92115

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R05-90/127
September 1990

EPA

# Superfund Record of Decision:

## Hagen Farm, WI

U.S. Environmental Protection Agency
Region 5, Library (PL-12J)
77 West Jackson Boulevard, 12th Floor
Chicago, IL 60604-3590

Printed on Recycled Paper

50272-101

| REPORT DOCUMENTATION PAGE | 1. REPORT NO. EPA/ROD/R05-90/127 | 2. | 3. Recipient's Accession No. |
|---|---|---|---|

| | |
|---|---|
| 4. Title and Subtitle<br>SUPERFUND RECORD OF DECISION<br>Hagen Farm, WI<br>First Remedial Action - Final | 5. Report Date<br>09/17/90<br>6. |
| 7. Author(s) | 8. Performing Organization Rept. No. |
| 9. Performing Orgainization Name and Address | 10. Project/Task/Work Unit No.<br>11. Contract(C) or Grant(G) No.<br>(C)<br>(G) |
| 12. Sponsoring Organization Name and Address<br>U.S. Environmental Protection Agency<br>401 M Street, S.W.<br>Washington, D.C. 20460 | 13. Type of Report & Period Covered<br>800/000<br>14. |

15. Supplementary Notes

16. Abstract (Limit: 200 words)


The 10-acre Hagen Farm site is a former waste disposal facility in Dade County, Wisconsin. This site is in a rural area that is dominated by sand and gravel mining and agricultural activities. From 1950 to 1966, waste materials were disposed of in three subareas of the site's defined area of contamination. Onsite investigations indicate that subarea A, a 6-acre area in the southern portion of the site, contains industrial wastes consisting of solvents and various other organics as well as municipal waste, whereas subareas B and C, each 1.5-acre areas in the northeastern portion of the site, appear to contain only scattered municipal wastes. Site investigations have determined the need for two concurrent operable units. The source control operable unit, which is defined in this Record of Decision (ROD), addresses the waste refuse and subsurface soil at areas A, B, and C with the goal of controlling the migration of the waste refuse and sub-soil and reducing the volume of contaminants from the waste and sub-soil to the ground water. The ground water operable unit will be addressed in a subsequent ROD. The primary contaminants of concern affecting the soil and waste refuse are VOCs including benzene, toluene, xylenes; other organics including phenols and PCBs; and metals including lead.

(See Attached Page)


17. Document Analysis a. Descriptors

Record of Decision - Hagen Farm, WI
First Remedial Action - Final
Contaminated Media: soil, debris
Key Contaminants: VOCs (benzene, toluene, xylenes); other organics (phenols, PCBs); metals (lead)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

| 18. Availability Statement | 19. Security Class (This Report) None | 21. No. of Pages 37 |
|---|---|---|
| | 20. Security Class (This Page) None | 22. Price |

(See ANSI-Z39.18) *See Instructions on Reverse* OPTIONAL FORM 272 (4-77) (Formerly NTIS-35) Department of Commerce

Abstract (Continued)

The selected remedial action for this site includes consolidating waste materials from disposal areas B and C into disposal area A and backfilling excavated depression areas within disposal areas B and C with clean soil, followed by revegetation; capping disposal area A after consolidation; treating 67,650 cubic yards of waste and 112,000 cubic yards of contaminated sub-soil materials in disposal area A using in-situ vapor extraction (ISVE) and treating off-gas emissions using carbon adsorption, followed by regenerating the spent carbon from the off-gas treatment process; and implementing site access restrictions and institutional controls including deed restrictions to prevent installation of drinking water wells and to protect the integrity of the cap. The estimated present worth cost for the remedial action is $3,299,000 which includes an annual O&M cost of $29,530 for 30 years.

PERFORMANCE STANDARDS OR GOALS: The goal of the ISVE will be a 90 percent removal of the VOCs from the waste and contaminated sub-soil. Off-gas extracts from the ISVE will be treated to meet State emission standards.

**HAGEN FARM SITE, WI**
**SOURCE CONTROL OPERABLE UNIT**

**DECLARATION FOR THE RECORD OF DECISION**

## Site Name and Location

Hagen Farm Site, Source Control Operable Unit
Dane County, Wisconsin

## Statement of Basis and Purpose

This decision document represents the selected remedial action for the Hagen Farm site, in Dane County, Wisconsin, Source Control Operable Unit, 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 Substance Pollution Contingency Plan (NCP).

This decision is based on the Administrative Record file for the Hagen Farm site.

The State of Wisconsin concurs with the selected remedy.

## Assessment of the Site

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

## Description of Remedy

This source control operable unit is the first of two operable units for the site. The selected remedial action for this operable unit addresses the source of contamination by remediation of on-site wastes and contaminated sub-surface soils.

The major components of the selected remedy include:

* Within the larger area of contamination (AOC), consolidation of non-native materials from disposal areas B and C into disposal area A with subsequent backfilling of disposal areas B and C with clean soil material;

* Installation of a WDNR NR 504 solid waste cap over disposal area A after consolidation;

* In-Situ Vapor Extraction of the waste refuse and sub-surface soils in disposal area A;

* Off-gas treatment through carbon adsorption;

* Regeneration of carbon from the off-gas treatment;

* Installation and maintenance of a fence around disposal areas A, B, and C during remedial activities; and

* Deed and access restrictions to prevent installation of drinking water wells within vicinity of the disposal areas and to protect the cap.

The following component of the selected remedy will be evaluated during the implementation of in-Situ Vapor Extraction:

* Determination of the optimum amount of essential nutrients (e.g., moisture, nitrogen, oxygen, and phosphate) to be added to the waste refuse and sub-surface soils in order to promote natural microbial activities, without decreasing the mass removal of the volatile organic compounds through in-Situ Vapor Extraction.

