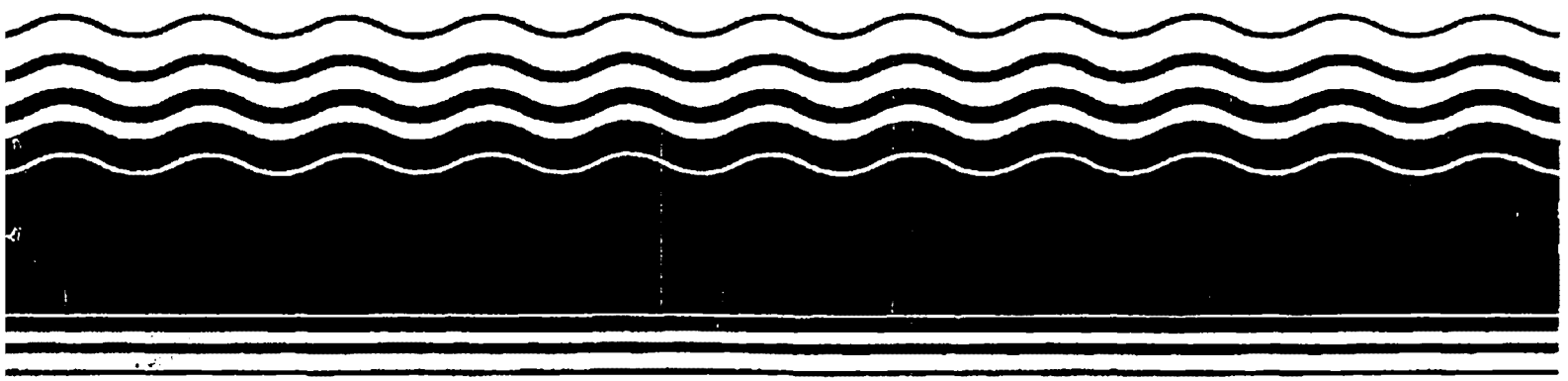
EPA541-R98-071
1999

# EPA Superfund
# Record of Decision Amendment:

## American Chemical Service Inc. Site
## Griffith, IN
## 7/27/1999



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

# RECORD OF DECISION AMENDMENT

for the

American Chemical Service, Inc. Superfund Site
Griffith, Indiana

July 1999

## CONTENTS

DECLARATION

SELECTED REMEDIAL ALTERNATIVE FOR THE

American Chemical Service, Inc., Site
Griffith, Indiana

**Statement of Basis and Purpose**

This decision document presents the amendment to the remedial action for the American Chemical Service, Inc. (ACS) site, Griffith, Indiana, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the administrative record for the site. The attached index identifies the items that comprise the administrative record upon which the amendment determination is based.

**Description of the Amended Remedy**

This decision document amends the 1992 ACS Record of Decision (ROD) to change the previously-selected cleanup method, consisting of a full treatment remedy that would have achieved residential-use cleanup levels, to a combined containment and treatment remedy that preserves the current use of the site as industrial use. The treatment of polychlorinated biphenyl (PCB) and volatile organic compound (VOC)-contaminated soil using low temperature thermal treatment (LTTT) and soil vapor extraction (SVE) systems will be replaced by the following remedial actions:

- Soil contaminants will be hydraulically and physically contained on site by surrounding the site with a subsurface barrier wall (a slurry wall modified by adding a vertical flexible membrane liner into the middle of the bentonite/soil slurry mixture), capping the site to reduce infiltration, and withdrawing groundwater inside the barrier wall to effect an inward groundwater gradient, where practicable.

- Volatile organic compound-laden soils within the containment system will be treated by installing and operating an SVE system in certain areas of the site that contain very high levels (greater than 10,000 mg/kg) of VOCs. The SVE system will be operated with the goal of reducing the very high VOC levels to prevent the possible degradation of the barrier wall by high VOC levels and the subsequent movement of VOCs off site into the groundwater.

- PCB-laden sediments in site wetlands will be excavated to achieve a cleanup level of 1 mg/kg to depth. Excavated sediments containing less than 50 mg/kg PCBs may be consolidated on site beneath the cap. Excavated sediments containing greater than 50 mg/kg PCBs will be disposed of off site at a TSCA-compliant facility. The wetlands area will be restored.

- A deed restriction will be maintained on the site so that the future use(s) of the property will be restricted to those activities which do not interfere with the performance of any cleanup activities or disturb the integrity of the completed containment system. Should a zoning change to residential use be made, such a change must be accompanied by the proper cleanup effort needed for the new site-use assumption.

For the time period ending approximately one year from the date of signature on this ROD Amendment, U.S. EPA will be gathering data from certain areas of the off-site groundwater contaminant plume to determine whether contaminants of concern may be addressed through monitored natural attenuation. In other discreet areas, U.S. EPA is testing the application of oxygen releasing compounds into the affected portion of the aquifer to ascertain whether bioremediation of the organic contaminants in the plume is enhanced. Should either of these alternative groundwater cleanup methods prove to be successful (as defined by agency guidance documents for the processes), U.S. EPA may initiate a second ROD Amendment proceeding so that the conventional pump and treat method denoted in the 1992 ROD may be modified as appropriate.

The groundwater cleanup standards identified as part of the selected remedy in the 1992 ROD remain unchanged, as well as the remaining aspects of the 1992 ROD remedial action not specifically addressed by this ROD Amendment.

**Declaration Statement**

The selected amended remedy is protective of human health and the environment, attains Federal and state requirements that are applicable or relevant and appropriate for this remedial action, is cost-effective, and is otherwise in compliance with CERCLA. This remedy satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

Because this remedy will result in hazardous substances remaining on-site above health-based levels, a review will be conducted every 5 years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

**State Concurrence**

The State of Indiana concurs with the amended remedy.

27 July 99

for William E. Muno, Director
Superfund Division

Date

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR
AMERICAN CHEMICAL SERVICE, INC. SITE
GRIFFITH, INDIANA

UPDATE #3
JULY 21, 1999

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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
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September 14, 1999

Mr. Frank Lyons
Regional Administrator
U.S. EPA, Region V
77 West Jackson Blvd.
Chicago, IL 60604

Dear Mr Lyons:

Re: Record of Decision (ROD) Amendment
American Chemical Services (ACS)
Superfund Site, Griffith, IN

Staff of the Indiana Department of Environmental Management (IDEM) have reviewed the United States Environmental Protection Agency's (U.S. EPA) draft Record of Decision Amendment for the American Chemical Services Superfund Site. The ACS Site was listed on the National Priorities List (NPL) September 21, 1984. IDEM is in full concurrence with the selected remedial alternative presented in this document.

The major components of the selected remedy include:

- Soil contaminants will be hydraulically and physically contained on-site by surrounding the site with a subsurface barrier wall (a slurry wall modified by adding a vertical flexible membrane liner into the middle of the bentonite/soil slurry mixture), capping the site to reduce infiltration, and withdrawing groundwater inside the barrier wall to affect an inward groundwater gradient.

- Volatile organic compound (VOC) laden soils within the containment system will be treated by installing and operating a Soil Vapor Extraction (SVE) system in certain areas of the site that contain very high levels (greater than 10,000 mg/kg) of VOCs. The SVE system will be operated with the goal of reducing the very high VOC levels. Reduced VOC levels will prevent the possible degradation of the barrier wall and the subsequent movement of VOCs off-site into the groundwater.

- Polychlorinated biphenyl (PCB) laden sediments in site wetlands will be excavated to achieve a cleanup level of 1 mg/kg to depth. Excavated sediments containing less than 50 mg/kg PCBs may be consolidated on-site beneath the cap. Excavated sediments containing greater than 50 mg/kg PCBs will be disposed of off-site at a Toxic Substances Control Act (TSCA) compliant facility. The wetlands area will be restored.

- A deed restriction will be maintained on the site so that the future use(s) of the property will be restricted to those activities that do not interfere with the performance of any cleanup activities or disturb the integrity of the completed containment system. Should a zoning change to residential use be made, such a change must be accompanied by the proper cleanup effort needed for the new site-use scenario.

Our staff have been working very closely with U.S. EPA Region V staff in the selection of an appropriate remedy and are satisfied with the selected alternative. We believe the remedy adequately addresses public health and environmental issues at the American Chemical Services site. In addition, we are pleased that you have taken steps to address the off-site buried drums in the vicinity of the barrier wall by assigning an On-scene Coordinator.

Please be assured that IDEM is committed to accomplishing the remediation of all Indiana sites on the National Priorities List and intends to fulfill all obligations required by law to achieve that goal.

Sincerely,

Lori F. Kaplan

Lori F. Kaplan
Commissioner

SKG:mg
cc: Rex Osborn, IDEM
Mary Beth Tuohy, IDEM
Sean Grady, IDEM
Tim Method, IDEM
Kevin Adler, U.S. EPA

# Record of Decision Amendment
# American Chemical Service, Inc., Site
# Griffith, Indiana

## Introduction

This Record of Decision (ROD) Amendment describes changes to the 1992 ROD for the American Chemical Service (ACS), Inc., Superfund site, Griffith, Indiana. The United States Environmental Protection Agency (U.S. EPA) is making these changes to the 1992 ROD as part of its responsibilities under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended.

The ROD Amendment includes modifications to the 1992 ROD to perform a combination of certain cleanup remedy elements that were previously evaluated in the 1992 ROD document, but portions of which were not selected as the 1992 cleanup remedy. The ROD Amendment consists of: 1) a revision to the assumed future use of the ACS property from residential use to industrial use; 2) a modification of the site cleanup approach from full treatment of contaminated materials to a combination of containment (using subsurface barrier wall and capping technologies) and partial treatment of mobile contaminants; 3) a modification to the wetlands cleanup method; 4) a modification to the groundwater contaminant plume cleanup method; and, 5) the placement of deed restrictions on the future uses of the site. The details of the ROD Amendment are described below.

