

WALTER R. BARCZAK
REGISTER OF DEEDS

AMOUNT 10.00

Document No. | DEED RESTRICTION AND NOTICE

Declaration of Restrictions and Notice to Future Purchasers

In Re: The flood plain portions of the property that is described on Exhibit A in the City and County of Milwaukee, Wisconsin

Recording Area

Name and Return Address:

Ted A. Warpinski
Friebert, Finerty & St. John, S.C.
330 East Kilbourn Avenue, Suite 1250
Milwaukee, Wisconsin 53202

Tax Key No. 041-9994-100

STATE OF WISCONSIN)
) ss.
COUNTY OF MILWAUKEE)

WHEREAS, MILWAUKEE COUNTY, a political subdivision of the State of Wisconsin, is the owner of the above-described property.

WHEREAS, it is the desire and intention of the property owner to impose on the property restrictions which will make it unnecessary to remediate soil contamination on the property to the generic non-industrial soil cleanup standards that are found in ch. NR 720, Wis. Adm. Code, and which would allow the implementation of the selected floodplain remedy.

WHEREAS, an Amended Record of Decision (Amended ROD) for the Moss-American Superfund Site, dated September 30, 1998, was issued by the U.S. Environmental Protection Agency which provides that if deed restrictions are recorded to limit the property's usage to recreational use, a recreational usage exposure scenario would be applied to the property, and generic non-industrial soil cleanup standards would not have to be met for the property, and further provides that deed restrictions are required to provide for maintenance of the soil cover that is required in the Amended ROD.

NOW THEREFORE, the owner hereby declares 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:

The property described above may not be used or developed for any use other than recreational use, unless (at the time that a non-recreational use is proposed) an investigation is conducted to determine the degree and extent of any remaining

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polycyclic aromatic hydrocarbon (PAH) contamination and benzene, toluene, ethylbenzene or xylene (BTEX) contamination and remedial action is taken as necessary to meet all recreational soil cleanup standards that are determined to be applicable at that time. If contaminated soil that remains on the property is excavated in the future, it will have to be sampled and analyzed and the treatment or disposal of the soil as a solid or hazardous waste may be necessary.

The following activities are prohibited unless prior written approval has been obtained from the U.S. Environmental Protection Agency and the Wisconsin Department of Natural Resources or their successors or assigns: (1) Excavating or grading of the land surface, or penetrating the cover or cap, on that portion of the property where a cover or cap has been placed (as approximately shown on attached Figure 1); (2) Filling on the covered area; (3) Construction, installation or removal of a building, pipe, road or any other structure with a foundation that would sit on or be placed within the cover; (4) Plowing for agricultural cultivation; (5) Extraction of groundwater for consumption or any purpose other than groundwater monitoring or remediation; (6) Any activity that does not comply with the Site's Health and Safety Plan, and (7) Any activity that may damage any remedial action component or interfere with or impair the effectiveness of the work performed under the ROD. In addition, the owner of the property shall allow reasonable access to the property so that others may inspect, maintain and repair the covered areas, and all other engineering controls and other remedial action components.

The restrictions contained within this document inure to the benefit of and are enforceable by the U.S. Environmental Protection Agency and the Wisconsin Department of Natural Resources, their successors or assigns. The U.S. EPA or the Department, or their successors or assigns, may initiate proceedings at law or in equity against any person or persons who violate or are proposing to violate these restrictions, to prevent the proposed violation or to recover damages for such violation.

Any person who owns the property described above may request that the U.S. Environmental Protection Agency and the Wisconsin Department of Natural Resources or their successors issue a determination that one or more of the restrictions set forth in this document is no longer required. Upon the receipt of such a request, the U.S. Environmental Protection Agency and the Wisconsin Department of Natural Resources shall determine whether or not the restrictions contained herein can be extinguished. If they determine that the restrictions can be extinguished, an affidavit, attached to a copy of their written determinations, 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, the undersigned assert that they are duly authorized to sign this document on behalf of Milwaukee County.

IN WITNESS WHEREOF, the owner of the property has executed this Declaration of Restrictions, this 21 day of June, 2000.

Approved by Corporation Counsel
this 19 day of June, 2000:

Robert G. Ott

MILWAUKEE COUNTY

By: F. Thomas Ament
Title: County Executive

By:
Title: County Clerk

Subscribed and sworn to before me this
21st day of June, 2000.

Notary Public, State of Wis.
My Commission: is permanent

This document was drafted by the Wisconsin Department of Natural Resources.

f:\dan\wp51\milcokng\DeedRestrict\DeedRest1.0602

EXHIBIT A

PORTIONS OF THE MOSS AMERICAN SUPERFUND SITE OWNED BY THE COUNTY OF MILWAUKEE, WISCONSIN

The Site - Tax Key No. 041-9994-100

That part of the NE 1/4 and NW 1/4 of Sec. 8, Township 8 N, Range 21 E, in the City and County of Milwaukee, State of Wisconsin, bounded and described as follows:

Commencing 298.13 feet south of the NW corner of the NE 1/4 Section, thence easterly 1328.18 feet along the Southerly line of the C&N.W.R.R. right of way, then south 911.06 feet, then west 150 feet, then south 594.11 feet, then northwesterly along the northerly line of the State of Wisconsin right of way 866.69 feet, then northwest 1120.24 feet, then north 874.73 feet, then easterly 651.34 feet to the point of beginning, containing 51.365 acres of land more or less.

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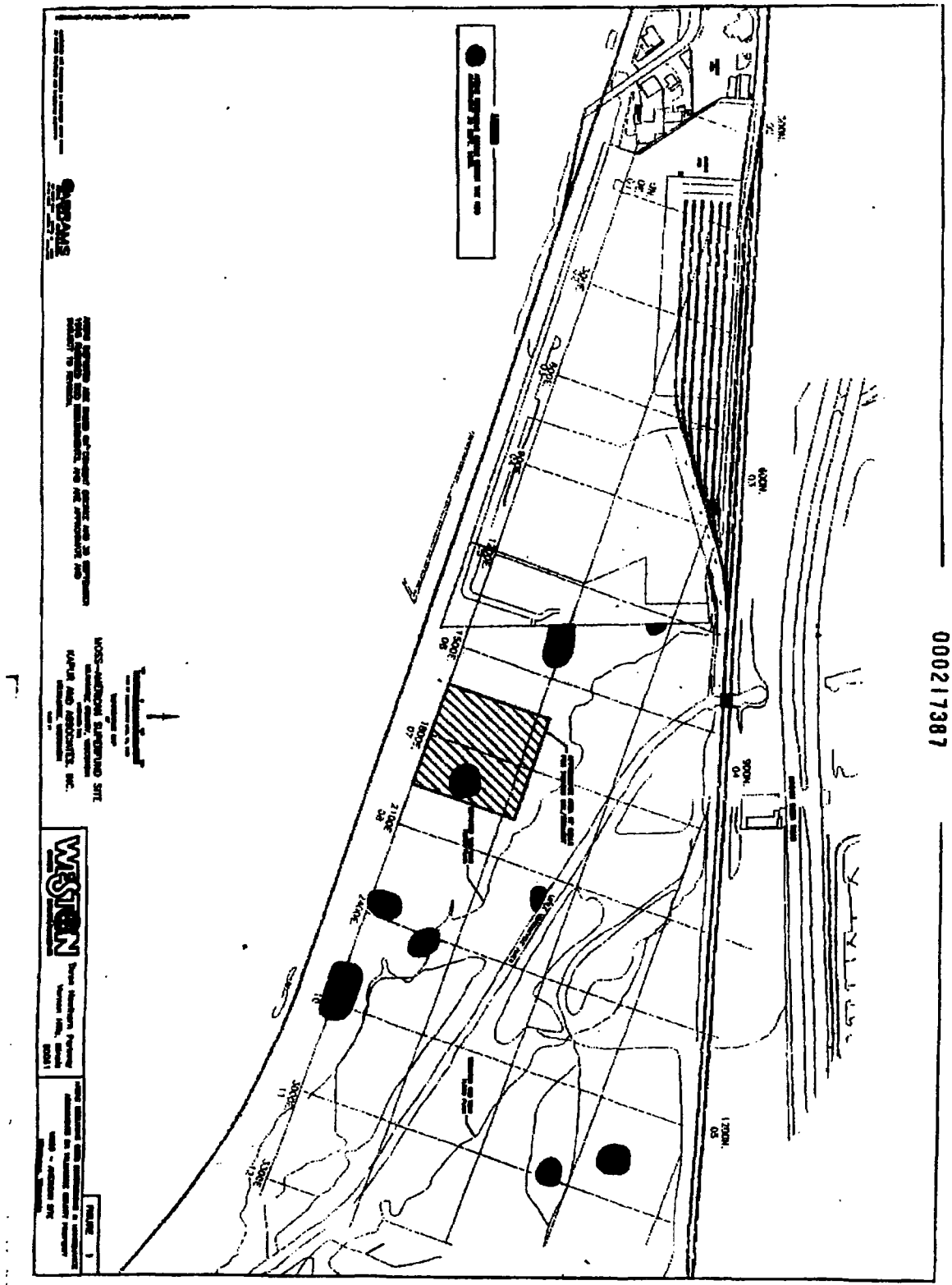


Document Number	DEED RESTRICTION AND NOTICE

Declaration of Restrictions and Notice to Future Purchasers

In Re: The property that is described on Exhibit A in the City and County of Milwaukee, Wisconsin.

STATE OF Nebraska)
)ss
COUNTY OF Douglas) (County where document is signed)

Recording Area

Name and Return Address

Parcel Identification Number (PIN)

WHEREAS, the UNION PACIFIC RAILROAD COMPANY, a Utah Corporation, is the owner of the above described property.