STATUTORY DETERMINATIONS

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

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

Valdas V. Adamkus
Regional Administrator

September 17th, 1990
Date

# RECORD OF DECISION

# DECISION SUMMARY

# HAGEN FARM SITE

# SOURCE CONTROL OPERABLE UNIT

# DANE COUNTY, WISCONSIN

Prepared By:

U.S. Environmental Protection Agency

Region V

Chicago, Illinois

September, 1990

**SUMMARY OF REMEDIAL ALTERNATIVE SELECTION**
**HAGEN FARM SITE, SOURCE CONTROL OPERABLE UNIT**
**DANE COUNTY, WISCONSIN**

**TABLE OF CONTENTS**


I. SITE NAME, LOCATION, AND DESCRIPTION . . . . . 3

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES . . . . . 4

III. COMMUNITY RELATIONS HISTORY . . . . . 5

IV SCOPE AND ROLE OF REMEDIAL ACTIVITIES . . . . . 6

V. SUMMARY OF SITE CHARACTERISTICS . . . . . 7

VI. SUMMARY OF SITE RISKS . . . . . 9

VII. DOCUMENTATION OF SIGNIFICANT CHANGES . . . . . 11

VIII. DESCRIPTION OF ALTERNATIVES . . . . . 12

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES. . 16

X. THE SELECTED REMEDY . . . . . 20

XI. STATUTORY DETERMINATIONS SUMMARY . . . . . 21

ROD SUMMARY
HAGEN FARM SUPERFUND SITE, SOURCE CONTROL OPERABLE UNIT
DANE COUNTY, WISCONSIN

SITE LOCATION AND DESCRIPTION

The Hagen Farm Site (the "Site") is located at 2318 County Highway A, approximately one mile east of the City of Stoughton, Dane County, Wisconsin. The 10-acre Site is situated in a rural surrounding that is dominated largely by sand and gravel mining and agriculture. Soil and gravel mining operations are located northwest, northeast and south of the Site. The Stoughton Airfield is located adjacent to the northwest corner of the Site. County Highway "A" passes just south of the Site (See Figure 1).

The City of Stoughton's municipal wells are located approximately two miles to the west, and eight private wells are located within 1,200 feet of the Site. The private wells located at the Site are no longer in use. Approximately 350 people reside within one mile of the Site.

The Site is located in the Yahara River watershed, in an area of flat to gently rolling topography. The Yahara River is located approximately 1.5 miles to the West and flows in a southerly direction. The land surface generally slopes toward the Yahara River from topographically high areas located to the northeast and east. Surface water drainage in the area is generally poorly developed, apparently due to permeable surface soils. The only substantial surface water bodies in the area are a pond located approximately 1/2 mile south of the Site and the Yahara River. There is no designated Wisconsin State significant habitat, or historic landmark site directly or potentially affected. There are no endangered species within close proximity of the Site.

The Site is located in an area dominated by glacial outwash deposits, which extend approximately one-half mile to the northeast. These deposits are dominated by sand and gravel. Beyond this, ground moraine and occasional drumlins are encountered. Lacustrine deposits associated with Glacial Lake Yahara are located approximately one-eighth mile south. Bedrock, primarily sandstones and dolomites, underlie the glacial deposits in this area. Bedrock generally slopes from the west to southwest, toward a preglacial valley associated with the Yahara River. The depth to bedrock ranges from 50 to 80 feet near the Site.

The current Site topography is the result of sand and gravel mining and waste disposal activities. Prior to these activities, the ground surface probably sloped from the existing topographically high area located west and northwest toward the southeast and east. The excavated area in the northwest corner of the property is flat. This flat area is separated by a ridge from the water-filled depression located to the northeast.

Within the Site's larger "Area of Contamination (AOC)", waste disposal took place within three subareas. These subareas are A (6 acres, located in the

southern portion of the Site), B and C (1.5 acres each, located in the northeastern portion) (See Figure 2). All three Areas reside within the Site's formally defined AOC. The Site has been covered with soil and is partially vegetated with grasses and tall trees.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Site was operated as a sand and gravel pit prior to the late 1950's. Observations suggest gravel operations encompassed an area bounded by the current access road to the east, the former Schroeter property boundary to the west and the current property boundary to the north (See Figure 2). Mining operations reportedly terminated approximately 14 to 18 feet below ground surface. Excavation may have ceased at this depth due to the presence of groundwater, more fine grained materials, or a change in sand and gravel quality.

The gravel pit was then used for disposal of waste materials from the late 1950s to the mid-1960s. During the period that the Site was operated as a disposal facility, the property was owned by Nora Sundby. The Site was operated by City Disposal Corporation. City Disposal Corporation was subsequently purchased by Waste Management of Wisconsin, Incorporated ("WMWI"). City Disposal was also the transporter of much of the waste that was deposited at the Site. The Site is currently owned by WMWI. It is known that Uniroyal, Incorporated ("Uniroyal") generated industrial waste, some of which was deposited at the Site beginning sometime in 1962 and continuing through August 1966.

Waste solvents and other various organic materials, in addition to the municipal wastes, were disposed of at the Site, including acetone, butyl acetate, 1-2-dichloroethylene, tetrahydrofuran, solid vinyl, sludge material containing methylethyl ketone and xylenes, and toluene. In a 103(c) Notification submitted to the United States Environmental Protection Agency ("U.S. EPA") by Uniroyal, in June 1981, Uniroyal indicated that F003 and F005 wastes, which are hazardous wastes within the meaning of the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. 6901, also were disposed of at the Site. This site stopped accepting waste in 1966, prior to regulation of hazardous waste disposal by RCRA Subtitle C.

Beginning in November 1980, in response to complaints received from local residents, the Wisconsin Department of Natural Resources ("WDNR") began conducting groundwater sampling at nearby private water supply wells. Sampling of the on-Site monitoring wells during the period 1980-1986 indicated certain organic compounds were present in the groundwater, including benzene, ethylbenzene, tetrahydrofuran, xylenes, and toluene.

In addition, nearby private water supplies on adjacent properties have also shown detectable levels of volatile organic compounds (VOCs). The private wells located on the Site had been impacted by acetone, tetrahydrofuran, vinyl chloride, xylene, trans 1,2-dichlorethene, and trichloroethylene.

In 1983, the State of Wisconsin brought an enforcement action for abatement of a public nuisance against WMWI and Uniroyal. At the same time, nearby

residents at the Site brought a civil action against WMWI and Uniroyal, seeking civil damages for reduced property values and potential health hazards resulting from groundwater and well contamination. The State of Wisconsin obtained a dismissal of its 1983 enforcement action against WMWI and Uniroyal after the Site was listed on the National Priorities List ("NPL"). In 1986, the parties to civil litigation brought by the nearby residents to the Site against WMWI and Uniroyal reached a settlement. The exact terms of the settlement were confidential. It is known, however, that one of the terms of the settlement required WMWI to purchase the Site property from Orrin Hagen, as well as other property located adjacent to the Site. Upon acquiring these properties, WMWI razed the structures constructed thereon.