## Background

The ACS Site is located at 420 S. Colfax Ave., Griffith, Indiana, (see Figure 1) and is comprised of 19 acres of American Chemical Service Corporation-owned or leased property which includes the so-called "Off-Site Containment" and the "On-Site Containment" areas, the 2-acre property known as the "Kapica-Pazmey" property, and a 15-acre portion of the Griffith Municipal Landfill. Groundwater contaminant plumes emanate from the ACS site (as demonstrated in Figure 1) and site wastes have impacted certain nearby wetland areas.

The American Chemical Service Corporation (ACSC) began a solvent recovery business on the ACS property in May 1955. ACSC past waste handling, storage, and disposal practices led to the contamination of the site (except for the Town of Griffith Landfill area and the Kapica-Pazmey area), to the extent described in the 1992 ROD and other documents. ACSC ceased its solvent reclaiming activities upon losing its interim (authorization to operate) status under the Resource Conservation and Recovery Act (RCRA) in 1990, although it continues its specialty chemical manufacturing operations to this day.

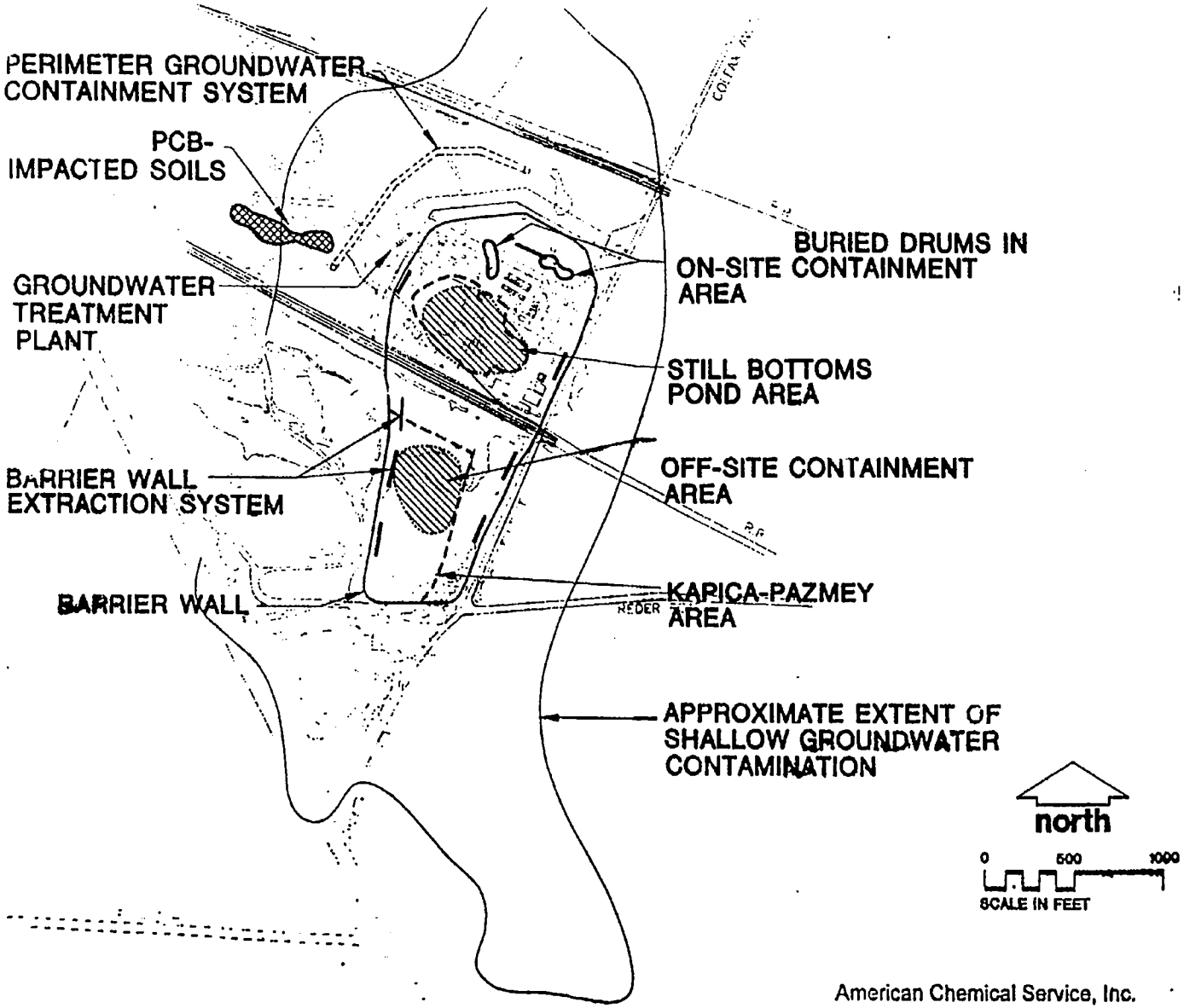


FIGURE 1

American Chemical Service, Inc.
Superfund site, Griffith, Indiana

The ACS Site has been extensively studied and tested to determine the nature and extent of chemical contamination in and around the site. The Remedial Investigation (RI) report shows that there are large areas on site with numerous types of buried contaminants that are both sources of groundwater contamination and potential contact hazards for site workers. Major waste categories include volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and heavy metals. These contaminants are found at variable concentrations within the Off-site Containment area, the Kapica/Pazmey area, and in the On-site Containment area. Volatile organic compounds such as benzene and chloroethane are a concern in area groundwater.

The 1992 ROD detailed U.S. EPA's determination that the purpose of the selected remedy was to restore the contaminated property using cleanup levels that would allow the future unrestricted use of the property, i.e., for residential use. U.S. EPA contemplated the use of groundwater-use restrictions for areas beyond ACSC property boundaries until the groundwater quality was restored to drinkable status. U.S. EPA would also restrict the future use of groundwater directly under the site. The following methods were to be used to perform the cleanup at the ACS site:

1. The excavation of buried wastes and up to 135,000 cubic yards of contaminated soils and debris, with subsequent on-site treatment of organic contaminants using low-temperature thermal desorption (LTTD) on soils and other methods such as steam-cleaning on the debris. Metals-containing residuals may have required a further immobilization step.

2. The off-site disposal of miscellaneous debris.

3. The excavation of approximately 400 drums in the On-site Containment area with shipment off site for incineration of the contents.

4. The implementation of soil vapor extraction (SVE) of VOC-contaminated soils, including the performance of a SVE pilot study in the buried waste in the On-site Containment area.

5. The construction of a groundwater extraction and treatment system capable of dewatering the site and also containing the off-site groundwater contaminant plume. Treated water would be discharged to the wetlands.

6. The further evaluation and monitoring of the impacted wetlands with possible cleanup of the wetlands.

7. The placement of a security fence around the site to prevent access to contaminants and the implementation of deed restrictions on the property.

8. The implementation of long term groundwater monitoring, including private well sampling. Impacted wells would be subjected to closure or the owner would receive groundwater-use advisories.

(Note: The Town of Griffith is separately addressing the 15-acre portion of the Griffith Municipal Landfill, through the Indiana State Solid Waste closure/post-closure program.)

The 1992 ROD also called for the LTTD and SVE systems to undergo treatability testing to determine if these cleanup methods would be able to attain final cleanup levels.

Based on a combined estimated volume of 135,000 cubic yards of impacted soil and debris, the 1992 ROD estimated that the selected cleanup remedy would cost between $38 million and $47 million to construct and implement over a 6-year to 8-year time frame.

## Site History Post-1992 ROD

In selecting the remedial action for the ACS site, U.S. EPA had relied upon, among other factors, waste-treatment volume estimates drawn from the RI report. After releasing the 1992 ROD, and in preparation for implementation of the cleanup, U.S. EPA conducted both additional sampling at the site and site-waste materials handling and treatability studies in 1997 to ascertain the accuracy of the soil volume estimate and to determine if LTTD was a viable cleanup remedy for the ACS site. The reports entitled "Pretreatment/Materials Handling Study Report" (1997) and "Thermal Treatability Study" (1998) contain the results of these testing efforts.

Results of the Materials Handling Study indicate that an estimated volume of 150,000 to 200,000 cubic yards of contaminated waste, soils, and debris would have to be excavated and treated using LTTD alone to remove VOCs, in order to meet the residential cleanup levels contained in the 1992 ROD. U.S. EPA found that municipal waste and other debris was not treatable using the steam cleaning method chosen in the 1992 ROD. Thus, the estimated volume of soils to be treated using the resource-intensive LTTD method had greatly increased. Moreover, much of the material could not be treated effectively using LTTD, since some of the waste stream was municipal waste and the VOC-mass was undercalculated. Municipal waste is not amenable to LTTD, and new disposal methods will have to be found. The waste handling study results project the need for an extra high level of safety requirements for site workers due to the high levels of VOCs that would be encountered when contaminated soils, wastes, and debris were excavated for treatment. The high levels of VOCs could

constitute an explosion hazard as well as an exposure hazard to site cleanup workers, and plausibly to area residents.

U.S. EPA also concluded that other management options may be necessary for ACS site wastes, because LTTD would not be a practicable treatment alternative, and on-site incineration, which would be required to properly treat the excavated wastes, is more expensive and perhaps not allowable under Indiana State law. Based upon the findings of the materials handling studies, the recalculated cleanup cost estimate for the 1992 ROD remedy is now $150 million to $246 million (present worth-1997), a substantial increase from the original $38-47 million (present worth -1992) cost estimate.