WHEREAS, it is the desire and intention of the property owner to impose on the property restrictions which will make it unnecessary to remediate soil contamination on the property to the non-industrial soil cleanup standards that are found in Ch. NR 720 Wis. Adm. Code, and which would allow the implementation of the selected cover systems.

WHEREAS, an Amended Record of Decision (Amended ROD) for the Moss-American Superfund Site, dated September 30, 1998, was issued by the U.S. Environmental Protection Agency which provides that if deed restrictions are recorded to limit the property's usage to an industrial use, an industrial usage exposure scenario would be applied to the property, and non-industrial soil cleanup standards would not have to be met for the property, and further provides that deed restrictions are required to provide for maintenance of the cover systems that are selected in the Amended ROD.

NOW THEREFORE, the owner hereby declares 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:

The property described above may not be used or developed for a residential, commercial, recreational, agricolnural, or other non-industrial use, without prior approval of the U.S. Environmental Protection Agency and the Wisconsin Department of Natural Resources or unless (at the time that the non-industrial use

is proposed) an investigation is conducted to determine the degree and extent of any remaining polycyclic aromatic hydrocarbon (PAH) contamination and benzene, toluene, ethylbenzene or xylene (BTEX) contamination and remedial action is taken as necessary to meet all non-industrial soil cleanup standards that are applicable at the time. If contaminated soil that remains on the property is excavated in the future, it will have to be sampled and analyzed and the treatment or disposal of the soil as a solid or hazardous waste may be necessary.

The following activities are prohibited unless prior written approval has been obtained from the U.S. Environmental Protection Agency and the Wisconsin Department of Natural Resources or their successors of assigns: (1) Excavating or grading of the land surface, or penetrating the cover or cap on all areas within the property where a cover or cap is installed as part of the implementation of the final Site remedy; (2) filling on the covered or capped area; (3) Construction, installation or removal of a building, pipe, road, or any other structure with a foundation that would sit on or be placed within the cover or cap; (4) Plowing for agricultural cultivation all areas of the property where a cover or cap is installed as part of the implementation of the final site remedy; (5) Extraction of groundwater for consumption or any purpose other than ground water monitoring re remediation; (6) Any activity in the capped or covered area and all other areas where remedial work is conducted that does not comply with the Site's Health and Safety Plan and (7) Any activity that may damage any remedial action component or interfere with or impair the effectiveness of the work performed under the ROD. In addition, the owner of the property shall either inspect, maintain and repair the asphalt cover if that cover was installed by the owner or shall allow reasonable access to the property so that others may inspect, maintain and repair the asphalt cover or cap if not installed by owner, and all other engineering controls and other remedial action components. [A map of the areas that were covered with an asphalt cap at the time this document was recorded is attached as Exhibit A.]

The restrictions contained in this document inure to the benefit of and are enforceable by the U.S. Environmental Protection Agency and the Wisconsin Department of Natural Resources, their successors and assigns. The U.S. EPA or the Department or their successors or assigns, may initiate proceedings at law or in equity against any person or persons who violate or are proposing to violate the restrictions created by this document to prevent the proposed violation or to recover damages for such violation.

Any person who owns the property described above may request that the U.S. Environmental Protection Agency and the Wisconsin Department of Natural Resources or their successors issue a determination that one or more of the restrictions set forth in this document is no longer required. Upon the receipt of such a request, the U.S. Environmental Protection Agency and the Wisconsin Department of Natural Resources shall determine whether or not the restrictions contained herein can be extinguished. If they determine that the restrictions can be extinguished, an affidavit, attached to a copy of their 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, [illegible] asserts that he/she is duly authorized to sign this document on behalf of the Union Pacific Railroad Company.

IN WITNESS WHEREOF, the owner of the property has executed this Declaration of Restrictions, this 20th day of July, 2000.

Signature: [illegible]
Printed Name: [illegible]

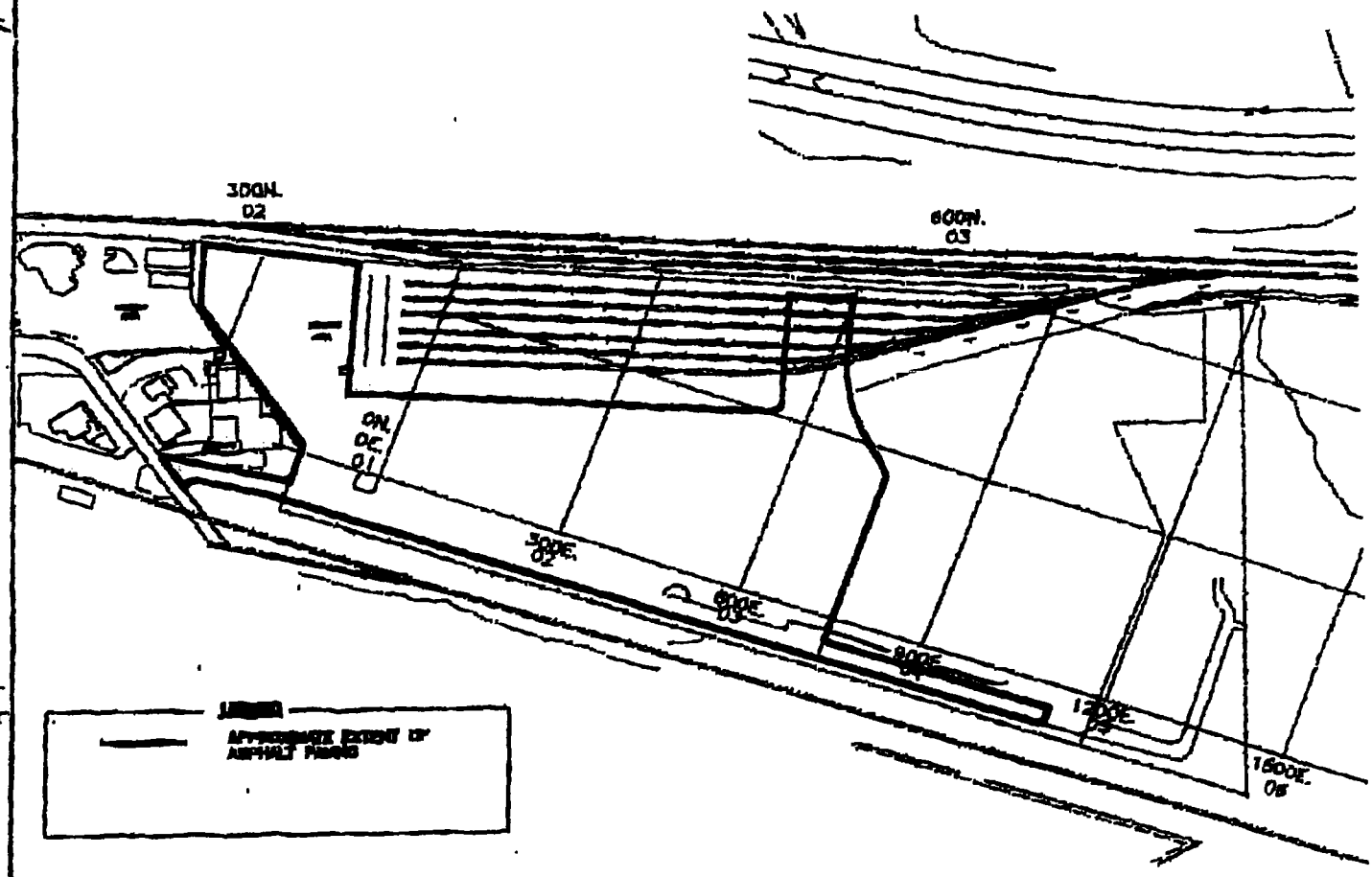
GENERAL NOTARY-State of Nebraska
MARY R. HOLEWINSKI
My Comm. Exp. Oct. 15, 2000

Subscribed to and sworn before me this 20th day of July, 2000.

[illegible]

