Third Five-Year Review Report

American Chemical Service, Inc. Superfund Site

Griffith
Lake County, Indiana
IND016360265

March 2011

PREPARED BY:

U.S. Environmental Protection Agency
Region 5

Chicago, IL

Approved by:

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Date:

3/15/2011

ACS Third Five-Year Review Report

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List of Acronyms

ACS	American Chemical Service, Inc.
BWES	Barrier Wall Extraction System
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
cfm	cubic feet per minute
DPE	Dual-Phase Extraction
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FML	Flexible Membrane Liner
GWTP	Groundwater Treatment Plant
HI	Hazard Index
IC	Institutional Control
ICTS	Institutional Control Tracking System
IDEM	Indiana Department of Environmental Management
ISCO	In-Situ Chemical Oxidation
ISVE	In-situ Soil Vapor Extraction
K-P Area	Kapica-Pazmey Area
LTGMP	Long-Term Groundwater Monitoring Plan
LTS	Long-term stewardship
LTTD	Low Temperature Thermal Desorption
mg/kg	Milligram per kilogram
MNA	Monitored Natural Attenuation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OFCA	Off-site Containment Area
ONCA	On-site Containment Area
ORC	Oxygen-Releasing Compound
O&M	Operation and Maintenance
PCBs	Polychlorinated Biphenyls
PCOR	Preliminary Closeout Report
PGCS	Perimeter Groundwater Collection System
ppb	Parts per billion
ppm	Parts per million
PRP	Potentially Responsible Party
PSVP	Performance Standard Verification Plan
RA	Remedial Action
RD	Remedial Design
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
SBPA	Still Bottoms Pond Area
SVOCs	Semi-Volatile Organic Compounds
TCL/TAL	Target Compound List/Target Analyst List
UU/UE	Unlimited Use and Unrestricted Exposure
VOCs	Volatile Organic Compounds
WasteLan	The Regional database related to CERCLA Information System

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Executive Summary

The American Chemical Service, Inc. (ACS) National Priorities List (NPL) site (the Site) is located in Griffith, Lake County, Indiana. The Site is comprised of approximately 19 acres of ACS-owned or leased property which includes the areas also known as "Off-Site Containment" and the "On-Site Containment" areas; the 2-acre property known as the "Kapica-Pazmey" Area; and portions of CSX Transportation Company-owned land that had been impacted by past ACS waste disposal practices. Land uses in the vicinity of the site are primarily industrial; however, there are several single-family residences and a prairie park near the Site.

ACS began operating a solvent recovery business at the Site in May 1955. Poor waste handling, storage, and disposal practices led to the contamination of the site as described in United States Environmental Protection Agency (EPA) 1992 Record of Decision (ROD) and subsequent documents. ACS ceased solvent reclaiming activities after losing its interim status under the Resource Conservation and Recovery Act (RCRA) in 1990. ACS currently operates as a specialty chemical manufacturer.

EPA identified the following principle threats at the Site: buried chemical drums, buried wastes, contaminated soil and debris, contaminated groundwater, and contaminated surface water. EPA determined that buried wastes and contaminated soil and debris were a continuing contamination source to groundwater and that the contamination might pose a direct contact threat if the material was excavated. EPA also determined that the excavated material might pose an inhalation threat due to permeation of volatile organic compounds (VOC) through existing cover material causing potential inhalation exposure of the contaminants into the neighboring community.

EPA issued a ROD for the Site in September 1992. Some of the ACS site potentially responsible parties (PRPs) conducted pre-design investigations in 1995 and voluntarily constructed site stabilization remedial measures in 1996 and 1997. EPA issued a ROD Amendment in July 1999 that incorporated the 1996/1997 stabilization measures and additional protective remedial actions into the amended cleanup remedy.

The amended cleanup remedy for the Site consisted of installation of a subsurface barrier wall around the site to contain buried wastes in place; installation of a groundwater extraction system inside the barrier wall to create an inward hydraulic gradient and outside the wall to extract contaminated water from outside of the containment; and installation and operation of a groundwater treatment plant to process the extracted groundwater. Additionally, the remedy included removal of buried drums containing chemicals; excavation of polychlorinated biphenyl (PCB)-contaminated sediment from adjacent wetlands; the placement of soil and/or engineered covers over the areas where contaminated soils were left in place; the installation and operation of an in-situ soil vapor extraction system to remove VOCs from soil; the application of a chemical oxidant into a contaminated soil area to destroy the source of VOCs (preventing further groundwater contamination); and groundwater monitoring tasks including yearly, limited residential well sampling.

EPA and over 40 PRPs signed a consent decree in January 2001 that included the construction, operation, and maintenance of the final cleanup remedy for the Site. Construction completion status was achieved in September 2004 and further remedy enhancements were constructed in 2005. Operation and maintenance of the site remedial actions is ongoing.

EPA issued the first Five-Year Review for the Site in April 2001. Because the final cleanup work had just begun under the consent decree, EPA issued a "Type 1a" report. EPA determined in 2001 that the remedy was protective of human health and the environment because interim cleanup measures had been completed and construction of the final remedial components was underway.

EPA completed the second Five-Year Review for the ACS site in April 2006 and determined that the cleanup remedy was operating as designed and was protective of human health and the environment.

EPA completed the third Five-Year Review for the ACS site in March 2011. The review found that the cleanup and containment remedy is operating as designed and is protective of human health and the environment in the short-term. Current data indicate that the plume remains contained in the site boundaries and the remedy is functioning as required to achieve cleanup goals.

Long-term protectiveness requires compliance with effective institutional controls (ICs) at the Site. Compliance with effective ICs will be ensured by maintaining, monitoring, and enforcing effective ICs. Restrictive covenants or deed restrictions have been implemented at the ACS property but need further evaluation to ensure their effectiveness. Also, ICs for groundwater impacted by contamination which is beyond the ACS property would be required if the ICs have not been implemented. Lastly, a long-term stewardship plan must be prepared. An IC Workplan may be required from the ACS Settling Defendants for the additional work described.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name: American Chemical Service, Inc. (ACS)

EPA ID: IND016360265

Region: 5 | **State**: IN | **City/County**: Griffith - Lake County

SITE STATUS

NPL status: ■ **Final** □ Deleted □ Other (specify)

Remediation status: □ Under Construction ■ **Operating** □ Complete

Multiple OUs? □ YES ■ **NO**

Construction completion date: September 27, 2004

Has site been put into reuse? ■ **YES** □ NO (ACS, Inc. is an operating facility.)

REVIEW STATUS

Lead agency: ■ **U.S. EPA** □ State □ Tribe □ Other Federal Agency

Author name: Giang-Van Nguyen

Author title: Remedial Project Manager | **Author affiliation:** U.S. EPA - Superfund

Review period: 09/01/2010 to 03/31/2011

Date(s) of site inspection: 09/08/2010

Type of review:

■ **Post-SARA** □ Pre-SARA □ NPL-Removal only
□ Non-NPL Remedial Action Site □ NPL State/Tribe-lead
□ Regional Discretion

Review number: □ 1 (first) □ 2 (second) ■**3 (third)** □ Other (specify)

Triggering action:

□ Actual RA Onsite Construction at OU #____
□ Actual RA Start at OU#____
□ Construction Completion
■ **Previous Five-Year Review Report**
□ Other (specify)

Triggering action date: 04/06/2006 (Signature date of second Five-Year Review report.)

Due date for Third Five-Year Review Report: 04/06/2011

Five-Year Review Summary Form continued

Issues:
Institutional Controls. Existing ICs in the form of restrictive covenants at the ACS Property must be further evaluated. Also, ICs for groundwater impacted by contamination beyond the ACS property would be required if the ICs have not been implemented. Long-Term Stewardship (LTS) must be ensured.

Recommendations and Follow-up Actions:
Institutional Controls. Ensure effectiveness of existing ICs which includes completion of a title evaluation, among other tasks. Ensure effective ICs exist for contaminated groundwater beyond the ACS property. An approved LTS plan is required.

Protectiveness Statement(s):
EPA has determined that the cleanup and containment remedy at the ACS site is operating as designed and is protective of human health and the environment in the short-term. Current data indicate that the plume remains contained in the site boundaries and the remedy is functioning as required to achieve cleanup goals.

Long-term protectiveness requires compliance with effective ICs at the Site. Compliance with effective ICs will be ensured by maintaining, monitoring and enforcing effective ICs. Restrictive covenants or deed restrictions have been implemented at the ACS property which need to be further evaluated to ensure their effectiveness. Also, ICs for groundwater impacted by contamination beyond the ACS property would be required if the ICs have not been implemented. Last, a long-term stewardship plan must be prepared. An IC Workplan may be required from the Settling Defendants for the additional work described.

Other Comments: None.

Environmental Indicators:

Date of last Regional review of Human Exposure Indicator (from WasteLan): 08/09/2010

Human Exposure Survey Status: Current Human Exposure Controlled

Date of last Regional review of Groundwater Migration Indicator (from WasteLan): 08/09/2010

Groundwater Migration Survey Status: Contaminated Groundwater Under Control

Ready for Reuse Determination Status:
-<u>In Continued Use</u>: Approximately 15-acre ACS production facility which is located on the northern portion of the site.
-<u>Not Ready for Reuse</u>: Approximately six acres undergoing remediation located on the southern portion of the site.

American Chemical Service, Inc. Superfund Site
Griffith, Indiana
Third Five-Year Review Report

I. Introduction

The United States Environmental Protection Agency (EPA) Region 5, in consultation with the Indiana Department of Environmental Management (IDEM), has conducted the third Five-Year Review for the American Chemical Service, Inc. (ACS) Superfund site (the Site) Griffith, Indiana. EPA conducted the review from September 2010 through February 2011 with information and assistance from Montgomery Watson Harza (MWH), the prime contractor hired by the ACS Settling Defendants to conduct the operation and maintenance activities at the site. This report documents the results of the third Five-Year Review at the ACS site.

Purpose

EPA conducts a Five-Year Review to determine whether a cleanup remedy at a site is, or is expected to be, protective of human health and the environment. EPA documents the review methods, findings, and conclusions in Five-Year Review reports. In addition, EPA identifes any issues that EPA found during the review of site cleanup remedies in Five-Year Review reports and make recommendations on ways to address these issues.

Authority

EPA prepared this Five-Year Review report pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) § 121 and the National Contingency Plan (NCP). CERCLA § 121 states:

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

EPA interpreted this requirement further in the NCP - 40 CFR § 300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The EPA Region 5 has conducted a Five-Year Review of the remedial actions implemented at the Site. This review was conducted by the Remedial Project Manager (RPM) for the Site from September 2010 through March 2011. Information for this review was obtained from several sources including site visit, reports prepared and submitted to EPA by MWH Consultants, under contract to the ACS Settling Defendant. This report documents the results of the review.

This is the third Five-Year Review for the Site. The triggering action for this statutory review is the completion date of the second Five-Year Review, April 6, 2006, as shown in EPA's WasteLAN database. The Five-Year Review is required since hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
Initial discovery of contamination (by State)	1972
Pre-NPL responses (by State)	1972-1975
NPL Listing	September 1984
RI/FS Completion and ROD Signature	September 1992
ROD Amendment	July 1999
Consent Decree	January 2001
Remedial Design Start	September 1994
Remedial Design Completion	August 1999
Final Remedial Action Start	January 2001
First Five-Year Review	April 2001
Construction dates (start, finish)	1996 through 2005
Construction completion (PCOR)	September 2004
Final Closeout Report (RA Report)	September 2005
Second Five-Year Review	April 2006
Site Inspection date(s) – Third review	September 2010

III. Background

Site Characteristics

The ACS site is located at 420 South Colfax Street, in Griffith, Lake County, Indiana (see **Figure 1a**). The site is comprised approximately 19 acres of ACS-owned or leased property which include the following areas: the "Off-Site Containment area (OFCA)", the "On-Site Containment area (ONCA)" area , a 2-acre property known as the "Kapica-Pazmey" (K-P) area, and portions of CSX Transportation Company-owned land that had been impacted by past ACS waste disposal practices (see **Figure 1b**).

Colfax Street borders the site on the east. An ACS-owned rail spur bisects the site in a northwest-southeast direction, between the fenced "On-Site" and "Off-Site" areas. Further to the west, south of the rail spur, the site is bordered by the active portion of the Griffith municipal landfill. Wetlands border the site to the west of the ACS facility and north of the rail spur. The Canadian National Railway (formerly the Grand Trunk Railway) forms the northern boundary of the site.

Figure 1a: 420 S. Colfax, Griffith, IN.

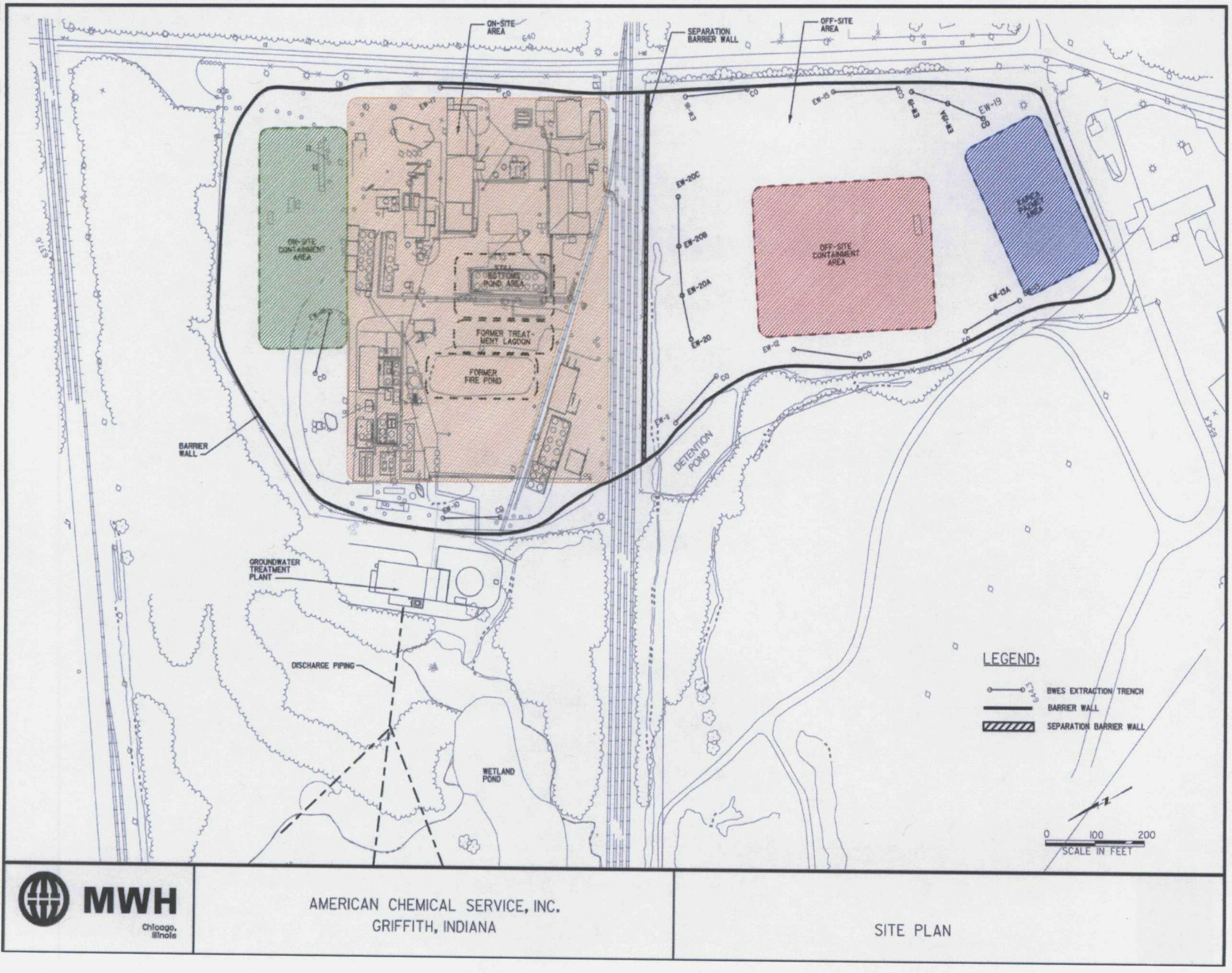

Figure 1b: ACS Site Plan

Land and Resource Use

ACS currently operates as a specialty-chemical manufacturer in the "On-Site" area. Property around the site is primarily used for commercial purposes, but there are several single-family residences nearby on Reder Road. Oak Ridge Prairie Park is located less than a half-mile north and east of the site (see **Figure 1a**).

History of Contamination

ACS began operating as a solvent recovery facility in May 1955. Solvent mixtures containing alcohols, ketones, esters, chlorinated hydrocarbon compounds, aromatic compounds, aliphatic compounds, and glycols were accepted and "reclaimed" by distillation. Many of the compounds had been used as cleaning solvents and so they contained various residual materials. ACS operated a series of batch chemical processes at various times during its history. ACS also conducted epoxidation and bromination operations, and storage and blending of waste-streams for a secondary fuel program at the Site. ACS ceased solvent reclaiming activities in 1990 after losing interim status under RCRA.

In the late 1960s and early 1970s, ACS manufactured small batches of chemicals. ACS also operated two on-site incinerators that burned still "bottoms," or non-reclaimable materials generated from its on-site production unit, and wastes from off-site generators. The first and second incinerator began operating in 1966 and 1968, respectively. In total, the two incinerators burned approximately two million gallons of industrial waste per year. ACS dismantled the incinerators in the 1970s.

ACS used several areas of the property for disposal of hazardous substances. EPA indentified and named these disposal areas as follows: 1) the Still Bottoms Pond Area (SBPA); 2) Treatment Lagoon #1 and adjacent area; 3) the ONCA; 4) the OFCA; and 4) the K-P area. The Off-site area is owned by ACS; however, it was named the Off-Site Area because a fence and rail spur separate it from the On-site area. The Off-Site Area includes the OFCA and the K-P area. The On-Site Area includes the ONCA, the SBPA, Treatment Lagoon #1, and adjacent areas (see **Figure 1b**).

ACS reportedly disposed of approximately 400 drums containing unknown sludges and semi-solids in the ONCA. The SBPA and Treatment Lagoon #1 received still bottoms from the solvent recovery process. The pond and lagoon were taken out of service in 1972, drained, and filled with an estimated 3,200 drums containing sludge materials. ACS utilized the OFCA principally for waste disposal area. The OFCA allegedly received wastes that included on-site incineration ash, general refuse, a tank truck containing solidified paint, and an estimated 20,000 to 30,000 drums that were punctured prior to disposal. ACS also reportedly disposed of hazardous substances directly on the K-P property as part of the drum recycling work conducted there. ACS reportedly ceased on-site disposal practices in 1975.

Initial Response Actions

EPA, pursuant to CERCLA, listed the ACS site on the National Priorities List (NPL) in September 1984. EPA started a Remedial Investigation (RI) in 1988 and conducted it in three phases. EPA completed the RI Report, the Baseline Risk Assessment, and a Feasibility Study (FS) in 1992.

Basis for Taking Action

The Risk Assessment and RI/FS report showed that the principle threats at the Site included buried drums, buried wastes, contaminated soil and debris, contaminated ground water, and contaminated surface water. EPA identified buried wastes and contaminated soil and debris as a continuing contaminant source to ground water, a direct contact threat should future excavation occur, and an inhalation threat from migration of volatile contaminants through existing cover material and possible dispersion of contaminants to the neighboring community.

Contaminants of Concern

Hazardous substances that have been released at the ACS site include:

Soil:	Polychlorinated Biphenyl's (PCBs), and many chlorinated- and non-chlorinated-volatile organic compounds (VOCs)
Groundwater:	Several chlorinated- and non-chlorinated-VOCs, including benzene and chloroethane
Sediment:	PCBs

Contaminant Exposures

Actual or potential human exposures to contaminants in sediments, soil, and groundwater are associated with human health risks due to levels that exceed EPA's risk management criteria[1] under reasonable exposure scenarios.

IV. Remedial Actions

Remedy Selection and Implementation

EPA issued a Record of Decision (ROD) on September 30, 1992. Pre-Design Investigations were conducted by some of the ACS Settling Defendants during 1995 and voluntary site stabilization activities were constructed during 1996 and 1997. EPA issued a ROD modification in July 1999. In addition, EPA issued an Explanation of Significant Difference (ESD) to the ROD in September 2004.

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[1] Whereby excess carcinogenic risk exceeds the risk range of 1×10^{-4} to 1×10^{-6} and/or non-carcinogenic hazards exceed a hazard index (HI) of 1.

The remedial action objectives for the Site addressed in the 1992 ROD were:

- To ensure that the public was not exposed to cancer and non-cancer risks greater than the acceptable risk range from drinking water, soils, buried drums/liquid wastes/sludges other substances from the ACS site;
- To restore ground water to applicable state and federal standards;
- To reduce the migration of contaminants off site through water, soils or other media; and
- To reduce the potential for erosion and possible migration of contaminants via site surface water and sediments.

The 1992 ROD cleanup action was to include the following work:

- groundwater cleanup through a pump and treat program;
- wetlands sediment cleanup and monitoring;
- excavation of intact chemical drums for off-site incineration;
- excavation and off-site disposal of miscellaneous contaminated debris;
- excavation of contaminant source areas and on-site treatment using low temperature thermal desorption (LTTD);
- evaluation of soil cleanup through a soil vapor extraction pilot study; and
- long term groundwater monitoring and limited private well monitoring.

In the original ROD (1992), EPA selected a complete cleanup action for the site with cleanup levels or goals that allowed Unlimited Use and Unrestricted Exposure (UU/UE) for future site use. One of the components of the remedy in 1992 ROD included LTTD; however, EPA had concerns regarding the feasibility of such technology for the Site. Therefore, a series of Pre-Design Investigations were conducted by ACS Settling Defendants to evaluate the viability of the remedy and establish design criteria for the components of the remedy. Later pre-design studies showed this approach to be not cost-effective, possibly unsafe to implement, and in some cases, technically impracticable. EPA therefore issued the 1999 ROD Amendment for the on-site areas. The 1999 ROD Amendment changed the on-site groundwater approach from a waste treatment remedy to one that uses combined technologies of containment, removal, and treatment for the waste. The requirement to treat the buried waste by LTTD was removed from the remedy based on the results of the pre-design technical evaluation.

EPA reached a cleanup agreement for the ACS site in a RA Consent Decree with over 40 ACS Settling Defendants in January 2001. Earlier, a portion of the ACS Settling Defendants had designed and then constructed certain aspects of the amended cleanup remedy while also conducting the pre-design studies. This portion of the ACS Settling Defendants installed a subsurface barrier wall around the ACS property in 1997 and then installed the interim groundwater extraction system inside the barrier wall ("Barrier Wall Extraction System" or BWES) to dewater the area to prevent movement of contaminated groundwater over and outside of the wall. They also installed an interim groundwater extraction system (the "Perimeter Groundwater Containment System" or PGCS) in the northern area of the site to control the movement of the more highly impacted groundwater in this area. Water collected from both systems was pumped to an on-site treatment plant (the "Groundwater Treatment Plant" or

GWTP) to remove the chemical contaminants before the cleaned water was discharged into the wetlands.

Figure 2 (next page) displays the overall site cleanup approach selected in the ROD Amendment.

In September 2004, U. S. EPA issued an Explanation of Significant Differences (ESD) to the 1992 Record of Decision (ROD) and 1999 ROD Amendment for the Site. This ESD explained a partial change in the clean up method for the groundwater contaminant plumes at the site. The ESD changed the off-site groundwater cleanup approach from solely pump-and-treat to a combination of pump-and treat, in-situ chemical oxidation (ISCO), and monitored natural attenuation (MNA).