U.S. EPA also performed sampling of wetland soils/sediments during 1996 to delineate the extent of PCB-impacted soil/sediment. Some areas contain PCBs in soil/sediment above 1 ppm, with values exceeding 50 ppm in some cases. U.S. EPA, in consultation with IDEM and wetlands experts, has determined that wetland soil/sediments containing greater than 1 ppm PCBs should be excavated and managed on-site or disposed of properly off-site.

During 1996-1997, U.S. EPA performed further sampling work to more fully delineate the off-site groundwater contaminant plumes. As seen in Figure 1, groundwater contaminant plumes, defined as those areas at which the groundwater exceeds contaminant cleanup levels, are present in the northern and southern areas of the site. Aquifer characteristics are such that it may be impracticable to implement a plume-wide groundwater pump-and-treat program to restore groundwater quality. U.S. EPA is evaluating the use of a combination of active restoration methods, such as groundwater pump-and-treat and in-situ oxidation strategies, and monitored natural attenuation to effect cleanup of the groundwater. Monitored natural attenuation consists of the monitoring of natural processes in the aquifer which act to biodegrade, dilute, or adsorb groundwater contaminants so as to make them immobile, dilute, or break down into less harmful compounds to prevent exposure to harmful levels of contaminants.

Additionally, as the above studies were being performed, certain cleanup work was also being performed at the ACS site. A subsurface barrier wall was installed around the ACSC property in 1997 in an effort to contain the wastes on site. Further, a groundwater extraction system was installed inside the barrier wall to dewater the area to prevent movement of groundwater over and outside of the wall. Lastly, a groundwater extraction system was installed in the northern area of the site to control the movement of the more highly impacted groundwater in this area. Water pumped from both systems is being routed to an on-site treatment plant to remove the chemical contaminants before the cleaned water is discharged into the wetland areas.

## Proposed 1999 ROD Amendment

U.S. EPA issued a proposed plan for ROD amendment in April 1999, based upon the new information created by the Material Handling Study work described above, and a request from the ACS PRP Group that U.S. EPA reconsider the future site-use assumption in making a cleanup decision. The new cost estimate information shows that the 1992 ROD cleanup method would not be cost effective in comparison to other cleanup or waste management methods. Moreover, U.S. EPA now assumes the future use of the site property will be industrial, in concert with the current zoning designation assigned by the Town of Griffith. U.S. EPA would have concerns regarding the health and safety of site cleanup workers, ACSC workers, and the surrounding public should widespread waste excavation occur, since the high levels of VOCs could create a health hazard. Lastly, the treatability studies show that the selected treatment method, LTTD, would not be effective in treating a majority of site wastes.

U.S. EPA proposed that wastes be contained by using a combination of cleanup alternatives evaluated in the 1992 ROD, including containment-type alternatives and treatment alternatives. Specifically, U.S. EPA proposed using applicable portions of Alternative 2 in the 1992 ROD -- subsurface barrier wall and surface capping--, and Alternative 5 -- soil vapor extraction of VOC-laden soil and debris-- along with the excavation and incineration of the contents of buried drums in the On-site Containment area. Under plans and specifications developed in accordance with Alternatives 2 and 5 of the 1992 ROD, some groundwater would be extracted and treated. However, U.S. EPA also proposed the testing of in-place cleanup alternatives and of monitored natural attenuation.

Other portions of the alternate remedy include the excavation of PCB-laden wetland soil/sediment. Excavated material with total PCB levels less than 50 ppm would be consolidated under the cap, and materials containing greater than 50 ppm would be disposed off-site in a TSCA-compliant facility. Deed restrictions would be placed on the property to ensure that should a zoning change to residential use be made, such a change is accompanied by the proper cleanup effort needed for the new site-use assumption. (Note: deed restrictions are now in place and can only be removed from the property with U.S. EPA concurrence.)

U.S. EPA released a Proposed Plan for ROD Amendment for public comment on April 19, 1999. The comment period was scheduled to run from April 19, 1999, through May 21, 1999. U.S. EPA hosted a public meeting at the Griffith Township Hall, Griffith, Indiana, on May 13, 1999, at 7:00 pm, and presented the proposed 1999 ROD Amendment and took official public comments from the audience. The comments have been addressed in the Responsiveness Summary attached to this ROD Amendment.

## Detailed Description of 1999 ROD Amendment

The ROD Amendment provides for the protection of human health and the environment through a combination of the following:

### 1. Limitations on the potential for future exposure to contaminants

U.S. EPA determined that two methods would be used to isolate contaminated areas to prevent future exposure to site contaminants:

#### a. Barrier Technologies

U.S. EPA would construct a subsurface barrier wall (sometimes termed a "slurry wall"), on the ACS site to minimize the movement of site contaminants off-site and to impede groundwater flow into the site, as described by Alternative 2 of the 1992 ROD. The barrier wall would be keyed into a clay confining layer approximately 25 feet below the surface. The pumping of groundwater from within the area surrounded by the slurry wall would maintain an inward groundwater gradient across the wall, where technically practicable. Contaminant source areas would be covered with a soil cap to reduce the infiltration of rainwater and snowmelt into the area enclosed by the slurry wall, and to prevent workers from directly contacting site contaminants. (Note: a barrier wall consisting of high-density polyethylene plastic and a bentonite-soil slurry was installed on the ACS site in 1997, see Figure 1.)

#### b. Deed Restriction

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.

### 2. Treatment of subsurface soils through soil vapor extraction

As described in Alternative 5 of the 1992 ROD, U.S. EPA would dewater the area behind the barrier wall, using a series of groundwater pumping wells, to allow for the excavation of intact drums containing hazardous wastes. Intact buried drums in the On-site Containment Area would be incinerated off-site. An in-situ vapor extraction (SVE) system would then be installed in certain areas of the site to treat both soils and buried wastes to remove VOCs and to also help to biodegrade VOCs and SVOCs in the ground. Removal of VOCs helps to prevent failure of the slurry wall and removes the explosion hazard associated with excavation of the soils. Collected VOCs and SVOCs would be destroyed on-site using catalytic oxidation equipment or captured on activated carbon for off-site destruction or disposal.

### 3. Extraction and treatment of contaminated ground water

Groundwater pumping and treatment would be performed in certain areas outside the barrier wall to restore groundwater quality. Treated groundwater would be discharged to the wetlands. Monitored natural attenuation and in-ground treatment methods may also be tested and used if successfully proven to restore groundwater quality. Natural attenuation is the general process of monitoring water quality over a period of time to demonstrate that natural processes are causing contaminant levels to fall due to a combination of dilution, biodegradation, and sorption forces within the groundwater aquifer. Should dilution, biodegradation, and sorption forces cause water quality to improve in a reasonable time frame versus active treatment methods, then monitored natural attenuation can be considered to be a viable cleanup alternative for groundwater. In ground treatment methods could include the introduction of oxygen-releasing compounds into the contaminant areas to aid in the biodegradation of organic compounds, and improve water quality.

U.S. EPA is currently collecting all appropriate data for the above alternatives to the groundwater pump and treat remedy selected in the 1992 ROD, to determine whether they could be used effectively at the ACS site. The agency expects to conclude its evaluation by Summer 2000. By that time, U.S. EPA will have examined all data and performed an analysis to determine whether the alternative methods would be expected to achieve the 1992 ROD cleanup goals in a reasonable timeframe for area groundwater. If the alternative methods appear to be viable, then U.S. EPA will consider a further amendment of the 1992 ROD by releasing another proposed plan for public comment.

### 4. Excavation of impacted wetlands soils

To remove direct contact hazards, the excavation of PCB-laden wetland soil/sediment, with the consolidation under the on-site cap of materials with less than 50 ppm, and the disposal off-site of material containing greater than 50 ppm, would be performed.

## Evaluation of ROD Amendment

U.S. EPA has evaluated the 1999 ROD Amendment in comparison to the 1992 ROD remedy, using the nine criteria below:

Overall Protection of Human Health and the Environment - addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with ARARS (Applicable or Relevant and Appropriate Requirements) - addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements (ARARs) of Federal and State environmental laws.

Long-Term Effectiveness and Permanence - refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

Reduction of Toxicity, Mobility, or Volume - refers to the anticipated performance of the treatment technologies a remedy may employ.

Short-Term Effectiveness - involves the period of time needed to achieve protection, and any adverse impacts on human health and environment that may be posed during the construction and implementation.

Implementability - is the technical and administrative feasibility of a remedy, including the availability of goods and services needed to implement the chosen solution.

Cost - includes estimated capital and operation and maintenance costs, and estimated present worth costs.

Support Agency Acceptance - indicates whether, based on its review of the Proposed Plan, the support agency concurs, opposes, or has no comment on the preferred alternative. This acceptance is typically assessed from support agency comments received during the public comment period.

Community Acceptance - will be assessed following a review of any public comments received on the Proposed Plan for ROD Amendment.

The nine criteria outlined above are commonly divided into three groups: threshold criteria, balancing criteria, and modifying criteria. The first two criteria are threshold criteria, and any proposed remedial action under consideration must satisfy them. The rest are balancing and modifying criteria, and are used to evaluate the strengths and weaknesses of those alternatives that satisfy the threshold criteria, leading to the selection of a cleanup alternative.

## Overall Protection of Human Health and the Environment

The site cleanup remedies set forth in both the 1992 ROD and in this ROD Amendment will protect human health and the environment. Potential routes through which humans and/or environmental receptors could be exposed to site contaminants (pathways) include ingestion of contaminated groundwater, direct contact with contaminants in the subsurface soil, and the movement of VOC contaminants from the subsurface soil into the groundwater.