Notary Public, State of Nebraska
My commission expires October 15, 2000

[illegible]22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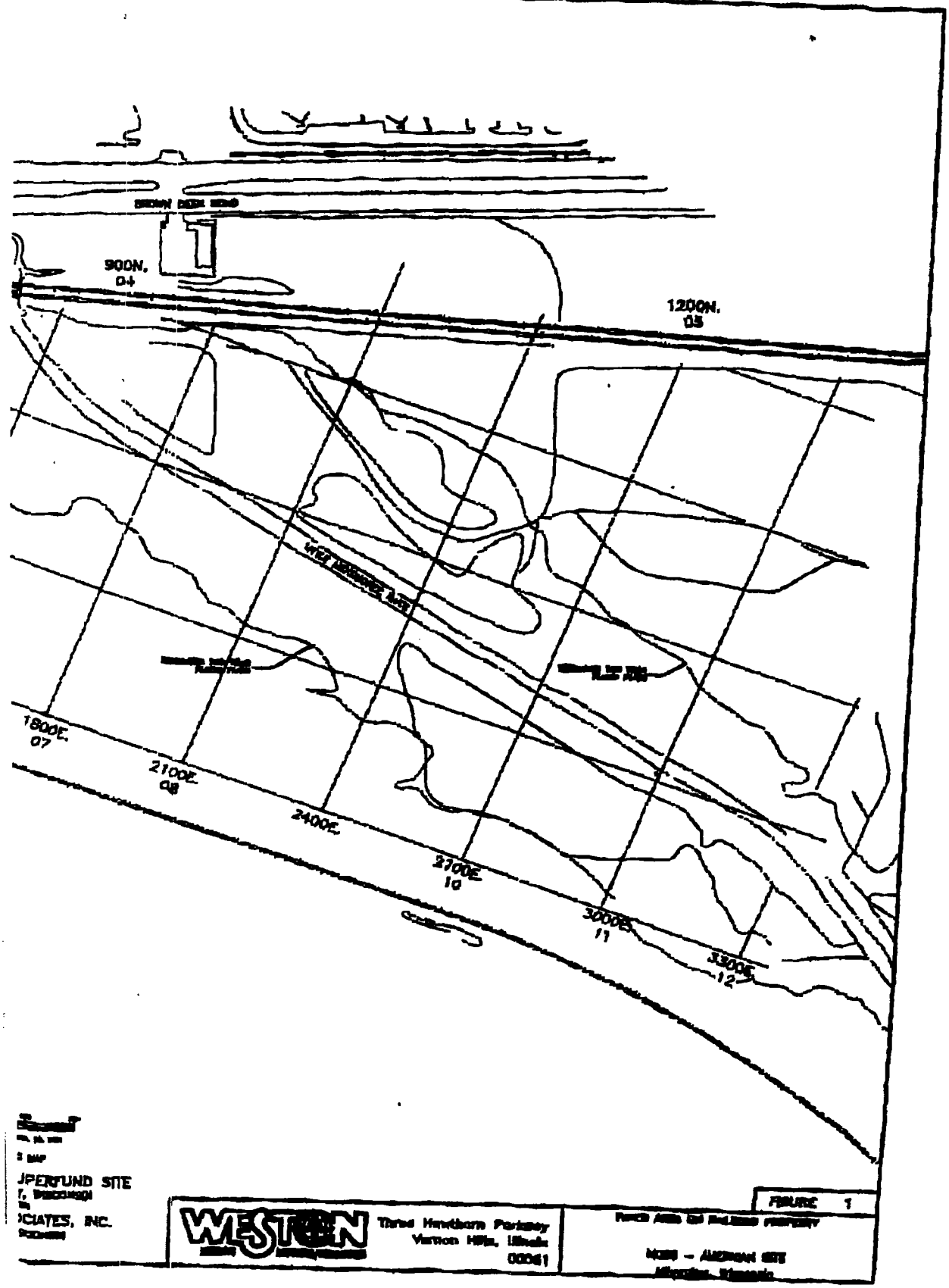
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12
WESTON
Three Hawthorn Parkway
Vernon Hills, Illinois
60061
FIGURE 1

ATTACHMENT 6

PRP Response to Recommendations in 2005 Five-Year Review Report

TRONOX

Name: A. Keith Watson
Title: Projec: Manager

Phone: (405) 775-5475
Fax: (405) 775-6863
e-mail: Keith.Watson@Tronox.com

March 31, 2008

Mr. Ross del Rosario
Remedial Project Manager (HSRW-6J)
U.S. Environmental Protection Agency
Region V
77 West Jackson Boulevard
Chicago, IL 60604

Re: Moss-American Superfund Site
Milwaukee, Wisconsin
Response to Inquiries Regarding Institutional Controls

Dear Mr. Rosario:

I am writing in response to your email of March 11, 2008, regarding follow-up on Russ Hart's letter of December 1, 2005, a follow-up to EPA's Five Year Review of the same year. The work done to date, including my letter of January 26, 2006 to Mr. Hart is attached. Basically, I will reiterate my discussion that institutional controls are in place and working at the Moss-American Site. No changes in land use have occurred in that time, with the exception that the UP Railroad property is not currently used for its commercial purpose, however, it remains fenced and under the watchful eye of the UPRR police.

I would note that I have been told verbally by the Little Menomonee River Parkway manager that no changes in the Parkway portion of the Superfund Site have occurred, either in use or ownership. I have not, however, been able to get this in writing. I will continue to remindmy contact in the County of our need for verification.

If you have any questions or comments, please call me at 405-775-5475.

Sincerely,

A. Keith Watson
Project Manager

Attachment

Copy - Tom Graan – Weston
Tom Wentland - WDNR

TRONOX

Name A. Keith Watson
Title Project Manager

Phone (405) 775-5475
Fax (405) 270-3980
e-mail keith.watson@tronox.com

January 23, 2006

Mr. Russell Hart
Remedial Project Manager (HSRW-6J)
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Re: Moss American Superfund Site
Milwaukee, Wisconsin
Five-Year Review Planning

Dear Mr. Hart:

I am writing in response to you letter dated December 1, 2005 regarding the status of the five issues identified in EPA's 5-year review of the Moss-American site. These issues were identified for further consideration as regards the implementation and protectiveness at the site. You and I discussed these issues by telephone and agreed that Tronox would respond to your letter with a plan for addressing the issues.

1. Tronox and EPA are similarly interested in addressing the quality of groundwater in the MW-33/34 areas. You may remember that Tronox had originally proposed to place a treatment gate in this area, but changed the plans when WDNR objected that such a gate would discharge directly into the Little Menomonee River. As you request, Tronox will use the January 2006 monthly report (due in February) as a mechanism to inform the agencies of our proposals to address treatment in this corner of the site.

2. EPA has tied consideration of Tronox's request to optimize the groundwater monitoring system to our completion of the modifications discussed in #1. Tronox requests that EPA revisit this position, as Tronox is spending large amounts of money monitoring and maintaining wells that have been documented as no longer needed. We request that you approve the removal those wells that are not involved in compliance monitoring.

3. EPA's many requests involving land ownership, restrictions, liens, encumbrances, easements, covenants are quite involved. To accomplish this request, we have contacted the UPRR and County, and will potentially need to employ the services of professionals like an environmental real estate attorney, title company and possibly a surveyor. We are still in the formative stages of this task and can only commit to cpmpletion during 2006.

4. Regarding the uncontaminated strip of land across the railroad tracks on Brown Deer Road, Tronox reiterates that its inclusion in the definition of the "Site" was not

appropriate and that EPA should move to remove it. Tronox has no use for this property and we spend a considerable amount of money mowing and picking up the trash that blows onto the property. As a listed part of the Moss-American site, sale of this property is nearly impossible, but if delisted, we would likely dispose of the property for commercial use.

5. As requested, Tronox will notify the agencies in our January 2006 of our plans to maintain/repair the wells in the treatment area.

If you have any questions or comments, please call me at (405) 775-5475.

Sincerely,

A. Keith Watson
Project Manager

Copy: N. Bock
D. Shandy
T. Wentland - WDNR

United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604

December 1, 2005

Mr. A. Keith Watson
Tronox LLC
Kerr-McGee Center
P.O. Box 25861
Oklahoma City, Oklahoma 73125

Re: Moss-American Site
Five Year Review Report Recommendation Followup

Dear Mr. Watson:

Recently, U.S. EPA generated a second Five Year Review Report discussing the status of remedy implementation and the protectiveness achieved at the Moss-American site. Within the Five Year Review Report, certain issues were identified for further consideration. The purpose of this letter is to restate those issues along with some of the recommendations discussed by the parties, and to suggest a timetable for needed corrections and implementation.

1. Funnel and Gate System - The treatment capacity of the final two gates is at present underutilized. The gradient in this area of the aquifer is very slight, such that it may be some time before contaminated groundwater near wells MW-33/34 reaches the final gate pairs. The parties discussed several options at the time of the June 2005 site inspection. These options included:

- the feasibility of installing another treatment gate near this zone of higher aquifer contamination.

- the possibility of inducing flow to move towards the final two gate pairs, either by extracting water near those gates, or injecting it back near the MW-33/34 vicinity.

- the possibility of planting appropriate trees near the final two gate pairs, thereby serving as "natural pumps" in drawing water towards this area.

U.S. EPA requests that Tronox and its consultant(s) consider which of the above options seem most feasible and, using the monthly progress reports as a reporting vehicle, inform the agencies in the January 2006 monthly report which options will be selected, and when installation can be expected.

2. Optimizing Groundwater Monitoring Network - U.S. EPA is aware of developing guidance in this area, and is cognizant of the need to make adjustments towards "long term monitoring optimization." At the point in time when the installation noted in item #1 is complete, U.S. EPA and WDNR will consider granting the request as made in Tronox/Weston's "Request for Modifications to the Groundwater Monitoring Program".

3. Tronox has observed that the parties revisited land use controls and executed revised and expanded proprietary controls in 2000, but there is currently no analysis of what restrictions were recorded on what specific properties, whether other interests in the particular property (e.g. pre-existing easements) need to be subordinated, whether title commitments are needed and whether there are properties at the site that do not have restrictions in place.

EPA requests that you demonstrate that controls cover the entire site area that needs to be restricted and that such controls have been properly recorded. Please provide an updated map covering the entire site that, parcel by parcel, indicates: 1) the current owners; and 2) the restrictions recorded. We request, for each parcel, a copy of title documents and the restrictions recorded showing the clerk's recording stamps. Please provide the address and contact information of the recording office.

EPA requests that you demonstrate that existing proprietary controls (restrictive covenant/easement etc.) were signed by a person or entity that owned the property at the time of signature and that existing proprietary controls are free and clear of all liens and encumbrances. Please include a certified title evaluation. Please provide copies of all encumbrances and other documents referred to in the title evaluation. Please provide a map that identifies the location of any existing encumbrances or rights (easements on the property). Please identify whether any existing claims or encumbrances have been subrogated.

EPA request that you identify any legal insufficiencies of the existing proprietary controls. Please evaluate whether the restrictions recorded on each parcel suffice; and whether the restrictions run with the land. Please evaluate whether all parcels that need restrictions have restrictions, and have the necessary restrictions. For example, are there parcels containing the old and new channels and areas containing control and/or monitoring equipment that don't have restrictions? The County and the Railroad may not own all of the parcels. Do all of the restrictions recorded follow the 2002 language issued under State law that specifically prohibited industrial use? Are there any restrictions that need to be added? Have any of the restrictions been violated?

4. Uncontaminated Strip of Land - U.S. EPA plans to draft a letter to Tronox and the State discussing this strip of land.