In August 2004, as requested by EPA and per an approved work plan, the ACS Settling Defendants conducted soil vapor sampling at the house near the intersection of Reder Road and Colfax Street. The purpose of this sampling was to determine if VOCs were present in the shallow soil vapor near the house. The results of the initial soil vapor investigation were considered anomalous due to probable interference from a natural gas leak at the residence. In 2005, the ACS Settling Defendants conducted additional work including an additional house inspection, indoor air sampling, and the installation of a vapor mitigation system. Based on the analytical results of the indoor air samples, EPA concluded that the concentrations were not sufficiently high to warrant actions beyond the installation of the precautionary vapor mitigation system.

In summary, the final remedy included the following tasks:

- Containment by the barrier wall and the PGCS;
- In-situ Soil Vapor Extraction (ISVE) in the SBPA (source reduction through treatment and prevention of vapor migration);
- ISVE in areas of VOC impact in the OFCA (source reduction through treatment and prevention of vapor migration);
- ISVE in the K-P Area (source reduction and prevention of vapor migration),
- Installation of an engineered cover over the areas containing buried waste (containment and prevention of direct contact with impacted soil and with vapors);
- Removal of PCB-contaminated sediments in the wetland areas by excavating and disposing of sediments appropriately;
- Removal and off-site disposal of the intact drums in the ONCA;
- Continued operation of the PGCS, BWES, and GWTP in accordance with the performance standard verification plan (PSVP);
- Active treatment and MNA for groundwater outside the barrier wall in the North and South/Southeast Areas;
- Long-term groundwater monitoring in accordance with EPA- approved groundwater monitoring program; and
- Private well sampling, in accordance with EPA-approved groundwater monitoring program.

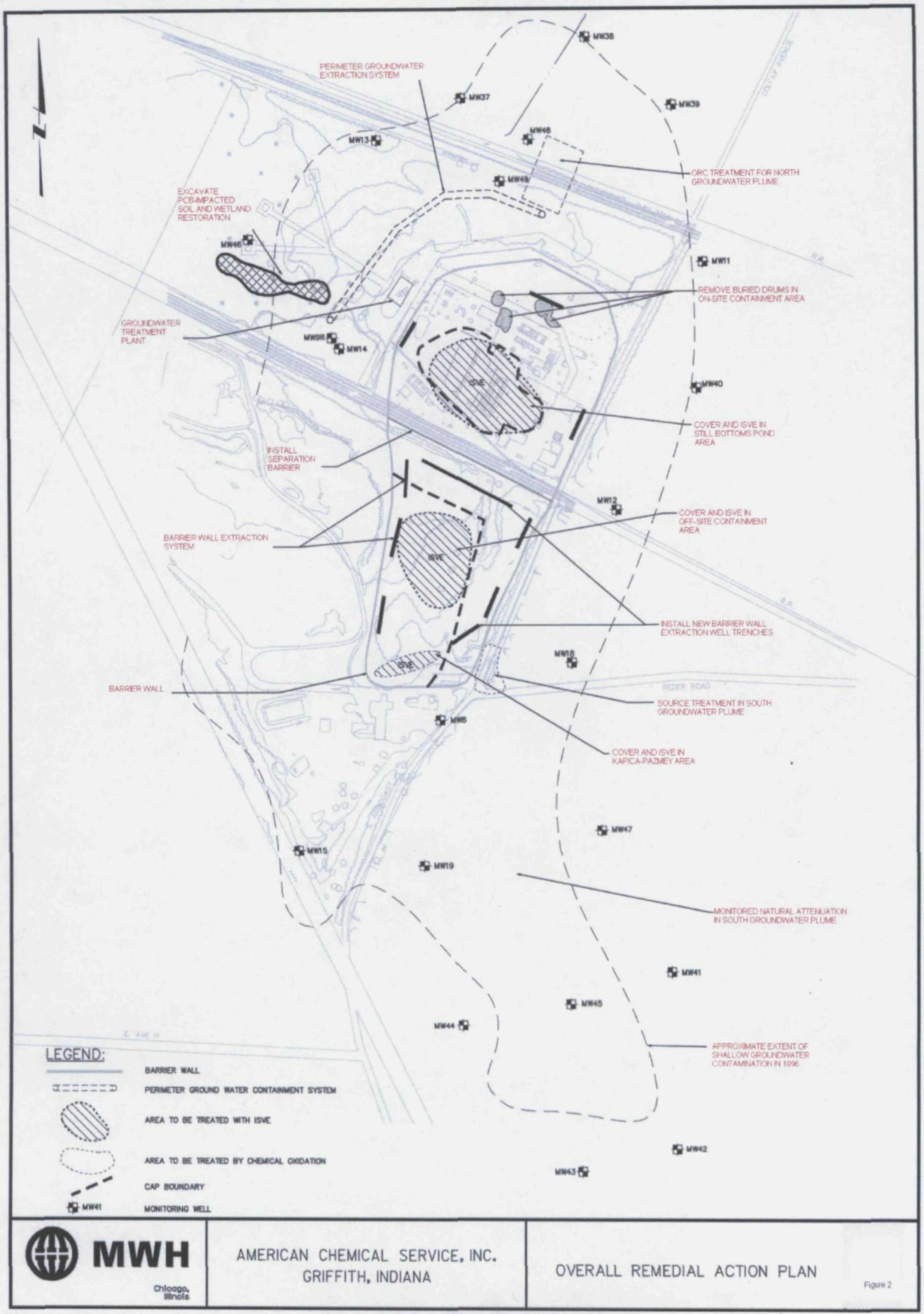

Figure 2: Overall Site Cleanup Approach Selected in the ROD Amendment

Institutional Controls

EPA requires that land-use restrictions, or Institutional Controls (ICs) be placed on a site where the implementation of an engineered remedy does not allow for UU/UE. Thus, an area of a site which has residual contamination above UU/UE levels would have an IC placed on it. 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. ICs are required to ensure the protectiveness of the remedy. Compliance with ICs is required to assure long-term protectiveness for any areas which do not allow for UU/UE.

Figure 2 on previous page depicts the current conditions of the site and areas which do not allow for UU/UE. Since the commercial/ industrial area within the ACS property boundary (see **Figure 3**) will remain after the remedy is completed, ICs consisting of proprietary controls in the form of restrictive covenants to restrict future land and groundwater use will serve to protect the engineered remedy, therefore preventing exposure to residual contaminants at the site. The table below summarizes institutional controls for these restricted areas.

Table 2 – Institutional Controls Summary

Media, Engineered Controls, & Areas that Do Not Support UU/UE (Based on Current Conditions).	**IC Objective**	**Title of Institutional Control Instrument Implemented**
ACS Property (On Site) - Area of containment with soil and groundwater treatment to achieve commercial/industrial re-use is identified in Figure 3.	-Prohibit future use that is incompatible with remedial actions in place including residential use and development and prohibit groundwater use. -Prohibit interference with remedy; Ensure proper maintenance	-Restrictive Covenant - Recorded with Lake County, Indiana County Clerk's Office (January 1994) -Town of Griffith Zoning Ordinances - Heavy Industrial Area
CSX Transportation Property (Off-Site) – Area of groundwater treatment to achieve cleanup objectives in wetland area.	-Prohibit future use that is incompatible with remedial actions in place including residential use and development and prohibit groundwater use. -Prohibit interference with remedy; Ensure proper maintenance.	-Restrictive Covenant - Recorded with Lake County, Indiana County Clerk's Office (March 1994) -Town of Griffith Zoning Ordinances – Heavy Industrial Area
Djurovic Property (Kapica-Pazmey Area) (On Site) – See Figure 3. Part of containment area.	-Prohibit future use that is incompatible with remedial actions in place including residential use and development and prohibit groundwater use. - Prohibit interference with remedy; Ensure proper maintenance.	-Restrictive Covenant - Recorded with Lake County, Indiana County Clerk's Office (February 1997) -Town of Griffith Zoning Ordinances – Open Green Space

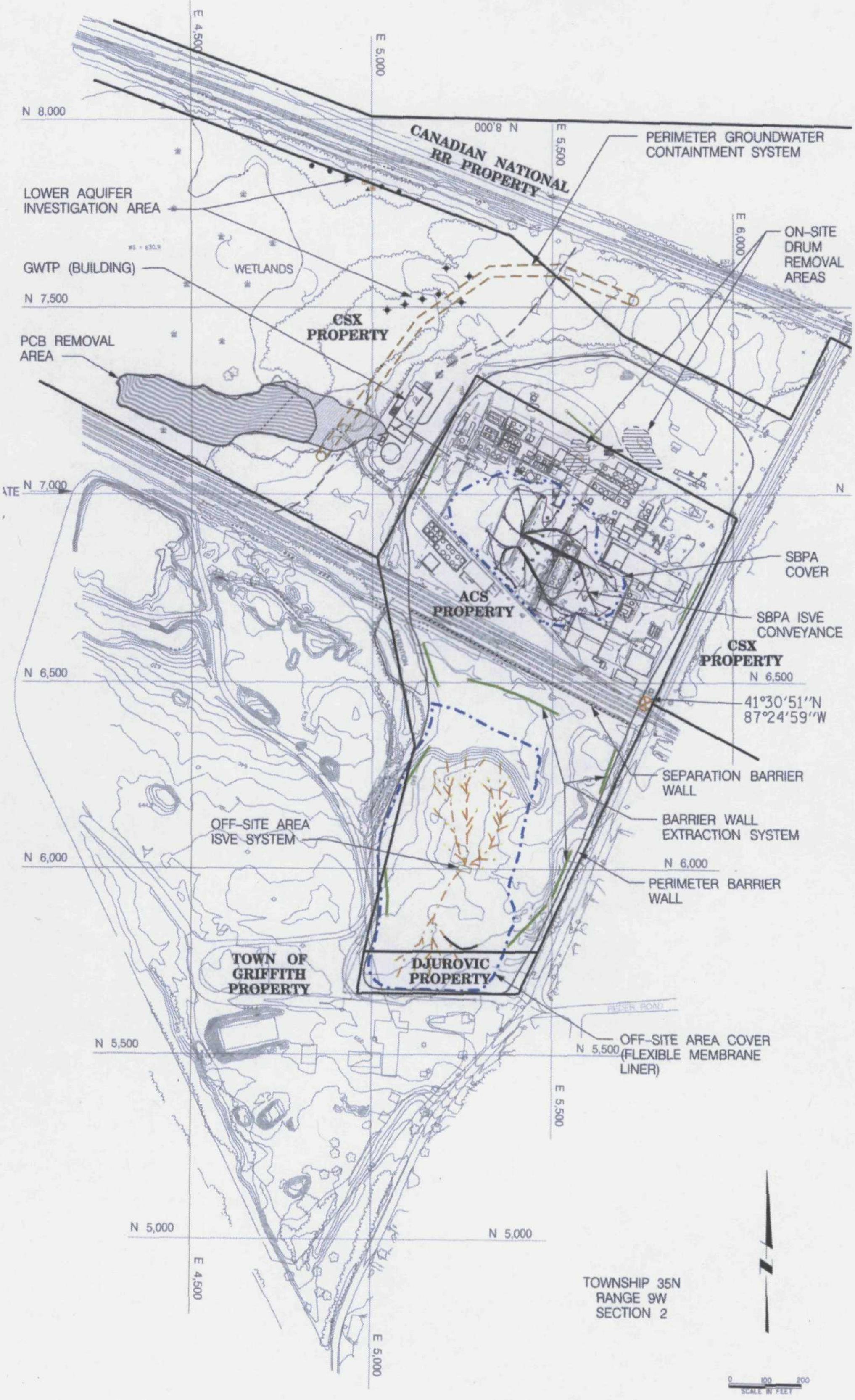

Figure 3: Area property owners map.

ICs for ACS Property

EPA addressed ICs in the 1999 ROD Amendment as follows:

> *A deed restriction will be maintained on the ACS property so that the future use of the property will be restricted to those activities which do not interfere with the performance of any cleanup activities listed in the 1992 ROD and this ROD Amendment, or disturb the integrity of the soil cap to be placed over the site.*

The 2001 Consent Decree with the ACS Settling Defendants also includes the following obligation of the Owner-Settling Defendants regarding institutional controls:

> *Owner-Settling Defendants have previously recorded deed restrictions which preclude residential development at the Site, use of ground water for potable purposes, and any interference with the final remedial action. Owner-Settling Defendants shall maintain these previously recorded deed restrictions as already imposed, until such time as EPA determines that they are no longer necessary. Commencing on the date of lodging of this Consent Decree, Owner-Settling Defendants shall refrain from using the Site, or such other property, in any manner that would interfere with or adversely affect the integrity or protectiveness of the remedial measures to be implemented pursuant to this Consent Decree. Nothing herein is intended to modify or eliminate Owner-Settling Defendant's pre-existing obligations with respect to these deed restrictions. If EPA determines that land/water use restriction in the form of state or local laws, regulations, ordinances or other governmental controls are needed to implement the remedy selected in the ROD and /or amended ROD, ensure the integrity and protectiveness thereof, or ensure non-interference therewith, Settling Defendants shall cooperate with EPA's and the State's efforts to secure such governmental controls.*

The Owner-Settling Defendants include ACS, Inc. and CSX Transportation Company. Zarja and Nadzda Djurovic own the K-P Area and are not considered Owner Settling Defendants. (see **Figure 3**).

The institutional controls "deed restriction" requirement in the ROD Amendment serves as a protectiveness measure to be used in concert with the containment and active treatment methods to provide for the protection of human health and the environment at the Site. Prior to the 2001 Consent Decree the ACS PRPs had asserted that they already had obtained voluntary deed restrictions on the impacted areas of the ACS site. The Consent Decree, however, made the ICs a binding requirement on the ACS Settling Defendants.

At the request of EPA, the ACS Settling Defendants prepared and submitted an Institutional Controls Study in November 2005. The Institutional Control Study contains a map showing the areas subjected to the ICs and copies of the actual ICs that were recorded with Lake County, IN. The ICs, in the form of deed restrictions, state that the ICs cannot be removed without permission of EPA and IDEM. The IC study also contains language that prohibits residential development at the site; the use of groundwater for potable purposes; and any interference with the final remedial actions.

However, the ACS Settling Defendants' IC Study is not complete. EPA had requested as part of the IC Study that the ACS Settling Defendants perform a title evaluation (for information-only purposes) to independently document that the ICs "run with the land" and that no parts of the site had been sold or transferred. The ACS Settling Defendants IC Study stated that the ICs "run with the land," and as a proposed alternative to a title search, they later submitted to EPA copies of deeds and limited and conditional property record reports from a title company. They did not perform a title search due to cost concerns and the fact that two of the three landowners are signatories to the consent decree (ACS and CSX Transportation).

The ACS Settling Defendants' IC Study does document the existence of restrictive covenants, but the proposed alternative title review does not adequately document that the existing controls were recorded and free and clear of all liens and encumbrances, or adequately investigate easements and restrictions. Therefore, the title evaluation portion of the IC Study needs to be completed to verify the long-term effectiveness of the ICs. Additionally, the IC study must be further evaluated to ensure that the objectives stated in the instruments are adequate to ensure the site and media is restricted, deed restrictions are enforceable and that the legal description adequately covers all the areas of concern. Also, as mentioned below, a long-term stewardship plan is required to ensure long-term protectiveness.

ICs for Groundwater beyond ACS Property

There are no governmental controls which restrict use of the Site other than general Town of Griffith zoning ordinances which categorize the properties as industrial and open green space. The majority of the Site is located in an area designated as heavy industrial use. The OFCA of the Site is in an area designated as Open Green Space which would also eliminate any potential for residential or other future development (see **Appendix 5- Town of Griffith Zoning District Map**).

Groundwater has been impacted beyond the ACS-owned property. Therefore, ICs are required to ensure that no inappropriate uses of the groundwater occur. Governmental ICs such as a groundwater use ordinance or well permitting requirement are likely the most appropriate for the groundwater beyond the ACS property to restrict groundwater use. Further review is needed to determine whether the governmental controls have been implemented in off-site areas and whether they are protective.

Additional Work

Once the title evaluation is completed, EPA will review that and further review the existing IC study to address the questions above. If additional work is required by the Settling Defendants then they will be required to prepare an IC Workplan.

Current Compliance

The remedy appears to be functioning as intended. Based on the Site inspection and data, EPA observed no inappropriate land or groundwater use. EPA is not aware of site or media uses which are inconsistent with the stated objectives of the ICs and cleanup goals. Access to the ACS property is further restricted by the use of fencing. Long-term protectiveness at the Site requires continued compliance with use restrictions to assure that the remedy continues to function as intended.

Long-Term Stewardship

Long-term stewardship (LTS) will ensure effective ICs are maintained and monitored and enforced and that the remedy continues to function as intended with regard to ICs. An LTS plan will be included, as part of an update to the O&M Plan, and it will be required to document long-term stewardship procedures. This plan will include a requirement that the ACS Settling Defendants must notify EPA and IDEM of any changes to local ordinances or if additional ICs are implemented. In addition, the LTS portion of the O&M Plan will require that the ACS Settling Defendants annually certify to the agencies that ICs remain in place and are effective.

Currently, all monitoring data show that the contaminant concentrations continue to decrease and are contained in the site boundaries, and with the institutional controls in place to restrict the use of ground water as a drinking water source, the remedy is considered to be protective of human health and the environment. EPA is requiring that monitoring continues at the site.

System O&M/Monitoring Program

Routine maintenance of the monitoring wells, extraction wells, ISVE system, and GWTP is performed by MWH, the ACS Settling Defendants' contractor. The routine maintenance activities are performed in accordance with the March 2005 O&M Manual, ISVE System, the July 1997 Operations & Maintenance Plan/Contingency Plan. Maintenance tasks include routine maintenance of ISVE System equipment, responding to system alarms or shutdowns; maintenance of pumps installed in the BWES trenches, DPE wells, and PGCS wells; and maintenance of the performance on the GWTP components.

The groundwater monitoring program has been performed in accordance with the September 2002 Revised Long-Term Groundwater Monitoring Plan (LTGMP). Groundwater and treated effluent have been monitored on a periodic basis to ensure treatment effectiveness. Water level monitoring has also tracked whether the barrier wall is performing as designed. Analyses included the chemicals of concern listed in the ROD and those parameters required under a discharge "permit" issued by IDEM for the GWTP.

O&M Costs

Approximate annual cost of O&M for ACS Site are shown in the table below

Table 3: Annual System Operations/O&M Costs

Date	Estimated Annual Cost	Actual Annual Cost	Comments
2006	$1,545,093	$1,658,248	- Positive and negative annual variances between original estimated costs and actual costs are within the ranges expected with original estimate of long-term O&M costs. Overall budget performance below budget is due to efficient operations and avoidance of costs associated with contingent items.
2007	$1,571,604	$1,577,306	
2008	$1,618,555	$1,815,961	
2009	$1,665,282	$1,777,672	
2010	$1,945,253	$1,680,476	
Total	**$8,345,786**	**$8,509,663**	

V. Progress Since the Last Review

EPA completed the second Five-Year Review for the ACS site in April 2006. The protectiveness statement from the 2006 Five-Year Review for the Site stated, "EPA has determined that the remedy at the ACS site is protective of human health and the environment because the cleanup is complete and the remedy is operating as designed."

The 2006 Five-Year Review included three issues and recommendations. Table 4 on next page provides a summary of the recommendations made in the 2006 Five-Year Review as well as follow up actions taken to address the recommendations.

Table 4: Actions Taken Since the Last Five-Year Review

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone	Action Taken and Outcome	Date of Action
Lower aquifer plume	Complete investigation, recommend and implement response action(s).	ACS Settling Defendants	December 2006 (installation date)	Completed Lower Aquifer Investigation, designed and installed Lower Aquifer Pumping System.	Pumping system began operating in September 2007.
Chemical Oxidant application pending	Complete final application as planned	ACS Settling Defendants	Late Spring 2006 (Target injection date)	Completed final application of chemical oxidation injections at a total of 160 locations.	Final application was completed in April 2006.
Institutional controls study completion	Complete IC study	ACS Settling Defendants and/or EPA	Fall 2006	IC study has not completed yet	

VI. Five-Year Review Process

Administrative Components

EPA began the third Five-Year Review at the site in September 2010. In July of 2010, EPA verbally notified IDEM and the ACS Settling Defendants that it was undertaking a five-year review. EPA also sent a letter to IDEM on September 13, 2010 to notify them of the pending five-year review.

Community Involvement

A Public Notice announcing that a Five-Year Review of the Site was to be conducted, was published on December 17, 2010 in *The Times* Northwest Indiana newspaper.

The third Five-Year Review report will be placed in the site files and local repositories for the Site at the following locations:

Griffith Public Library
940 North Broad Street
Griffith, IN 46319

Griffith Town Hall
111 North Broad Street
Griffith, IN 46319

EPA Record Center
Room 714
77 West Jackson
Chicago, IL 60604

Document Review

This Five-Year Review consisted of a review of relevant documents including the ROD, the ROD Amendment, the ESD, the RA reports, correspondence, previous five-year review reports, status reports, groundwater monitoring reports, and active treatments systems quarterly monitoring reports. The list of documents reviewed for this five-year review can be found in Appendix 1.

Data Review

EPA reviewed operating data pertaining to three major portions of the site remedial action: the containment actions; the groundwater cleanup action; and the soil cleanup actions. Generally, the data indicate that the various soil cover have been regularly inspected and repaired as necessary; the main barrier wall is containing contaminants within; and the GWTP has been running continuously for the last five years (except during maintenance periods). Additionally, the GWTP effluent meets permitted discharge levels except for the very occasional exceedance; the ISVE system has been very successful in removing VOCs from the ground; the ISVE system thermal oxidizers are greater than 99% efficient in destroying the influent VOCs and have not exceeded permitted discharge levels; and the groundwater monitoring program continues to show that contaminant levels outside of the main barrier wall have not impacted adjacent private drinking water wells and have been decreasing since the wall was installed.

Discussion concerning specific remedial action operations follows:

A. **Containment Actions**

1. Soil Cover

The various types of engineered soil cover placed on the ACS site was designed and constructed to accomplish the following objectives:

- Eliminate potential direct contact with contaminated soil;
- Eliminate potential direct contact with VOC-contaminated groundwater;
- Reduce the potential for soil contaminant migration to groundwater by reducing infiltration into highly impacted areas; and
- Provide a surface seal for the ISVE system to minimize potential short-circuiting and maximize the capture of VOC vapor.

EPA review of monthly reports (and quarterly reports, as appropriate) verifies that the ACS Settling Defendants regularly performed the following activities as part of an overall program to demonstrate that the engineered soil cover was performing as designed:

- Monitoring of vacuum level and air flow through the ISVE system (high vacuum levels would indicate little or no short-circuiting through the soil cover);
- Monitoring water levels in wells and piezometers within the boundaries of the cover (higher than expected water levels would indicate excess infiltration is occurring); and
- Regular quarterly inspections and spot inspections after major storm events (to check for cracking or erosion).

Reviewed data indicate that the engineered soil cover has accomplished the remedial objectives since installation and that immediate repair, if any, is made as necessary due to erosion or cracking.

2. Barrier Wall/Barrier Wall Extraction System

The BWES was installed inside the main barrier wall to help maintain hydraulic capture within the wall. The BWES is comprised of eight 100-foot long extraction trenches, one 150-foot long extraction trench, and one 350-foot long extraction trench. Until the site-wide dewatering effort occurred, there was not consistent hydraulic capture within the wall (i.e. in some areas groundwater levels were higher inside the wall than directly on the other side). Since the dewatering effort began, data show that water levels are mostly 2-6 feet higher on the outside of the barrier wall than inside, creating hydraulic capture. Generally, the only area not achieving full hydraulic capture is near where the PGCS is operating because it also tends to lower the water table in that area. However, this is acceptable because the barrier wall has not been shown to be leaking. The BWES will achieve hydraulic capture once the PGCS no longer needs to be operated.