The 1992 ROD remedy addressed the soil exposure pathway through the excavation of contaminated soil to cleanup levels, with the subsequent treatment of contaminated soil using LTTD and the solidification of soil contaminated with heavy metals. The ROD Amendment addresses the soil pathway through the placement of a soil cap and barrier wall, plus the implementation of SVE to remove VOCs and, to a lesser extent, SVOCs, from the ground. Excavation of PCB-laden soil in the wetland area, and the placement of deed restrictions on the property, would also prevent exposures to contaminants.

Thus, while the 1992 ROD cleanup remedy relied solely on the destruction and/or solidification of soil contaminants, the ROD Amendment relies on a combination of treatment and containment methods to minimize exposure pathways.

## Compliance with ARARs

The 1992 ROD cleanup methods would have complied with the ARARs listed in that document. This ROD Amendment will comply with the ARARs listed in the 1992 ROD, and any state and federal laws that may have since been updated. The ROD Amendment requires that the remedial actions comply with the current versions of the ARARs listed in the 1992 ROD.

## Long-Term Effectiveness and Permanence

The 1992 ROD remedy achieved long-term effectiveness and permanence through the removal and destructive treatment of groundwater, subsurface soil, surface soil contaminants (except heavy metals, which cannot be destroyed).

The ROD Amendment achieves a lower level of long-term effectiveness and permanence for the soil, although some treatment of VOCs would occur. Residuals would be managed over the long term by containment within the barrier wall and cap structure.

## Reduction of Toxicity, Mobility, or Volume Through Treatment

Both the 1992 ROD and the ROD Amendment utilize permanent treatment technologies to address soil contaminants. The 1992 ROD would treat the entire soil contaminant mass. The ROD Amendment would only treat the VOCs and the SVOCs to a lesser extent. However, the SVE treatment would remove the more mobile compounds so that they are not a future source of groundwater contamination.

## Short-Term Effectiveness

U.S. EPA estimates that short-term impacts due to site cleanup work will be lower under the ROD Amendment than under the 1992 ROD. Short-term impacts typically associated with large-scale excavation activities (such as the release of dust and of vapors from wastes with high levels of VOCs) and the methods to alleviate the impacts (extensive vapor-control methods), would be of concern under the 1992 ROD. A significantly lower volume of contaminants will be excavated under the ROD Amendment than under the 1992 ROD, and U.S. EPA expects the duration of impacts to be much shorter.

In addition, U.S. EPA estimates that the length of time of the cleanup activities under the ROD Amendment is much shorter than under the 1992 ROD, due to other factors besides the soil volume difference. U.S. EPA estimates that it will take about 3 years to complete construction work under the ROD Amendment, from the time equipment is brought to the site to begin work, to the time the soil cap is completely in place, although the SVE equipment will likely operate for 2-10 years afterwards before it can be turned off. The 1992 ROD remedy would have required about 6-8 years to complete the excavation and LTTD process. U.S. EPA estimates that the duration of the groundwater cleanup effort would be the same under the 1992 ROD or the ROD Amendment.

## Implementability

The ROD Amendment will be less difficult to implement than the 1992 ROD. Construction and operation of SVE equipment at the site would be less difficult logistically than construction and operation of the LTTD technology. SVE technology is readily available on a commercial scale and have been previously used for the treatment of VOCs at other sites.

## Cost

The ROD Amendment will cost significantly less to implement than the 1992 ROD cleanup (as revised due to the results of the materials handling and treatability studies). The estimated cost for completing the ROD Amendment, using one or more of the various cleanup methods, ranges from $45 million to $50 million (in addition to the estimated $13 million spent to date implementing the limited remedial actions now in place and performing the treatability and materials handling studies). This cost estimate includes an $18 million capital cost plus $27 million (present net worth at a 5% discount rate) in operation and maintenance (O&M) costs over 30 years. The revised cost estimate for implementing the 1992 ROD is $150 million to $246 million, including O&M costs.

## Support Agency Acceptance

The State of Indiana concurs with the ROD amendment.

## Community Acceptance

U.S. EPA has evaluated community acceptance of the ROD Amendment in the attached Responsiveness Summary.

## Statutory Determinations

The Superfund law (CERCLA), requires U.S. EPA to clean up NPL sites to achieve the protection of human health and the environment in compliance with Federal and state environmental laws and policies (ARARs). Selected cleanup remedies must also be cost-effective and utilize permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable, with an emphasis on cleanup remedies that employ treatment to permanently and significantly reduce the toxicity, mobility or volume of the hazardous substances, pollutants or contaminants. Based upon the evaluation of the nine criteria, U.S. EPA believes that the ACS site ROD and ROD Amendment satisfy these requirements of CERCLA, in that the ROD and ROD Amendment would be protective of human health and the environment, would attain ARARs, would be cost-effective, and would use treatment technologies to permanently and significantly reduce the toxicity, mobility or volume of the hazardous substances, pollutants or contaminants to the maximum extent practicable.

# RESPONSIVENESS SUMMARY

American Chemical Service, Inc. Site
Griffith, Indiana

The public participation requirements of CERCLA §113(k)(2)(B)(I-v) and CERCLA §117 have been met during the 1999 Record of Decision (ROD) Amendment process for the American Chemical Service, Inc. (ACS), site. Sections 113(k)(2)(B)(iv) and 117(b) of CERCLA require U.S. EPA to respond "...to each of the significant comments, criticisms, and new data submitted in written or oral presentations" on a proposed plan for a remedial action. This Responsiveness Summary addresses those concerns expressed by the public, potentially responsible parties (PRPs), and governmental bodies in written and oral comments received by U.S. EPA regarding the proposed 1999 ROD Amendment for the ACS site.

## Background

U.S. EPA issued a fact sheet/proposed plan for this ROD Amendment in April 1999 to the public in the Town of Griffith, Indiana, prior to the start of the public comment period. U.S. EPA placed an advertisement announcing the availability of the proposed plan and the start of the comment period in the Hammond Times (Ridge Zone), on April 15, 1999.

U.S. EPA maintained information repositories at the three following locations: U.S. EPA Region 5, 77 W. Jackson Blvd., Chicago, IL; Griffith Branch Library, 940 N. Broad St., Griffith, IN; and at the Griffith Township Hall, 111 N. Broad St., Griffith, IN. The Agency made the Administrative Record available to the public for review at each of these locations as well.

The public comment period ran from April 19, 1999, to May 21, 1999. U.S. EPA received no timely requests for an extension to the 30-day comment period.

The Agency hosted a public meeting at the Griffith Township Hall on May 13, 1999, to provide background information on the Site, provide details of the proposed 1999 ROD Amendment, and to take oral public comments regarding the proposed amendment to the Site cleanup action. U.S. EPA answered questions about the Site and the 1999 ROD Amendment proposal under consideration. A court reporter documented formal oral comments on the Proposed Plan and U.S. EPA has placed a verbatim transcript of this public meeting in the information repositories and in the Administrative Record. Written comments were also accepted at this meeting, although none were submitted. Approximately 18 persons attended the meeting, including local residents, agency representatives and potentially responsible party (PRP) representatives.

During the comment period, U.S. EPA received 2 sets of written comments and 7 people provided oral comments during the public hearing concerning the proposed plan. This Responsiveness Summary includes comments received during the public comment period and the U.S. EPA's responses to those comments, and is a part of the 1999 ROD Amendment.

Summary of Significant Comments

A. **Written**

**Comment 1A**: Mr. George E. Smolka, Griffith, IN

Mr. Smolka mailed a set of 21 comments to the agency on May 21, 1999, some of which were also given during the public hearing:

"My commentary concerning the superfund site known as American Chemical Service (ACS) located in Griffith, IN is divided into three sections:

I. Commentary on statements made during the May 13th public meeting by EPA, IDEM, and the PRP representatives in the persons of their consultant, Montgomery Watson, Inc.;
II. Commentary on the technical efficacy of the proposed containment method; and
III. Commentary on the long term probabilities of the proposed ROD and questions about technologies which might apply but were not mentioned at the meeting.

1. "The most telling statement made during the hearing was made by Kevin Adler of EPA in the introductory comments of his part of the presentation. He state[d] that the EPA had grave concerns about the safety of the ACS personnel if the buried toxic materials on site were exhumed and processed. If EPA has concerns about the casual transitory exposure of above ground personnel how can it ignore the long term effects of such obviously dangerous chemicals on the air and drinking-water of the town of Griffith?

2. "Furthermore, since migration of the toxic plume may already have reached the retired old Griffith landfill site and since the leachate of this site is simply being pumped out into the adjacent legal drain without treatment, how can the EPA ignore [that] this continues exposure of the adjacent lands and people to the toxics at ACS for the indefinite period of the containment?

3. "The statement was made [during the public hearing] by Mr. [Peter] Vagt [of Montgomery Watson] that the ground level aquifer rests on a clay bed of glacial origin of some 3.05 m deep. While this is clearly an adequate barrier for water, no evidence was presented that this is an adequate barrier to one or all of the toxic organics

permeating the ACS site. The time span for the proposed containment is indefinite, and therefore even very slow migration of toxics through this layer poses a long term potential hazard.

4. "Mention was made by several participants that some if not a majority of the existing toxics are contained in buried drums. If this is the case, careful handling of those still intact, poses little no hazard except for the surface contamination from adjacent ruptured drums. To leave these potentially hazardous but to this date processable components in contact with wet earth until they too rust through and rupture is nothing less than criminal negligence. Furthermore, the simplest student will be able to calculate that processing intact drums is far less costly than thousands of cubic meters of contaminated wet soil.