5. Well Casing - Well casing construction should be such that the wells do not serve as conduits for surface water infiltration. This was discussed in the field with KMC/Weston representatives, and it is EPA's impression that all parties agree this is a needed maintenance item. As in item #1 above, Tronox shall inform the agencies in the January 2006 monthly report how such well casing repair/subsidence will be accomplished, and what timetable the agencies

may expect for such repairs to be made.

Thank you for your consideration of these matters.

Yours truly,

Russell D. Hart

cc:

T. Wentland, WDNR
M. Gonzalez, ORC

ATTACHMENT 7

GEOS Groundwater Analysis

Memorandum

Date: 12/18/2009

Subject: **Remedy Review of Groundwater Issues for Moss America**

From: **David Wilson GEOS, U.S. EPA Region 5**

To: **Ross del Rosario RPM, U.S. EPA Region 5**

GEOS was requested to review groundwater conditions as it relates to the constructed funnel-and-gate groundwater remedy at the Moss America site. GEOS performed a preliminary review on selected site information that was available and looked for potential issues that may require further evaluation. The purpose of this memo is to provide example text that could be used within the Moss America Five Year Review (FYR).

GEOS completed statistical analyses of groundwater concentration data for wells throughout the Moss America site, using software developed by Subterranean Research, Inc., and referred to in this report as PAM. The data used for this analysis are contained in the databases "Moss_GW_Test-Result.xlsx"; "Moss_GW_Batch.xlsx" ,"Moss_GW_Sample.xlsx", "Moss_GW_Location.xlsx"", provided by the consultants to the responsible party (RP), Weston Solutions, Inc. Statistical analyses was performed using PAM on the groundwater chemistry data starting from 1st quarter 2000 until 1st quarter 2009. A table of all statistically significant findings is included as an attachment tc this memo.

GEOS reviewed the following groundwater elevation contour maps, 1st Quarter 2004, 2nd Quarter 2004, undated map contained in the 2005 U.S. EPA Five Year Review, and 3rd Quarter 2007.

GEOS's preliminary finding included issues that may affect the performance of the constructed funnel-and-gate groundwater remedy at the Moss America site. GEOS's preliminary findings were also reviewed by Matt Tonkin of S.S. Papadopulos & Assoc. Inc. These Findings were presented to Ross del Rosario the site RPM in a conference call meeting 12/2/2009 with David Wilson present and Matt Tonkin attending by phone.

The following example FYR text incorporates GEOS's preliminary findings included the issues that may affect the performance of the constructed funnel-and-gate groundwater remedy at the Moss America site. The example FYR text was also reviewed by Matt Tonkin of S.S. Papadopulos & Assoc. Inc.

Example FYR Text Relating to the Constructed Funnel-and-Gate Groundwater Remedy at the Moss America site

"Good contaminant removal efficiency is occurring at the upgradient treatment gates within the groundwater funnel and gate treatment system, i.e., at gates 1 and 2. For example, naphthalene concentrations drop from around 4000 ug/l to 40-80 ug/l to 8-10 ug/l as groundwater flows from the upgradient side of the gate, into the gate treatment zone itself, and past gates 1 and 2. (see Figure 2.) This suggests that the funnel-and-gate remedial technology is suitable for the conditions encountered at the site. However, monitoring data indicate that little beneficial treatment is occurring at the two gates that are immediately downgradient of the current mapped extent of contamination (i.e., gates 3 and 4), or at the most down gradient pair of treatment gates (i.e., gates 5 and 6). Water level data suggest that historically there has been little to no hydraulic gradient from areas known to be contaminated – i.e., around monitoring wells MW-34S and MW-7S located in the northern corner of the impounded area - to the two easternmost pairs of treatment gates (see Figure 1.)

Historically, free product (NAPL) has been identified in the vicinity of monitoring wells MW-34S and MW-7S. Free product continues to be found in these two wells during recent sampling events. These wells exceed standards for many PAHs. Monitoring well MW-34S exceeds cleanup standards for numerous contaminants of concern including ANTHRACENE, BENZENE, BENZO(A)PYRENE, BENZO(B)FLUORANTHENE, CHRYSENE, FLUORANTHENE, FLUORENE, NAPHTHALENE, PYRENE. Monitoring well MW-7S exceeds standards for, BENZENE and NAPHTHALENE. (see Table 1, & Figure 3.) In addition, increasing concentrations are identified for several COCs at these, and other, wells. For example, well MW-34S appears to show statistically increasing contaminant concentrations for ANTHRACENE, BENZO(A)PYRENE, BENZO(B)FLUORANTHENE, CHRYSENE, FLUORANTHENE, FLUORENE, NAPHTHALENE, PYRENE. In addition, current contaminant concentrations from monitoring well MW-34S also appear worse (i.e., higher than) as compared to a baseline time period (September 2000 to June 2002) for ANTHRACENE, BENZO(A)PYRENE, BENZO(B)FLUORANTHENE, CHRYSENE, FLUORANTHENE, FLUORENE, NAPHTHALENE, PYRENE. Monitoring well MW-33S has historically and continues to exceed standards for NAPHTHALENE. Current contaminant concentrations from well MW-33S also appear worse (i.e., higher contaminant concentrations than) as compared to a baseline time period (September 2000 to June 2002) for ANTHRACENE and FLUORENE.

Measured water levels indicate that in the area around monitoring wells MW-7S and MW-34S there has been little to no hydraulic gradient that would cause groundwater and any contaminants to flow toward the southeast in the direction of the lower pair of treatment gates (i.e., gates 3 and 4). Instead, measured water levels suggest that if any potential for flow does exist in this area, then this potential – determined by gradient comparing levels in MW-7s, MW34S and MW-33s – has historically been toward the

southwest in the direction of monitoring well MW-33S, where the sheet piling barrier ends and there are no active treatment gates. In this area, water level measurements have historically shown a drop in groundwater elevation between the monitoring well MW-33S and piezometer PZ-02 of about 0.5 foot to nearly 1.0 foot (see Figure 1.) This groundwater gradient indicates a potential for groundwater and contaminants to flow from MW-33S around the southwest end of the sheet-pile containment wall and to from there flow northward, ultimately discharging in to the Little Menomonee River or tributary thereof. However, there is no record of piezometer PZ-02 having been sampled for contaminant concentrations. In addition, no groundwater monitoring wells exist northwest of the funnel sheet-pile containment wall so there is no chemistry data to verify a continuing off-site contaminant release in this area.

Finally, the pattern of water levels and hydraulic gradients in the vicinity of wells MW-7s/MW34S, and from these wells toward MW-33s to the southwest and toward the easternmost gates, may suggest that the sheet piling wall to the north of wells MW-7s/MW-34s does not form a sufficiently competent barrier to groundwater flow and contaminant migration to cause migration to the east where contaminants would ultimately be treated (see Figure 1.) As a result, there is some possibility that contaminants are presently passing through the sheet piling and discharging in to the Little Menomonee River in the vicinity of wells MW-7s/MW34S."

Table 1

Moss American Kerr-McGee Statistical Analysis 11/25/2009									
Analyte Name	**Well ID**	**Units**	**Trend Test** Date Range 2000-2008	**Standard Test** Compare Last Four Quarters' UCL to the Wisconsin PAL			**Baseline Test** Compare Recent Data to the UPL or LPL of a Baseline Interval of Years 2000-2002		
			Result	**Result**	**UCL (Units)**	**Standard (Units)**	**Result**	**UPL or LPL (Units)**	**Most Recent Data (Units)**
ANTHRACENE	MW-33S	ug/L	No Trend	Compliance	1.02	600.00	Worse	0.10	1.10
ANTHRACENE	MW-34S	ug/L	Upward	Exceedance	709.33	600.00	Worse	71.03	840.00
ANTHRACENE	TG1-1	ug/L	Upward	Exceedance	997.50	600.00	Worse	124.68	450.00
ANTHRACENE	TG5-1	ug/L	No Trend	Compliance	0.05	600.00	Worse	0.04	0.06
BENZENE	MW-34S	ug/L	No Trend	Exceedance	8.07	0.50	No Change	14.76	7.00
BENZENE	MW-38S	ug/L	No Trend	Exceedance	2.66	0.50	No Change	3.08	1.80
BENZENE	MW-4S	ug/L	NSD	Exceedance	31.59	0.50	NSD		5.10
BENZENE	MW-7S	ug/L	Downward	Exceedance	1.01	0.50	No Change	8.46	0.90
BENZENE	TG1-1	ug/L	Downward	Exceedance	1.73	0.50	Better	7.36	0.20
BENZO(A)PYRENE	MW-34S	ug/L	Upward	Exceedance	134.97	0.02	Worse	16.56	160.00
BENZO(A)PYRENE	MW-35S	ug/L	No Trend	Exceedance	0.06	0.02	Better	0.29	<0.01
BENZO(A)PYRENE	MW-36S	ug/L	No Trend	Exceedance	0.03	0.02	Worse	0.02	0.03
BENZO(A)PYRENE	MW-3S	ug/L	No Trend	Exceedance	0.04	0.02	No Change	0.04	<0.02
BENZO(A)PYRENE	MW-4S	ug/L	NSD	Exceedance	8.68	0.02	NSD		<1.00
BENZO(A)PYRENE	TG1-1	ug/L	Upward	Exceedance	244.98	0.02	Worse	34.17	110.00
BENZO(A)PYRENE	TG1-2	ug/L	No Trend	Exceedance	0.03	0.02	No Change	0.79	<0.02
BENZO(A)PYRENE	TG5-1	ug/L	No Trend	Exceedance	0.02	0.02	No Change	0.02	0.01
BENZO(A)PYRENE	TG5-3	ug/L	No Trend	Exceedance	0.04	0.02	No Change	0.02	<0.01
BENZO(A)PYRENE	TG6-2	ug/L	No Trend	Exceedance	0.07	0.02	No Change	0.07	0.02
BENZO(B)FLUORANTHENE	MW-34S	ug/L	Upward	Exceedance	126.55	0.02	Worse	15.01	150.00
BENZO(B)FLUORANTHENE	MW-4S	ug/L	NSD	Exceedance	7.35	0.02	NSD		<1.80
BENZO(B)FLUORANTHENE	TG1-1	ug/L	Upward	Exceedance	234.32	0.02	Worse	32.46	100.00
BENZO(B)FLUORANTHENE	TG5-1	ug/L	No Trend	Exceedance	0.02	0.02	No Change	0.04	0.01