The Site was proposed for inclusion on the NPL on September 18, 1985. The Site was placed on the NPL in July of 1987. Subsequently, WMWI and Uniroyal, the two potentially responsible parties ("PRPs") named by U.S. EPA in connection with the Site to date, entered into an Administrative Order by Consent (U.S. EPA Docket No. VW 87-C-016, dated September 14, 1987) (the "Consent Order") with the U.S. EPA and the WDNR. In the Consent Order, WMWI and Uniroyal agreed to conduct a Remedial Investigation and Feasibility Study ("RI/FS") at the Site. Accordingly, in July of 1988, upon U.S. EPA approval, in consultation with the WDNR, of the required Work Plans, fieldwork at the Site commenced.

Two operable units, which are being conducted concurrently, have been defined for the Site. Operable Unit ("OU") I, which is the Source Control Operable Unit ("SCOU"), is intended to address waste refuse and sub-surface soils ("Waste/sub-Soils") at disposal area A and the two smaller disposal areas B and C. OU II, which is the Groundwater Control Operable Unit ("GCOU"), is intended to address the contaminated groundwater at the Site. The OU approach was agreed upon after discussions among U.S. EPA, WDNR, and PRPs during the early phase of the implementation of the Work Plan for the RI.

The RI for the SCOU was completed in early 1989, and the Technical Memorandum for the SCOU was submitted in March 1989. The RI for the GCOU was initiated in July 1989 and the Technical Memorandum for GCOU was submitted in February 1990. Currently, additional field activities to define the extent of plume migration are ongoing. The RI report for the GCOU, including the Endangerment Assessment, is scheduled for completion in July 1991. The ROD for the GCOU is scheduled for early 1992.

COMMUNITY RELATIONS ACTIVITIES

A Community Relations Plan for the Site was finalized in July 1988. This document lists contacts and interested parties throughout the local and government community. It also establishes communication pathways to ensure timely dissemination of pertinent information. The RI/FS and the Proposed Plan for the SCOU were released to the public in July 1990. All of these documents were made available in the information repositories maintained at the Stoughton Public Library and Klongland Realty. An administrative record file containing these documents and other site-related documents was

placed at the Stoughton Public Library. The notice of availability of these documents was published in the Stoughton Courier-Hub and Madison Capital Times on July 5, 1990. Press releases were also sent to all local media. A public comment period was held from July 11, 1990 to August 10, 1990. In addition, a public meeting was held on August 2, 1990 to present the results of the RI/FS and the preferred alternative as presented in the Proposed Plan for the Site. All comments which were received by U.S. EPA during the public comment period, including those expressed verbally at the public meeting, are addressed in the Responsiveness Summary which is the third section of this ROD.

A public meeting was held on July 27, 1989 to explain the findings of the RI and the operable unit approach. A fact sheet was developed in conjunction with this meeting. Advertisements were placed to announce the meeting and a press release was sent to all local media. Prior to the public meeting, U.S. EPA representatives held a separate briefing for Town officials.

A press release was sent to local media on March 27, 1989 to update the community on the progress of Dane County, Wisconsin Superfund sites, including Hagen Farm.

An RI "Kickoff" meeting was held on July 14, 1988 to explain the RI process. A fact sheet was developed in conjunction with this meeting. Advertisements were placed in the Madison Capital Times and Stoughton Courier-Hub and a press release was sent to all local media.

Upon the signing of the Consent Order in July 1987, U.S. EPA held a 30-day public comment period. A press release was sent to all local media and advertisements were placed.

## IV SCOPE AND ROLE OF RESPONSE ACTION

This response action is a final source control operable unit and is consistent to the maximum extent practicable with Section 300.430 (e)(3) of the National Contingency Plan ("NCP"). This final source control operable unit is being implemented to protect human health and the environment by controlling the migration and reducing the volume of contaminants from the Waste/sub-Soils to the groundwater. This ROD addresses the source of groundwater contamination, namely the waste mass in the AOC consisting of subareas A, B, and C and the underlying contaminated sub-soils.

This source control action, by reducing the toxicity and controlling the migration of contaminants, is fully consistent with all future site work, including the ongoing groundwater investigation at the Site. In addition, this action will positively affect the cost of the final groundwater remedy by limiting the amount of groundwater that is likely to become contaminated from this source.

The media that poses the greatest risk is considered to be the groundwater contaminant plume. The contaminated Waste/sub-Soils are considered to be a long-term threat to human health and environment, primarily as a principal

source of groundwater contamination. The VOCs in the Waste/sub-Soils are considered to be the principal threat for this SCOU.

The groundwater contamination problem will be addressed in a future GCOU, Record of Decision which is expected to be the final action for the Site.

The FS identified two remedial objectives for the SCOU based on the data obtained during the RI and the possible exposure routes identified. The objectives identified in the FS are:

1) To reduce or minimize direct contact with contaminated waste and soils; and,

2) To reduce or minimize release of contaminants to the groundwater.

## V SUMMARY OF SITE CHARACTERISTICS

In March, 1989, a Technical Memorandum for the SCOU was completed under the guidance and oversight of U.S. EPA and WDNR. The Remedial Investigation (i.e., Technical Memorandum #1) for the SCOU was to determine the nature and extent of contamination at the source, and evaluate possible exposure pathways. The report summarized all soil-gas, test-pit, soil, air, and on-site groundwater analytical data that had been collected. This report should be consulted for a more through description of the site characteristics.

The following are the results of RI at the Site:

- Based on the geophysical survey, soil-gas, and test-pit survey, it appears that most of the waste disposal activity occurred in disposal area A. Disposal area A encompasses approximately six acres (100 feet long and 400 feet wide). The wastes within disposal area A are buried to a depth of two to three feet near the eastern edge, to a depth of 16 feet near the center. Eight feet is the average overall thickness of buried wastes. The volume of waste for disposal area A is estimated at 67,650 cubic yards. The test-pit survey and refuse borings indicate that the type of waste present in disposal area A includes plastic sheeting, paper-coated plastic, paint sludge, grease, rubber, and municipal waste, such as wood, glass, paper, and scrap metal. No drums were discovered during the test-pit excavation activity.

  Based upon refuse borings, test-pits, and groundwater table measurements, the bottom of the waste refuse material is estimated to be 10 to 15 feet above the seasonal high water table in disposal area A. The volume of unsaturated sub-waste soils for disposal area A is approximately 112,000 cubic yards.

  Disposal areas B and C seem to contain only scattered domestic wastes. A geophysical survey, test-pits and soil gas tests revealed a small quantity of municipal waste in disposal areas B and C. It appears that disposal areas B and C were not used for the disposal of industrial

waste.