5. "Mr. Adler indicated that no attempt was made to ascertain the extent of migration of the ACS plume into the abandoned Griffith landfill. The reason given was that there was no way of knowing what materials were already present in the landfill and identification of the isolated ACS components might be impossible. By the same reasoning additional toxics may be percolating from the Griffith landfill onto the ACS site which may be more difficult to deal with or may interact chemically with ACS wastes to produce even more toxic products. Ignorance may be bliss but it is also frequently deadly. The probability may be low, but would you risk your children or grandchildren to this numbers game?

6. "When queried about heavy metals none of the regulatory personnel or those from Montgomery Watson had much information about heavy metal contamination at the ACS site. Since I made my living as a chemist and biochemist in industrial settings for many years, I know that various heavy metals are used in industrial synthesis, reformation, oxidation and other processes of the chemical industry. Since also, the solvents used for processing final products come in contact with these catalysts and are contaminated by them, I find it very strange indeed that so little knowledge about heavy metals is available. Some of these are highly toxic. Moreover, they may react in an acidic environment to give very deadly products which may be volatile or very water soluble.

7. "When asked about the monitoring system currently being used at ACS, the response from regulators and consultants seemed to indicate that no material specific sensors were in use, other than pH sensors. Neither gas-specific detectors nor compound specific electrodes, nor redox detectors, to mention but a few, were in use. Considering the advanced state of statistical process control devices and other analytical methods available "off the shelf" the lack of automated, computer controlled monitoring leaves me puzzled. The tenants of Murphy's law should teach you that things will go wrong at the most inopportune time. As one example, what will you say if

a dangerous, let-alone deadly, outgassing occurs during a long week end and there is no one on site to monitor?

"Two major aspects of the ACS site lead me to believe that the proposed changes to the ROD are categorically the wrong choices. 1. The hydrology of this area is both pervasive and dynamic and 2. The volume and mass of the contaminants is potentially so large as to pose a threat for even innocuous materials:

8. Clean water leaking down from the upper aquifer to the lower of course poses no threat but more importantly would not be detectable easily. That any natural layer is imperfect and filled with flaws, weak spots, cracks and fissures is known to any geologist. To assume that the clay layer under ACS is intact and flawless, without thorough testing, is ridiculous. Once the lower aquifer is contaminated it will be impossible to reverse. Even with adequate monitoring of the lower aquifer and the future ability to detect leakage at an early stage, the outlay of money for capping and monitoring would be wasted if as a result of future leakage the site has to be dug up anyway.

9. "Furthermore even a very low contamination with some materials, where the health hazard level is close to the limit of detection, would make the lower aquifer unusable. That is a blatant wastage of resources. On this basis alone the material must be dug up and destroyed before irreversible contamination occurs.

10. "What will be the effect of hydrostatic pressures and subterranean streaming on the containment barrier? Are these dynamics understood for this site?

11. "My understanding of the monitoring system currently in place seems inadequate to the needs of the site. I respectfully request a complete set of protocols for this site to more fully evaluate the proposed methods.

12. "No attention seems to have been paid to the potential for chemical reactions occurring underground at the site. Of particular concern to me is the well known effect of some solvents to act in synergy with others to mobilize materials that are not soluble in either neat solvent (multitudinous examples exist in the literature). Furthermore it is a well known fact that anaerobic oxidations lead to significantly changed materials in landfill types of environments (e.g., the formation of large quantities of methane in landfills). Not only degradation reactions occur but reformation reactions also. In this vein, toxic, explosive, and solvency problems may arise at this site which are not expected and will be very costly and difficult to deal with. To avoid this class of problems, the only logical answer is separation, removal and destruction of the materials at this site. I do not wish to imply that the probability for such problems is in my estimation high, but if they occur, the cost for remediation will be enormous.

13. "The barrier erected suffers from a lack of in-ground experience. These types of [high density polyethylene] HDPE layers backed by bentonitic clays have only been in use for some fifteen years, at most. I have some experience with accelerated testing and know that in most cases it is a poor predictor of stability of containers. Under accelerated testing, some things fail that won't under simple time testing and others survive that completely fail under time testing. I will not bore you with the rational, reasons and chemistry for this since it is very complex. It is already known that under the time-dependent impact of organic solvents, a bentonitic barrier begins to increase in permeability. Since it is clear that the site will be in existence for many years, it is a bad place to test this technology; failure will be very costly.

14. "Has the cost of pollution of the upper and lower aquifer as lost resources and added costs for water to the town of Griffith been included in the +$47 million estimate? Is someone prepared to accept these costs should they occur?

15. "Is the long term cost of years of monitoring included in the $47- $50 million price tag? Has there been provision for Hazmat costs associated with an emergency generated at the site. Is there a Hazmat team and <u>all</u> the necessary equipment available for an unforeseen emergency? Are the costs for this included?

16. "I feel that both EPA and the PRP's (Principally Responsible Parties) are in too much of a hurry to bring this problem to a conclusion in the cheapest way possible. You run the risk of never enough time (or money) to do it right , but always enough time (or money) to do it over. The "do it over" costs will far exceed the current high estimate both in current and inflated dollars.

17. "The continued existence of the hazardous materials at the site and the increasing time dependent risk of mixing, chemical and physical interaction, percolation, diffusion and dispersal over time by many mechanisms other than water flow; make this [proposed] ROD [amendment] seem a very poor excuse for a solution.

18. "Accidental and catastrophic exposure and dispersal are only possible if the hazardous material is still in place. Should such an event or events occur, you will not have the luxury of debate and consideration. Action will have to be immediate and concentrated. Such actions are both very costly and have an increased risk of failure (crash programs tend to crash). In a political climate of increased accountability do you [EPA] and the PRPs want to answer for such an avoidable disaster?

19. "While you address the possibility of oxygen donor enrichment you do not mention any of the currently experimental and or foreign bioremediation methods available in the literature and as articles of commerce. Single-celled organisms (both selected and engineered) of various types have been tested by inoculation and injection *in situ* under varying conditions all over the world for bioremediation of ACS-types of problems.

Have either EPA or the PRP's looked at the possibility and applicability of such solutions to the ACS problem?

20. "The plans for the remediation of the affected adjacent wetlands has not been addressed. Could you please send me a complete plan with protocols for this phase of the restoration?

21. "A conceptual problem exists with an indefinite monitoring period. As time proceeds and the people involved in the original decision retire or die, the seriousness of the problem, its potential effect on the community will fade from conscience and the mounting cost will all exert pressure to discontinue monitoring. If a long period of years of problem-free operation precede such a decision, all involved will be lulled into complacency and wishful thinking. All other factors not withstanding, human nature will push for such a decision. Many of the most serious consequences may occur imperceptibly slowly and take many years to become apparent. We live in a society with a very short memory and little appreciation of history. To leave a potential problem in place, like a sleeping monster, is at best foolish."

**Response 1A**:

1. U.S. EPA regrets that the commenter may have misinterpreted Mr. Adler's remarks made during the public hearing. Through the proposed plan for ROD Amendment, U.S. EPA expressed its concern for the safety of site cleanup workers should low temperature thermal treatment (LTTT) or incineration be implemented as an ACS site cleanup remedy. According to site studies, soil and debris heavily laden with volatile organic compounds (VOCs) could lose up to 60% or more of the contaminant mass due to volatilization during handling, which could pose an explosive hazard as well as a toxic exposure problem to cleanup workers. These potential exposures would certainly not be "casual[ly] transitory." Nearby the cleanup site, ACS, Inc., workers and local residents would also be potentially at risk should uncontrolled emissions occur during the widespread excavation and materials handling operations needed to support either LTTT or incineration treatment methods.

Further, U.S. EPA discussed during the public hearing the nine criteria that the agency uses to evaluate potential cleanup alternatives at Superfund sites. Two of those criteria were "short term effectiveness" and "long term effectiveness," which suggest that the agency must consider the short term effects of cleanup alternatives (such as exposure to very high levels of toxins or unsafe working conditions during a cleanup action) in conjunction with the long term effects of cleanup actions (such as the potential for future exposures to much lower levels of toxins, if any, over a long period of time) and try to determine the most feasible cleanup route to take. In this case, it is clear to the Agency that unacceptable short term risks could occur if site-wide excavations were necessary during the cleanup action. Conversely, the containment

with treatment remedy would prevent off-site exposures to site contaminants over the long term so as to reduce the potential for exposure to site contaminants in those areas.

U.S. EPA also disagrees with the commenter's assertion that the agency is 'ignoring the long term effects of site contaminants on the air and drinking water' of Griffith, IN. Implementing the 1992 ROD, as modified by the 1999 ROD Amendment, will clean up groundwater to drinking water standards and provide protectiveness over the long term. Site-related contaminants are not being released to the air in sufficient quantities to cause measurable risks at this time. The performance of the cleanup remedy, as amended, will help prevent both short term and long term uncontrolled air emissions from the site by removing a great part of the mass of VOCs using the SVE treatment systems and by placing a barrier between the ground and the atmosphere (cap) that will help to prevent VOC emissions to the atmosphere.

2. U.S. EPA again disagrees with the commenter's assertion that the agency is 'ignoring continued exposure of ACS contaminants to adjacent lands and people.' As explained in the 1992 ROD, the town landfill was originally added to the ACS site listing; however, investigations showed that:

"The Baseline Risk Assessment did not identify any completed exposure pathways from the landfill. Additionally, the [Remedial Investigation] RI did not indicate that the landfill was causing any downgradient ground water contamination. This could be due in part to the dewatering activities at the landfill. As part of the RI, it was determined through [groundwater] modeling, that if the current dewatering system was discontinued the ground water flow patterns would not change significantly. Given these facts, this ROD does not require remedial action at the Griffith Municipal Landfill." [1992 ROD, p. 31]

Further, the proposed containment-with-treatment remedy would prevent contaminants from moving off site into the landfill area. Thus, the landfill area would not be a concern in terms of the ACS site cleanup action under either the 1992 ROD or the 1999 ROD Amendment cleanup methods. The town of Griffith must address any contaminants which users of the landfill place in the town landfill, under its landfill closure agreement with the state of Indiana.