The groundwater sampling data from 2006 to 2010 demonstrate that the main barrier wall and the BWES are working to contain contaminants inside the main barrier wall. Results from several monitoring wells outside the barrier wall, but inside the impacted groundwater zones, show that concentrations in groundwater contaminant plumes are decreasing. Results from certain other up-gradient, down-gradient, and side-gradient monitoring wells have been consistently free of site-related contaminants, indicating that groundwater contaminants have not moved outside of the barrier wall.

The ACS Settling Defendants regularly perform O&M activities on the BWES to maintain its effectiveness. This work includes evaluation and routine maintenance of pumps installed in the BWES trenches.

B. **Groundwater Cleanup/Monitoring Actions**

1. Pump-and-Treat

Pump-and-treat systems have been operated at several locations in the upper and lower aquifer over the past ten years. The PGCS has captured impacted groundwater in the upper aquifer since 1997. Individual pumps are operating in three lower aquifer monitoring wells to remove localized concentrations of benzene. Groundwater monitoring data show that the pump-and-treat systems have been effective at removing or reducing contaminant levels in the affected aquifers. Thus, the pumping will be continued until contaminant concentrations are reduced enough in the impacted areas to support a transition to MNA.

2. Groundwater Monitoring

The ACS Settling Defendants regularly perform groundwater monitoring activities in accordance with the revised Long-Term Groundwater Monitoring Plan dated September 2002 (LTGMP). They currently sample selected groundwater monitoring wells on a semi-annual basis. Sixteen upper aquifer wells and 16 lower aquifer wells are sampled and analyzed for indicator VOCs (benzene, chloroethane, tetrachloroethene (PCE), trichloroethene, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, 1,1-dichloroethane, 1,2-dichloroethane, and vinyl chloride). Semi-volatile organic compounds (SVOCs) and metals are sampled from selected wells on an annual basis. A full-scan of Target Compound List/Target Analyst List (TCL/TAL) parameters was analyzed for in 2006 and 2010. Water level measurements are also taken on a quarterly basis to confirm that the PGCS is capturing the northern upper aquifer plume.

In September 2009, the ACS Settling Defendants submitted a Technical Memorandum of Proposed Modifications to the LTGMP to EPA and IDEM. The proposed modifications included recommendations for removing certain wells from the LTGMP, changing sampling frequency from semi-annually to annually, eliminating full-scan sampling events, and streamlining the reporting format. EPA and IDEM provided comments on the proposed modifications on June 2010. On August 13, 2010, the ACS Settling Defendants submitted a response to the EPA and IDEM's comments on the proposed modifications. The ACS Settling Defendants will use these comments to revise the LTGMP.

Reviewed data from 2006 to 2010 indicate that the PGCS has been effective in preventing further off-site migration of contaminants in the groundwater. While some contaminant levels have shown variability, generally, no upward trends exist although there are a few exceptions in some wells and some results show decreasing concentration trends (see a detailed data discussion in Data Discussion section below.)

3. Groundwater Treatment Plant (GWTP)

The GWTP was constructed in 1997 to handle limited flow volumes and low-level contaminant loads from the initial pump-and-treat approach taken at the ACS site while certain pre-design studies were underway. Significant treatment method changes were then completed in December 2000 to meet the expected increases in both the quantity of groundwater to be treated and the contaminant levels in the water as the amended remedy was constructed and operated. The GWTP treatment train consists of the following steps: flow equalization, free-phase product removal, emulsified-product removal, organic compound removal and destruction, dissolved metals removal, solids removal and handling (for off-site disposal), disinfection and discharge, and air emissions control.

The GWTP was designed and constructed to reduce the contaminant levels in the groundwater that the BWES and PGCS (including the 3 lower aquifer wells that are pumped) extracts to meet the effluent quality standards established by IDEM and EPA for the ACS site. Treated water is discharged to the wetlands area near the GWTP.

The ACS Settling Defendants perform compliance monitoring monthly and report the results monthly to IDEM and EPA. A review of past effluent sampling results showed that only a few, minor exceedances occurred. In all cases, the ACS Settling Defendants immediately addressed the situation to prevent further discharge of non-compliant treated water as well as immediately notifying EPA of the occurrence and the steps taken to address the situation. The ACS Settling Defendants also collect a yearly sediment sample from the discharge area in the wetlands to assess whether or not PCBs are accumulating (above the 1 part per million (ppm) cleanup level in the wetland sediment) as a result of the discharge. No PCBs have been detected in these sediment samples.

4. Chemical Oxidation

From 2004-2006, the ACS Settling Defendants completed four rounds of ISCO into a part of the southern upper aquifer plume area outside the main barrier wall. Four full-scale applications have been made to treat the hydrocarbons trapped in a four-foot thick "smear zone" at the water table near the intersection of Colfax Street and Reder Road (see **Figure 4**, next page) to prevent the continual re-contamination of the upper aquifer in this area. These treatments involved injecting large volumes of water (and chemical reagents) into the water table zone. After completion of the full-scale chemical oxidant applications, the southern upper aquifer contaminant plume was addressed through MNA. Post-application sampling results showed that the hydrocarbon concentrations in the smear zone have been significantly reduced and that down-gradient groundwater quality has subsequently improved. For example, prior to the application of the chemical oxidant, benzene levels have ranged as high as 6,000 parts per billion (ppb) in groundwater samples taken from monitoring well (MW)-6, the monitoring well that is the best indicator of contaminant leaching directly from the smear zone. Overall, benzene and chloroethane concentrations data have shown a decreasing trend in MW-6 since ISCO treatment were conducted.

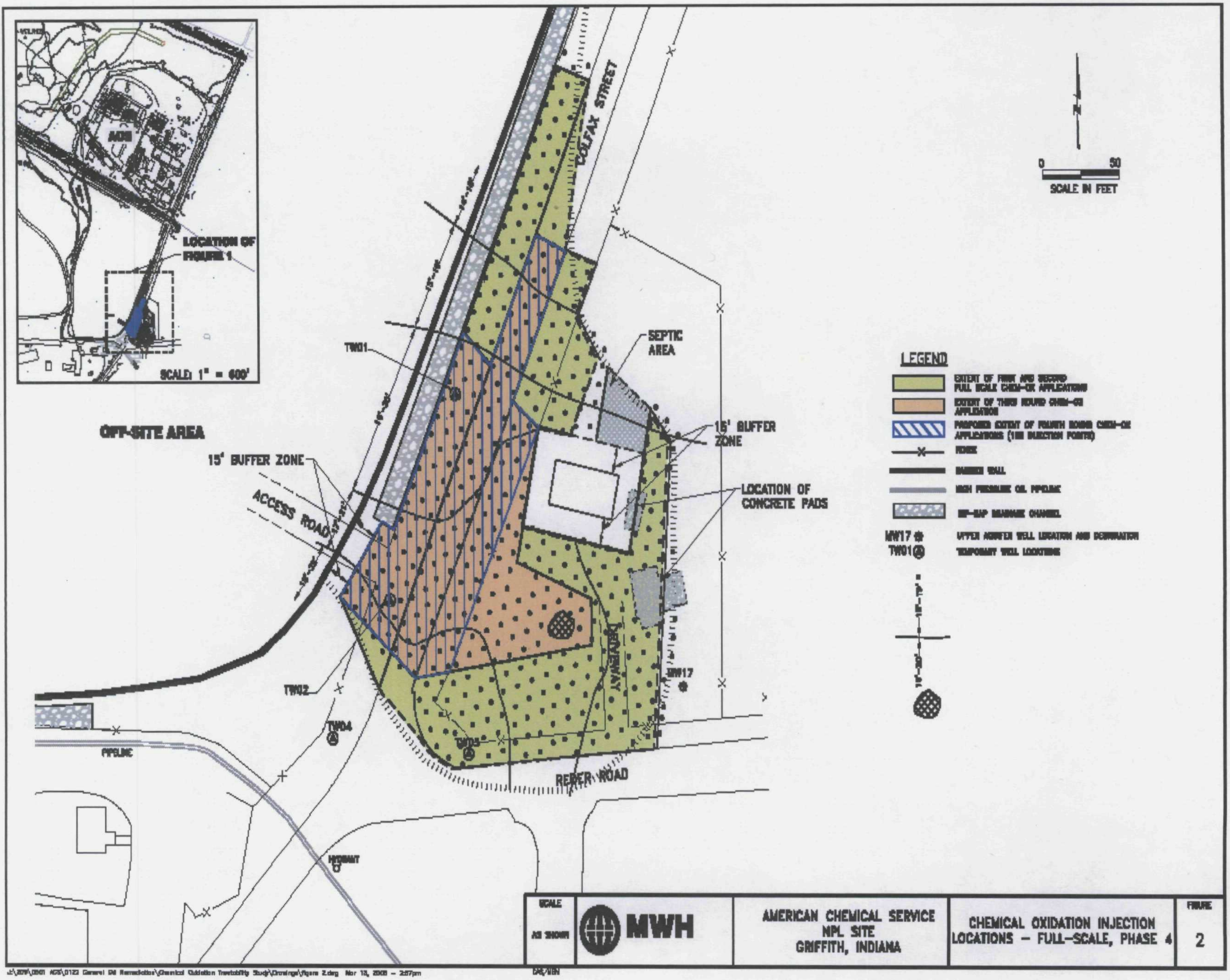

Figure 4: Chemical Oxidant Injection Area.

5. Monitored Natural Attenuation

The 1999 ROD Amendment changed the on-site groundwater cleanup approach to a containment remedy rather than a restoration remedy. The 2004 ESD changed the off-site groundwater cleanup approach from solely pump-and-treat to a combination of pump-and-treat, chemical oxidant application, and MNA. The MNA has been implemented in the southern upper aquifer contaminant plume of the ACS site.

6. Residential Well Monitoring

Some residences located to the south along Reder Road are situated over the groundwater contaminant plume. The drinking water wells associated with these residences do not have their drinking water wells installed in the upper aquifer. There are the low levels of contaminants are found in the upper aquifer, but the residences receive water from the lower aquifer which is not impacted in this area.

ACS Settling Defendants selected the following five residential wells for sampling under the groundwater monitoring program to ensure the wells have not been impacted:

Well Identity	[redacted]
PW-A	[redacted] Reder Road
PW-B	[redacted] Reder Road
PW-C	[redacted] Reder Road
PW-D	[redacted] Reder Road
PW-T	[redacted] Reder Road

The residential well PW-A was not sampled because the house has been unoccupied since 2007 and it has no electrical power.

These wells are located over or near the southern upper aquifer groundwater contaminant plume. These homes participate in the yearly residential well sampling event conducted by the ACS Settling Defendants. The water samples are analyzed for low concentration, full-scanTarget Compound List/Target Analyte List (TCL/TAL) parameters. The residential well sample results were compared to the groundwater cleanup levels for the Site (generally the Maximum Contaminant Levels (MCL) under the Safe Drinking Water Act (SDWA)) and to other risk-based levels as appropriate. To date none of the contaminants associated with the groundwater plume have been detected in the private well water samples. The water quality in these private wells consistently met SDWA standards. Reviewed data showed that the samples collected from all residential wells contained trace concentrations of several organic compounds during the 2009 sampling event. However, these detects were likely due to laboratory contamination. This conclusion was confirmed by re-sampling. The analysis of a re-sampling event showed no organic compound detections.

7. Data Discussion

The following is a discussion on the concentration trends based on the results of the March 2010 groundwater sampling event at the site. The graphs in Appendix 4 show the increasing/decreasing concentration trends in monitoring wells. Appendix 4 also includes Table 7, which contains the Upper Aquifer Monitoring Well Data Summary and Table 8, which contains the Lower Aquifer Monitoring Well Data Summary.

Upper Aquifer

VOCs

Historically, monitoring data from the upper aquifer has shown seasonal variability. This pattern has been evident in samples collected from interior wells, located to the north and south of the Site.

Concentrations of benzene and chloroethane have decreased significantly in samples collected from MW-48 since active remediation was started.

Concentrations of benzene and chloroethane continue to be significantly lower than their respective maximum baseline values (6,750 micrograms per liter (µg/l) and 715µg/l) in samples from MW-49.

South of the Site, monitoring well MW-06 has historically shown seasonal variability with higher concentrations in the spring and lower concentrations in the fall. However, from 2004 to 2006, four rounds of ISCO treatments were completed near the intersection of Colfax Street and Reder Road. Monitoring well MW-06 is located down-gradient of the ISCO treatment area and is an indicator of remediation progress in this area. The treatments appear to have interrupted the expected seasonal variability formerly observed at MW-06.

Concentrations of benzene and chloroethane were elevated in the fall of 2005 and the spring of 2006 in samples collected from MW-06. Since these two sampling events, benzene concentrations have ranged from below the detection limit to 160µg/l, and chloroethane concentrations have ranged from below the detection limit to 37µg/l. Benzene and chloroethane concentrations in samples from MW-06 continue to be variable, but remain lower than the elevated concentrations typically detected in MW-06 prior to the ISCO treatments. Overall, benzene and chloroethane concentrations have shown a decreasing trend since ISCO treatments were conducted (see the concentration trend in Appendix 4).

Benzene and chloroethane concentrations in the sample from MW-19, located 500 feet down-gradient of MW-06, were detected at 6.2µg/l and 7.4µg/l, respectively. Benzene concentrations in samples from MW-19 have ranged from below the reporting limit to just over the reporting limit. There does not appear to be either an increasing or decreasing trend for benzene concentrations at this well. The chloroethane concentration in the sample from MW-19 in March 2010 is higher than the concentration detected in October 2009 (7µg/l), but is lower than the concentration detected during March 2009 (9.4µg/l).

Chloroethane concentrations detected were at or above the maximum baseline concentration in samples at this well from March 2003 to September 2004. Chloroethane concentrations detected show an overall decreasing trend since March 2004.

Decreasing concentrations of benzene and chloroethane have been reported in samples collected from interior well MW-45, located 1,000 feet down-gradient of MW06. The benzene and chloroethane concentrations in samples from this well have remained below 5μg/l for the past several years.

During the three monitoring events from October 2007 through September 2008, benzene was detected at trace, estimated concentrations in monitoring well MW-15 which is located down-gradient of the Town of Griffith Landfill. However, benzene or chloroethane have not been detected at MW-15 or any other down-gradient wells during the past three sampling events.

Data from upper aquifer monitoring wells indicate that VOC contamination has not spread beyond historical limits. Perimeter monitoring wells have been below detection limits for benzene and chloroethane and concentrations of the two compounds (within the plume), have been decreasing.

The overall decreasing concentrations of benzene and chloroethane in the samples from wells MW-06, MW-19, and MW-45 are likely related to the success of the ISCO treatments and natural attenuation.

SVOCs

The LTGMP requires that upper aquifer monitoring wells MW-06 and MW-19 be analyzed annually for bis(2-chloroethyl) ether. Bis (2-chloroethyl) ether was not detected in either of the samples collected from MW-06 or MW-19 in March 2010. Concentrations of bis (2-chloroethyl)ether continue to show a decreasing trend in samples collected from both MW-06 and MW-19.

Arsenic Analytes

The LTGMP requires that samples from monitoring wells MW-06, MW-15, and MW-43 be analyzed annually only for arsenic . Arsenic was not detected in the sample collected from MW06 in March 2010. Concentrations of arsenic continue to show a decreasing trend at MW06. Arsenic was detected in samples collected from MW-15 and MW-43 at concentrations of 57μg/l and 18μg/l, respectively. Both of these concentrations exceed the EPA MCL of 10μg/l. However, these detections were likely due to laboratory contamination and are not representative of actual groundwater conditions. The concentrations of arsenic in samples collected from MW-15 and MW-43 are variable but have remained below their respective baseline concentrations.

Lower Aquifer

VOCs

VOCs are detected at variable concentrations in several lower aquifer wells.

During the March 2010 sampling event, benzene was detected at interior well, MW-09R at a concentration of 4.6μg/l. This concentration is substantially below the baseline value at this well.

Chloroethane was detected at a concentration of 7.9μg/l at interior well MW-29 during the March 2010 sampling event. This concentration is below the baseline value of 10μg/l for the second consecutive sampling event. Chloroethane concentrations peaked at 100μg/l in September 2006, but have shown a steadily decreasing trend since that sampling event.

Two VOCs, benzene and chloroethane, were detected in the sample collected from interior well MW10C during the March 2010 sampling event. Benzene was detected at a concentration of 190 μg/l, which exceeds the baseline value of be variable at MW-10C, but have shown an overall decreasing trend since a peak concentration of 4,800 μg/l was observed in March 2003.

Chloroethane was detected at 210 μg/l, well below the baseline concentration of 420 μg/l for MW-10C. Chloroethane concentrations have remained below baseline values since September 2003. In order to remediate the chloroethane from this location, a pumping system within MW-10C was installed to extract and treat the groundwater.

During the March 2010 sampling event, benzene was detected in the sample collected from interior well MW-56 at a concentration of 92 μg/l. Benzene concentrations continue to show an overall decreasing trend at MW-56. Similar to MW-10C, a pumping system was installed in this well to extract groundwater for treatment.

Benzene was detected at a trace concentration (1.9 μg/l) in the sample collected from MW-53 during the March 2010 sampling event. This well is located northwest of the Site. Previous benzene concentrations reached 12 μg/l in April 2007. Similar to those in MW-10C and MW-56 a lower aquifer pumping system was installed to extract and treat the groundwater at this location. The pumping system was brought on-line in September 2007 and appears to be capturing the contaminated groundwater. Benzene concentrations have remained below the EPA MCL of 5 μg/l since March 2008.

PCE was detected at low, but generally increasing concentrations in samples from down-gradient well MW-30 between September 2004 and April 2007. This well is located northwest of the Site, just east of MW-53. Similar to the one near MW-53, as well as the ones in MW-10C and MW-56, a low-rate extraction pump was installed in MW-30 to capture the contaminated groundwater near this well. The pumping system was brought on-line in September 2007. PCE has not been detected in samples collected from MW-30 during the past six sampling events since the pumping system was installed.

Benzene was detected in the sample collected from down-gradient well MW33 at an estimated concentration of 2.2 µg/l. MW-33 is nested with well MW-30 and is screened in the deepest part of the lower aquifer. Benzene has been detected at MW-33 during the past six sampling events, but all of the detected concentrations have been below the EPA MCL of 5 µg/l for this compound.

Chloroethane was detected in the sample collected from MW-54R during the March 2010 sampling event at an estimated concentration of 3.7µg/l. This concentration is lower than the detected concentration during the October 2009 sampling event (4.9µg/l). Prior to the October 2009 sampling event, chloroethane had not been detected in samples collected from MW-54R.

PCE was detected at trace, estimated concentrations at down-gradient wells MW-32, MW-54R, MW-55, and MW-59. However, all of these detections were flagged by the laboratory because PCE was also detected in an associated laboratory blank. During the data validation process, all of the detections were qualified as not detected at the reported concentrations. These detections are the result of laboratory contamination and are not representative of groundwater conditions at these locations. PCE has not been detected at these wells during previous sampling events.

SVOC

The LTGMP requires that samples from lower aquifer monitoring well MW-09R be analyzed annually for bis (2-chloroethyl) ether. During March 2010, bis (2-chloroethyl) ether was detected in the sample collected from MW-09R at a concentration of 4.5 µg/l. This concentration is substantially below the maximum baseline concentration of 50µg/l for this well. Concentrations of this compound in samples collected from MW-09R have remained relatively constant over thelast several years.

C. **In-situ Soil Vapor Extraction (ISVE)**

Two ISVE systems were installed at the ACS site to reduce the mass of VOCs in three source areas (SBPA, OFCA, and K-P Area) below the ground surface and inside the main barrier wall. Reducing the VOC mass within the barrier wall helps to reduce the possibility of VOCs breaching the barrier wall in the future. Extracted VOCs are conveyed to two thermal oxidizers that are located in the GWTP building and which destroy the VOCs prior to atmospheric release. Operation of the ISVE systems will continue until the total removal rate has been reduced to the goal of 100 pounds per day or less for the combined systems. At that point, the system will be transitioned to a passive system by discontinuing use of the blower system. **Figure 5-VOC Removal Rate** (next page) shows a chart of the measured extraction levels based on pre-treated vapor samples taken from the ISVE systems. Extraction rates have been as high as 1,400 pounds per day.

Some of the ISVE system wells have the capability of removing groundwater as well as soil vapor. These wells, termed Dual-Phase Extraction (DPE) wells, and the BWES dewater the upper aquifer in the vicinity of the ISVE systems. Lowering the water table exposes more of the soil VOC contaminants to the vacuum imparted by the ISVE systems and creates airflow pathways through the soil and wastes, increasing the effectiveness of the ISVE system. Pumped water is directed to the GWTP for treatment.

The ACS Settling Defendants continuously take compliance monitoring samples of treated air streams from the thermal oxidizers to demonstrate that off-gas emissions meet allowable discharge levels under an IDEM air permit. The compliance monitoring consists of the sampling and analysis of the inlet and outlet vapor streams of the thermal oxidizers. Results are reported to EPA and IDEM. The results are also used to determine the overall destruction efficiency of the thermal oxidizers and as indicators for the need for maintenance or repair.

The vapor samples are collected and submitted to a laboratory for VOC and SVOC analysis on a monthly basis. Collection of the effluent sample is not required when the system is down for maintenance. The IDEM air quality standards (as specified in Rule 326 Indiana Administrative Code [(IAC) 2-1-1(b)(3)(A)]) state that VOC emissions cannot exceed 3 pounds per hour or 15 pounds per day or 25 tons per year. Reviewed data demonstrates that the thermal oxidizers usually achieve a 99% or higher destruction efficiency rate and that the 3 pounds-per-hour criterion has not been exceeded.

Figure 6-Total VOCs Removed (follows Figure 5) shows the total estimated mass of VOCs removed from the ACS site by the ISVE systems. Initially, the soil vapor extraction systems were removing over 1,000 pounds per day of volatile organic chemical contaminants from the ground. Currently, the average removal rate is about 100-150 pounds per day. As of June 2010, a total of 889,692 pounds of VOCs have been removed from the Site. The ACS Settling Defendants, proposed a procedure for the transition of ISVE system from active phase to passive phase once the active ISVE system has achieved the target goal of 100 pounds per day or less with EPA and IDEM.

The ACS Settling Defendants regularly inspect and maintain the ISVE system components in accordance with the March 2005 Operation & Maintenance Manual, ISVE System. Regular O&M activities include evaluation of equipment operation parameters, routine maintenance of equipment, and responding to system alarms or shutdowns as well as taking the monthly emissions compliance samples. Samples are collected monthly to ensure that the thermal oxidizers are complying with the established performance criteria.