Moss American Kerr-McGee Statistical Analysis 11/25/2009									
Analyte Name	Well ID	Units	Trend Test Date Range 2000-2008	Standard Test Compare Last Four Quarters' UCL to the Wisconsin PAL			Baseline Test Compare Recent Data to the UPL or LPL of a Baseline Interval of Years 2000-2002		
			Result	Result	UCL (Units)	Standard (Units)	Result	UPL or LPL (Units)	Most Recent Data (Units)
BENZO(B)FLUORANTHENE	TG6-2	ug/L	No Trend	Exceedance	0.07	0.02	No Change	0.06	<0.04
CHRYSENE	MW-34S	ug/L	Upward	Exceedance	404.07	0.02	Worse	37.91	480.00
CHRYSENE	MW-35S	ug/L	No Trend	None	0.04	0.02	Better	0.28	<0.04
CHRYSENE	MW-3S	ug/L	No Trend	Exceedance	0.26	0.02	No Change	0.30	<0.08
CHRYSENE	MW-4I	ug/L	NSD	None	0.03	0.02	NSD		<0.06
CHRYSENE	MW-4S	ug/L	NSD	Exceedance	16.88	0.02	NSD		<2.90
CHRYSENE	TG1-1	ug/L	Upward	Exceedance	782.25	0.02	Worse	77.42	300.00
CHRYSENE	TG5-1	ug/L	No Trend	Exceedance	0.05	0.02	No Change	0.08	0.05
FLUORANTHENE	MW-34S	ug/L	Upward	Exceedance	2530.39	80.00	Worse	277.03	3000.00
FLUORANTHENE	MW-4S	ug/L	NSD	Exceedance	126.88	80.00	NSD		23.00
FLUORANTHENE	TG1-1	ug/L	Upward	Exceedance	3804.33	80.00	Worse	428.17	1700.00
FLUORANTHENE	TG1-3	ug/L	Upward	Compliance	0.28	80.00	No Change	1.66	0.27
FLUORANTHENE	TG5-1	ug/L	No Trend	Compliance	0.18	80.00	Worse	0.04	0.21
FLUORANTHENE	TG6-3	ug/L	Upward	Compliance	0.09	80.00	Worse	0.08	0.08
FLUORENE	MW-33S	ug/L	No Trend	Compliance	78.60	80.00	Worse	54.30	72.00
FLUORENE	MW-34S	ug/L	Upward	Exceedance	2124.15	80.00	Worse	286.67	2500.00
FLUORENE	MW-4S	ug/L	NSD	Exceedance	299.36	80.00	NSD		210.00
FLUORENE	TG1-1	ug/L	Upward	Exceedance	3295.34	80.00	Worse	403.75	1600.00
FLUORENE	TG1-2	ug/L	Upward	Compliance	20.64	80.00	No Change	32.81	20.00
FLUORENE	TG1-3	ug/L	Upward	Compliance	1.37	80.00	No Change	2.33	1.40
NAPHTHALENE	MW-33S	ug/L	Downward	Exceedance	65.15	8.00	Better	3345.86	76.00
NAPHTHALENE	MW-34S	ug/L	Upward	Exceedance	12864.84	8.00	Worse	6862.93	14000.00
NAPHTHALENE	MW-38S	ug/L	Downward	Exceedance	722.44	8.00	No Change	1411.93	94.00
NAPHTHALENE	MW-3S	ug/L	No Trend	Exceedance	821.65	8.00	No Change	980.00	<1.00

Moss American Kerr-McGee Statistical Analysis 11/25/2009

Analyte Name	Well ID	Units	Trend Test Date Range 2000-2008	Standard Test Compare Last Four Quarters' UCL to the Wisconsin PAL			Baseline Test Compare Recent Data to the UPL or LPL of a Baseline Interval of Years 2000-2002		
			Result	Result	UCL (Units)	Standard (Units)	Result	UPL or LPL (Units)	Most Recent Data (Units)
NAPHTHALENE	MW-4S	ug/L	NSD	Exceedance	885.45	8.00	NSD		830.00
NAPHTHALENE	MW-7S	ug/L	Downward	Exceedance	238.35	8.00	Better	4495.93	22.00
NAPHTHALENE	TG1-1	ug/L	No Trend	Exceedance	6778.92	8.00	Worse	3781.11	4500.00
NAPHTHALENE	TG1-2	ug/L	Downward	Exceedance	62.37	8.00	No Change	149.95	37.00
PYRENE	MW-34S	ug/L	Upward	Exceedance	2024.15	50.00	Worse	224.42	2400.00
PYRENE	MW-4S	ug/L	NSD	Exceedance	140.12	50.00	NSD		14.00
PYRENE	TG1-1	ug/L	Upward	Exceedance	3139.71	50.00	Worse	417.60	1300.00

NR means test was Not Requested.
NSD means Not Sufficient Data to perform test.
£ means slope estimate for log-transformed data, with units of "1/yr". Log(2) times its reciprocal is doubling(+)/halving(-) time.
indicates caution is needed because test data contain large proportion of nondetects.
ø indicates confidence interval for slope contains zero, despite confidence attained value.
Statistical Note: ND surrogate = 0.5 × Median of Nondetects' Reporting Detection Limits.
These results obtained on 11/25/2009 using PAM Version 0.40beta. Run Identifier: 0002C6F00-323609EEE-001AA0C0530C.

Trend Test

The summary table provides two pieces of information from the trend test, a classification of the result and the numerical estimate of the slope (rate of change of concentration). A classification of "Increasing" signifies the contaminant concentration within a well is increasing over the time-frame of interest, and is visually emphasized by a red background. Attention should be given to wells with increasing trends since this could signify migration of the contaminant, non-containment of the contamination source, or other possible problems with the remediation process. A "Decreasing" classification signifies that the contaminant concentration within a well is decreasing for the time-frame of interest, using a blue-green background to cue the reader. A "No Trend" result means that there is neither an increasing nor a decreasing statistically significant trend. If the data set employed has a large proportion of non-detects, a special symbol is included.

The numerical estimate of the slope is negative if decreasing and positive if increasing. Because logarithmic transformations of concentrations are sometimes used, a special symbol in the value column indicates when the slope is the rate of change of the logarithmic transformation of the concentration, rather than rate of change of the concentration itself.

Comparison-to-Standard Test

The summary table provides three pieces of information from each comparison-to-standard test—a classification of the result, an upper confidence limit (UCL) typically estimated from the four most recent concentration data, and the pertinent performance standard (e.g., a clean-up standard). A classification of "Exceedence" means the UCL for contaminant concentration of the most recent four samples exceeds the clean-up standard. These well locations are considered contaminated. A classification of "Compliance" means that the UCL is less than the clean-up standard. A classification of "None" means that a statistically significant compliance or exceedence was not found. A special symbol is included if the data set employed has a large proportion of non-detects.

Comparison-to-Baseline Test

The summary table provides three pieces of information for each comparison-to-baseline test—a result classification, an upper prediction limit (UPL), and the concentration of the most recent sample. A classification of "Worse" means the contaminant concentration of the most recent sample exceeded the UPL determined from the baseline data (usually 8 early results) for that well location. This signifies the concentration of the most recent sample statistically exceeds the range predicted on the basis of the baseline data only. This is evidence that the contamination is becoming worse at the well location. A "Better" classification means the contamination concentration of the most recent sample was below the lower prediction limit (LPL) of the baseline for that well location. This signifies that the concentration of the most recent sample was statistically less than the range predicted from the baseline data, and is evidence that the contamination is significantly better at the well location. The result "No Change" means that the most recent datum is within the range anticipated from the baseline data. If the baseline data set employed has a large proportion of non-detects, a special symbol is included.