Surficial soils are thin or absent over most of the waste refuse areas. The waste is unsaturated. Contaminant movement through the waste occurs as surface water percolates into the waste mass and dissolved contaminants infiltrate through underlying unsaturated soils to the water table. Soil erosion could contribute to some movement of contaminants, but is not considered a primary pathway because the Site has a relatively flat, vegetated topography.

- During the soil-gas survey, VOCs detected include acetone, benzene, toluene, 2-hexanone, ethylbenzene, and xylenes. The distribution of VOCs in disposal area A appears to be fairly scattered, however, no detects occurred in the northwest section of disposal area A.

- To determine if the waste was "characteristic" according to RCRA Subtitle C, an Extraction Procedure ("EP") toxicity and Flammability test was conducted on a composite sample of refuse boring and soil boring spoils. Results of the EP toxicity characteristic test indicate that the waste refuse does not exhibit EP toxicity as defined by Wisconsin Administrative Code ("WAC") NR 181.

- Compounds detected in the source characterization wells (groundwater beneath disposal area A) include tetrahydrofuran, xylenes, ethylbenzene, toluene, and 2-butanone. The highest concentrations of these compounds, such as tetrahydrofuran (630 parts per million (ppm)), xylenes (35 ppm), and 2-butanone (4400 ppm) were observed in well SCW4, near the southern end of disposal area A. Semi-VOCs, such as benzoic acid (29 ppm), 4-methylphenol (6 ppm), and phenol (6 ppm) were also detected in the groundwater at the Site. Table 1 summarizes the VOC and semi-VOC groundwater concentration data.

- The results of the air analysis indicated low concentrations of a number of VOCs, generally below 10 parts per billion (ppb), in each of the samples collected. Two compounds, methylene chloride and trichlorofluoromethane, were detected at higher concentrations in the samples (approximately 100 ppb). However, these compounds were also identified in associated trip blanks. Air VOC concentrations measured from downwind location were not substantially different from those measured at the other locations. These data do not identify an atmospheric gradient of VOCs across the waste area, because the type and magnitude of VOCs identified from upwind samples were similar to downwind samples.

- The screened data for the waste refuse indicate that waste refuse material at the Site contains semi-VOCs, such as butylbenzylphthalate (18 ppm), and bis(2-ethylhexyl)phthalate (120 ppm). Low levels of poly chlorinated biphenyls ("PCBs"), in the range of 300 ppb were also detected in the waste refuse (See Table 2).

- Surface water does not appear to be a direct pathway for contaminant migration, due to a lack of an established surface water drainage

system. Furthermore, based on surface water quality results and inferred groundwater flow paths, it appears the drainage ditch east of the Site and Sunby's pond to the south are not groundwater discharge points.

The results of the RI at the Site indicate that the waste refuse materials in disposal area A have been and continue to be a source for sub-surface soil and groundwater contamination.

The investigation for the groundwater contamination at the Site is expected to be completed by the end of 1990. Initial results of the investigation indicate that the groundwater flows to the south and that the contaminant plume extends south of the pond located one-half mile from the Site. The exact boundary of the southern edge of the plume has not yet been determined. Seven residential wells located downgradient of the Site were sampled on August 1990 for any potential impact from the contaminant plume. More details of the nature and extent of the groundwater contaminant plume will be addressed in the subsequent GOOU.

## VI SUMMARY OF SITE RISKS

This section qualitatively describes the risks posed by contaminants in Waste/sub-Soils to human health and the environment. Based on the historical findings and on-site groundwater data, which exceeded the drinking water and groundwater quality standards of the U.S. EPA and the WDNR, respectively, it is determined that remedial action is needed to address the source of the groundwater contamination. Because this remedy is a source control operable unit, a final baseline risk assessment for the Site is not available. No quantitative risk numbers have been calculated for exposure to site contaminants. However, qualitative risk information is organized and outlined below to demonstrate that action is necessary to stabilize the site and prevent the degradation of the groundwater. The baseline risk assessment for the Site will be conducted later during the GOOU phase.

The greatest risk present at the Site is from the groundwater contamination. However, the source of the groundwater contamination is the contamination found in the Waste/sub-Soils at the Site.

The following is a qualitative discussion of the site risks.

(A) Contaminants of Concern

The following chemicals have been detected in soil gas, leachate and on-site groundwater wells at concentrations above background, and screened waste refuse analyses and can be inferred to be present in source wastes.

| VOCs | Semi-VOCs | |
|---|---|---|
| . Ethylbenzene | . Benzyl alcohol | . bis (2-chloroisppropyl)ether |
| . Toluene | . Phenol | . bis (2-ethylhexyl)phthalate |

- Xylenes
- Tetrahydrofuran
- 2-Butanone
- Vinyl chloride
- Acetone
- Benzene
- 4-Methylphenol
- 2,4-Dimethylphenol
- Benzoic Acid
- Naphthalene
- Dieldrin
- PCBs
- 4-chloro-3-methylphenol
- diethylphthalate
- di-n-octyl phthalate
- 1,4-dichlorobenzene
- 4,4-DDE

In addition, inorganic compounds such as lead and barium were also detected at the Site at concentrations above background.

Table 3 compares the concentrations of these contaminants detected in groundwater at the Site with Federal and State Standards. As indicated in this table, the levels of contaminants found at the source characterization wells far exceed Federal and State standards. For the case of Tetrahydrofuran, the most frequently detected compound at the Site, the level (630,000 ppb) is 12,600 times higher than the State groundwater enforcement standard (50 ppb). This data clearly indicates that the Waste/sub-Soils are acting as a source of groundwater contamination. This source will continue to load contaminants to the groundwater unless addressed by a remedial action.

(B) Exposure Assessment

The exposure assessment identifies potential pathways and routes for contaminants of concern to reach the receptors. The potential exposure pathways are: exposure to air emissions from the landfill, direct contact exposure to contaminated waste and soils, and exposure to contaminated groundwater.

At present, the wastes do not appear to be a source of exposure via inhalation of volatilized chemicals. A preliminary evaluation of ambient air quality at the Site boundary did not identify an elevated level of VOC emissions. In addition, active generation of landfill gas, which can facilitate VOC emissions, is not occurring at the Site. Based on these preliminary air quality data, it appears that the air contaminants released from the Site to the downwind residents do not pose a risk to human health or the environment.