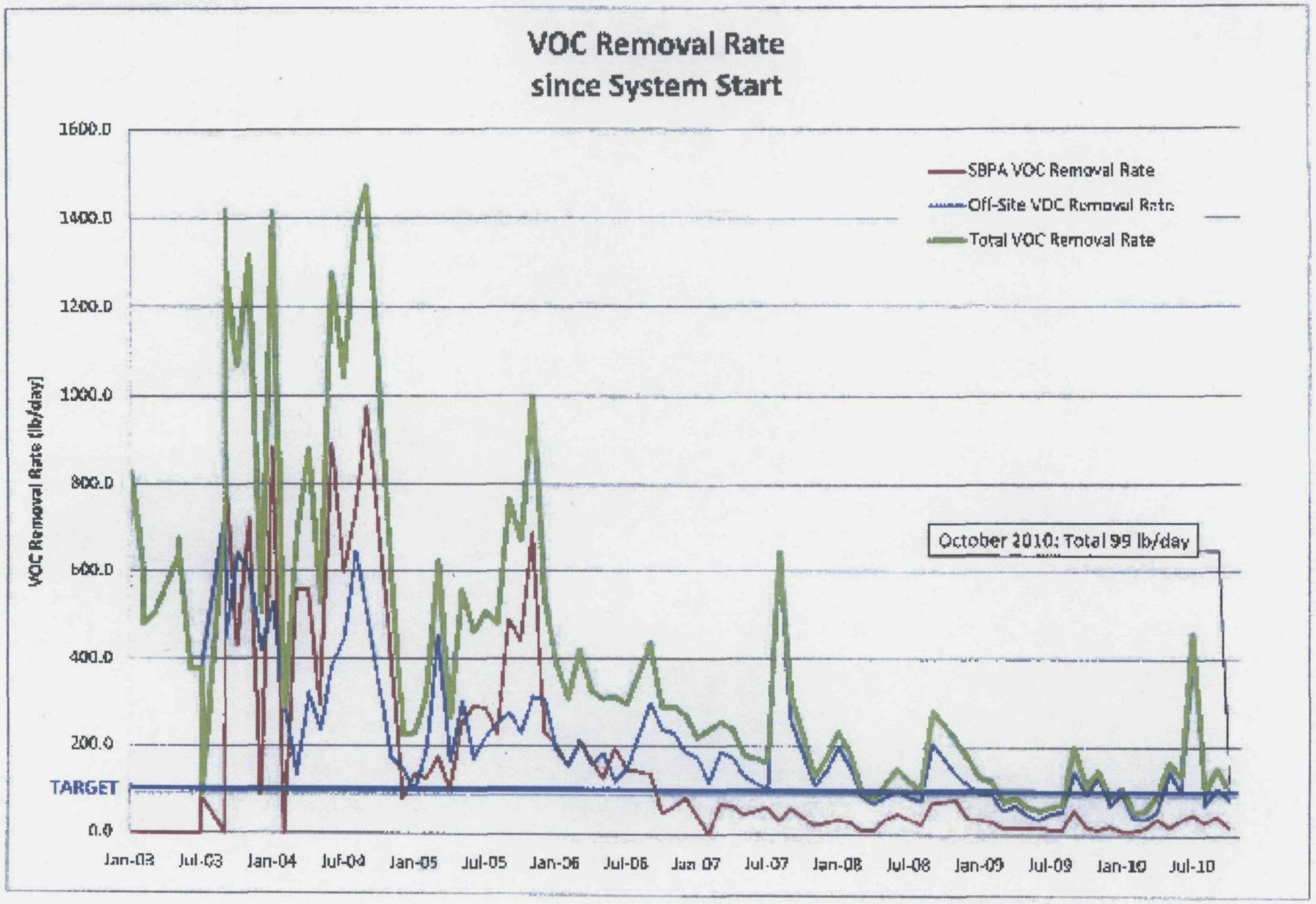

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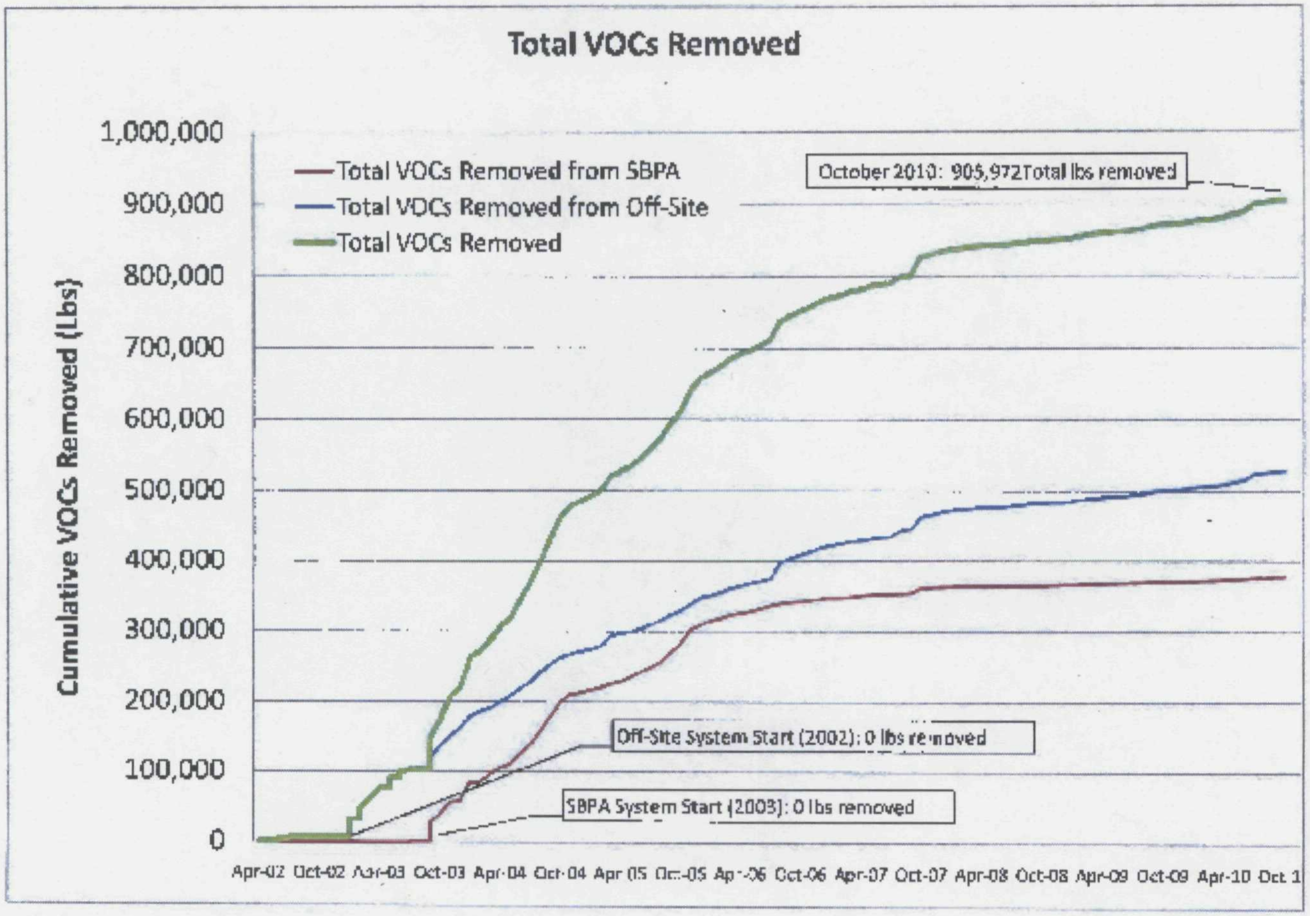
Figure 5: VOC Removal Rate

Figure 6: Total VOCs Removed by ISVE



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Site Inspection

EPA conducted a site inspection on September 8, 2010. EPA was assisted by representatives from IDEM and the MWH, the ACS Settling Defendants' contractor. The purpose of the inspection was to assess the progress of remedy implementation, ensure records and site documents were available and current, inspect the GWTP and ISVE systems to verify they were operational and have no significant problems, and view general site conditions and areas of the engineering cover. At the time of the inspection, the GWTP and ISVE systems were operating as designed, and the GWTP and ISVE blower sheds appeared to be very well-maintained. The final cover over the containment areas were in good condition. EPA observed some small, low bare spots on the Off-Site Cover area. There was no evidence of any violations of the ICs that are in place at the site.

Other Information

Health and safety has been a continual focus at the Site since the beginning of the investigations in 1988, through the completion of remedial construction and the O&M and systems monitoring program.

As of June 30, 2010, there have been:

- 4,785 consecutive days with no lost time due to an accident or H&S incident, and
- 2,477 consecutive days without an incident requiring first aid.

Interviews

EPA did not formally interview members of the public about the protectiveness of the remedial actions at the ACS site for this Five-Year Review.

VII. Technical Assessment

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

Answer A - Yes. EPA's analysis shows that the Site remedy is functioning as intended by the 1992 ROD, as amended by the 1999 ROD Amendment and the 2004 ESD. The containment actions (main barrier wall, BWES) are preventing further off-site movement of contaminated groundwater, the active treatment systems (ISVE, PGCS, GWTP, and ISCO) are effectively removing and destroying soil and groundwater contaminants, and the ICs are in place to help prevent exposure to residual contaminant levels at the site during future site use.

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

Answer B - Yes. EPA notes no changes in cleanup standards and cleanup levels "to be considered" for site contaminants. Also, EPA notes no changes to contaminant exposure pathways considered in the ROD, as amended.

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

Answer C - No.

Technical Assessment Summary

The ACS site remedy is functioning as intended by the 1992 ROD, as amended by the 1999 ROD Amendment, and the 2004 ESD. There have been no changes to the site physical conditions that would affect the protectiveness of the remedy. EPA has noted no changes to exposure assumptions, toxicity data, cleanup levels, remedial action objectives, or any other information that could call into question the protectiveness of the remedy for the Site.

Some minor issues exist with the site remedy (see next section). These issues do not affect the protectiveness of the remedy over the short-term but should be addressed within a reasonable time frame to help maintain protectiveness over the long term.

Also, long-term protectiveness required compliance with effective ICs at the Site. Compliance with effective ICs will be ensured by maintaining, monitoring, and enforcing effective ICs. Restrictive covenants or deed restrictions have been implemented at the ACS property which need to be further evaluated by ACS Settling Defendants or/and EPA to ensure their effectiveness. Also, if not implemented, ICs for groundwater impacted by contaminations which is beyond the ACS property are required. Last, a long-term stewardship plan must be prepared.

VIII. Issues

Table 2: Issues

Issue	Affects Current Protectiveness?	Affects Future Protectiveness?
Effectiveness of existing ICs in the form of restrictive covenants at the ACS Property must be further evaluated. Also, ICs for groundwater impacted by contamination beyond the ACS property would be required if the ICs have not been implemented. Long-term Stewardship (LTS) must be ensured.	No	Yes

IX. Recommendations and Follow-up Actions

Table 3: Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Effectiveness of existing ICs in the form of restrictive covenants at the ACS Property must be further evaluated. Also, ICs for groundwater impacted by contamination beyond the ACS property would be required if the ICs have not been implemented. Long-term Stewardship (LTS) must be ensured.	-Ensure effectiveness of existing ICs which includes completion of a title evaluation, among other tasks. Ensure effective ICs exist for impacted groundwater beyond the ACS property. An approved LTS plan is required. -An IC Workplan may be required from the ACS Settling Defendants for the additional work described.	ACS Settling Defendants and/or EPA	EPA	August 2011	No	Yes

X. Protectiveness Statement

EPA has determined that the cleanup and containment remedy at the Site is operating as designed and is protective of human health and the environment in the short-term. Current data indicate that the plume remains contained in the site boundaries and the remedy is functioning as required to achieve cleanup goals.

Long-term protectiveness requires compliance with effective ICs at the Site. Compliance with effective ICs will be ensured by maintaining, monitoring, and enforcing effective ICs. Restrictive covenants or deed restrictions have been implemented at the ACS property which need to be further evaluated to ensure their effectiveness. Also, ICs for groundwater impacted by contamination beyond the ACS property would be required if the ICs have not been implemented. Last, a long-term stewardship plan must be prepared. An IC Workplan may be required from the Settling Defendants for the additional work described.

XI. Next Review

The next Five-Year Review for the ACS site will be completed no later than five years after the signature date of this Five-Year Review.

APPENDICES

Appendix 1

List of Documents Reviewed

1. Second 5-Year Review for the ACS site (U.S. EPA, April 2006)
2. Monthly Progress and Quarterly O&M and Monitoring Reports (Montgomery, Watson, Harza (MWH), 2006 – 2010)
3. Record of Decision (U.S EPA, September 1992)
4. ROD Amendment (U.S. EPA, July 1999)
5. Preliminary Closeout Report (U.S. EPA, September 2004)
6. Institutional Controls Study (ACS Executive Committee, November 2005)
7. Separation Barrier Wall Installation Construction Completion Report (MWH, March 2002)
8. Revised Long-Term Groundwater Monitoring Plan (MWH, September 2002)
9. Final PCB-impacted Soil Excavation In the Wetland Area Construction Completion Report (MWH, November 2002)
10. (Draft) Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (U.S. EPA, November 2002)
11. Final Off-Site Area Interim Engineered Cover Construction Completion Report including Spoils Pile Consolidation (MWH, February 2003)
12. Final Barrier Wall Extraction System Off-Site Area Upgrades Construction Completion Report (MWH, March 2003)
13. Final Buried Drum Removal in On-Site Containment Area Construction Completion Report (MWH, March 2003)
14. Off-Site Containment Area and Kapica-Pazmey Area In-Situ Soil Vapor Extraction Systems Construction Completion Report (MWH, March 2004)
15. Still Bottoms Pond Area Interim Engineered Cover Construction Completion Report, including Fire Pond Closure (MWH, March 2004)
16. Off-Site Area Final Engineered Cover Construction Completion Report (MWH, June 2004)
17. Still Bottoms Pond Area In-Situ Soil Vapor Extraction System Construction Completion Report (MWH, June 2004)
18. Still Bottoms Pond Area Final Engineered Cover Construction Completion Report (MWH, January 2005)
19. Operation & Maintenance Manual, ISVE Systems (MWH, March 2005)
20. Health and Safety Field Manual (MWH, June 2005)
21. Remedial Action Completion Report (MWH, September 2005)
22. Explanation of Significant Difference (U.S. EPA, September 2004)
23. Soil Vapor Intrusion Summary Report, [redacted] Reder Road (MWH, October 2005)

Appendix 2

Site Inspection Checklist

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

Five-Year Review Site Inspection Checklist (Template)

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

I. SITE INFORMATION

Site name: American Chemical Service, Inc.	**Date of inspection:** 09/08/10
Location and Region: Griffith, IN	**EPA ID:** IND 016360265
Agency, office, or company leading the five-year review: U.S. EPA Region 5	**Weather/temperature:** Clear 60 °F

Remedy Includes: (Check all that apply)

- ✓ Landfill cover/containment
- ✓ Access controls
- ✓ Institutional controls
- ✓ Groundwater pump and treatment
- Surface water collection and treatment
- Monitored natural attenuation
- Groundwater containment
- Vertical barrier walls
- Other Groundwater Treatment Plant
  ISVE System

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Chris Daly & Peter Vagt Supervising Engineer Project Manager 09/08/10
Name Title Date
Interviewed [✓ at site] at office by phone Phone no. ______
Problems, suggestions: Report attached ______
N/A

2. **O&M staff** Lee Orosz ______ 09/08/10
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 IDEM
Contact Prabhakar Kasarabada Environmental Manager 09/08/10 317-234-0352
Name Title Date Phone no.
Problems; suggestions; Report attached
N/A

Agency
Contact
Name Title Date Phone no.
Problems; suggestions; Report attached

Agency
Contact
Name Title Date Phone no.
Problems; suggestions; Report attached

Agency
Contact
Name Title Date Phone no.
Problems; suggestions; Report attached

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

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

1. **O&M Documents**
   - O&M manual [✓ Readily available] Up to date N/A
   - As-built drawings Readily available Up to date N/A
   - Maintenance logs Readily available Up to date N/A

   Remarks

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

   Remarks

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 N/A
   - Effluent discharge Readily available Up to date N/A
   - Waste disposal, POTW Readily available Up to date N/A
   - Other permits ______ Readily available Up to date N/A

   Remarks Not required

5. **Gas Generation Records** Readily available Up to date [✓ N/A]

   Remarks

6. **Settlement Monument Records** Readily available Up to date [✓ N/A]

   Remarks

7. **Groundwater Monitoring Records** Readily available Up to date [✓ N/A]

   Remarks

8. **Leachate Extraction Records** Readily available Up to date [✓ N/A]

   Remarks

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

   Remarks

10. **Daily Access/Security Logs** Readily available Up to date [✓ N/A]

    Remarks

IV. O&M COSTS

1. **O&M Organization**

State in-house — Contractor for State
PRP in-house — [✓ Contractor for PRP]
Federal Facility in-house — Contractor for Federal Facility
Other____
____

2. **O&M Cost Records**

Readily available — Up to date
Funding mechanism/agreement in place
Original O&M cost estimate________________ Breakdown attached

Total annual cost by year for review period if available

From________ To________ ____________ Breakdown attached
Date — Date — Total cost
From________ To________ ____________ Breakdown attached
Date — Date — Total cost
From________ To________ ____________ Breakdown attached
Date — Date — Total cost
From________ To________ ____________ Breakdown attached
Date — Date — Total cost
From________ To________ ____________ Breakdown attached
Date — Date — Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: ____________________________________
____
____
____
____
____

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. **Fencing damaged** — Location shown on site map — Gates secured — N/A

Remarks____
____

B. Other Access Restrictions

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

Remarks____
____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented Yes No [✓ N/A]
Site conditions imply ICs not being fully enforced Yes No [✓ N/A]

Type of monitoring (*e.g.*, self-reporting, drive by) ____
Frequency ____
Responsible party/agency ____
Contact ____ Name ____ Title ____ Date ____ Phone no.

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

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

2. **Adequacy** ICs are adequate ICs are inadequate N/A
Remarks ____

D. General

1. **Vandalism/trespassing** Location shown on site map [✓ No vandalism evident]
Remarks ____

2. **Land use changes on site** N/A
Remarks Not changed

3. **Land use changes off site** [✓ N/A]
Remarks ____

VI. GENERAL SITE CONDITIONS

A. Roads Applicable N/A

1. **Roads damaged** Location shown on site map [✓ Roads adequate] N/A
Remarks ____

B. Other Site Conditions

Remarks______________________________

VII. LANDFILL COVERS [✓ Applicable] 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______ N/A

---

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

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

---

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

---

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

---

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

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

---

1. **Settlement** Location shown on site map No evidence of settlement
Areal extent______ Depth______
Remarks______ N/A

---

2. **Material Degradation** Location shown on site map No evidence of degradation
Material type______ Areal extent______
Remarks______ N/A

---

3. **Erosion** Location shown on site map No evidence of erosion
Areal extent______ Depth______
Remarks______ N/A

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent__________ Depth__________
Remarks__________
N/A

5. **Obstructions** Type__________ No obstructions
Location shown on site map Areal extent__________
Size__________
Remarks N/A

6. **Excessive Vegetative Growth** Type__________
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent__________
Remarks N/A

D. Cover Penetrations Applicable N/A

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

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

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

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

5. **Settlement Monuments** Located Routinely surveyed [✓ N/A]
Remarks N/A

E. Gas Collection and Treatment Applicable [✓ 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 [✓ N/A]

1. **Outlet Pipes Inspected** Functioning N/A
Remarks______________________________
____

2. **Outlet Rock Inspected** Functioning N/A
Remarks______________________________
____

G. Detention/Sedimentation Ponds Applicable 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 [✓ 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 [✓ 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 [✓ Applicable] N/A

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

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

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 N/A

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

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

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

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

C. Treatment System Applicable N/A

1. **Treatment Train** (Check components that apply)
   Metals removal Oil/water separation Bioremediation
   Air stripping Carbon adsorbers
   Filters
   Additive (*e.g.*, chelation agent, flocculent)
   [✓ Others] GWTP & ISVE System
   [✓ Good condition] Needs Maintenance
   Sampling ports properly marked and functional
   Sampling/maintenance log displayed and up to date
   Equipment properly identified
   Quantity of groundwater treated annually
   Quantity of surface water treated annually
   Remarks All equipments are labeled & in good condition

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

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

4. **Discharge Structure and Appurtenances**
   [✓ N/A] Good condition Needs Maintenance
   Remarks

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

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

D. Monitoring Data

1. Monitoring Data
   [✓ Is routinely submitted on time] Is of acceptable quality

2. Monitoring data suggests:
   [✓ Groundwater plume is effectively contained] Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

Properly secured/locked Functioning Routinely sampled ✓Good condition

All required wells located Needs Maintenance N/A

Remarks______________________________

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.).

GWTP & ISVE system were operating as designed, and GWTP & ISVE blower sheds appeared to be very well-maintained. The final cover over the containment areas were in good conditin

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.

C. Early Indicators of Potential Remedy Problems

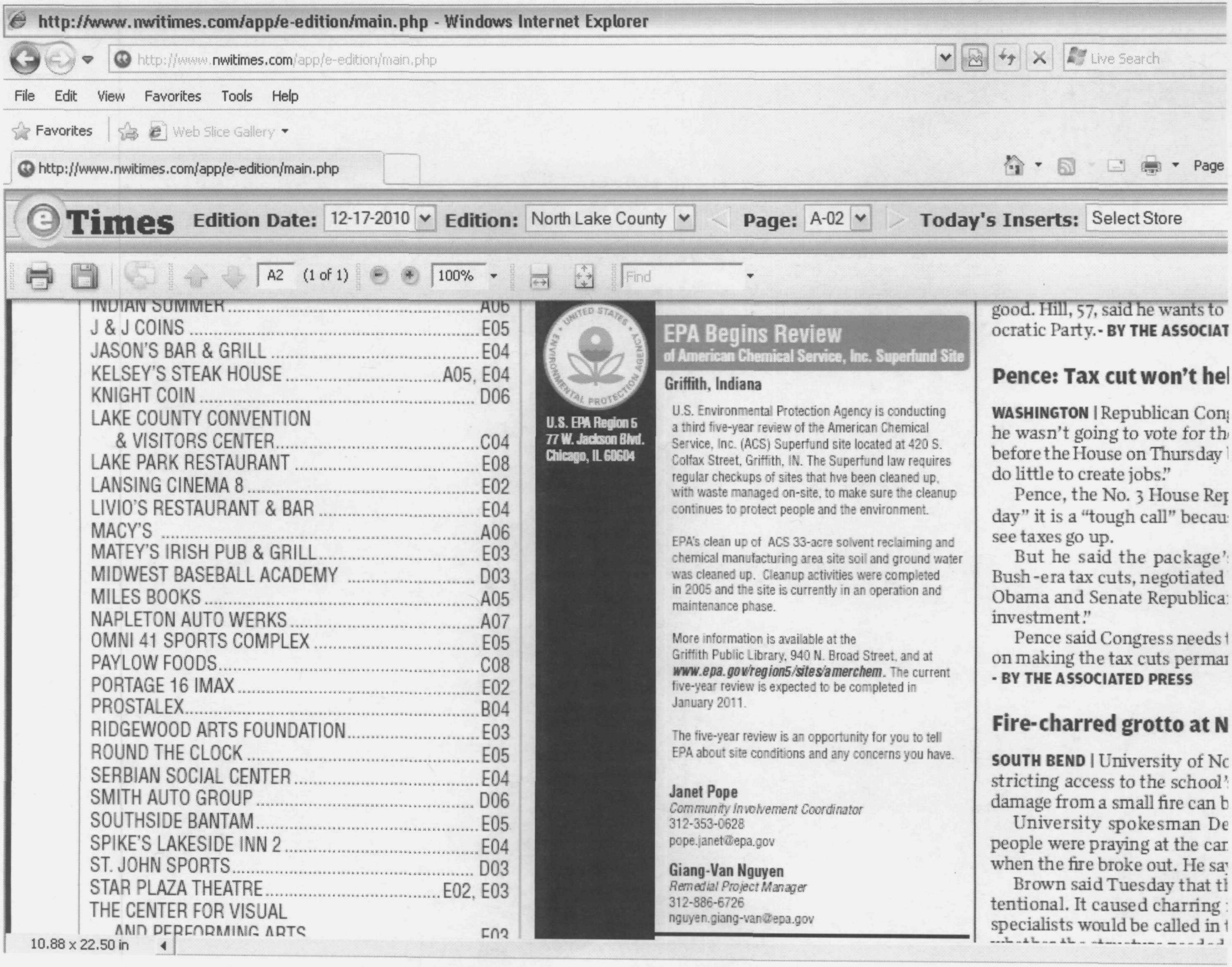
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Appendix 3

Copy of the Public Ad



INDIAN SUMMER	A06
J & J COINS	E05
JASON'S BAR & GRILL	E04
KELSEY'S STEAK HOUSE	A05, E04
KNIGHT COIN	D06
LAKE COUNTY CONVENTION & VISITORS CENTER	C04
LAKE PARK RESTAURANT	E08
LANSING CINEMA 8	E02
LIVIO'S RESTAURANT & BAR	E04
MACY'S	A06
MATEY'S IRISH PUB & GRILL	E03
MIDWEST BASEBALL ACADEMY	D03
MILES BOOKS	A05
NAPLETON AUTO WERKS	A07
OMNI 41 SPORTS COMPLEX	E05
PAYLOW FOODS	C08
PORTAGE 16 IMAX	E02
PROSTALEX	B04
RIDGEWOOD ARTS FOUNDATION	E03
ROUND THE CLOCK	E05
SERBIAN SOCIAL CENTER	E04
SMITH AUTO GROUP	D06
SOUTHSIDE BANTAM	E05
SPIKE'S LAKESIDE INN 2	E04
ST. JOHN SPORTS	D03
STAR PLAZA THEATRE	E02, E03
THE CENTER FOR VISUAL AND PERFORMING ARTS	E03

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

EPA Begins Review
of American Chemical Service, Inc. Superfund Site

Griffith, Indiana

U.S. Environmental Protection Agency is conducting a third five-year review of the American Chemical Service, Inc. (ACS) Superfund site located at 420 S. Colfax Street, Griffith, IN. The Superfund law requires regular checkups of sites that hve been cleaned up, with waste managed on-site, to make sure the cleanup continues to protect people and the environment.