Figure 1

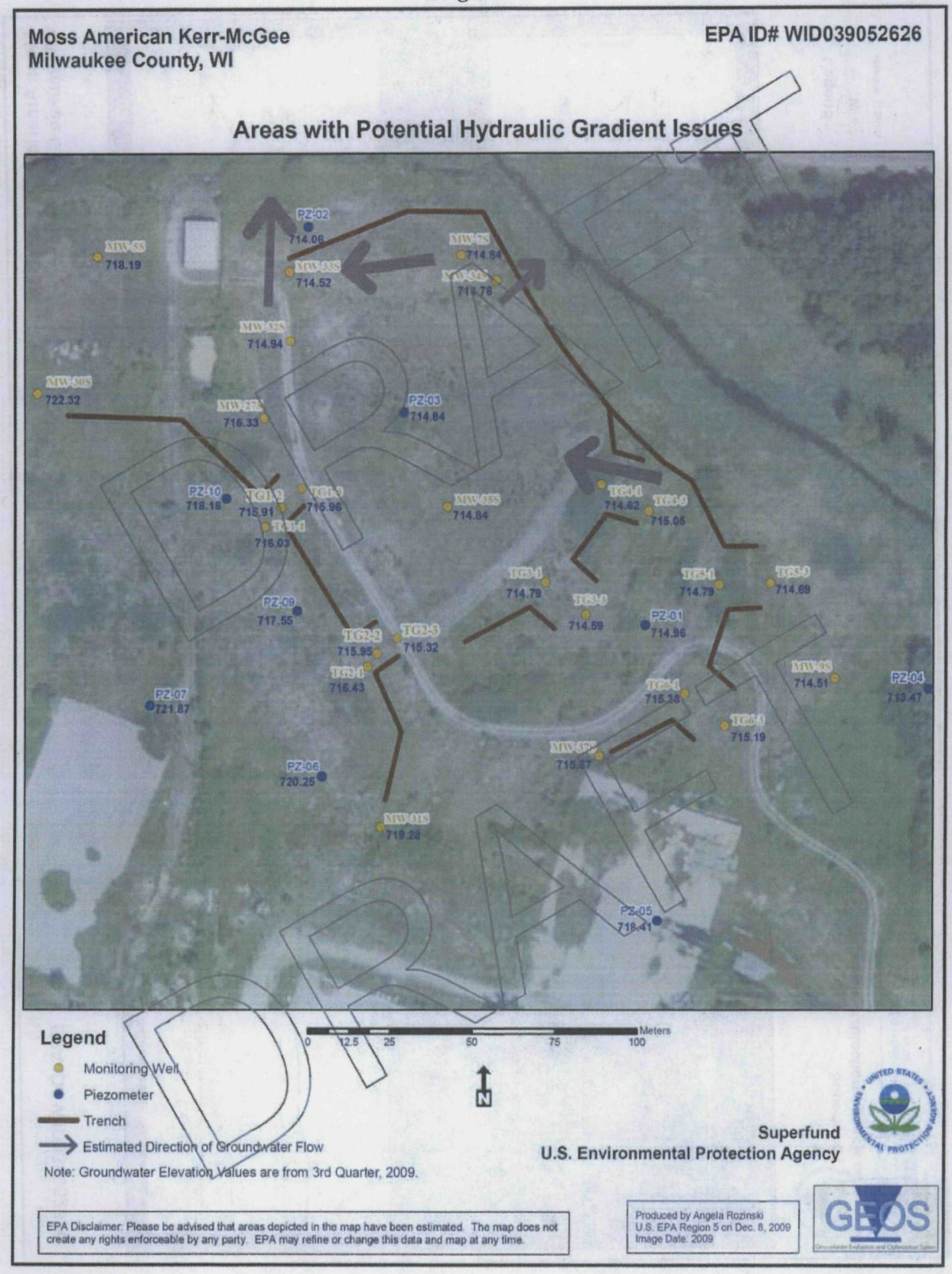

Moss American Kerr-McGee
Milwaukee County, WI
EPA ID# WID039052626
Areas with Potential Hydraulic Gradient Issues
PZ-02
714.06
MW-5S
718.19
MW-7S
714.84
MW-9S
714.52
MW-8S
714.78
MW-12S
714.94
MW-10S
722.32
MW-2S
716.33
PZ-03
714.84
PZ-10
718.18
TG1-3
715.91
TG1-5
716.96
TG1-4
716.03
MW-6S
714.84
TG4-4
714.62
TG4-5
715.05
TG3-4
714.79
TG3-5
714.69
TG3-3
714.59
PZ-01
714.96
PZ-09
717.55
TG2-2
715.95
TG2-3
715.32
TG2-4
716.43
PZ-07
721.87
MW-3S
714.51
PZ-04
713.47
TG5-4
715.38
TG6-5
715.19
MW-4S
715.37
PZ-06
720.25
MW-1S
719.28
PZ-05
718.41
Legend
Monitoring Well
Piezometer
Trench
Estimated Direction of Groundwater Flow
Note: Groundwater Elevation Values are from 3rd Quarter, 2009.
0
12.5
25
50
75
100
Meters
N
Superfund
U.S. Environmental Protection Agency
EPA Disclaimer: Please be advised that areas depicted in the map have been estimated. The map does not create any rights enforceable by any party. EPA may refine or change this data and map at any time.
Produced by Angela Rozinski
U.S. EPA Region 5 on Dec. 8, 2009
Image Date: 2009
GEOS

Figure 2

Moss American Kerr-McGee
Milwaukee County, WI

EPA ID# WID039052626

Gate 1: Naphthalene Analytical Results (2005- 2009)

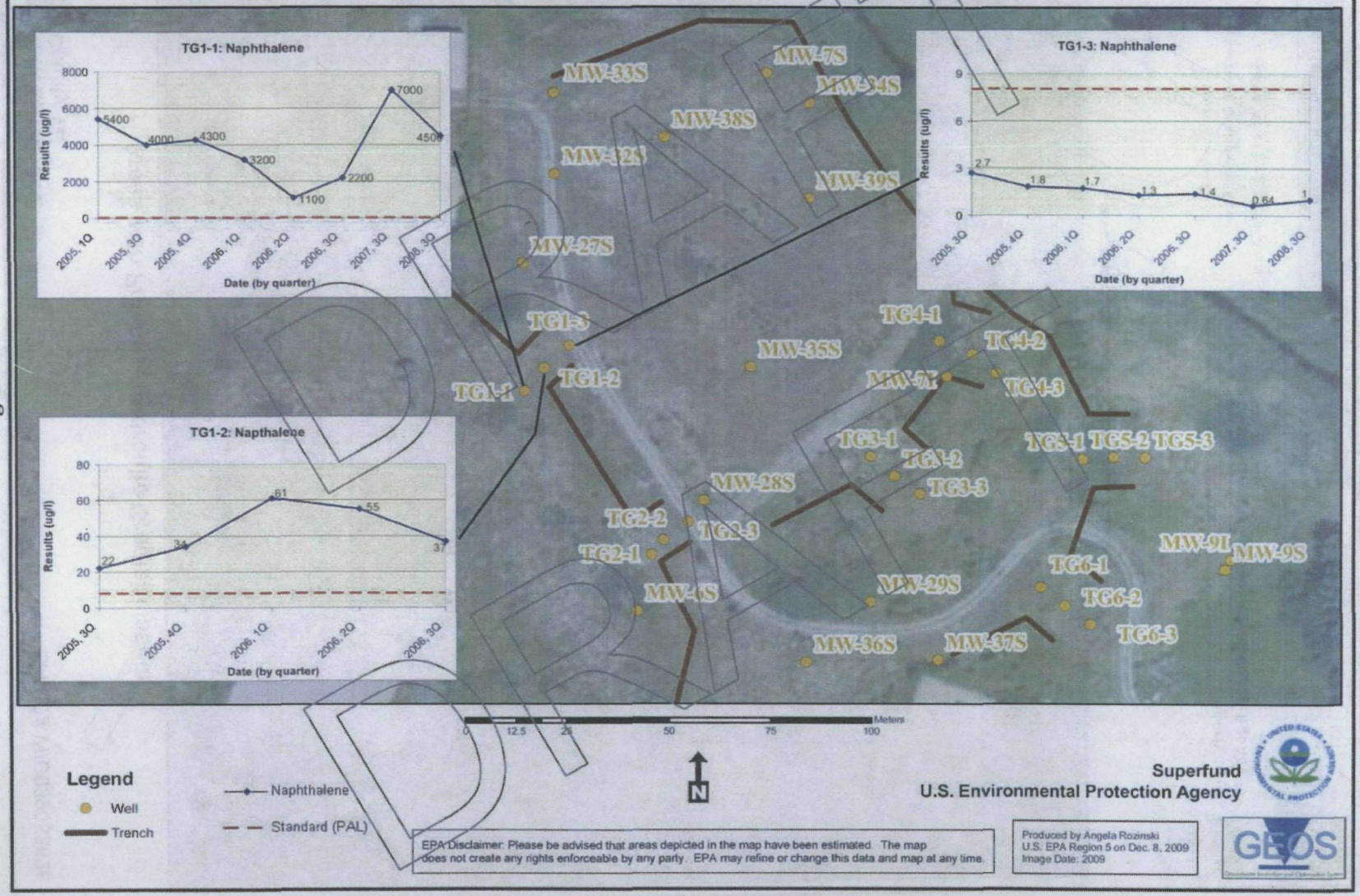
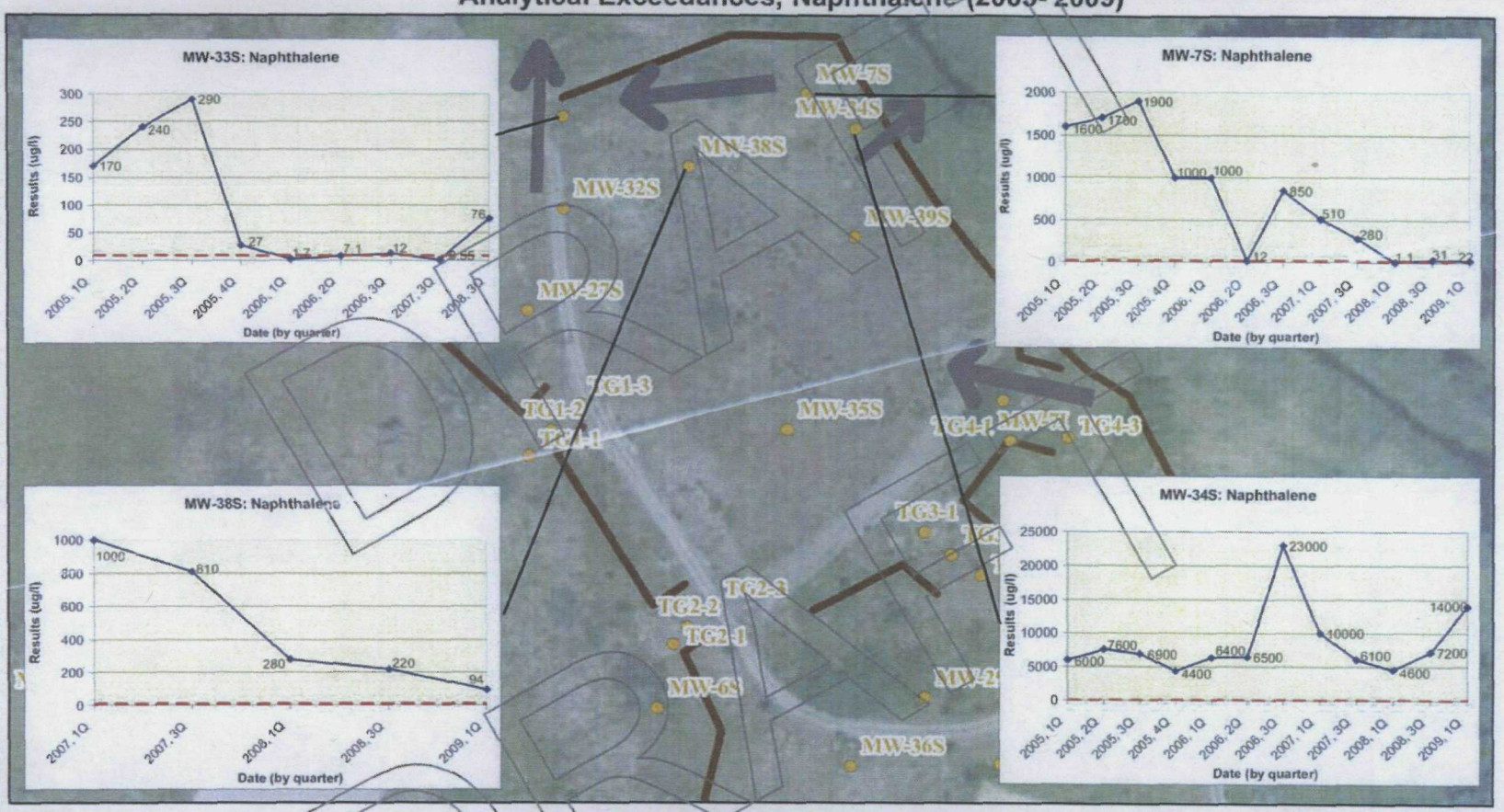