Wastes at the Site are covered with approximately 1 to 3 ft of soil, much of which supports thick vegetation. However, some areas of the Site are not vegetated and show exposed waste material. Therefore, a potential exists for direct human contact with waste. The most likely population group which may come in contact with the Site is anticipated to be periodic trespassers. This population group is small, because the Site is secured from incidental trespass by a fence and because the location is in a rural area which is not heavily populated. These individuals may incur contaminant exposure by skin contact with waste and by incidental ingestion of waste material adhering to hands.

Contaminants contained in the waste have affected groundwater in the vicinity of the Site. Data obtained from on-Site groundwater indicates that substantial amounts of contaminants have been released from the

Waste/sub-Soils to the groundwater. Present risks from the groundwater are unacceptable. As shown in Table 3, the contaminants in the on-Site groundwater exceed Federal and State Standards. Continued leaching of contaminants from the Waste/sub-Soils to the groundwater will result in continued unacceptable risks. Should the contaminants migrate to existing private wells, or in the unlikely event of future site development involving the installation of a water supply well, contaminant exposure via groundwater use and consumption may occur. More detailed evaluation of both current and future potential human health and environment risks associated with contaminated groundwater exposure will be addressed in subsequent steps of GCOU.

Implementation of the selected remedy as presented by this SCOU will reduce exposure to contaminated soils, control air emissions, and minimize or reduce contaminant migration to the groundwater.

(C) Environmental Assessment

The natural habitat existing prior to sand and gravel mining operations at the Site was destroyed. At present, the waste disposal area is covered with a layer of soil material which supports vegetation primarily consisting of grasses and other herbaceous plants, with some tall trees. This area is likely frequented by wildlife including birds, small mammals and deer. Although an inventory of plant and animal species has not been performed, the Site is not known to be inhabited by rare or endangered species. Land in the vicinity has been developed for agricultural, mining and commercial purposes. Sensitive ecological habitats (e.g., wetlands) are not in close proximity to the Site. The Site is not in a floodplain. The potential adverse impacts of Site wastes on the surrounding ecology are not considered appreciable in comparison to the loss of habitat which historically occurred during the active sand and gravel mining phase of the Site.

## VII DOCUMENTATION OF SIGNIFICANT CHANGES

No significant changes have been made since the publication of the FS and Proposed Plan in July 1990.

## VIII DESCRIPTION OF ALTERNATIVES

Alternatives for the remediation of contaminated Waste/sub-Soils, were developed to achieve the following goals:

- minimize the potential for direct contact with the contamination;
- minimize the potential for migration of waste/sub-Soils contaminants into the groundwater.

A comprehensive list of appropriate remedial technologies was identified for Source Control. These technologies were screened based on their cost,

implementability and effectiveness, characteristics of the Site and the characteristics of the contaminants. Technologies which satisfied the initial screening requirements were refined to form remedial action alternatives. The five alternatives developed are detailed below.

The source control alternatives are:

* Alternative 1: No Action;
* Alternative 2: Capping;
* Alternative 3: In-Situ Vapor Extraction and Capping;
* Alternative 4: Waste Consolidation with Biological Treatment, Vapor Extraction and Capping; and,
* Alternative 5: Waste Excavation with on-Site Incineration, Vapor Extraction and Capping.

A description of each of these options follows:

ALTERNATIVE 1: NO ACTION

This alternative is evaluated as required by the NCP to determine the public health, public welfare and environmental consequences of taking no further action.

ALTERNATIVE 2: CAPPING

Non-native materials (i.e., solid waste materials) as determined based on visual inspection, located within disposal areas B and C would be consolidated into disposal area A before cap construction begins, although additional fill material may be required to satisfy minimum slope requirements. Grading would be accomplished using conventional construction equipment. The final grade would be constructed so that precipitation would be directed away from the source waste. Drainage swales would be constructed to direct runoff to match existing surface flow patterns. After the desired slope is obtained, the necessary cap materials would be placed.

In the FS, three types of caps were considered: capping to upgrade the existing cover to meet the requirements for facilities without an operating license (i.e., an NR 181.44(12) cap); upgrading the existing cover to meet the requirements of a solid waste cap (i.e., an NR 504.07 or Subtitle D cap); and upgrading the existing cover to meet the closure requirements for facilities with an operating license (i.e., an NR 181.44(13) or Subtitle C cap). Figures 4 through 6 describe typical details of these caps.

Closure of the Site with a RCRA Subtitle C cap is a potentially relevant and appropriate requirement, because RCRA wastes (i.e., F003 and F005 listed waste) were disposed of at the Site. Because this alternative does

not involve any treatment to reduce the mobility, toxicity, or volume of waste, it was determined that the more impermeable capping option afforded by Subtitle C and NR 181 was both relevant and appropriate under this alternative. Therefore, only the Subtitle C cap will be evaluated for this alternative during the comparative analyses. No treatment of contaminants is involved in this alternative.

The cap would be designed to cover disposal area A. The area to be capped is approximately 240,000 sq ft (5.5 acres). The capital costs of this alternative is approximately $2,751,000, and annual Operation and Maintenance (O&M) cost is $8,899. The 30-year Present Worth (PW) cost is $2,888,000. The amount of time necessary to implement this alternative would be 7 months.

ALTERNATIVE 3: IN-SITU VAPOR EXTRACTION AND CAPPING

In this alternative, the Waste/sub-Soils in disposal area A would be treated using In-Situ Vapor Extraction (ISVE). Gas is extracted from the Waste/sub-Soils through extraction wells placed strategically at the Site. The gas travels from the wells through header pipes using a blower. The off-gases would be treated and discharged to the atmosphere.

Vapor extraction is used primarily for treating VOC contamination. A vapor extraction system is relatively inexpensive and allows for process flexibility during remediation activities. The major costs for this technology are the installation of extraction and injection wells. The number of wells used may vary during operation to improve system efficiency. By treating the Waste/sub-Soils in place without excavation, release of untreated contaminants to the atmosphere is avoided.

Prior to the implementation of in-Situ Vapor Extraction, non-native materials from disposal areas B and C will be consolidated to disposal area A. Approximately 37,000 cubic yards of fill is needed to bring area A up to required slopes before cap placement. Consolidation of solid waste materials from areas B and C will provide some of the required fill material and will ensure that all site waste materials are properly confined. Then a low permeability cap, which meets the requirements of NR 504.07, WAC, will be installed over disposal area A (see Figure 5). The NR 504.07 cap would reduce leachate production by reducing infiltration and would control moisture content in the Waste/sub-Soils to improve the Vapor Extraction system performance.