EPA's clean up of ACS 33-acre solvent reclaiming and chemical manufacturing area site soil and ground water was cleaned up. Cleanup activities were completed in 2005 and the site is currently in an operation and maintenance phase.

More information is available at the Griffith Public Library, 940 N. Broad Street, and at ***www.epa.gov/region5/sites/amerchem***. The current five-year review is expected to be completed in January 2011.

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

Janet Pope
Community Involvement Coordinator
312-353-0628
pope.janet@epa.gov

Giang-Van Nguyen
Remedial Project Manager
312-886-6726
nguyen.giang-van@epa.gov

good. Hill, 57, said he wants to
ocratic Party. - **BY THE ASSOCIAT**

Pence: Tax cut won't hel

WASHINGTON | Republican Con
he wasn't going to vote for th
before the House on Thursday
do little to create jobs."

Pence, the No. 3 House Re
day" it is a "tough call" becau
see taxes go up.

But he said the package'
Bush-era tax cuts, negotiated
Obama and Senate Republica
investment."

Pence said Congress needs
on making the tax cuts perma
- BY THE ASSOCIATED PRESS

Fire-charred grotto at N

SOUTH BEND | University of N
stricting access to the school'
damage from a small fire can b

University spokesman De
people were praying at the ca
when the fire broke out. He sa

Brown said Tuesday that t
tentional. It caused charring
specialists would be called in

Appendix 4

Graphs Concentration Trend
Table 7 Summary Upper Aquifer Monitoring Well Data
Table 8 Summary Lower Aquifer Monitoring Well Data

Appendix B

Concentration Vs. Time Plots

Upper Aquifer Monitoring Wells

- MW06
- MW11
- MW12
- MW13
- MW14
- MW15
- MW17
- MW19
- MW37
- MW39
- MW42
- MW43
- MW44
- MW45
- MW48
- MW49

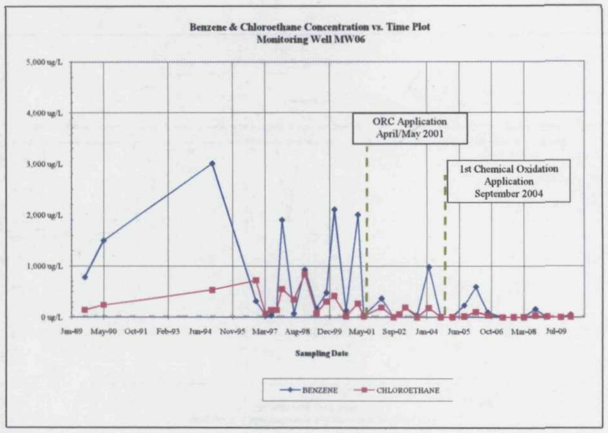
Lower Aquifer Monitoring Wells

- MW08
- MW09R
- MW10C
- MW23
- MW28
- MW29
- MW30
- MW31
- MW32
- MW33
- MW51
- MW52
- MW53
- MW54R
- MW55
- MW56
- MW58
- MW59
- MW60

Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW06

DATE	BENZENE	CHLOROETHANE
BASELINE	**320**	**720**
August-89	780 ug/L	140 ug/L
May-90	1,500 ug/L	240 ug/L
December-94	3,000 ug/L	530 ug/L
November-96	320 ug/L	720 ug/L
April-97	35 ug/L	67 ug/L
July-97	39 ug/L	140 ug/L
September-97	140 ug/L	140 ug/L
December-97	1,900 ug/L	550 ug/L
June-98	72 ug/L	350 ug/L
December-98	930 ug/L	840 ug/L
June-99	180 ug/L	78 ug/L
November-99	480 ug/L	310 ug/L
March-00	2,100 ug/L	420 ug/L
September-00	130 ug/L	22 ug/L
March-01	2.000 ug/L	270 ug/L
June-01	26 ug/L	18 ug/L
March-02	370 ug/L	190 ug/L
September-02	BDL	BDL
December-02	54 ug/L	56 ug/L
March-03	180 ug/L	190 ug/L
September-03	39 ug/L	BDL
March-04	980 ug/L	180 ug/L
September-04	2.7 ug/L	2.6 ug/L
March-05	BDL	3 ug/L
September-05	230 ug/L	14 ug/L
March-06	590 ug/L	100 ug/L
September-06	91 ug/L	37 ug/L
April-07	BDL	BDL
October-07	BDL	0.9 ug/L
March-08	BDL	3.1 ug/L
September-08	160 ug/L	36 ug/L
March-09	1.8 ug/L	11 ug/L
October-09	BDL	BDL
March-10	43 ug/L	10 ug/L

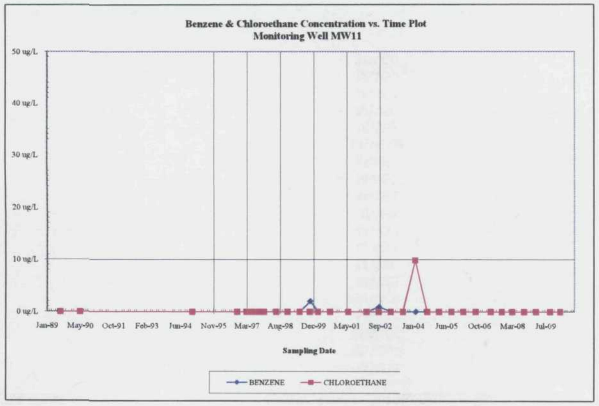
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW11

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
August-89	BDL	BDL
May-90	BDL	BDL
January-95	BDL	BDL
November-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	2 ug/L	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	0.9 ug/L	BDL
March-03	BDL	BDL
September-03	BDL	BDL
March-04	BDL	9.9
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

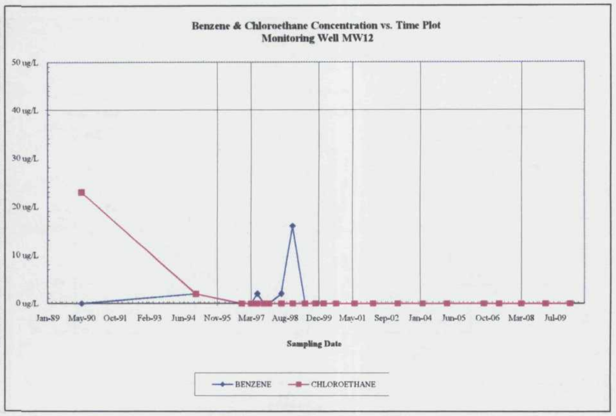
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW12

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
August-89		
May-90	BDL	23 ug/L
January-95	2 ug/L	2 ug/L
November-96	BDL	BDL
March-97	BDL	BDL
June-97	2 ug/L	BDL
October-97	BDL	BDL
December-97	BDL	BDL
June-98	2 ug/L	BDL
December-98	16 ug/L	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
March-03	BDL	BDL
March-04	BDL	BDL
March-05	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
March-08	BDL	BDL
March-09	BDL	BDL
March-10	BDL	BDL

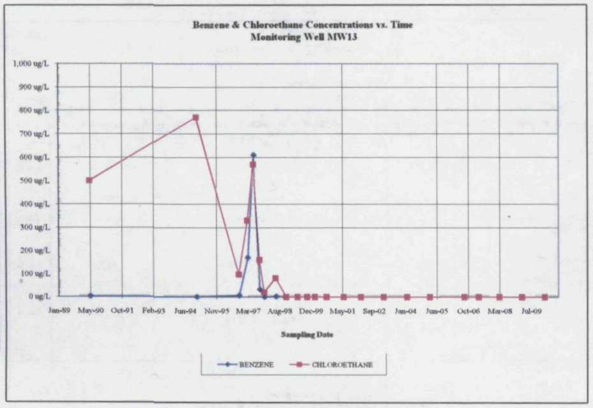
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW13

DATE	BENZENE	CHLOROETHANE
BASELINE	**610**	**570**
August-89		
May-90	2 ug/L	500 ug/L
January-95	BDL	770 ug/L
November-96	6 ug/L	97 ug/L
March-97	170 ug/L	330 ug/L
June-97	610 ug/L	570 ug/L
October-97	33 ug/L	160 ug/L
December-97	BDL	20 ug/L
June-98	2 ug/L	82 ug/L
December-98	BDL	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
March-03	BDL	BDL
March-04	BDL	BDL
March-05	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
March-08	BDL	BDL
March-09	BDL	BDL
March-10	BDL	BDL

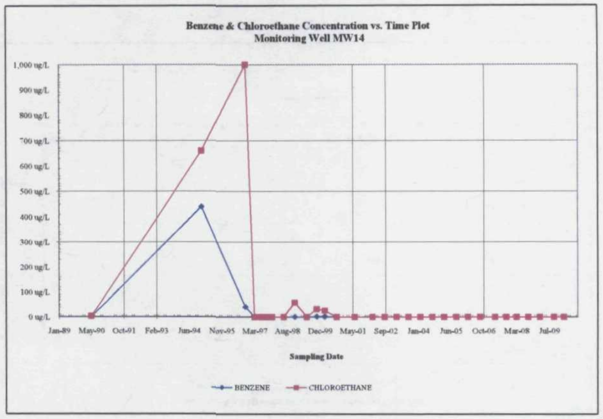
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW14

DATE	BENZENE	CHLOROETHANE
BASELINE	**41**	**1000**
August-89		
May-90	2 ug/L	3 ug/L
January-95	440 ug/L	660 ug/L
November-96	41 ug/L	1,000 ug/L
March-97	BDL	BDL
June-97	1 ug/L	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	BDL	59 ug/L
June-99	BDL	BDL
November-99	2 ug/L	32 ug/L
March-00	2 ug/L	26 ug/L
September-00	BDL	BDL
June-01	BDL	BDL
March-02	1 ug/L	BDL
September-02	BDL	BDL
March-03	0.7 ug/L	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

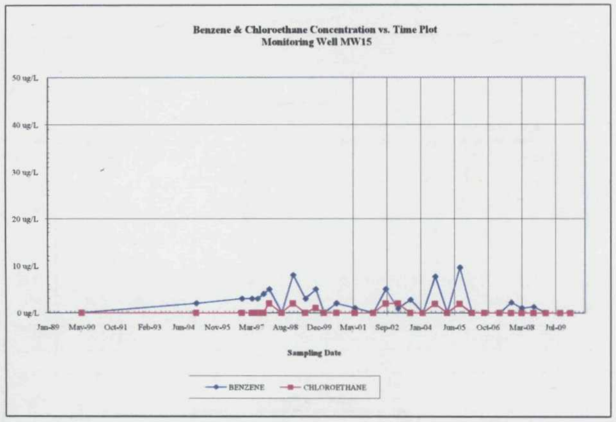
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW15

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
August-89		
May-90	BDL	BDL
January-95	2 ug/L	BDL
November-96	3 ug/L	BDL
April-97	3 ug/L	BDL
June-97	3 ug/L	BDL
September-97	4 ug/L	BDL
December-97	5 ug/L	2 ug/L
June-98	BDL	BDL
December-98	8 ug/L	2 ug/L
June-99	3 ug/L	BDL
November-99	5 ug/L	1 ug/L
March-00	BDL	BDL
September-00	2 ug/L	BDL
June-01	1 ug/L	BDL
March-02	BDL	BDL
September-02	5 ug/L	2 ug/L
March-03	1 ug/L	2 ug/L
September-03	2.8 ug/L	BDL
March-04	BDL	BDL
September-04	7.7 ug/L	1.9 ug/L
March-05	BDL	BDL
September-05	9.6 ug/L	1.9 ug/L
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	2.2 ug/L	BDL
March-08	1.0 ug/L	BDL
September-08	1.3 ug/L	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

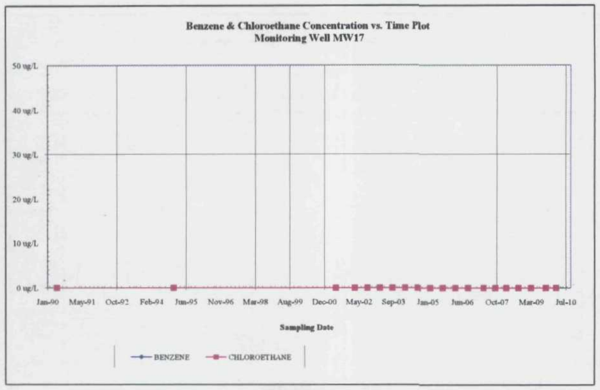
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW17

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
May-90	BDL	BDL
December-94	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	BDL	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

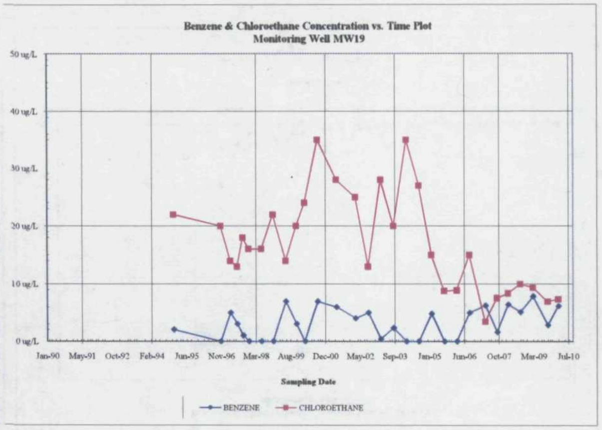
BDL = Below the Detection Limit
Baseline values adopted from nearby abandoned
well MW18



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW19

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**20**
August-89		
May-90		
December-94	2 ug/L	22 ug/L
November-96	BDL	20 ug/L
March-97	5 ug/L	14 ug/L
June-97	3 ug/L	13 ug/L
September-97	1 ug/L	18 ug/L
December-97	BDL	16 ug/L
June-98	BDL	16 ug/L
December-98	BDL	22 ug/L
June-99	7 ug/L	14 ug/L
November-99	3 ug/L	20 ug/L
March-00	BDL	24 ug/L
September-00	7 ug/L	35 ug/L
June-01	6 ug/L	28 ug/L
March-02	4 ug/L	25 ug/L
September-02	5 ug/L	13 ug/L
March-03	0.4 ug/L	28 ug/L
September-03	2.3 ug/L	20 ug/L
March-04	BDL	35 ug/L
September-04	BDL	27 ug/L
March-05	4.8 ug/L	15 ug/L
September-05	BDL	8.8 ug/L
March-06	BDL	8.9 ug L
September-06	5.0 ug/L	15.0 ug/L
April-07	6.3 ug/L	3.4 ug/L
October-07	1.6 ug/L	7.6 ug/L
March-08	6.5 ug/L	8.4 ug/L
September-08	5.1 ug/L	10.0 ug/L
March-09	7.9 ug/L	9.4 ug/L
October-09	2.8 ug/L	7.0 ug/L
March-10	6.2 ug/L	7.4 ug/L

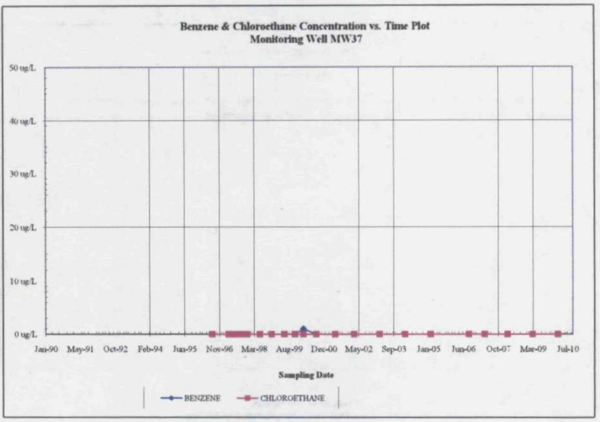
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW37

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
August-89		
May-90		
December-94		
August-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	1 ug/L	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
March-03	BDL	BDL
March-04	BDL	BDL
March-05	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
March-08	BDL	BDL
March-09	BDL	BDL
March-10	BDL	BDL

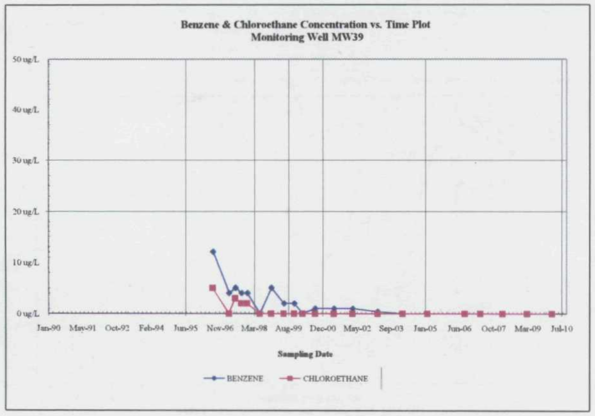
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW39

DATE	BENZENE	CHLOROETHANE
BASELINE	**12**	**10**
August-89		
May-90		
December-94		
August-96	12 ug/L	5 ug/L
March-97	4 ug/L	BDL
June-97	5 ug/L	3 ug/L
September-97	4 ug/L	2 ug/L
December-97	4 ug/L	2 ug/L
June-98	BDL	BDL
December-98	5 ug/L	BDL
June-99	2 ug/L	BDL
November-99	2 ug/L	BDL
March-00	BDL	BDL
September-00	1 ug/L	BDL
June-01	1 ug/L	BDL
March-02	1 ug/L	BDL
March-03	0.4 ug/L	BDL
March-04	BDL	BDL
March-05	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
March-08	BDL	BDL
March-09	BDL	BDL
March-10	BDL	BDL

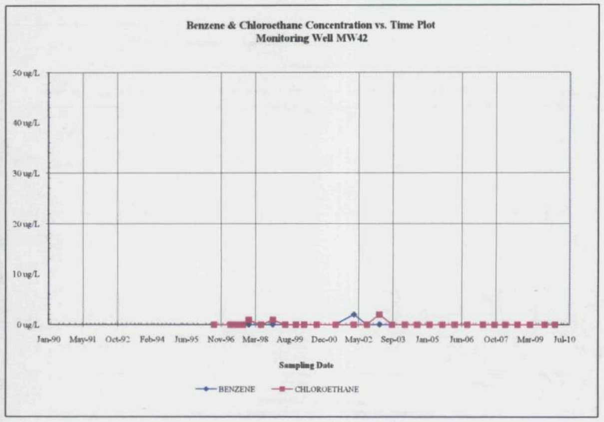
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW42

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
August-89		
May-90		
December-94		
August-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	0.9 ug/L
June-98	BDL	BDL
December-98	BDL	0.9 ug/L
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
February-02	2 ug/L	BDL
September-02	BDL	BDL
March-03	BDL	2 ug/L
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

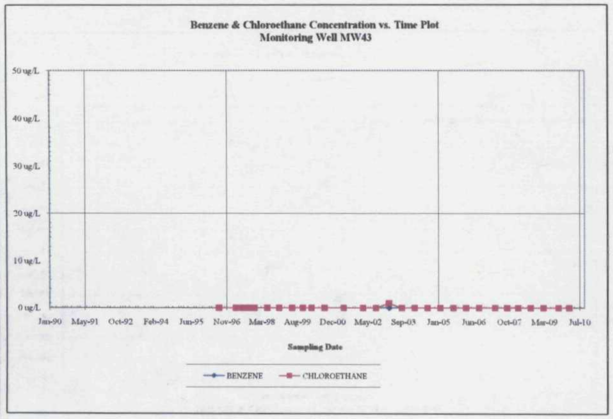
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW43

DATE	BENZENE	CHLOROETHANE
BASELINE	10	10
August-89		
May-90		
December-94		
August-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	BDL	1 ug/L
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

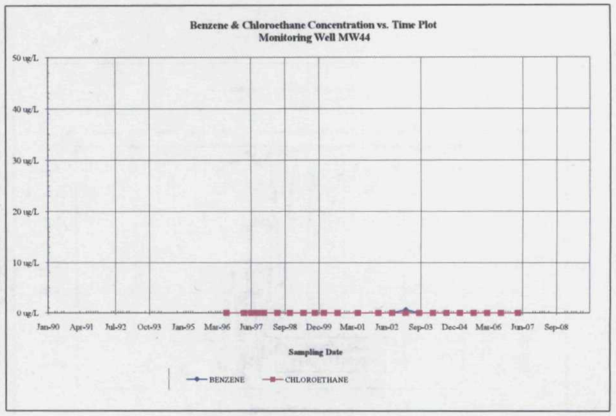
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW44

DATE	BENZENE	CHLOROETHANE
BASELINE	10	10
August-89		
May-90		
December-94		
August-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	0 6 ug/L	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL

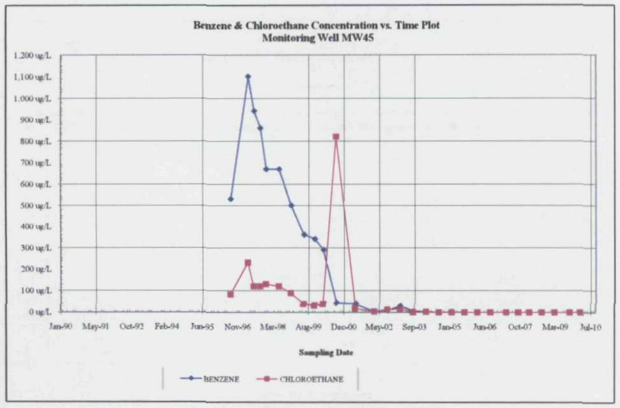
BDL = Below the Detection Limit



Concentration vs. Time Plot for Upper Aquifer Monitoring Well MW45

DATE	BENZENE	CHLOROETHANE
BASELINE	**1045**	**215**
August-89		
May-90		
December-94		
August-96	530 ug/L	82 ug/L
April-97	1,100 ug/L	230 ug/L
June-97	940 ug/L	120 ug/L
September-97	860 ug/L	120 ug/L
December-97	670 ug/L	130 ug/L
June-98	670 ug/L	120 ug/L
December-98	500 ug/L	88 ug L
June-99	360 ug/L	38 ug/L
November-99	340 ug/L	32 ug/L
March-00	290 ug/L	38 ug/L
September-00	43 ug/L	820 ug/L
June-01	39 ug/L	17 ug/L
March-02	3 ug/L	4 ug/L
September-02	8 ug/L	13 ug/L
March-03	29 ug/L	15 ug/L
September-03	5 ug/L	BDL
March-04	3.7 ug/L	2.7 ug/L
September-04	BDL	BDL
March-05	2.4 ug/L	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	0.4 ug/L	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