Figure 3

Moss American Kerr-McGee
Milwaukee County, WI

EPA ID# WID039052626

Analytical Exceedances, Naphthalene (2005- 2009)



Legend

- Well
- Trench
- Estimated Direction of Groundwater Flow
- Naphthalene
- Standard (PAL)

Superfund
U.S. Environmental Protection Agency

EPA Disclaimer: Please be advised that areas depicted in the map have been estimated. The map does not create any rights enforceable by any party. EPA may refine or change this data and map at any time.

Produced by Angela Rozinski
U.S. EPA Region 5 on Dec. 8, 2009
Image Date: 2009

GEOS

ATTACHMENT 8

PRP Report on Revised Groundwater Monitoring Program

Weston Solutions, Inc.
Suite 500
750 East Bunker Court
Vernon Hills, IL 60061-1865
847-918-4000 • Fax 847-918-4055
www.westonsolutions.com

29 March 2007

Mr. Russell D. Hart
Remedial Project Manager (SR-6J)
U.S. Environmental Protection Agency
Region V
77 West Jackson Boulevard
Chicago, IL 60604

RFW Work Order No. 13471.003.001
TRONOX Work Order No. 40-50-01-AKW-AE

Re: November 2006/March 2007 Monitoring Well Installation and Abandonment
Moss-American Site, Milwaukee, WI

Dear Mr. Hart:

This letter serves to inform the United States Environmental Protection Agency (U.S. EPA) of the monitoring well installation and abandonment activities that occurred from 20 to 22 November 2006 and 19 March 2007. A total of two monitoring wells were installed, and 22 monitoring wells were abandoned. Work was conducted as specified in WESTON's 5 November 2004 *Request for Modifications to Groundwater Monitoring Program*, subsequent to U.S. EPA comments to this request dated 10 July 2006, and WESTON's response to comments letter dated 19 September 2006. Monitoring wells were installed and abandoned in accordance with Wisconsin Department of Natural Resources (WDNR) *Groundwater Monitoring Well Requirements* – Chapter NR 141.

Attachment A contains the soil boring logs and well installation logs of the two wells installed within the funnel and gate area of the site. The two wells, MW-38S and MW-39S were installed in the locations shown on Figure 1 within the stagnant groundwater plume. This is the area where phytoremediation will be implemented in spring 2007 and these monitoring wells will be used, in part, to monitor contaminant concentrations and groundwater elevations.

Attachment B contains well development forms for monitoring wells MW-38S and MW-39S.

Attachment C contains the well abandonment logs for the 22 monitoring wells that are no longer in service at the site. Monitoring well MW-2S could not be field located and is believed to have been destroyed in the past. Monitoring wells MW-15S, MW-21S, and MW-22S were also found to be destroyed prior to WESTON's arrival on site in November 2006. The protective casing from MW-21S and MW-22S were found strewn on the ground. Monitoring well MW-15S was never found and is believed to have been destroyed as well.

Monitoring well MW-11I could not be abandoned during the November 2006 mobilization. Attempts were made to pull the casing; however, the drill rig was unable to do so. The MW-11S casing was removed to below 30 inches below ground on 19 March 2007 with an acetylene torch to properly finalize this abandonment in accordance with WDNR requirements.

The boring logs, and monitoring well installation and abandonment logs have been submitted to the WDNR Bureau of Drinking Water and Groundwater Section under separate cover, as called for in NR 141. Figure 1 presents the locations of the new and remaining monitoring wells and piezometers, and identifies each of the monitoring wells that have been abandoned at the site.

The groundwater sampling program will continue to be implemented with the changes that are noted in WESTON's response to comment letter of 19 September 2006. Specifically, monitoring wells located within the stagnant groundwater plume area will be sampled on a semi-annual basis, in March and September. This will coincide with the beginning and end of the growing season of the saplings to be planted as part of the phytoremediation to occur in this area. The monitoring wells located along the river channel, MW-A through MW-K, will be sampled on an annual basis, in September. This sampling will coincide with the annual sampling of the on-site treatment and performance monitoring wells. Table 1 summarizes the completed November 2006 and March 2007 well installation and abandonment activities, and the future sampling program.

Should you have any questions or comments, please contact me at (847) 918-4142 or Keith Watson at (405) 775-5475.

Very truly yours,

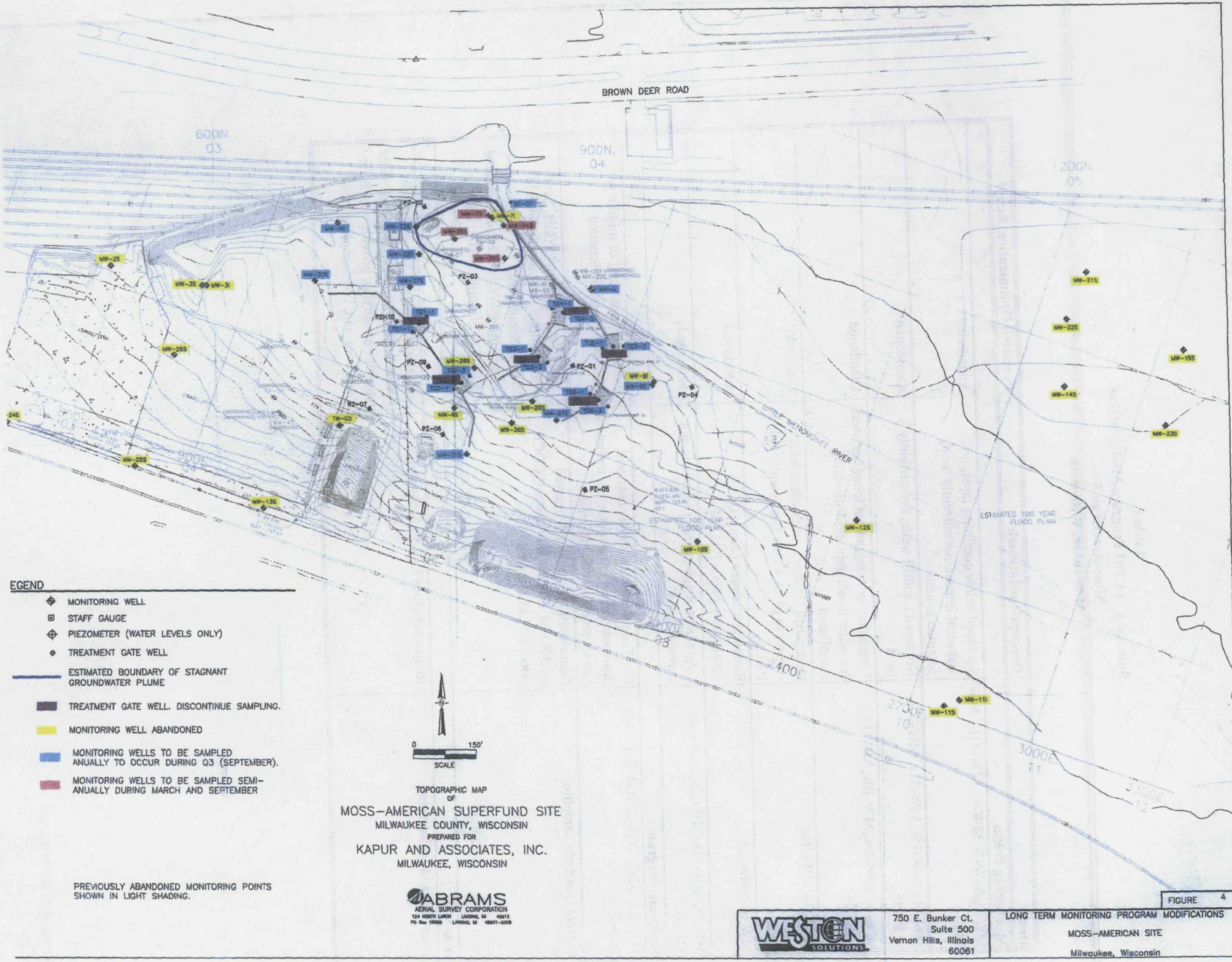
WESTON SOLUTIONS, INC.