As stated for Alternative 2, a RCRA Subtitle C cap would be potentially relevant and appropriate. The U.S. EPA and WDNR have determined that for this particular Alternative, the Subtitle C cap, while relevant, is not appropriate because construction of the ISVE system would impair the integrity of a Subtitle C cap. An NR 504.07 cap will provide an adequate level of protection when combined with treatment and can easily be repaired after installation of the ISVE system.

For the discharge of off-gas emitted from the Vapor Extraction procedure,

Chapter NR 445, WAC, Control of Hazardous Pollutants, is an ARAR. The off-gases would be treated using a carbon adsorption system in order to meet NR 445, WAC. Spent carbon or other residues from the off-gases treatment process will be sent back to the manufacture to be regenerated.

During full-scale ISVE implementation, a treatability study will be performed to determine the feasibility of enhancing the natural biodegradation of organic compounds. The treatability study would be designed to determine the optimum amounts of nutrients (e.g., moisture, oxygen, nitrogen, and phosphate) to be added to the Waste/Sub-soils to promote biological activity without interfering with ISVE treatment.

The volume of waste to be treated is approximately 67,650 cubic yards, and the volume of sub-surface soils to be treated is approximately 112,000 cubic yards. The cap would be designed to cover disposal area A within the larger AOC. The area to be capped is approximately 240,000 sq ft (5.5 acres). The capital costs of this alternative is approximately $2,679,400, based upon a vapor extraction system of 25 Injection/Extraction wells. The average annual O&M cost is $29,530, and the 30-year PW cost is approximately $3,299,000. The amount of time necessary to implement this alternative, including ISVE, would be 5 years.

ALTERNATIVE 4: WASTE CONSOLIDATION WITH BIOLOGICAL TREATMENT, VAPOR EXTRACTION AND CAPPING

This alternative involves consolidating waste from disposal areas A, B and C into an upgraded facility within the AOC. The upgraded facility would be used as a treatment/disposal cell. Waste would be consolidated using conventional excavation equipment. Dewatering should not be necessary, because the water table is below the predicted depth of refuse. Once the treatment/disposal area has been upgraded, a high permeability soil cover will be placed over the waste to allow infiltration of precipitation, and to minimize direct contact risks during the implementation of this alternative. Leachate produced in the cell would be recirculated back through the waste to promote biological activity within the cell. Nutrients and microorganisms may be added to leachate to enhance biodegradation. The excess leachate produced during and at the end of the implementation will be treated and discharged to a surface water. The RCRA Subtitle C cap would be installed over the treatment cell after treatment is completed.

Under this alternative, a large depression would be created by waste excavation from disposal area A exposing contaminated subsurface soils. This depression would be filled with imported clean fill materials followed by a NR 504.07 solid waste cap. The remaining contaminated subsurface soils would be treated with in-Situ Vapor Extraction.

For the construction of the retrofitted unit within the AOC, the State and Federal hazardous waste landfill requirements, NR 181, WAC, and 40 CFR 264.301 were determined to be both relevant and appropriate. This determination was made because an entirely new treatment/disposal cell

would be constructed within a minimally contaminated area of the AOC. The double lined treatment/disposal cell would provide maximum protection for treatment of the contaminants. After completion of treatment, a RCRA Subtitle C (NR 181, WAC) cap would be placed over the treatment/disposal unit. The Subtitle C cap would be relevant and appropriate because the integrity of the cap could be maintained and it would provide maximum protection to the treatment/disposal unit. The LDR requirements are not ARARs for this alternative, because no "placement" of waste occurs. Upgrading an existing landfill facility to consolidate wastes within the AOC does not constitute placement, according to the NCP.

For the discharge of excess leachate produced from this alternative, the NR 105, WAC, Surface Water Quality for Toxic Substances, is an ARAR. The excess leachate would be treated in order to meet NR 105 standards. A toxicity characteristics leaching procedure ("TCLP") test will be conducted for the treatment sludge to determine whether further treatment is necessary for disposal in a RCRA compliant landfill in order to comply with Land Disposal Restrictions ("LDRs").

The volume of waste to be consolidated and treated is approximately 67,650 cubic yards from disposal area A and non-native materials from disposal areas B and C. The capital costs of this alternative is approximately $12,894,000. The average annual O&M cost is $82,300, and the 30-year PW cost is approximately $14,129,000. The amount of time necessary to implement this alternative would be 10 years.

ALTERNATIVE 5: WASTE EXCAVATION WITH ON-SITE INCINERATION, VAPOR EXTRACTION AND CAPPING

This alternative incorporates waste excavation with on-site incineration and disposal. The excavation activities are the same as described in Alternative 4. On-Site materials handling, staging, and storage may also be required. Waste would be characterized prior to incineration. Treatment residuals, such as ash and scrubber water, would be further treated, if necessary, and disposed of off-Site in accordance with the LDRs.

Under this alternative, a large depression would be created by waste excavation exposing contaminated sub-surface soils in disposal area A. This depression would be filled with imported clean fill materials and the non-native materials from disposal areas B and C, followed by a Solid Waste cap. The contaminated sub-surface soils would be treated with ISVE.

For this alternative, incineration would be done in an incinerator which meets the design requirements of 40 CFR Part 264 Subpart O. A TCLP test will be conducted for the treatment residuals, such as ash and scrubber water, to determine whether further treatment is necessary for disposal in a RCRA compliant landfill in order to comply with LDRs requirement.

The volume of waste to be incinerated is approximately 67,650 cubic yards from disposal area A. The capital costs of this alternative is

approximately $59,410,000. The average annual O&M cost is $22,800, and the 30-year PW cost is approximately $59,858,000. The amount of time necessary to implement this alternative would be 5 years.

## IX SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

A detailed analysis was performed on the five alternatives using the nine evaluation criteria in order to select a source control remedy. The following is a summary of the comparison of each alternative's strength and weakness with respect to the nine evaluation criteria. These nine criteria are:

1) Overall Protection of Human Health and the Environment
2) Compliance with Applicable or Relevant and Appropriate Requirements (ARAR's)
3) Long-Term Effectiveness and Permanence
4) Reduction of Toxicity, Mobility, or Volume through Treatment
5) Short-Term Effectiveness
6) Implementability
7) Cost
8) State Acceptance
9) Community Acceptance

### 1. Overall Protection of Human Health and the Environment

Alternative 1, No Action, will not provide protection from risks associated with site contaminants. Groundwater will continue to degrade due to release from the source. Therefore, it will not be discussed any further, since it is not protective and thus, not an acceptable alternative.