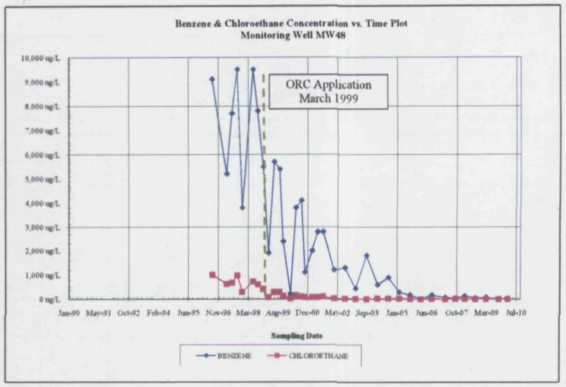
BDL = Below the Detection Limit



Concentration vs. Time Plot for Upper Aquifer Monitoring Well MW48

DATE	BENZENE	CHLOROETHANE
BASELINE	**9500**	**1000**
August-89		
May-90		
December-94		
August-96	9,100 ug/L	1,000 ug/L
March-97	5,200 ug/L	620 ug/L
June-97	7,700 ug/L	670 ug/L
September-97	9,500 ug/L	980 ug/L
December-97	3,800 ug/L	300 ug/L
June-98	9,500 ug/L	720 ug/L
September-98	7,800 ug/L	610 ug/L
December-98	5,500 ug/L	420 ug/L
March-99	1,900 ug/L	83 ug/L
June-99	5,700 ug/L	290 ug/L
September-99	5,400 ug/L	290 ug/L
November-99	2,400 ug/L	140 ug/L
March-00	220 ug/L	24 ug/L
June-00	3,800 ug/L	160 ug/L
September-00	4,100 ug/L	100 ug/L
November-00	1,100 ug/L	78 ug/L
March-01	2,000 ug/L	78 ug/L
June-01	2,800 ug/L	80 ug/L
September-01	2,800 ug/L	100 ug/L
March-02	1,200 ug/L	33 ug/L
September-02	1,300 ug/L	32 ug/L
March-03	440 ug/L	15 ug/L
September-03	1,800 ug/L	BDL
March-04	590 ug/L	22 ug/L
September-04	890 ug/L	20 ug/L
March-05	290 ug/L	19 ug/L
September-05	170 ug/L	11 ug/L
March-06	7.3 ug/L	4.6 ug/L
September-06	170.0 ug/L	15.0 ug/L
April-07	65.0 ug/L	4.7 ug/L
October-07	46.0 ug/L	6.0 ug/L
March-08	130 ug/L	8.4 ug/L
September-08	46 ug/L	BDL
March-09	79 ug/L	4.7 ug/L
October-09	1.3 ug/L	BDL
March-10	33 ug/L	BDL

BDL = Below the Detection Limit



Appendix B

Concentration Vs. Time Plots

Upper Aquifer Monitoring Wells

MW06
MW11
MW12
MW13
MW14
MW15
MW17
MW19
MW37
MW39
MW42
MW43
MW44
MW45
MW48
MW49

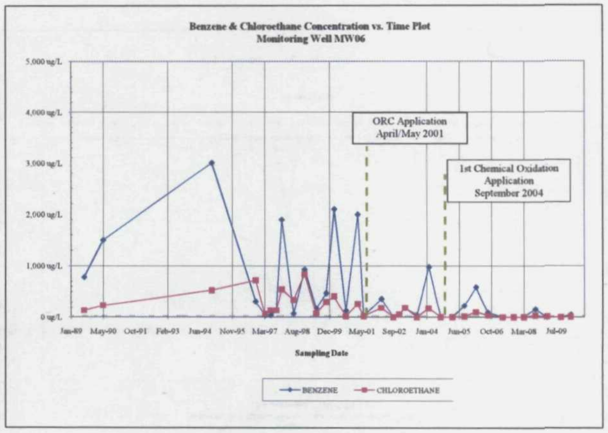
Lower Aquifer Monitoring Wells

MW08
MW09R
MW10C
MW23
MW28
MW29
MW30
MW31
MW32
MW33
MW51
MW52
MW53
MW54R
MW55
MW56
MW58
MW59
MW60

Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW06

DATE	BENZENE	CHLOROETHANE
BASELINE	**320**	**720**
August-89	780 ug/L	140 ug/L
May-90	1,500 ug/L	240 ug/L
December-94	3,000 ug/L	530 ug/L
November-96	320 ug/L	720 ug/L
April-97	35 ug/L	67 ug/L
July-97	39 ug/L	140 ug/L
September-97	140 ug/L	140 ug/L
December-97	1,900 ug/L	550 ug/L
June-98	72 ug/L	350 ug/L
December-98	930 ug/L	840 ug/L
June-99	180 ug/L	78 ug/L
November-99	480 ug/L	310 ug/L
March-00	2,100 ug/L	420 ug/L
September-00	130 ug/L	22 ug/L
March-01	2,000 ug/L	270 ug/L
June-01	26 ug/L	18 ug/L
March-02	370 ug/L	190 ug/L
September-02	BDL	BDL
December-02	54 ug/L	56 ug/L
March-03	180 ug/L	190 ug/L
September-03	39 ug/L	BDL
March-04	980 ug/L	180 ug/L
September-04	2.7 ug/L	2.6 ug/L
March-05	BDL	3 ug/L
September-05	230 ug/L	14 ug/L
March-06	590 ug/L	100 ug/L
September-06	91 ug/L	37 ug/L
April-07	BDL	BDL
October-07	BDL	0.9 ug/L
March-08	BDL	3.1 ug/L
September-08	160 ug/L	36 ug/L
March-09	1.8 ug/L	11 ug/L
October-09	BDL	BDL
March-10	43 ug/L	10 ug/L

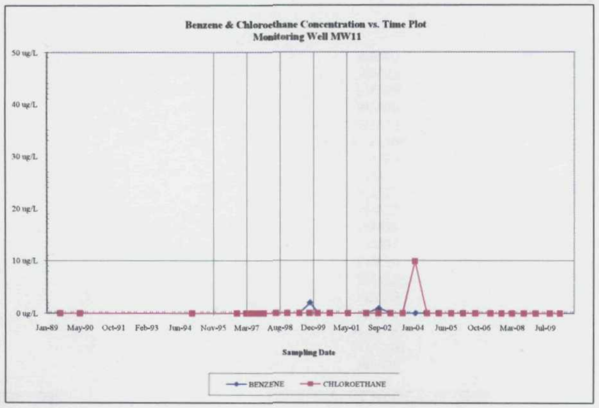
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW11

DATE	BENZENE	CHLOROETHANE
BASELINE	10	10
August-89	BDL	BDL
May-90	BDL	BDL
January-95	BDL	BDL
November-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	2 ug/L	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	0.9 ug/L	BDL
March-03	BDL	BDL
September-03	BDL	BDL
March-04	BDL	9.9
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

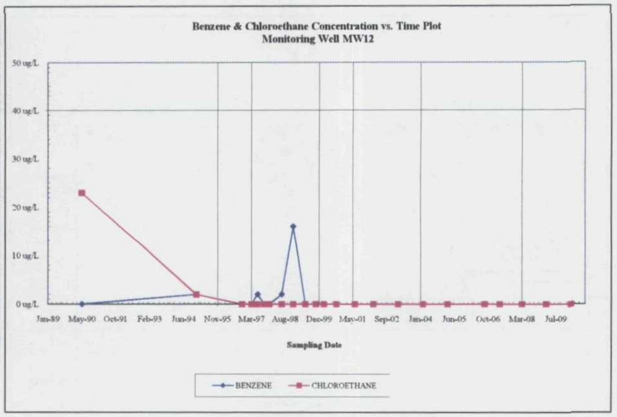
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW12

DATE	BENZENE	CHLOROETHANE
BASELINE	10	10
August-89		
May-90	BDL	23 ug/L
January-95	2 ug/L	2 ug/L
November-96	BDL	BDL
March-97	BDL	BDL
June-97	2 ug/L	BDL
October-97	BDL	BDL
December-97	BDL	BDL
June-98	2 ug/L	BDL
December-98	16 ug/L	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
March-03	BDL	BDL
March-04	BDL	BDL
March-05	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
March-08	BDL	BDL
March-09	BDL	BDL
March-10	BDL	BDL

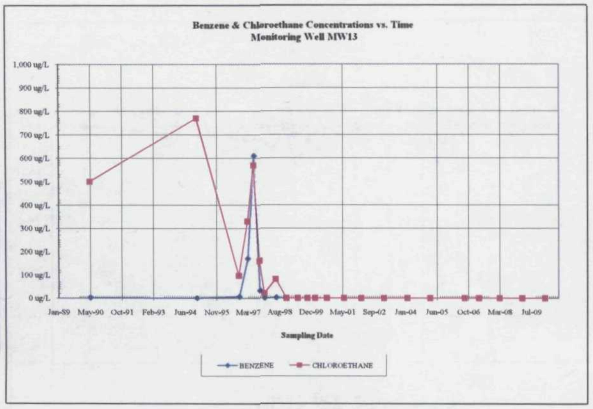
BDL = Below the Detection Limit



Concentration vs. Time Plot for Upper Aquifer Monitoring Well MW13

DATE	BENZENE	CHLOROETHANE
BASELINE	**610**	**570**
August-89		
May-90	2 ug/L	500 ug/L
January-95	BDL	770 ug/L
November-96	6 ug/L	97 ug/L
March-97	170 ug/L	330 ug/L
June-97	610 ug/L	570 ug/L
October-97	33 ug/L	160 ug/L
December-97	BDL	20 ug/L
June-98	2 ug/L	82 ug/L
December-98	BDL	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
March-03	BDL	BDL
March-04	BDL	BDL
March-05	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
March-08	BDL	BDL
March-09	BDL	BDL
March-10	BDL	BDL

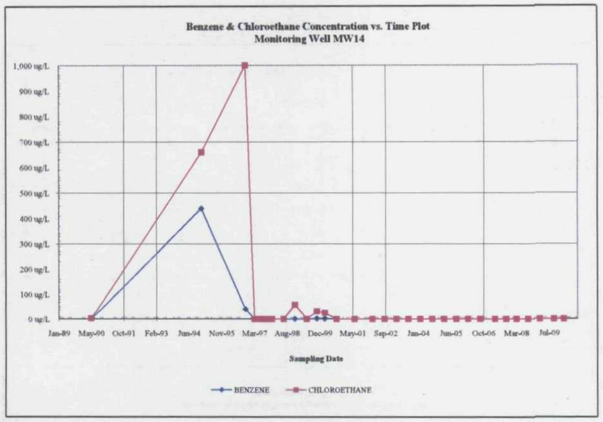
BDL = Below the Detection Limit



Concentration vs. Time Plot for Upper Aquifer Monitoring Well MW14

DATE	BENZENE	CHLOROETHANE
BASELINE	**41**	**1000**
August-89		
May-90	2 ug/L	3 ug/L
January-95	440 ug/L	660 ug/L
November-96	41 ug/L	1,000 ug/L
March-97	BDL	BDL
June-97	1 ug/L	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	BDL	59 ug/L
June-99	BDL	BDL
November-99	2 ug/L	32 ug/L
March-00	2 ug/L	26 ug/L
September-00	BDL	BDL
June-01	BDL	BDL
March-02	1 ug/L	BDL
September-02	BDL	BDL
March-03	0.7 ug/L	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

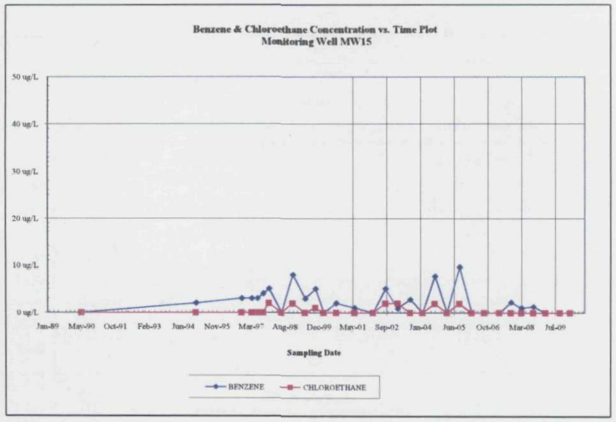
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW15

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
August-89		
May-90	BDL	BDL
January-95	2 ug/L	BDL
November-96	3 ug/L	BDL
April-97	3 ug/L	BDL
June-97	3 ug/L	BDL
September-97	4 ug/L	BDL
December-97	5 ug/L	2 ug/L
June-98	BDL	BDL
December-98	8 ug/L	2 ug/L
June-99	3 ug/L	BDL
November-99	5 ug/L	1 ug/L
March-00	BDL	BDL
September-00	2 ug/L	BDL
June-01	1 ug/L	BDL
March-02	BDL	BDL
September-02	5 ug/L	2 ug/L
March-03	1 ug/L	2 ug/L
September-03	2.8 ug/L	BDL
March-04	BDL	BDL
September-04	7.7 ug/L	1.9 ug/L
March-05	BDL	BDL
September-05	9.6 ug/L	1.9 ug/L
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	2.2 ug/L	BDL
March-08	1.0 ug/L	BDL
September-08	1.3 ug/L	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

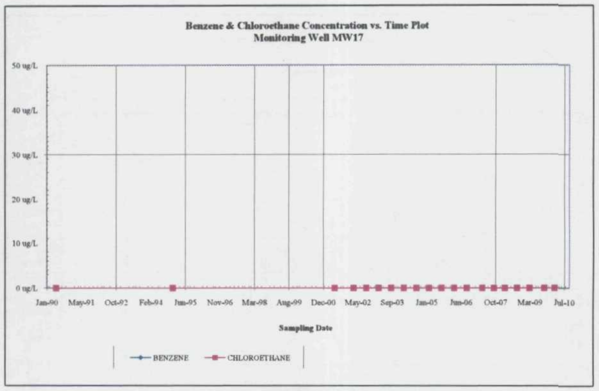
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW17

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
May-90	BDL	BDL
December-94	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	BDL	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

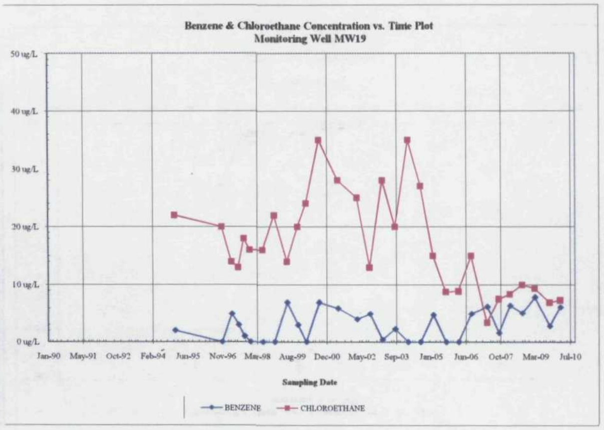
BDL = Below the Detection Limit
Baseline values adopted from nearby abandoned
well MW18



Concentration vs. Time Plot for Upper Aquifer Monitoring Well MW19

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**20**
August-89		
May-90		
December-94	2 ug/L	22 ug/L
November-96	BDL	20 ug/L
March-97	5 ug/L	14 ug/L
June-97	3 ug/L	13 ug/L
September-97	1 ug/L	18 ug/L
December-97	BDL	16 ug/L
June-98	BDL	16 ug/L
December-98	BDL	22 ug/L
June-99	7 ug/L	14 ug/L
November-99	3 ug/L	20 ug/L
March-00	BDL	24 ug/L
September-00	7 ug/L	35 ug/L
June-01	6 ug/L	28 ug/L
March-02	4 ug/L	25 ug/L
September-02	5 ug/L	13 ug/L
March-03	0.4 ug/L	28 ug/L
September-03	2.3 ug/L	20 ug/L
March-04	BDL	35 ug/L
September-04	BDL	27 ug/L
March-05	4.8 ug/L	15 ug/L
September-05	BDL	8.8 ug/L
March-06	BDL	8.9 ug L
September-06	5.0 ug/L	15.0 ug/L
April-07	6.3 ug/L	3.4 ug/L
October-07	1.6 ug/L	7.6 ug/L
March-08	6.5 ug/L	8.4 ug/L
September-08	5.1 ug/L	10.0 ug/L
March-09	7.9 ug/L	9.4 ug/L
October-09	2.8 ug/L	7.0 ug/L
March-10	6.2 ug/L	7.4 ug/L

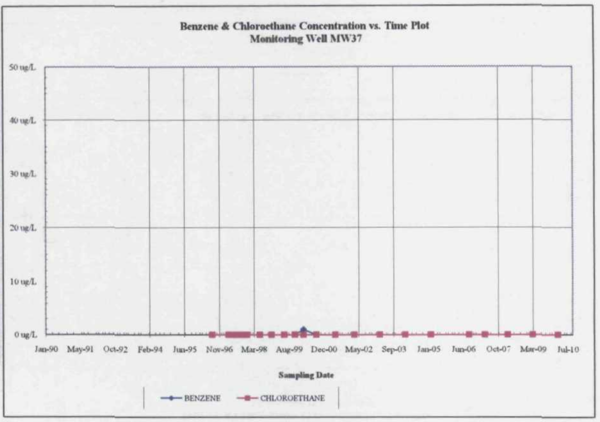
BDL = Below the Detection Limit



Concentration vs. Time Plot for Upper Aquifer Monitoring Well MW37

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
August-89		
May-90		
December-94		
August-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	1 ug/L	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
March-03	BDL	BDL
March-04	BDL	BDL
March-05	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
March-08	BDL	BDL
March-09	BDL	BDL
March-10	BDL	BDL

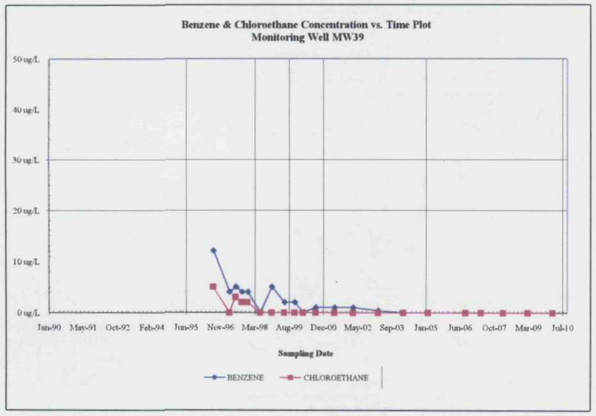
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW39

DATE	BENZENE	CHLOROETHANE
BASELINE	**12**	**10**
August-89		
May-90		
December-94		
August-96	12 ug/L	5 ug/L
March-97	4 ug/L	BDL
June-97	5 ug/L	3 ug/L
September-97	4 ug/L	2 ug/L
December-97	4 ug/L	2 ug/L
June-98	BDL	BDL
December-98	5 ug/L	BDL
June-99	2 ug/L	BDL
November-99	2 ug/L	BDL
March-00	BDL	BDL
September-00	1 ug/L	BDL
June-01	1 ug/L	BDL
March-02	1 ug/L	BDL
March-03	0.4 ug/L	BDL
March-04	BDL	BDL
March-05	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
March-08	BDL	BDL
March-09	BDL	BDL
March-10	BDL	BDL

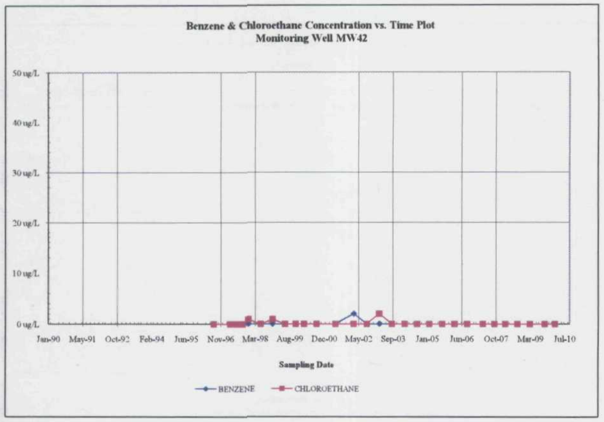
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW42

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
August-89		
May-90		
December-94		
August-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	0.9 ug/L
June-98	BDL	BDL
December-98	BDL	0.9 ug/L
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
February-02	2 ug/L	BDL
September-02	BDL	BDL
March-03	BDL	2 ug/L
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

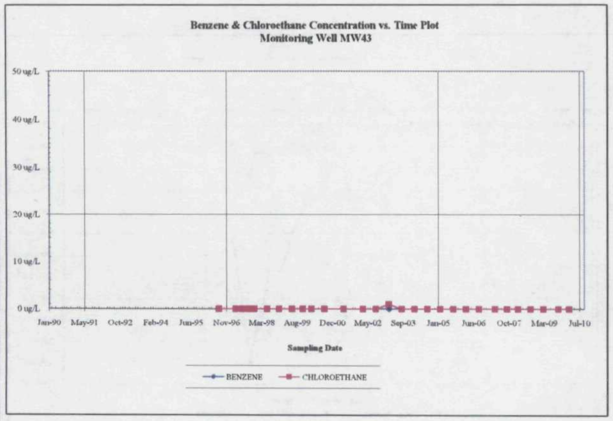
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW43

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
August-89		
May-90		
December-94		
August-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	BDL	1 ug/L
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

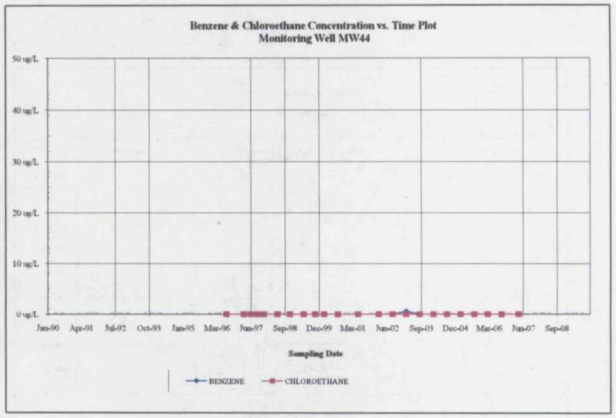
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW44

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
August-89		
May-90		
December-94		
August-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	0.6 ug/L	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL

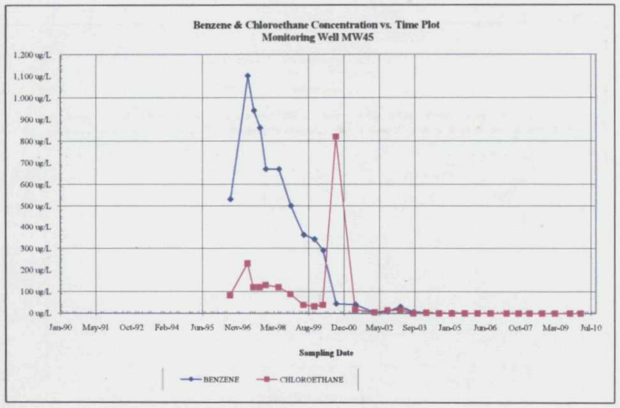
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW45