Thomas P. Graan

Thomas P. Graan, Ph.D.
Principal Project Manager

TPG\tg

cc: T. Wentland, WDNR
K. Watson, KMC



EGEND

- MONITORING WELL
- STAFF GAUGE
- PIEZOMETER (WATER LEVELS ONLY)
- TREATMENT GATE WELL
- ESTIMATED BOUNDARY OF STAGNANT GROUNDWATER PLUME
- TREATMENT GATE WELL. DISCONTINUE SAMPLING.
- MONITORING WELL ABANDONED
- MONITORING WELLS TO BE SAMPLED ANUALLY TO OCCUR DURING Q3 (SEPTEMBER).
- MONITORING WELLS TO BE SAMPLED SEMI-ANUALLY DURING MARCH AND SEPTEMBER

PREVIOUSLY ABANDONED MONITORING POINTS SHOWN IN LIGHT SHADING.

0 150'
SCALE

TOPOGRAPHIC MAP
OF
MOSS-AMERICAN SUPERFUND SITE
MILWAUKEE COUNTY, WISCONSIN
PREPARED FOR
KAPUR AND ASSOCIATES, INC.
MILWAUKEE, WISCONSIN

ABRAMS
AERIAL SURVEY CORPORATION
124 NORTH LARCH LANSING, MI 48912
PO Box 19008 LANSING, MI 48901-8008

WESTON SOLUTIONS
750 E. Bunker Ct.
Suite 500
Vernon Hills, Illinois
60061

FIGURE 4

LONG TERM MONITORING PROGRAM MODIFICATIONS
MOSS-AMERICAN SITE
Milwaukee, Wisconsin

ATTACHMENT 9

EPA Notification to State on Initiating Five-year Review

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF
SR-6J

July 9, 2009

Thomas Wentland, State Project Manager
Wisconsin Department of Natural Resources
Southeast District/Plymouth Service Center
1155 Pilgrim Road
Plymouth, WI 53073

Re: Notification of Five Year Review Start

Dear Mr. Wentland:

This letter is to notify you that U. S. EPA is beginning the process of working on the next five year review for the Moss-American Superfund Site (site) in Milwaukee, Wisconsin. This statutory review for Moss American will be conducted according to the requirements in Section 121 of CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). Its objective is to evaluate the remedy implemented at the site and determine if it remains protective of human health and the environment.

The five year review report is due no later than mid-April 2010. We are providing you this notification so that U.S. EPA and the Wisconsin Department of Natural Resources (WDNR) can begin the necessary coordination activities. At your earliest convenience, I would like to discuss WDNR's role in the review process, the schedule for the review, the timing for site inspection, issuing the required public notice, getting input from the public, and any specific issues that are of concern to you.

I look forward to working with you on this five year review for Moss American.

If you have any questions, you can reach me at (312) 886-6195.

Sincerely,

Ross del Rosario
Remedial Project Manager

ATTACHMENT 10

Public Notice Ad on EPA Intent to Conduct Next Five-Year Review

Milwaukee Journal Sentinel
October 14, 2009

EPA Begins Review of Moss-American Superfund Site

Milwaukee, Wisconsin

U.S. Environmental Protection Agency is conducting a five-year review of the Moss-American Superfund site. The site comprises 88 acres of a former creosote facility at the intersection of Brown Deer and Granville roads and six miles of the Little Menomonee River, adjacent to the former facility. The Superfund law requires regular checkups of sites that have been cleaned up or where cleanup has been ongoing for at least five years – with waste managed on-site – to make sure the cleanup continues to protect people and the environment. This is the third five-year review of this site.

In 2002, EPA began cleaning up PAH contamination in the soil and sediment (mud) by using a technology called low-temperature thermal desorption; modifying the "exposure scenario" for areas of the site owned by Union Pacific Railroad from residential to industrial; allowing for the exposure scenario for downstream areas of the site owned by Milwaukee County to be changed from residential to recreational; and rerouting and dredging about six miles of the Little Menomonee River.

More information is available at the Mill Road Library, 6431 N. 76th St., Milwaukee, and at www.epa.gov/Region5/sites/mossamerican. The review should be completed by April 2010.

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

Susan Pastor
Community Involvement Coordinator
312-353-1325
pastor.susan@epa.gov

Ross Del Rosario
Remedial Project Manager
312-886-6195
delrosario.rosauro@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 11

List of Documents Reviewed

List of Documents Reviewed:

1. *Remedial Investigation (RI) Report – January 1, 1990*
2. *Feasibility Study (FS) Report – May 24, 1990*
3. *Record of Decision (ROD) – September 27, 1990*
4. *Explanation of Significant Differences (ESD) – April 29, 1997*
5. *ROD Amendment – September 30, 1998*
6. *RD/RA Consent Decree (CD) – March 29, 1996*
7. *Appendix 6 of CD – Statement of Work (SOW)*
8. *Second Five-Year Review Report – September 20, 2005*
9. *NR 140 of the Wisconsin Administrative Code – Groundwater Quality*
10. *Various documents from Tronox since 2005, responding to EPA recommendations on second Five-Year Review Report: 1) January 23, 2006 and 2) March 31, 2008*
11. *Deed Restrictions (4) entered by Milwaukee County and Union Pacific Railroad since 2000.*

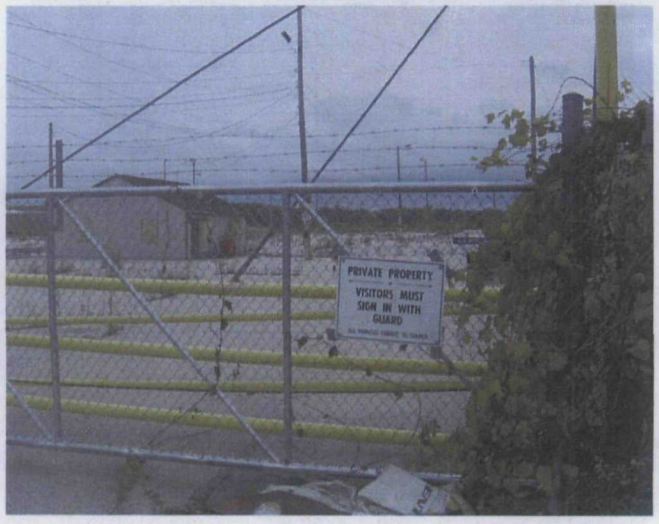
ATTACHMENT 12

Site Photos

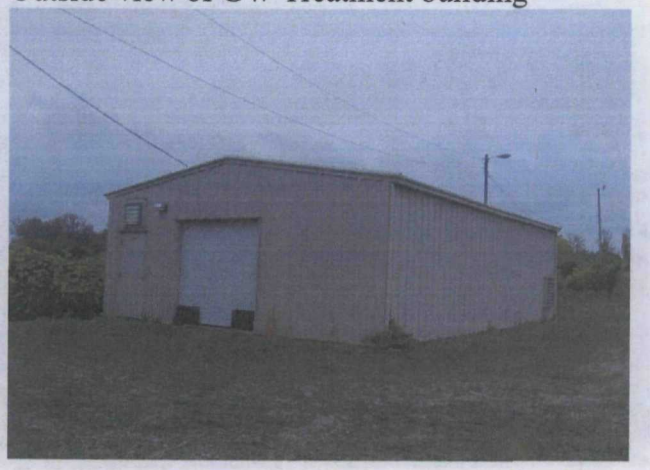
ATTACHMENT 12 – SITE PHOTOS

Entrance to the site from the west

Entrance to the site from the east



Outside view of GW Treatment building



Another view of entrance from the east

Inside view of GW Treatment building

Fencing around the western side of site

Little Menomonee River looking upstream from Silver Spring Drive (August 2009)

Restoration work along Reach 4/5 (October 2009)

Sediment being excavated along Reach 4/5 of Little Menomonee River (August 31, 2009)

Sediment excavation work under Appleton Ave. Bridge (November 6, 2009)

Excavated sediment being hauled away at Reach 4/5 at Little Menomonee River (August 31, 2009)

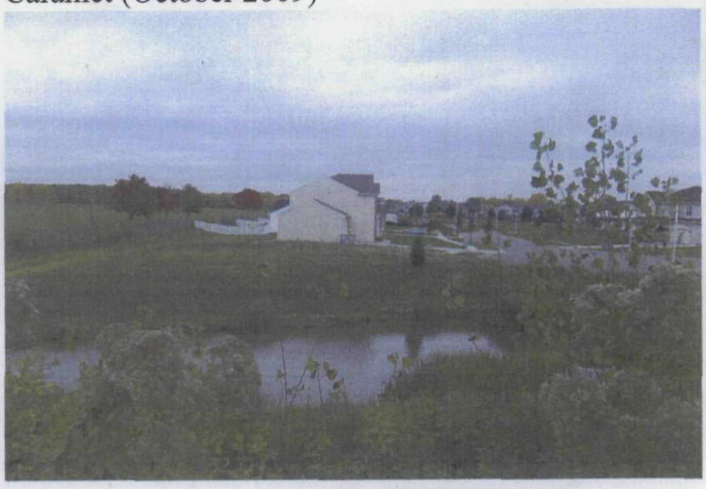
Sediment exaction work under Silver Spring Drive Bridge (October 29, 2009)

Dam installation prior to dredging river (August 29, 2009)

Gravel pile on Leon Terrace – north of Reach 4/5 Five-year Review Inspection (Oct. 2009)

Dirt pile on 91st and Calumet Five-year Review Inspection (Oct. 2009)

Subdivision adjacent to dirt pile on 91st and Calumet (October 2009)



View of completed restoration work on Reach 4/5 (December 2009)

Demobilization underway after completion of Reach 4/5 work (December 8, 2009)