Alternatives 2 through 5 will reduce contaminant migration from the waste and minimize any future direct contact threats. Alternative 3 through 5 also provide treatment, thus reducing the amount of contaminants available to move into the groundwater. Continued groundwater impacts from Site contaminants will be reduced by varying degrees by Alternatives 2 through 5. Alternative 3, In-Situ Vapor Extraction, would provide protection from exposure to the waste during implementation because treatment would be in-situ and excavating the waste is minimized. Direct contact exposure to contaminated waste and soils may occur in Alternative 4 and 5 during excavation of disposal area A.

It is not the intent of the proposed alternatives to provide protection from risks which may be associated with contaminants currently existing in the groundwater. Existing groundwater contamination will be addressed in the GOOU.

### 2. Compliance with ARARs

The alternatives would comply with all applicable or relevant and appropriate federal and state environmental laws. No waiver would be

necessary to implement these alternatives.

For Alternative 2, a RCRA Subtitle C multi-layer cap would be installed in order to comply with RCRA cap design standards.

Alternatives 3 and 5 would meet the State landfill closure requirements (i.e., NR 504.07, WAC). Alternative 4 would meet State (NR 181, WAC) and Federal (40 CFR 264.301) hazardous waste landfill requirements. Alternative 4 also would meet the Federal RCRA Subtitle C cap requirement.

NR 445, Control of Hazardous Pollutants, is an ARAR for Alternatives 3, 4 and 5. The extracted off-gases should be treated in order to meet NR 445 emission limit requirements.

Toxic Substances Control Act ("TSCA") is not an ARAR for this site because PCBs detected at the Site, at a maximum level of 300 ppb, is less than 5 ppm.

The full listing of ARARs for the Site is contained in the FS.

3. Long-Term Effectiveness and Permanence

Residual risks associated with direct contact with wastes will be reduced by each alternative through capping, which will minimize direct exposure to wastes. Alternatives 3, 4 and 5 will reduce these risks further by removing and treating, biodegrading or incinerating contaminants. Risks associated with direct contact with waste materials in the future will be minimized through implementation of institutional controls.

Residual risks associated with migration of contaminants from the source to groundwater were considered greatest for Alternative 2, because the wastes are only contained and not treated or destroyed. Alternatives 3 through 5 provide the lowest residual risks to groundwater since the source of groundwater contamination is being treated.

Effectiveness is exclusively dependent on maintaining the integrity of the cap over the long term for Alternative 2. Alternative 2 will not remove contaminants within the waste which could ultimately migrate to the groundwater. Therefore, maintenance of the cap is key to the long-term effectiveness and permanence of this alternative.

Alternative 2 through 4 will be effective in achieving remedial objectives through installation of multi-layer cap, which will limit the infiltration of precipitation through the landfill and preclude the leaching of contaminants into the groundwater.

Alternative 3 will be effective in removing VOCs in the Waste/sub-Soils through vapor extraction. In addition, the installation of the solid waste cap will minimize the leaching of contaminants into the groundwater.

Alternative 4 is anticipated to be effective in achieving remedial objectives through biological degradation. Tests at other sites have

demonstrated that bioremediation is a promising technology. However, its application to this site would have to be verified. Alternative 5 is anticipated to be effective in removing contaminants in the landfill through contaminant destruction (incineration) permanently. Each of Alternatives 2 through 5 are anticipated to require system monitoring and maintenance of the integrity of the landfill cover materials.

4. Reduction of toxicity, mobility or volume (TMV) through Treatment

Alternative 2 does not provide treatment of contaminants to reduce the mobility, toxicity or volume of either the waste or the sub-waste soils.

Alternative 3 through 5 will reduce toxicity, mobility, or volume of the contaminants through treatment of Waste/sub-Soils. Alternative 3, in addition to the multi-layer cap, is estimated to remove as much as 90 percent of the VOCs from the Waste/sub-Soils through the implementation of ISVE, but will not address chemicals with low volatility (e.g., phenols and barium). Because semi-volatiles are not treated by ISVE, treatability tests for degradation of semi-volatiles by microbial methods will be explored during full-scale ISVE implementation. For alternatives 3, 4 and 5, the extracted VOCs in the air stream will eventually be destroyed through the regeneration of the carbon.

Alternative 4 uses leachate recirculation in the waste to promote biological degradation of the contamination. Leachate recirculation could potentially reduce 100 percent of the VOCs contamination, if the process is given enough time. During treatment, the waste will be within a RCRA-type cell where migration of contaminants into the groundwater will be minimized to the extent possible.

Alternative 5 will destroy the VOCs and semi-VOCs present in the Waste permanently through incinerating the waste mass.

5. Short-term Effectiveness

Alternative 2 and 3 can be implemented shortly after design approval because there are no substantive permit requirements. Alternatives 4 and 5 will require the longest time to implement due to the need to meet substantive permit requirements to site new disposal and treatment facilities. At least one, and as many as two to three years, may be required to comply with air and water quality discharge requirements, and perform the necessary treatability studies and test burns. These steps would likely require several years to complete before a full scale system would be operational.

A low risk would be posed to remediation workers and the community during the implementation of Alternative 5 related to potential exposure to incinerator off-gases. This risk is anticipated to be low because monitoring of air contaminants at the Site boundary will be conducted to ensure that acceptable levels are maintained. Alternatives which require excavation of site wastes (Alternatives 4 and 5) may pose a potential risk to remediation workers via direct exposure to wastes, dusts and VOCs.

Alternative 5, Waste Excavation with on-site Incineration, may pose added risks to the community and workers due to increased air emissions. However, the levels of potential contaminant exposure to remediation workers could be minimized by the use of personal protective equipment and standard dust control measures in each alternative. Alternatives 2 and 3 are anticipated to pose minimal risks to remediation workers and the community because they do not involve excavating the waste. Additional risks to the surrounding ecology were not considered appreciable for any of the alternatives.

6. Implementability

Alternatives 2 is the easiest to technically implement compared to the other three alternatives. Alternative 3 is somewhat easier to implement than Alternative 4 and 5 because it involves less construction at the Site. The most difficult alternative to implement would be Alternative 5. Difficulties associated with this alternative include accessing a supplementary fuel source on-site, disposing of the ash, supplying sufficient water needed for the scrubbers, and treating and disposing the contaminated scrubber water. Alternatives 3 and 4 would both be relatively straightforward to implement technically. Administratively, alternatives 2 and 3 are easier than alternatives 4 and 5 because they involve less coordination with relevant agencies.