DATE	BENZENE	CHLOROETHANE
BASELINE	**1045**	**215**
August-89		
May-90		
December-94		
August-96	530 ug/L	82 ug/L
April-97	1.100 ug/L	230 ug/L
June-97	940 ug/L	120 ug/L
September-97	860 ug/L	120 ug/L
December-97	670 ug/L	130 ug/L
June-98	670 ug/L	120 ug/L
December-98	500 ug/L	88 ug L
June-99	360 ug/L	38 ug/L
November-99	340 ug/L	32 ug/L
March-00	290 ug/L	38 ug/L
September-00	43 ug/L	820 ug/L
June-01	39 ug/L	17 ug/L
March-02	3 ug/L	4 ug/L
September-02	8 ug/L	13 ug/L
March-03	29 ug/L	15 ug/L
September-03	5 ug/L	BDL
March-04	3.7 ug/L	2.7 ug/L
September-04	BDL	BDL
March-05	2.4 ug/L	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	0.4 ug/L	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

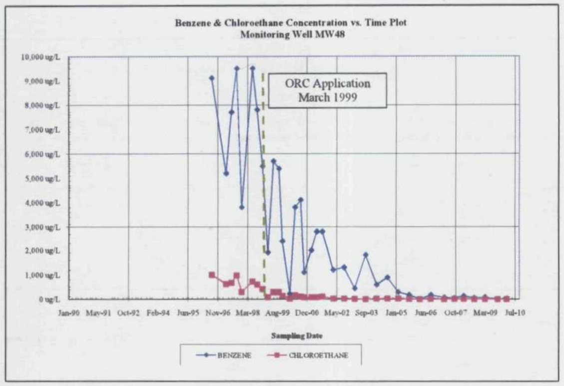
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW48

DATE	BENZENE	CHLOROETHANE
BASELINE	**9500**	**1000**
August-89		
May-90		
December-94		
August-96	9,100 ug/L	1,000 ug/L
March-97	5,200 ug/L	620 ug/L
June-97	7,700 ug/L	670 ug/L
September-97	9,500 ug/L	980 ug/L
December-97	3,800 ug/L	300 ug/L
June-98	9,500 ug/L	720 ug/L
September-98	7,800 ug/L	610 ug/L
December-98	5,500 ug/L	420 ug/L
March-99	1,900 ug/L	83 ug/L
June-99	5,700 ug/L	290 ug/L
September-99	5,400 ug/L	290 ug/L
November-99	2,400 ug/L	140 ug/L
March-00	220 ug/L	24 ug/L
June-00	3,800 ug/L	160 ug/L
September-00	4,100 ug/L	100 ug/L
November-00	1,100 ug/L	78 ug/L
March-01	2,000 ug/L	78 ug/L
June-01	2,800 ug/L	80 ug/L
September-01	2,800 ug/L	100 ug/L
March-02	1,200 ug/L	33 ug/L
September-02	1,300 ug/L	32 ug/L
March-03	440 ug/L	15 ug/L
September-03	1,800 ug/L	BDL
March-04	590 ug/L	22 ug/L
September-04	890 ug/L	20 ug/L
March-05	290 ug/L	19 ug/L
September-05	170 ug/L	11 ug/L
March-06	7.3 ug/L	4.6 ug/L
September-06	170.0 ug/L	15.0 ug/L
April-07	65.0 ug/L	4.7 ug/L
October-07	46.0 ug/L	6.0 ug/L
March-08	130 ug/L	8.4 ug/L
September-08	46 ug/L	BDL
March-09	79 ug/L	4.7 ug/L
October-09	1.3 ug/L	BDL
March-10	33 ug/L	BDL

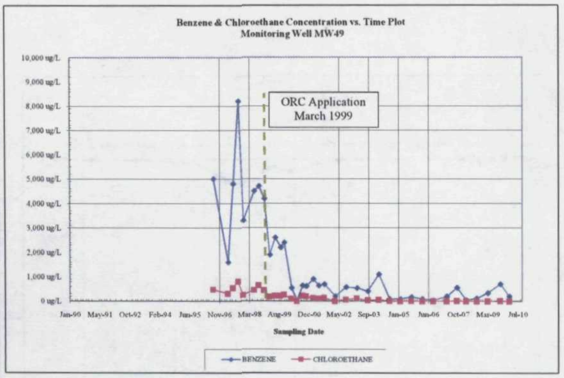
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Upper Aquifer Monitoring Well MW49

DATE	BENZENE	CHLOROETHANE
BASELINE	**6750**	**715**
August-89		
May-90		
December-94		
August-96	5,000 ug/L	480 ug/L
April-97	1,600 ug/L	310 ug/L
June-97	4,800 ug/L	540 ug/L
September-97	8,200 ug/L	810 ug/L
December-97	3,300 ug/L	250 ug/L
June-98	4,500 ug/L	450 ug/L
September-98	4,700 ug/L	650 ug/L
December-98	4,200 ug/L	440 ug/L
March-99	1,900 ug/L	180 ug/L
June-99	2,600 ug/L	220 ug/L
September-99	2,200 ug/L	210 ug/L
November-99	2,400 ug/L	260 ug/L
March-00	530 ug/L	91 ug/L
June-00	BDL	BDL
September-00	630 ug/L	220 ug/L
November-00	610 ug/L	190 ug/L
March-01	900 ug/L	120 ug/L
June-01	630 ug/L	91 ug/L
September-01	690 ug/L	130 ug/L
March-02	200 ug/L	BDL
September-02	570 ug/L	60 ug/L
March-03	530 ug/L	110 ug/L
September-03	400 ug/L	38 ug/L
March-04	1,100 ug/L	52 ug/L
September-04	90 ug/L	11 ug/L
March-05	89 ug/L	5.9 ug/L
September-05	170 ug/L	9.3 ug/L
March-06	86 ug/L	3.3 ug/L
September-06	25 ug/L	BDL
April-07	190 ug/L	BDL
October-07	550 ug/L	10.0 ug/L
March-08	40 ug/L	BDL
September-08	120 ug/L	BDL
March-09	330 ug/L	BDL
October-09	700 ug/L	12 ug/L
March-10	190 ug/L	BDL

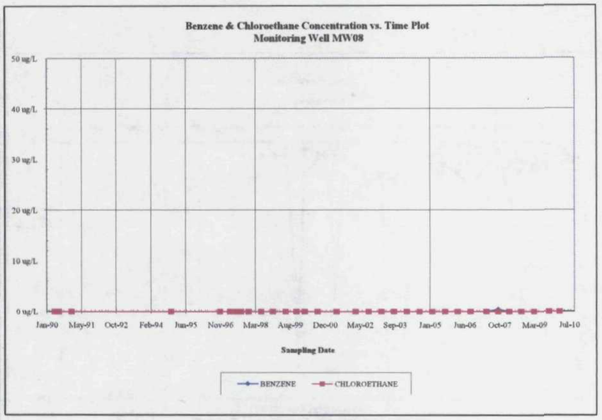
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW08

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
May-90	BDL	BDL
July-90	BDL	BDL
January-91	BDL	BDL
December-94	BDL	BDL
November-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	BDL	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	0.4 ug/L	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

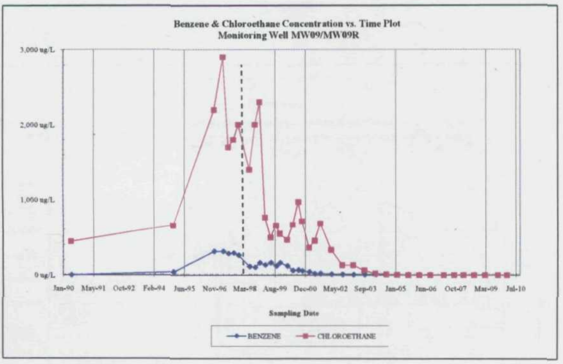
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW09/MW09R

DATE	BENZENE	CHLOROETHANE	
BASELINE	**310**	**2900**	
August-89			
May-90	BDL	440 ug/L	
January-95	40 ug/L	650 ug/L	
November-96	310 ug/L	2,200 ug/L	
April-97	310 ug/L	2,900 ug/L	
June-97	280 ug/L	1,700 ug/L	
September-97	290 ug/L	1,800 ug/L	
December-97	260 ug/L	2,000 ug/L	MW09
June-98	110 ug/L	1,400 ug/L	MW09R
September-98	100 ug/L	2,000 ug/L	
December-98	160 ug/L	2,300 ug/L	
March-99	130 ug/L	760 ug/L	
June-99	160 ug/L	490 ug/L	
September-99	120 ug/L	650 ug/L	
November-99	160 ug/L	540 ug/L	
March-00	120 ug/L	460 ug/L	
June-00	60 ug/L	660 ug/L	
September-00	65 ug/L	970 ug/L	
November-00	55 ug/L	710 ug/L	
March-01	41 ug/L	360 ug/L	
June-01	19 ug/L	450 ug/L	
September-01	23 ug/L	680 ug/L	
March-02	11 ug/L	330 ug/L	
September-02	9 ug/L	130 ug/L	
March-03	8 ug/L	130 ug/L	
September-03	6.6 ug/L	61 ug/L	
March-04	8.3 ug/L	22 ug/L	
September-04	6.5 ug/L	11 ug/L	
March-05	6.8 ug/L	3.8 ug/L	
September-05	6.2 ug/L	BDL	
March-06	5.5 ug/L	BDL	
September-06	4.4 ug/L	BDL	
April-07	4.7 ug/L	BDL	
October-07	4.9 ug/L	BDL	
March-08	4.4 ug/L	BDL	
September-08	5.8 ug/L	BDL	
March-09	5.9 ug/L	BDL	
October-09	4.6 ug/L	BDL	
March-10	4.6 ug/L	BDL	

BDL = Below the Detection Limit

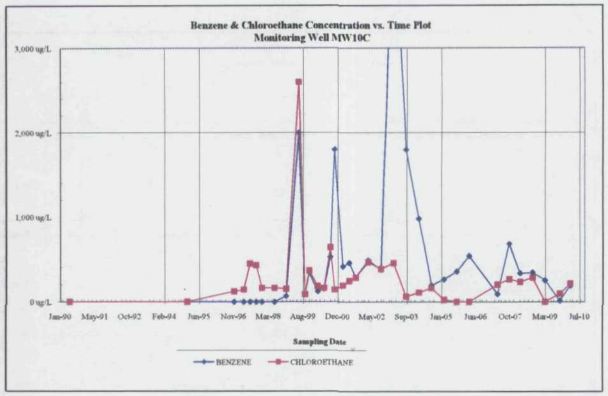


- - - - - - Line indicates change to replacement well

Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW10C

DATE	BENZENE	CHLOROETHANE
BASELINE	**150**	**420**
August-89		
May-90	BDL	BDL
January-95	BDL	BDL
November-96	BDL	120 ug/L
March-97	BDL	140 ug/L
June-97	BDL	440 ug/L
September-97	BDL	420 ug/L
December-97	BDL	160 ug/L
June-98	BDL	160 ug/L
December-98	66 ug/L	150 ug/L
June-99	2,000 ug/L	2,600 ug/L
September-99	83 ug/L	88 ug/L
November-99	340 ug/L	360 ug/L
March-00	120 ug/L	180 ug/L
June-00	150 ug/L	160 ug/L
September-00	520 ug/L	630 ug/L
November-00	1,800 ug/L	140 ug/L
March-01	410 ug/L	190 ug/L
June-01	450 ug/L	240 ug/L
September-01	280 ug/L	280 ug/L
March-02	480 ug/L	460 ug/L
September-02	370 ug/L	380 ug/L
March-03	4,800 ug/L	450 ug/L
September-03	1,800 ug/L	60 ug/L
March-04	980 ug/L	110 ug/L
September-04	190 ug/L	160 ug/L
March-05	260 ug/L	25 ug/L
September-05	350 ug/L	BDL
March-06	530 ug/L	BDL
April-07	90 ug/L	200 ug/L
October-07	670 ug/L	260 ug/L
March-08	330 ug/L	230 ug/L
September-08	340 ug/L	280 ug/L
March-09	250 ug/L	BDL
October-09	15 ug/L	96 ug/L
March-10	190 ug/L	210 ug/L

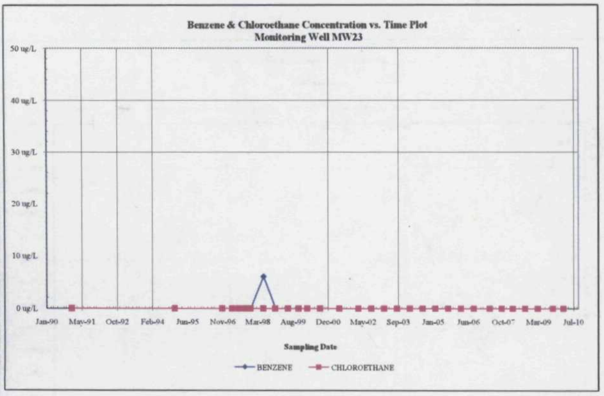
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW23

DATE	BENZENE	CHLOROETHANE
BASELINE	10	10
August-89		
January-91	BDL	BDL
January-95	BDL	BDL
November-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	6 ug/L	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	BDL	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

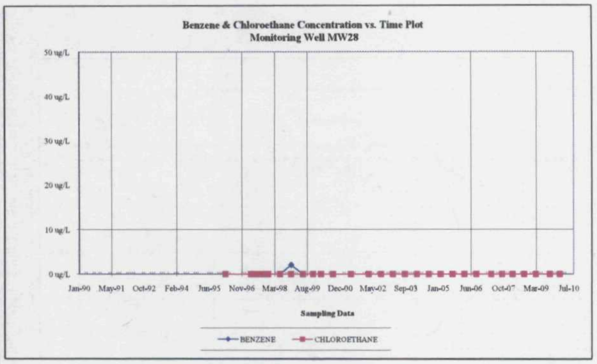
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW28

DATE	BENZENE	CHLOROETHANE
BASELINE	10	10
August-89		
May-90		
January-95		
March-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	2 ug/L	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	BDL	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

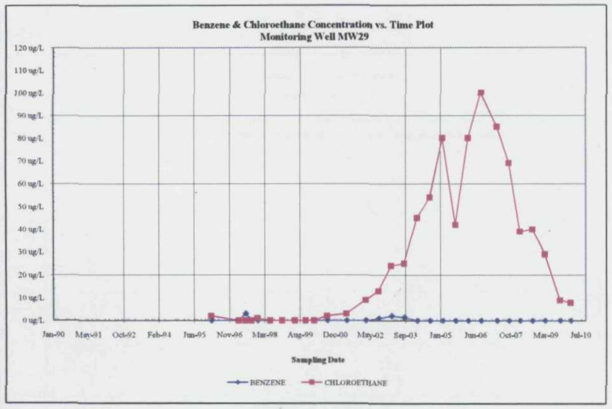
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW29

DATE	BENZENE	CHLOROETHANE
BASELINE	10	10
August-89		
May-90		
January-95		
March-96	BDL	2 ug/L
March-97	BDL	BDL
June-97	3 ug/L	BDL
September-97	BDL	BDL
December-97	BDL	1 ug/L
June-98	BDL	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	2 ug/L
June-01	BDL	3 ug/L
March-02	BDL	9 ug/L
September-02	1 ug/L	13 ug/L
March-03	2 ug/L	24 ug/L
September-03	1.4 ug/L	25 ug/L
March-04	BDL	45 ug/L
September-04	BDL	54 ug/L
March-05	BDL	80 ug/L
September-05	BDL	42 ug/L
March-06	BDL	80 ug/L
September-06	BDL	100 ug/L
April-07	BDL	85 ug/L
October-07	BDL	69 ug/L
March-08	BDL	39 ug/L
September-08	BDL	40 ug/L
March-09	BDL	29 ug/L
October-09	BDL	9 ug/L
March-10	BDL	7.9 ug/L

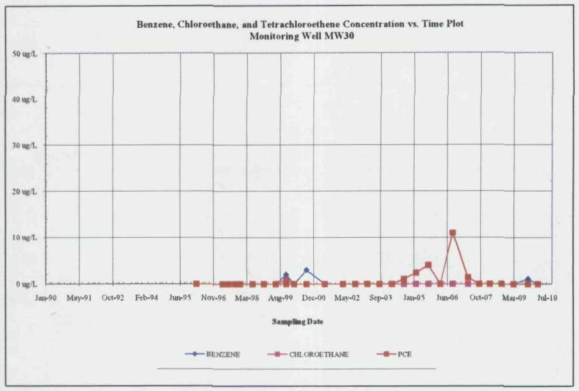
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW30

DATE	BENZENE	CHLOROETHANE	PCE
BASELINE	10	10	10
August-89			
May-90			
January-95			
March-96	BDL	BDL	BDL
March-97	BDL	BDL	BDL
June-97	BDL	BDL	BDL
October-97	BDL	BDL	BDL
December-97	BDL	BDL	BDL
June-98	BDL	BDL	BDL
December-98	BDL	BDL	BDL
June-99	BDL	BDL	BDL
November-99	2 ug/L	1 ug/L	BDL
March-00	BDL	BDL	BDL
September-00	3 ug/L	BDL	BDL
June-01	BDL	BDL	BDL
March-02	BDL	BDL	BDL
September-02	BDL	BDL	BDL
March-03	BDL	BDL	BDL
September-03	BDL	BDL	BDL
March-04	BDL	BDL	BDL
September-04	BDL	BDL	1.1 ug/L
March-05	BDL	BDL	2.4 ug/L
September-05	BDL	BDL	4.0 ug/L
March-06	BDL	BDL	BDL
September-06	BDL	BDL	11.0 ug/L
April-07	BDL	BDL	1.4 ug/L
October-07	BDL	BDL	BDL
March-08	BDL	BDL	BDL
September-08	BDL	BDL	BDL
March-09	BDL	BDL	BDL
October-09	1.1 ug/L	BDL	BDL
March-10	BDL	BDL	BDL

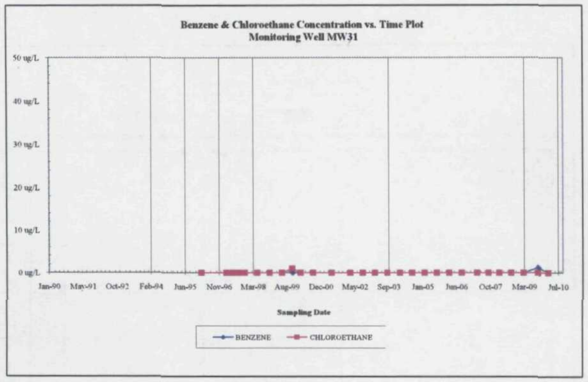
BDL = Below the Detection Limit
PCE = Tetrachloroethene



Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW31

DATE	BENZENE	CHLOROETHANE
BASELINE	10	10
August-89		
May-90		
January-95		
March-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	BDL	1 ug/L
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	BDL	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	1.2 ug/L	BDL
March-10	BDL	BDL

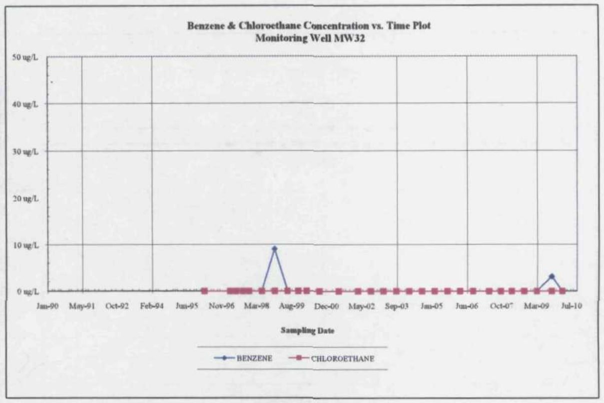
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW32

DATE	BENZENE	CHLOROETHANE
BASELINE	10	10
August-89		
May-90		
January-95		
March-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	9 ug/L	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	BDL	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	3.1 ug/L	BDL
March-10	BDL	BDL

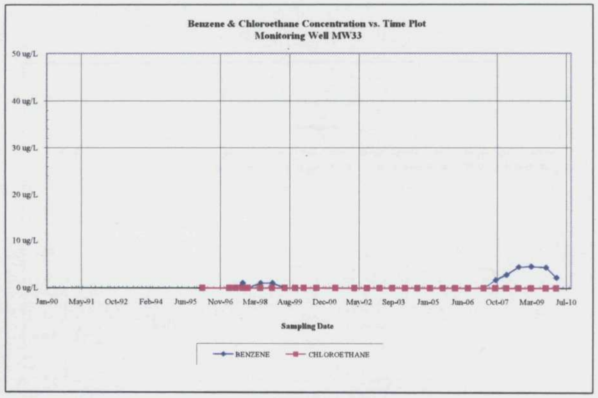
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW33

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
August-89		
May-90		
January-95		
March-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
October-97	1 ug/L	BDL
December-97	BDL	BDL
June-98	1 ug/L	BDL
December-98	1 ug/L	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	BDL	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	1.7 ug/L	BDL
March-08	2.8 ug/L	BDL
September-08	4.5 ug/L	BDL
March-09	4.6 ug/L	BDL
October-09	4.4 ug/L	BDL
March-10	2.2 ug/L	BDL

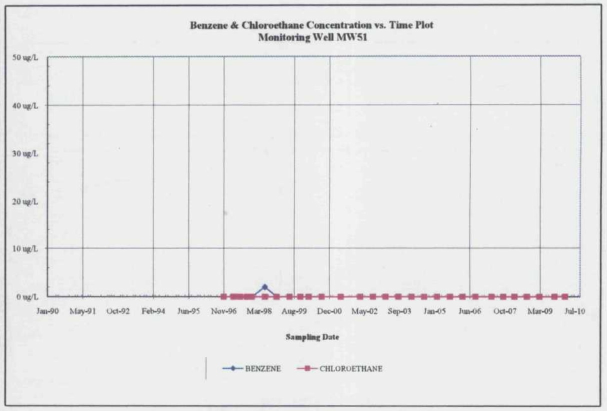
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW51

DATE	BENZENE	CHLOROETHANE
BASELINE	**100**	**100**
August-89		
May-90		
January-95		
November-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
October-97	BDL	BDL
December-97	BDL	BDL
June-98	2 ug/L	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	BDL	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

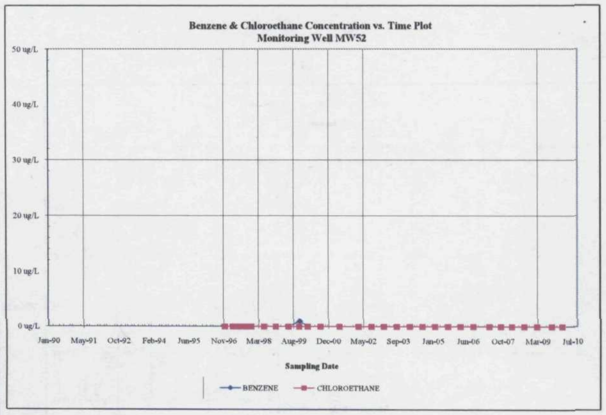
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW52

DATE	BENZENE	CHLOROETHANE
BASELINE	**100**	**100**
August-89		
May-90		
January-95		
December-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	1 ug/L	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	BDL	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

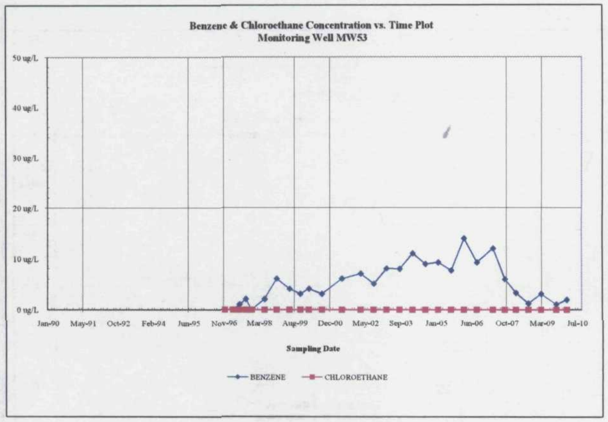
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW53