Furthermore, results of recent groundwater monitor well sampling in the town landfill show that little or no ACS-type contaminants are found there, confirming the Agency's decision in the 1992 ROD to delete the landfill from the site. (Note: U.S. EPA has placed this information in the information repository.)

3. U.S. EPA agrees with the commenter that the movement of "toxins" through the clay layer could be a long term concern at the site, but only if nothing was done about the site contamination. The Agency recognizes that the volatile organic compounds

(VOCs) beneath the ACS site are the most mobile contaminant fraction, and that semi-volatile organics (SVOCs) and, to an extent, heavy metals are less likely to move off-site, since SVOCs and metals tend to sorb onto clay particles very tightly. Also, SVOCs are less soluble in water than VOCs, and thus will not tend to move with the groundwater as readily as VOCs will.

The Agency will use several active treatment methods to prevent VOC-contamination from reaching the lower aquifer by removing the more mobile contaminant fraction from beneath the site. The soil vapor extraction (SVE) systems will be installed to remove the VOCs from the ground, and groundwater from within the barrier wall will be pumped out to create an inward gradient, reducing the potential for contaminants to move off site through the barrier wall. The removal of the mobile VOCs lowers the possibility of their later movement through the clay layer.

However, the Agency recognizes that groundwater levels in the upper aquifer within the barrier wall cannot be lowered enough to produce an upward gradient from the lower aquifer, through the clay layer, to the upper aquifer. The upward gradient would help prevent the downward movement of VOCs through the clay layer. Therefore, there will be periodic monitoring of the groundwater beneath the site, to ensure that the lower aquifer remains free of site contaminants. This monitoring will detect any break-throughs, which will then be handled appropriately by, for example, pumping and treating the impacted groundwater. Even so, the Agency believes that handling potential lower aquifer contaminants, if any, in this manner will be safer than digging up the contaminant mass for treatment above ground.

4. The Agency agrees that the removal of intact drums of contaminants is highly desirable. Such a removal is an integral portion of the overall ACS site cleanup plan. Note that the 1992 ROD called for the removal of about 400 drums of waste from the site, and that this number has since been raised to perhaps as high as 2500 after further testing was performed at the site. However, during the public hearing a few people questioned whether it was true that over 80,000 drums of waste may be buried at the site and if so, why aren't we removing them.

The Agency acknowledges that there are quite a few drum carcasses disposed of in the "Off-site Containment" area, but test pits dug into the ground in that area showed that many were damaged and therefore incapable of holding any liquids. It would be safer to remove the VOC contaminants from the ground using SVE rather than digging up the highly contaminated soil and debris for processing in a thermal treatment device. If the great majority of the (estimated) 80,000 drums were intact, then the cleanup alternative more than likely would have contemplated a drum removal component.

5. (See also response to comment 2., above.) Previous investigations ruled out the need to further ascertain the extent of ACS site contamination into the town landfill.

Moreover, the barrier wall containment system is designed to both prevent the movement of ACS contaminants off-site and the movement of off-site contaminants on site. Should that happen, however, the containment system is designed to capture and remove them by pumping out groundwater to maintain an inward gradient.

6. Heavy metals are not the primary contaminants of concern at the ACS site. According to the 1992 ROD, certain heavy metals are found in the soil and debris beneath the ACS site. These metals include varying concentrations of lead (as mentioned at the hearing), antimony, thallium, arsenic, cadmium, beryllium, manganese, barium, and chromium (+6 valence). However, lead was identified in the 1992 ROD as indicator metal (that is, if you clean up lead-containing soils then the rest of the metals would be cleaned up as well). Groundwater in the lower aquifer appears to contain naturally occurring levels of arsenic. The containment system is designed to contain these compounds as well as the VOCs and other organic compounds mentioned at the public hearing. Any volatile compounds created by heavy metal catalysts would be removed by the SVE treatment system. Soluble metals would be removed by the groundwater pumping system inside the barrier wall.

7. The monitoring systems and sensors used are standard for the water treatment industry. Computer controls are adequate to monitor the pumping and treatment systems on a day-to-day basis, also, a trained operator is present 5 days per week to perform necessary maintenance and upkeep. Should a standard parameter become off-specification, the computer automatically shuts down the pumping system until the human operator can fix the problem. "Deadly" outgassings would not occur since the concentrations of contaminants in the water being treated do not approach levels at which a "toxic cloud" would be created upon treatment equipment failure.

The effluent is monitored on a routine basis in accordance with the National Pollutant Discharge Elimination System (NPDES) requirements for water treatment plants under the Clean Water Act. Under the NPDES requirements, the ACS PRP Group has received a permit from the state of Indiana to discharge treated water from the plant as long as it meets allowable discharge standards. The routine monitoring is performed to demonstrate compliance with the discharge permit and to also show that equipment is functioning properly.

8. Enough monitor wells have been placed into the site area to delineate the extent of the clay layer between the upper and lower aquifers such that the Agency is more than comfortable with the assumption that it is continuous beneath the site in the containment area. Installation of the barrier wall also verified the extent of the clay layer, as the barrier wall is keyed into the clay layer. Monitoring water quality is thus an adequate measure to ensure containment.

Additionally, if leakage was discovered, the situation would not automatically cause the site to be dug up as the commenter assumes. In-place cleanup measures, if needed, using such technologies as grout injection, could be performed to mitigate leakage through the clay layer or barrier wall.

9. The Agency agrees with the commenter that some chemical compounds (such as vinyl chloride and benzene, to name but two) may demonstrate long term health effects at very low levels. However, a detection of low levels of compounds in the lower aquifer does not preclude its use as a drinking water source. The safety of site cleanup workers and local residents must be taken into account before stating that the material must be dug up as the only solution to the problems at the site.

10. The hydrostatic dynamics for site soil types (sand) are well documented in the geotechnical literature and have been taken into account for the construction of the barrier wall. Hydrostatic pressure is one reason why complete dewatering of the area within the barrier wall (to expose all VOCs to SVE) cannot occur. The barrier wall could well collapse if complete dewatering occurred. Also, barrier walls such as the one installed on the site are routinely "keyed" into an underlaying clay layer to guard against "subterranean streams" breaching the containment system.

11. The protocols for the site groundwater monitoring system are available in the information repositories listed above. The Agency believes the amount of monitoring is adequate to protect human health and the environment.

12. The Agency is aware that chemical reactions take place underground at cleanup sites such as the ACS site. For instance, common dry cleaning solvents found in groundwater break down into different chemical compounds under differing underground conditions. These compounds are a concern. If the solvents encounter a reducing or anaerobic (oxygen-poor) environment, such as that found beneath landfills, vinyl chloride could form in the groundwater. Aerobic (oxygen-rich) conditions generally would preclude the break down of the solvents into vinyl chloride.

At the ACS site, the SVE system will be employed to remove mobile VOCs from beneath the site. Additionally, the SVE system will help to introduce oxygen into the underground areas, which will facilitate the aerobic degradation of many semi-volatile organic compounds into smaller compounds that would be recoverable by SVE. Furthermore, the groundwater pumping system will also remove soluble compounds formed underground for treatment in the groundwater treatment plant. Thus, complete excavation and treatment of the site soils and debris is not the only answer.

13. The Agency disagrees with the commenter's implication that the barrier wall technology is merely being "tested" at the site. Subsurface barrier walls are proven technologies in use at many cleanup sites throughout the nation. Although the Agency

agrees with the commenter' that bentonite clay can become more permeable over time when exposed to high levels of VOCs, the barrier wall is a combination of high density polyethylene (HDPE) plastic and bentonite clay. These two materials in concert help to guard against wall failure. Also, SVE is being used to remove or bioremediate the high levels of VOCs found in the ground, so that less pressure is placed on the bentonite clay to remain as impermeable as when the barrier wall was first installed. In addition, the containment system uses the groundwater pumping system as a safeguard against wall leakage. Should a leak occur, the inward gradient across the barrier wall serves to help direct water flow into the site area through a leak and not out through the leak. Standard technologies would then be used to repair any leaks in the barrier wall upon discovery.

14. The loss of use of the ACS site portion of the upper and lower aquifers is categorized as "natural resource damage" by state and federal officials. The U.S. Fish and Wildlife Service and the Indiana Department of Environmental Management (the natural resource trustees) may bring a natural resource damage claim against all potentially responsible parties to compensate for the loss of natural resources. The natural resource damage estimate is not included in the site cleanup cost estimate, however. To date, no burden has been placed on the town of Griffith water supply and none is foreseen. Should the site impact the water supply, the town of Griffith could have legal recourse against the parties involved at the site (although it would be a matter for the courts to decide).

15. The cost of long term groundwater monitoring is included in the future response cost estimate given in the proposed plan. These costs are included in the long term "Operation and Maintenance" costs for the site.

The Agency has responsibility for ensuring "Hazmat" teams are available for deployment at all emergency cleanup sites. Such teams can be comprised of members of local fire departments, state personnel, or federal personnel and associated cleanup contractors. The estimated response costs at the site do not include future Hazmat response costs (if any). Moreover, the ACS PRP Group or its contractor(s) would be responsible to react to emergency situations which they cause.

16. The Agency and the ACS PRP Group have been studying the site problems in different capacities for some time. With the information we now have, it is time to stop studying the problem and to start implementing a solution. Although the "do it over" cleanup costs may exceed the current cleanup estimate, the Agency believes that the potential human cost of loss of life of a cleanup worker due to hazardous working conditions that may occur during an excavation, is higher than any "do it over" cost. Moreover, cost is one of the nine criteria the Agency uses to evaluate cleanup methods. Although not as important a criterion as overall protection of human health, cost is an important issue at all cleanup sites.

17. (See also response to comment #12, above.) Based upon the nine criteria for evaluating a cleanup remedy, the Agency believes that the ROD amendment proposal is a strong one.

18. As demonstrated by the materials handling study performed on site wastes, "accidental and catastrophic exposure and dispersal" is also possible if the material at the site is excavated and handled for treatment as required under the 1992 ROD. It is much safer to address the contaminants in the manner presented in the proposed plan for ROD amendment. The Agency is assuming accountability at any site for which it issues a Record of Decision, as required under Superfund law.

19. The Agency has not pursued the inoculation of site soil and debris with selected or engineered organisms to assist in the bioremediation of site soils. However, the ROD amendment does not preclude such a plan. (Note that the ACS PRP Group is testing groundwater cleanup through the injection of a non-organic oxidizer (trademark name: "Oxygen Releasing Compound" (ORC)) into the upper aquifer in limited locations. The ORC slowly releases oxygen into the groundwater to assist naturally-occurring aerobic bacteria in the water to use the organic compounds present as food, and therefore clean up the water.)

20. The Agency has approved the excavation plans for the wetlands contamination, and placed them in the information repository. Restoration plans are subject to review by the natural resource trustees at the site, the U.S. Fish and Wildlife Service and the Indiana Department of Environmental Management. The restoration plans are not yet completed, but will be placed into the information repositories when completed.

21. The costs of long term groundwater monitoring are included in the estimated (present worth) cleanup costs for the site. Moreover, the decision to monitor is in keeping with closure requirements for municipal landfills (such as the adjacent town landfill). It is not unusual to expect the level of monitoring to fall as conditions allow as the years progress, although increased monitoring could occur as well. The SVE system will have removed a large part of the principal threat (the VOCs) at the site so that the need to monitor at a high rate may lessen, but until the site is no longer potentially harmful to human health or the environment, monitoring will continue.

**Comment 2A**: The ACS RD/RA Executive Committee and Members ("PRPs"), through Karaganis & White, Ltd., Chicago, IL. The ACS RD/RA Executive Committee ("Committee") submitted the comments below as well as supporting information from the administrative record:

1. "The Committee supports the amendment of the ACS Site ROD to eliminate the requirement for low temperature thermal treatment at that Site. As the Agency is aware, the Committee developed the Material Handling Study and Low Temperature

Treatability Study which clearly demonstrate the such technology is not technically appropriate or cost-effective for the ACS Site. These studies have now been cited as part of the EPA's basis for amending the ROD.

2. "The Committee also supports the modification of the ROD to include soil vapor extraction systems as the treatment technology for the ACS Site. The combined treatment/containment remedy now proposed for the amended ROD is the remedial approach advocated by the Committee through the 1992 Feasibility Study and its 1994 Petition to Amend the ROD. We continue to support the modified remedial approach as the most technically sound and cost-effective for this Site.

3. "....Members of the public raised concerns with respect to the Town of Griffith ground water quality and the involvement of Town officials in the determination of the Site future use scenario. With respect to the first concern, the Committee has sampled the Town's monitoring wells for the organic constituents found in ACS Site ground water. As the monitoring results show, the [Town] Landfill has not been impacted by organic constituents similar to those [detected] beneath the ACS Site.

4. "....Town officials were involved in the Agency determination to adopt an industrial use scenario. Town officials were asked about their anticipated plans for the relevant area of Griffith, and consistently stated that the area was designated for commercial/industrial uses. In fact, the Town indicated that residential uses had been "grandfathered in" and as housing was vacated, new residential use would not be allowed in the area.

5. "It is also useful to note that the materials used to construct the barrier wall were tested prior to their installation to make sure they would withstand contact with high concentration solvents. The materials were exposed to solvents and tests were performed to show that the bentonite clay and HDPE plastic did not deteriorate."

**Response 2A**:

1. The Agency acknowledges the Committee's support for the proposed ROD amendment, and agrees that the Agency evaluated the results of the above-cited studies and used them as a basis for the ROD amendment.

2. The Agency acknowledges the Committee's support for the proposed ROD amendment and agrees that the proposal is both "technically sound and cost-effective for this site."

3. (See response to comment #2 from the previous commenter.)

4. The proposed plan assumes that future use of the property will be commercial/industrial. Should that change, it is likely that further cleanup would be necessary to achieve residential standards for protectiveness. However, in the interim, the deed restriction placed on the property will help prevent the unauthorized use of the property not in accordance with the cleanup method enacted.

5. The Agency acknowledges that the Committee tested the barrier wall materials prior to installation in an effort to show that the barrier wall materials would likely withstand attack by the chemical contaminants beneath the site. However, as the previous commenter pointed out, very long term data is lacking. Thus, the inward gradient and the removal of VOCs using SVE are an important part of the site cleanup proposal.

B. **Oral**

Note: The following comments were taken from the official transcript of the public meeting held to discuss the proposed plan and receive public comments on the proposal. The entire transcript is a part of the administrative record for the ACS site.

**Comment 1B**: Rick Malmquist, address unknown

"...if there's 80,000 drums and you're only going to take out 400, it seems to me that you could filter the ground for a hundred years and not get all this contamination out unless you were to get out all those drums."

**Reply 1B**:

U.S. EPA discussed during the public meeting that the number of intact drums in the Off-site Containment area is hard to quantify. As noted by the commenter, the 400-2500 intact drums in the northern portion of the site (near the ACS facility) will be removed for proper disposal as the agency estimates that these drums are able to be handled safely. Although there may be a very large number of drum carcasses in the Off-site Containment area, test pits dug into several of the drum disposal areas in the Off-site Containment area show that perhaps only a very few are still able to hold their contents. Thus, the agency believes that wholesale excavation of the off-site containment area to find a few intact drums among the thousands of carcasses is not conducive to a safe or cost effective cleanup action. Further, the agency believes it is much safer to remove the spilled contents of the drums using soil vapor extraction equipment. Lastly, the agency estimates that the soil vapor extraction equipment [used to "filter the ground"] will be operated for 5-15 years to remove a large percentage of soil VOC contamination, but the goal is not necessarily the complete removal of all contaminants. The containment system is designed to handle residual contaminants and prevent them from moving off site.

**Comment 2B**: Joe Thomas, address unknown

1. "I think that there is completely inadequate information being given to the public prior to this public comment period."

2. "If there is a question about the number of drums on the site, the EPA should come up with an estimate that is dependable relative to the number of drums that were on the site and how many, in fact, degraded and deteriorated over time and how many are still out there. It doesn't seem to me that there's very much certainty about the number of drums that can be removed intact. And it certainly isn't clear to me how many drums, in fact, have deteriorated on the site."

3. "....I object to the assumed future use used in developing the amendment to the ROD. I believe that it's unclear, at least it's unclear in answering the questions in this setting, what the reason was for changing that assumed future use. It appears to be that the polluters, that is the potentially responsible parties pushed the EPA into it. And it was a way to get them to revise the ROD so that they could reduce the cost of the cleanup. Now, if that's the case, then it's backwards."

4. "Regarding the assumed future use, it should go back to what it could be rather than what EPA wants it to be.....if, in fact, it was a different future use, then it would change the remedy of the ROD. And, on that basis, it's not clear to me that there's been adequate information about that assumption of future use. And I object to them changing the assumed future use."

**Reply 2B**:

1. The Agency believes that it made available to the public an adequate amount of information for review to allow comment on the ACS site proposed plan for ROD amendment. The proposed plan itself is not intended to contain every bit of information gathered at a site, for it would be impossible to summarize all available site information in a short, readable format. Rather, the proposed plan is a summary of the matters at hand at the site, and it refers the reader to the information repositories, which contain all site-derived information, for further information on which to base their comment(s).

2. The Agency estimates that there are between 400 and 2500 drums in the northern part of the site that are intact and able to be removed for proper disposal off site. An answer to the question of how many drums are degraded or deteriorated in the southern portion of the site is not inexpensively or easily obtained, given the sheer number of drum carcasses that have reportedly been placed in that area. The best evidence indicates that only a very small percentage of drums are removable intact. Based upon photographs taken at the site of test pits dug into the southern area of the site, it is clear that a great number of the drums are deteriorated and cannot be

removed intact. Moreover, the results of the material handling study show that it could be very unsafe for site cleanup workers to handle the highly contaminated materials. Given the high risks of removal and that there is clearly a high number of deteriorated drums that will not be removed, the precise number of intact drums is thus not a very useful figure to obtain.

3. U.S. EPA believes that assuming future industrial use of the ACS site is appropriate, given that Town officials have indicated that the zoning in the area is not likely to change in the future. Moreover, the potentially responsible parties have provided material handling and treatability study data to U.S. EPA that show that the 1992 ROD remedy could be unsafe for cleanup workers to implement, that low temperature thermal treatment was not technically sound for use on much of the waste mass (incineration would have to be used instead), but was overly costly to perform. All these reasons supported the proposal to amend the ROD, not just the economic reason.