DATE	BENZENE	CHLOROETHANE
BASELINE	**10**	**10**
August-89		
May-90		
January-95		
December-96	BDL	BDL
March-97	BDL	BDL
June-97	1 ug/L	BDL
September-97	2 ug/L	BDL
December-97	BDL	BDL
June-98	2 ug/L	BDL
December-98	6 ug/L	BDL
June-99	4 ug/L	BDL
November-99	3 ug/L	BDL
March-00	4 ug/L	BDL
September-00	3 ug/L	BDL
June-01	6 ug/L	BDL
March-02	7 ug/L	BDL
September-02	5 ug/L	BDL
March-03	8 ug/L	BDL
September-03	7.9 ug/L	BDL
March-04	11 ug/L	BDL
September-04	8.9 ug/L	BDL
March-05	9.2 ug/L	BDL
September-05	7.6 ug/L	BDL
March-06	14 ug/L	BDL
September-06	9.2 ug/L	BDL
April-07	12.0 ug/L	BDL
October-07	5.9 ug/L	BDL
March-08	3.2 ug/L	BDL
September-08	1.2 ug/L	BDL
March-09	3.0 ug/L	BDL
October-09	1.0 ug/L	BDL
March-10	1.9 ug/L	BDL

BDL = Below the Detection Limit



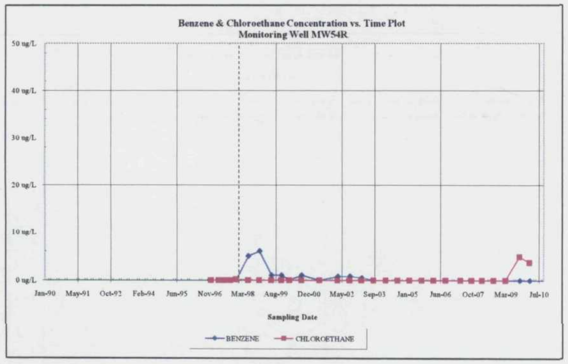
Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW54R

DATE	BENZENE	CHLOROETHANE
BASELINE	10	10
August-89		
May-90		
January-95		
December-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	0.1 ug/L	0.2 ug/L
June-98	5 ug/L	BDL
December-98	6 ug/L	BDL
June-99	1 ug/L	BDL
November-99	1 ug/L	BDL
March-00	BDL	BDL
September-00	1 ug/L	BDL
June-01	BDL	BDL
March-02	1 ug/L	BDL
September-02	1 ug/L	BDL
March-03	0.5 ug/L	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	4.9 ug/L
March-10	BDL	3.7 ug/L

<- MW54R

BDL = Below the Detection Limit

MW54 was damaged by a vehicle and was replaced with MW54R

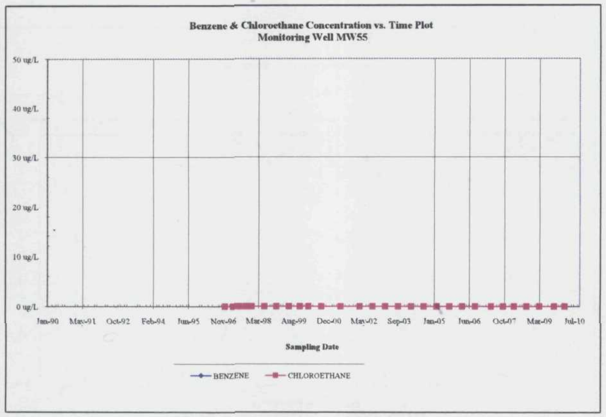


------------ Line indicates change to replacement well

Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW55

DATE	BENZENE	CHLOROETHANE
BASELINE	10	10
August-89		
May-90		
January-95		
December-96	BDL	BDL
March-97	BDL	BDL
June-97	BDL	BDL
September-97	BDL	BDL
December-97	BDL	BDL
June-98	BDL	BDL
December-98	BDL	BDL
June-99	BDL	BDL
November-99	BDL	BDL
March-00	BDL	BDL
September-00	BDL	BDL
June-01	BDL	BDL
March-02	BDL	BDL
September-02	BDL	BDL
March-03	BDL	BDL
September-03	BDL	BDL
March-04	BDL	BDL
September-04	BDL	BDL
March-05	BDL	BDL
September-05	BDL	BDL
March-06	BDL	BDL
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

BDL = Below the Detection Limit



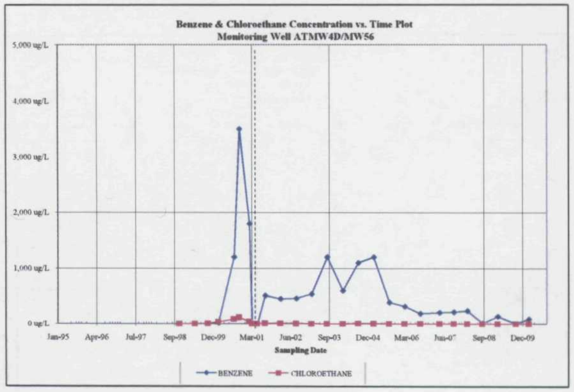
Concentration vs. Time Plot for
Lower Aquifer Monitoring Well ATMW4D-MW56

DATE	BENZENE	CHLOROETHANE
BASELINE	-	-
December-98	BDL	BDL
June-99	BDL	BDL
November-99	3 ug/L	9 ug/L
March-00	12 ug/L	34 ug/L
September-00	1,200 ug/L	88 ug/L
November-00	3,500 ug/L	120 ug/L
March-01	1,800 ug/L	42 ug/L
April-01	BDL	BDL
June-01	BDL	BDL
September-01	510 ug/L	10 ug/L
March-02	450 ug/L	8 ug/L
September-02	460 ug/L	6 ug/L
March-03	540 ug/L	4 ug/L
September-03	1,200 ug/L	BDL
March-04	600 ug/L	BDL
September-04	1,100 ug/L	7 ug/L
March-05	1,200 ug/L	6.4 ug/L
September-05	390 ug/L	BDL
March-06	320 ug/L	BDL
September-06	190 ug/L	BDL
April-07	210 ug/L	BDL
October-07	220 ug/L	1.8 ug/L
March-08	240 ug/L	BDL
September-08	13 ug/L	2.4 ug/L
March-09	140 ug/L	BDL
October-09	1.1 ug/L	BDL
March-10	92 ug/L	BDL

ATMW4D

MW56

BDL = Below the Detection Limit

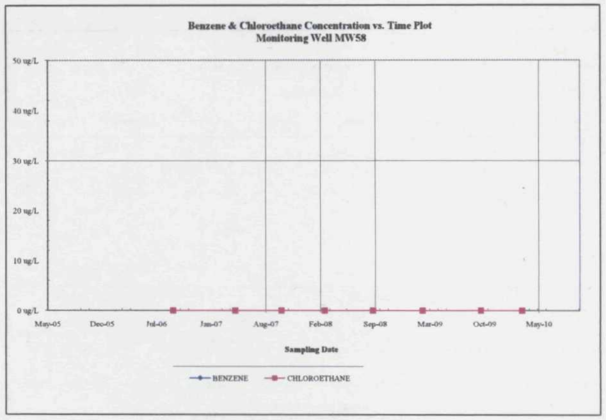


---------- Line indicates change to replacement well

Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW58

DATE	BENZENE	CHLOROETHANE
BASELINE	-	-
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

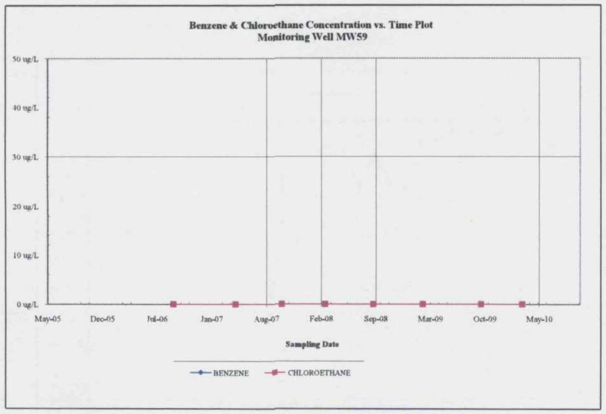
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW59

DATE	BENZENE	CHLOROETHANE
BASELINE	-	-
September-06	BDL	BDL
April-07	BDL	BDL
October-07	BDL	BDL
March-08	BDL	BDL
September-08	BDL	BDL
March-09	BDL	BDL
October-09	BDL	BDL
March-10	BDL	BDL

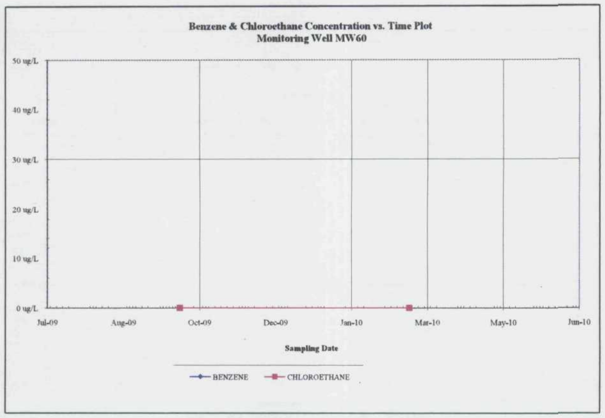
BDL = Below the Detection Limit



Concentration vs. Time Plot for
Lower Aquifer Monitoring Well MW60

DATE	BENZENE	CHLOROETHANE
BASELINE	-	-
October-09	BDL	BDL
March-10	BDL	BDL

BDL = Below the Detection Limit



Appendix 4 - Table 7
Upper Aquifer Monitoring Well Data Summary
American Chemical Services NPL Site
Griffith, Indiana

Upper Aquifer Monitoring Well	Date Installed	Locations Relative to VOC Plume Area	Current Sampling Parameters	Current Trends
MW06	July 1989	Interior	Well is sampled for indicator VOCs semiannually, arsenic and bis(2-chloroethyl)ether annually, and full-scan parameters every three years.	Since last five year review, benzene are detected at variable concentration between 1.8 ug/L and 590 ug/L. Chloroethane are detected at variable concentration between 0.9ug/L and 100 ug/L. Overall concentrations have decreased since 2001.
MW12	March 1990	Upgradient	Well is sampled for indicator VOCs annually and full-scan parameters every three years.	No indicator VOCs have been detected at this well since 1998
MW13	April 1990	Downgradient/ Side gradient	Well is sampled for indicator VOCs annually and full-scan parameters every three years.	No indicator VOCs have been detected at this well since 1998
MW14	April 1990	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	Trichloroethene was detected at trace concentrations in March 2005 and March 2008. No other indicator VOCs have been detected since 2003
MW15	April 1990	Downgradient	Well is sampled for indicator VOCs semiannually, arsenic annually, and full-scan parameters every three years.	Benzene has been observed sporadically at generally decreasing concentrations. Concentrations have been less than the MCL (5 ug/L) since 2005.
MW17	April 1990	Upgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	Benzene and Chloroethane, the VOCs characteristic of the ACS Site have not been detected in this upgradient well. There have been occasional trace detections of tetrachloroethene in previous samples, but was not detected in the sample collected in March 2010
MW19	April 1990	Interior	Well is sampled for indicator VOCs semiannually, bis(2-chloroethyl)ether annually, and full-scan parameters every three years.	Benzene concentrations have been variable between 1 and 8 ug/L since the well was installed in 1994. Chloroethane has been detected at variable concentrations between 3 ug/L and 35 ug/L.
MW37	July 1996	Downgradient/ Side gradient	Well is sampled for indicator VOCs annually and full-scan parameters every three years.	There has been only one detection of benzene in this well since it was installed in 1996. Benzene was detected at 1 ug/L in March 2000.
MW42	July 1996	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	Trichloroethene was detected at a trace concentration in September 2005. No benzene or chloroethane has been detected at this well since September 2005
MW43	July 1996	Downgradient	Well is sampled for indicator VOCs semiannually, arsenic annually, and full-scan parameters every three years.	There has only been one detection of a VOC in this well since it was constructed in August 1996. That was for chloroethane at 1 ug/L in March 2003.
MW44	July 1996	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	There has only been one detection of a VOC in this well since it was constructed in August 1996. That was for benzene at 0.6

Appendix 4 - Table 7
Upper Aquifer Monitoring Well Data Summary
American Chemical Services NPL Site
Griffith, Indiana

				ug/L in March 2003.
MW45	July 1996	Interior	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	Benzene and chloroethane were detected in this well early on in the investigation, showing that it was at the downgradient end of the upper aquifer plume. Only trace (less than 5 ug/L) concentrations have been detected in this well since September 2003.
MW48	July 1996	Interior	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	Since last five year review, benzene has been detected at variable concentration between 1.3 ug/L and 290 ug/L (below baseline). Chloroethane has been detected at variable concentration between 4.6 ug/L and 19 ug/L. Overall benzene concentrations has been decreased since 1998.
MW49	July 1996	Interior	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	Benzene has been detected at variable but decreasing concentrations. Chloroethane has not been detected since 2007.

Appendix 4 -Table 8
Lower Aquifer Monitoring Well Data Summary
American Chemical Services NPL Site
Griffith, Indiana

Upper Aquifer Monitoring Well	Date Installed	Locations Relative to VOC Plume Area	Current Sampling Parameters	Current Trends
MW08	March 1990	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	Benzene was detected at a trace concentration in October 2007. No other VOCs have been detected in this well.
MW09R	March 1998	Interior	Well is sampled for indicator VOCs semiannually, bis(2-chloroethyl)ether annually, and full-scan parameters every three years	Benzene concentrations were increasing at the original MW09 in 1997. A tracer study indicated that the source was leakage from the upper aquifer. The original well was abandoned. This replacement well has shown decreasing benzene concentrations. Since March 2006, benzene has been detected at variable concentration between 4.4 ug/L and 6.8 ug/L. Chloroethane has not been detected since September 2006.
MW10C	April 1990	Interior	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	Benzene and chloroethane have been detected at variable concentrations since it was installed in 1995. Groundwater is continually extracted from this well by pumping. Since March 2006, benzene has been detected at variable concentration between 15 ug/L and 670 ug/L. Chloroethane has been detected at variable concentration between 96 ug/L and 280 ug/L (below the baseline).
MW23	January 1991	Downgradient Sidegradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	There has been only one detection of VOCs in this well since it was installed in 1991. Benzene was detected at 6 ug/L in June 1998.
MW28	February 1996	Upgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	There has been only one detection of VOCs in this well since it was installed in 1996. Benzene was detected at 2 ug/L in December 1998.
MW29	February 1996	Interior	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	Since March 2005, chloroethane has been detected at variable concentration between 7.9 ug/L and 100 ug/L. Chloroethane concentrations showed an increasing trend through September 2006, but have been decreasing since that event.
MW30	February 1996	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	Tetrachloroethene was detected at low but slightly increasing concentrations from Sept. 2004 through April 2007. Since March 2006, Benzene was only detected one in October 2009. No chloroethane or tetrachloroethene has been detected in this well since 2005. An extraction well has operated continuously in this well since Sept. 2007.
MW31	February 1996	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	There has been only one detection of VOCs in this well since it was installed in 1996. Benzene was

Appendix 4 -Table 8
Lower Aquifer Monitoring Well Data Summary
American Chemical Services NPL Site
Griffith, Indiana

				detected at 1.2 ug/L in October 2009..
MW32	February 1996	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	Trichloroethene was detected at a trace concentration in March 2008. No other indicator VOCs have been detected during the past several years. Benzene has been detected at 3.1 ug/L in October 2009.
MW33	February 1996	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	Benzene concentrations have shown an increasing trend since October 2007 at variable concentration between 1./7 ug/L and 4.6 ug/L. The well is located within the lower aquifer extraction system at the downgradient edge of the site.
MW51	October 1996	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	There has been only one detection of VOCs in this well since it was installed in 1996. No benzene or chloroentane was detected since 2005.
MW52	December 1996	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	There has been only one detection of VOCs in this well since it was installed in 1996. No benzene or chloroentane was detected since 2005.
MW53	December 1996	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	The increasing benzene concentration at this well was the reason that the lower aquifer extraction system was installed in this region of the lower aquifer.
MW54R	March 1998	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	The original MW54 was struck by a vehicle during site remediation in 1997. Benzene was detected at low levels in this replacement wells between 1998 and 2003. VOCs have not been detected since.
MW55	December 1996	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	No indicator VOCs have been detected at this well since it was constructed in 1996.
MW56	April 2001	Interior	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	This well was constructed to replace ACS well ATMW4D, in which benzene was detected. Benzene concentrations have been decreasing in this well since pumping started in March 2005.
MW58	August 2006	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	MW58 and MW59 were installed to act as sentinel wells downgradient from the lower aquifer extraction system, centered around MW53. Except for an erroneous detection of TCE in a sample collected in March 2008, no VOCs have been detected in these well
MW59	August 2006	Downgradient	Well is sampled for indicator VOCs semiannually and full-scan parameters every three years.	
MW60	September 2009	Downgradient	Well was installed in September 2009 to replace existing sentinel wells MW58 and MW59.	This well was installed downgradient of MW53. It replaced existing sentinel wells MW58 and MW59 which are no longer downgradient of MW53 due to a localized change in groundwater flow resulting from the lower aquifer pumping system

Note:

Appendix 4 -Table 8
Lower Aquifer Monitoring Well Data Summary
American Chemical Services NPL Site
Griffith, Indiana

1 = Trichloroethene detections at MW58 and MW59 in March 2008 were determined to be the result of contaminated sampling equipment. and not representative of groundwater conditions.

These wells were re-sampled in July 2008 and no VOCs were detected.

Appendix 5

Town of Griffith Zoning District Map

ZONING DISTRICT MAP

TOWN OF GRIFFITH, INDIANA

TOWN COUNCIL

GRETA CARROLL
1st Ward

RICHARD C. KONOPASEK
2nd Ward

MATTHEW NAJAR
3rd Ward

MICHAEL GULLEY
4th Ward

STAN DOBOSZ
5th Ward

CLERK-TREASURER

RONALD J. SZAFARCZYK

DIRECTOR OF PUBLIC WORKS

JAMES D. REYOME

BUILDING COMMISSIONER

DONCHE ANDONOV

TOWN ATTORNEY

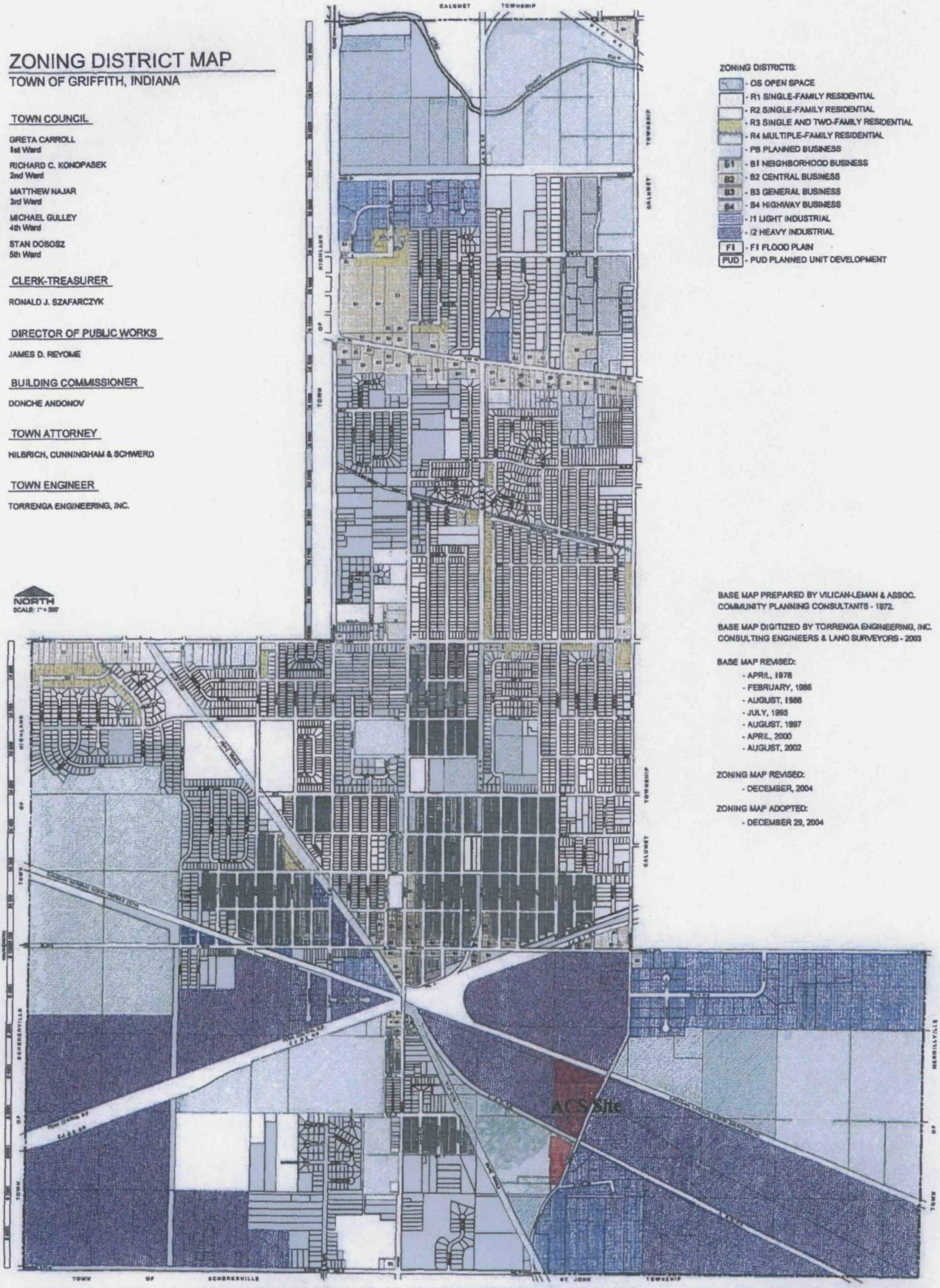
HILBRICH, CUNNINGHAM & SCHWERD

TOWN ENGINEER

TORRENGA ENGINEERING, INC.

ZONING DISTRICTS:

- OS OPEN SPACE
- R1 SINGLE-FAMILY RESIDENTIAL
- R2 SINGLE-FAMILY RESIDENTIAL
- R3 SINGLE AND TWO-FAMILY RESIDENTIAL
- R4 MULTIPLE-FAMILY RESIDENTIAL
- PB PLANNED BUSINESS
- B1 - B1 NEIGHBORHOOD BUSINESS
- B2 - B2 CENTRAL BUSINESS
- B3 - B3 GENERAL BUSINESS
- B4 - B4 HIGHWAY BUSINESS
- I1 LIGHT INDUSTRIAL
- I2 HEAVY INDUSTRIAL
- FI - FI FLOOD PLAIN
- PUD - PUD PLANNED UNIT DEVELOPMENT



BASE MAP PREPARED BY VILICAN-LEMAN & ASSOC.
COMMUNITY PLANNING CONSULTANTS - 1972.

BASE MAP DIGITIZED BY TORRENGA ENGINEERING, INC.
CONSULTING ENGINEERS & LAND SURVEYORS - 2003

BASE MAP REVISED:
- APRIL, 1978
- FEBRUARY, 1986
- AUGUST, 1988
- JULY, 1995
- AUGUST, 1997
- APRIL, 2000
- AUGUST, 2002

ZONING MAP REVISED:
- DECEMBER, 2004

ZONING MAP ADOPTED:
- DECEMBER 29, 2004

EXHIBIT D