4. As the commenter points out, should the site zoning change in the future, then the cleanup remedy may have to be revisited to accommodate that change. U.S. EPA agrees with that assumption. However, U.S. EPA does not have a say in property zoning matters, as that is for the Town to decide. The commenter is referred to the Town to discuss zoning matters for the site.

**Comment 3B**: George Smolka, Griffith, Indiana

"I see a great many problems."

1. "Number one, the types of materials and the numbers of materials that were listed in your proposal is woefully inadequate. The efficacy of the barrier wall depends in great part on the types of materials you're going to be trying to retain and contain."

2. "Secondly, you're making an assumption that a clay layer is going to impede the percolation of the organics. I would be more than willing [to say] .... yes, you will contain it for a period of time, but we're talking an indefinite period of time. Unless that material is removed over some reasonable period of time, it will eventually percolate through everything. Once it reaches the second aquifer, I think you're going to have a very serious problem because you've got people that do have wells and are still using wells for drinking water and other things."

3. "Once that second aquifer is contaminated, it is my humble opinion that cleaning that up will be extremely, extremely expensive. Therefore, containment does not look to me to be the best procedure because all you're doing is postponing the inevitable. And since costs generally tend to go up, the overall costs are going to continue to go up."

4. "....the nature of the materials that are down there including toxic metals really needs to be addressed. Those things have a percolation or distribution rate quite different from the organics you're trying to contain."

5. "....you're using ultraviolet. I have a question with respect to that. That's a free radical initiative reaction which means that any chlorinated or I should say halogenated organics have a potential for producing dioxin. It means that your destructive technique, unless you're enriching it with oxygen as part of the system, it may be causing as much harm as good."

6. "...since the last estimate of the plume was in '96, quite a lot of things could have happened since then. You really need to have some idea of where this material is right now and you don't. And that, as far as I'm concerned, is unacceptable."

7. "There is a serious problem with an assumed future use with respect to property rights. If that property at some long time in the future is acquired by somebody else and they wish to use it in some other way, by assuming an industrial use, you lock them into that use because these materials are not going to spontaneously disappear. That infringes on their right to use the lands. I have a problem with that."

8. "The problem is that some time in the future will the people have forgotten what was there and then retroactively we have to start this whole....mess all over again? I don't think it's a very good idea. I think the material needs to be removed and destroyed either and or both. And to beg the question simply on the basis of immediate costs differing the total cost to some future generation is totally unfair....it's also not wise."

9. "Until and unless that contamination is completely removed, it serves as a source of continued contamination. The barrier that you're putting up, no have no history to show that the barrier will last more than 15 years. So I think it's essentially futile and misleading. You say you're putting up a barrier but because this technology has only been in use for a relatively limited period of time, you cannot say with any degree of certainty that this thing will last more than 15 years. Since that is the case your remedy is seriously flawed. Now, when you have an hundred years of history....and it worked, then fine. But as of right now, I see an awful lot of technical problems. And you don't have the answers. And if you pretend you have the answers, I think you're misleading the public."

**Reply 3B**:

1. The proposed plan document is not intended to contain every bit of information gathered at a site, for it would be impossible to summarize all available site information in a short, readable format. Rather, the proposed plan is a summary of the matters at hand at the site, and it refers the reader to the information repositories, which contain

all site-derived information, for further information on which to base their comment(s). The chemical compounds discovered at the site are listed in many site documents, including the Remedial Investigation (RI) Report and the 1992 ROD. In addition, as noted above (see Reply 2A, #5) the ACS Executive Committee tested the barrier wall materials prior to installation in an effort to show that the barrier wall materials would likely withstand attack by the chemical contaminants found beneath the site. However, as the commenter pointed out in his written comments, very long term data is lacking. Thus, the inward gradient and the removal of VOCs using SVE are an important part of the site cleanup proposal.

2. U.S. EPA agrees that contamination of the lower aquifer would be a situation to avoid. Thus, while the clay layer between the aquifers will likely impede the movement of VOCs (the most mobile class of compounds) out of the upper aquifer for some period of time, the Agency notes that the SVE system will be operated to remove a large percentage of the VOCs, which will lessen the threat that they pose to the lower aquifer.

3. U.S. EPA agrees that it would be expensive to clean up site-derived contamination in the lower aquifer should it become necessary to do so. However, the proposed ROD Amendment calls for using both treatment (SVE) and containment to protect human health and the environment. The combination of the two is predicted to prevent contamination of the lower aquifer by removing the mobile (VOCs) fraction of contaminants from the ground.

4. The level of heavy metals at the site are not as high as the VOC levels and thus have a lesser impact on the site cleanup action versus the VOCs. However, clay layers tend to adsorb metals and prevent their movement through the clay, not unlike many organic compounds, so that the heavy metals will be prevented from moving into the lower aquifer during the implementation of the cleanup action.

5. As noted during the public meeting, the groundwater cleanup system uses an ultraviolet (UV) light treatment system to remove organic compounds from the water by destroying them. The UV system also uses hydrogen peroxide as an oxidation source to prevent the production of dioxin.

6. As noted during the public meeting, the graphics that contained the most readable information for all the audience to see, happened to be those produced in 1996. While it is unfortunate that the graphics were not updated for the public meeting, the range of the contaminant plume is well known and is monitored on a frequent basis. Also, movement of the plume is very slow, so that the 1996 graphics essentially still give a good idea as to where contaminants are today.

7. Property rights belong to the current owner(s) and are impacted by zoning decisions made at a local level. The Town has indicated to the ACS Executive Committee that it will keep the property zoned industrial well into the future, thus U.S. EPA's assumption that the property is an industrial parcel is valid. Should the ACS property be acquired by another party (who then may acquire all the cleanup liability associated with it) and that party wishes to use it in some other way, then the party will have to perform a cleanup action appropriate for the desired use of the property.

8. U.S. EPA has placed a deed restriction on the ACS property to alert potential future owners of the fact that a contaminant containment system is (to be) erected on the property and needs to be maintained. A new owner may have to implement a different cleanup process at the site should the future owner decide that it wants to use the property in an inconsistent manner with the containment system.

9. U.S. EPA agrees that until the entire cleanup action is constructed and the containment and treatment systems are operating, the site serves as a source of continued contamination to the groundwater. However, once the remedy is in place, the source will be contained and prevented from moving off site. (Although the barrier wall may only have a "15 year" history, the cleanup remedy includes the removal of groundwater from within the barrier wall enclosure, creating an inward gradient to help prevent movement of chemicals off site. Also, the SVE system will be operated to remove a large amount of VOCs from beneath the ground, both to help prevent destruction of the barrier wall materials and prevent the movement of chemicals off site. Lastly, groundwater monitoring will be performed to demonstrate that all systems are working; if found not to be the case, then repairs will be made to restore them to the required state.

**Comment 4B**: Howard Anderson, address unknown

"There is contamination going into the Town dump..." 'but it is not shown on the map and you are not doing anything about it.'

**Reply 4B**:

With the installation of the barrier wall, the probability of site contaminants entering the Town landfill (in sufficient quantity to differentiate them from landfill contaminants) becomes very small. Inward groundwater gradients will also prevent the movement of contaminants off site, whether into the landfill area or elsewhere.

The Agency notes that the graphics used at the public meeting were intended to give a general view of the location of site contaminants. Prior to that meeting, information was available to show that site contaminants are not a concern in the Town landfill

area. (See also the original 1992 ROD for a discussion of the landfill's impact on the ACS site.)

**Comment 5B**: Arnold Stassin, address unknown

'I am concerned that you limited testing to a certain area, and not a half-mile or more or the other side of Colfax Street and in other areas. There is a lot of cancer in a two block area and it is uncertain as to whether site contamination caused the cancers.' [Note: the area was not identified by the commenter.]

**Reply 5B**:

Sampling of area soil and groundwater has delineated the nature and extent of ACS site contamination, which has been well documented. Data gathered to date show tha sampling soil in areas a half-mile away will not show evidence of contaminants derived from the ACS site because the contaminants have not moved off site that far, except fo as documented in the upper aquifer contaminant plume moving off site in a southeasterly direction.

The commenter is referred to U.S. EPA's sister agency, the Agency for Toxic Substance and Disease Registry (ATSDR) for assistance in determining whether exposure to site contamination contributed to the neighborhood health problems alluded to in his comment. A local (Chicago) telephone number for ATSDR is (312) 886-7476.

**Comment 6B**: Bob Hanchar, address unknown

"At the....different time periods when those barrels were supposedly buried was it legal?"

**Reply 6B**:

As discussed at the public meeting, the disposal of materials on site may be described as being "inappropriate," given the facts today regarding environmental impacts of the dumped chemicals, but it was not necessarily illegal at the time the materials were dumped. The legality of the disposal is not an issue with regards to remedy selection, however.

**Comment 7B**: Unidentified Speaker, address unknown

"I'd rather go in there and dig up everything....I would like to get it cleaned up as quick as I could...." 'but where would you (directed to members of the audience) put it? In your back yard? A lot of people do not want it in their yards.'

**Reply 7B**:

U.S. EPA agrees with the commenter that the materials at the ACS site should not be dug up and disposed of off site (in someone else's "back yard"), but the agency disagrees that the material should be dug up for processing and treatment "as quick as" possible. As U.S. EPA presented at the public meeting and in the proposed plan for ROD amendment, the results of the materials handling and treatability studies show that it may be unsafe for cleanup workers to attempt to dig up the materials and then process them before placing them into a treatment device. Also, low temperature thermal treatment may not be appropriate for use on much of the material that would be excavated. The proposed treatment (using SVE) and containment remedy is appropriate for the ACS site, as it is protective of human health and the environment. VOCs will be removed from the ground (without excavating the area) and destroyed, while at the same time other materials are contained on site and prevented from moving off site.