Alternatives 2 through 4 require services and materials that should be available. It is assumed that appropriate material to perform cap construction could be obtained from a borrow source located within four miles of the Site. For Alternative 5, materials and services are available, but their availability is more restricted than the other alternatives.

7. Cost

Alternative 2 involves a capital costs of $2,751,000, annual Operation and Maintenance (O&M) costs of $8,899 and a 30-year Present Worth (PW) cost of $2,888,000.

Alternative 3 involves a capital costs of $2,679,400, average annual O&M cost of $29,530, and a 30-year PW cost of $3,299,000.

Alternative 4 involves a capital costs of $12,894,000, average annual O&M cost of $82,300, and a 30-year PW cost of $14,129,000.

Alternative 5 involves a capital costs of $59,410,000, average annual O&M cost of $22,800, and a 30-year PW cost of $59,858,000.

8. State Acceptance

The State of Wisconsin is in agreement with the U.S. EPA's analyses and recommendations presented in the RI/FS and the proposed plan. The State concurs with the selected alternative (presented in Section X, below).

9. Community Acceptance

The specific comments received and U.S. EPA's responses are outlined in the Attached Responsiveness Summary.

X THE SELECTED REMEDY

As provided in CERCLA and the NCP, and based upon the evaluation of the RI/FS and the nine criteria, the U.S. EPA, in consultation with the WDNR, has selected Alternative 3 as the source control remedial action at the Hagen Farm Site.

The major components of Alternative 3 include the following:

* Within the larger AOC, the non-native material from the disposal areas B and C will be consolidated in disposal area A. All waste movement will be done within the AOC. No placement will occur. The excavated depression areas within disposal areas B and C will be filled with clean soil and landscaped with vegetation native to the area.

* The Cap will be placed on disposal area A in compliance with the current requirements of Ch. NR 504.07, WAC for closure of solid waste disposal facilities. The cap will consist of a grading layer, a minimum 2-foot clay layer (compacted to a permeability of $1 \times 10^{-7}$ cm/s or less), a gravel drainage layer, a frost protective soil layer, and a minimum 6 inches top soil layer (see Figure 5). The cap will be constructed prior to the pilot-scale test and full-scale implementation of the in-Situ Vapor Extraction. The integrity of the cap will be maintained during the ISVE implementation and for many years afterwards.

* In-Situ Vapor Extraction will be implemented in the contaminated waste refuse and sub-surface soils of disposal area A. Prior to the full-scale implementation of the ISVE, a pilot-scale test will be conducted at the Site to determine the remedial design parameters (i.e., number of extraction and injection wells, the spacing between wells, pumping rate) to achieve maximum removal of the VOC's. The goal of the ISVE extraction will be 90 percent removal of VOCs in the Waste/sub-Soils.

  During the full-scale ISVE implementation, a treatability study will be performed to examine the feasibility of adding essential nutrients (e.g., moisture, oxygen, nitrogen, and phosphate) to the Waste/sub-Soils in order to enhance the natural microbial degradation of organic compounds. The study will be designed to determine the optimum amounts of nutrients to be added to the Waste/sub-Soils in order to promote the microactivities, without decreasing the mass removal of the VOCs by ISVE. If determined to be feasible, this treatment will be implemented as part of the remedy.

* Off-gas emitted from the extraction wells will be treated using a carbon adsorption system in order to meet the air quality standards of the State, NR 445, WAC. The spent carbon or any other residues from this off-gas treatment process will be sent back to the manufacturer to be

regenerated, thus they are not subject to LDRs.

* Institutional controls would be relied upon to provide additional effectiveness to the remedy. These include zoning restriction, deed notice, and construction of a fence.

## XI STATUTORY DETERMINATIONS

The selected remedy must satisfy the requirements of Section 121 of CERCLA to:

a. protect human health and environment;
b. comply with ARARs;
c. Be cost-effective;
d. Utilize permanent solutions and alternate treatment technologies to the maximum extent practicable; and,
e. Satisfy the preference for treatment as a principle element of the remedy or document in the ROD why the preference for treatment was not satisfied.

The implementation of Alternative 3 at the Site satisfies the requirements of CERCLA as detailed below:

a. Protection of Human Health and the Environment

Implementation of the selected alternative will reduce and control potential risks to human health posed by exposure to contaminated waste and air emission by treating contaminated Waste/sub-Soils.

Capping the landfill, in addition to reducing any potential risks posed by direct exposure to contaminated waste, will reduce the infiltration of precipitation through the landfill. Groundwater contaminant loading will thus be reduced. In-Situ Vapor Extraction of the contaminated Waste/sub-Soils will also reduce the groundwater contaminant loading.

No unacceptable short-term risks will be caused by implementation of the remedy. The site workers may be exposed to noise and dust nuisances during construction of the cap. ISVE should not present short-term risks due to VOC emission if properly designed and monitored. A Standard Safety program will manage any short-term risks. Dust control measures and off-gas treatment would reduce those risks as well.

b. Compliance with ARARs

An NR 504.07 Solid Waste cap is an ARAR for Alternative 3. A RCRA Subtitle C cap, while relevant, is not appropriate, as described in Section VIII of this ROD. NR 445, WAC, Control of Hazardous Pollutants, is an ARAR for the discharge of off-gas from the vapor extraction procedure.

Compliance with Wisconsin Statute, Chapter 160 and NR 140, WAC, will be achieved through the selection of the final remedy for the GCOU for this

site.

The selected remedy will attain all Federal and State applicable or relevant and appropriate environmental requirements.

c. Cost-Effectiveness

Alternative 3 is a cost-effective alternative providing for protection of human health and the environment and long-term effectiveness. Alternative 2 is somewhat less expensive than the selected remedy, but provides a lesser degree of long-term effectiveness because no treatment of contaminants is involved. Because there is no treatment, there is a greater risk of contaminants entering the groundwater with Alternative 2 over the long term. Alternative 4 is four-times more expensive than Alternative 3 without providing proportional effectiveness. Alternative 5 (Incineration) is the most expensive remedy. Although Alternative 5 provides complete destruction of the contaminants at the Site, Alternative 3 provides similar effectiveness through a combination of treatment and containment of the residuals at far less cost.

d. Utilization of Permanent Solutions and Alternative Treatment Technologies or Recovery Technologies to the Maximum Extent Practicable

U.S. EPA and the State of Wisconsin believe the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost-effective manner for the SCOU remedy at the Hagen Farm site. Of the alternatives that are protective of human health and the environment and comply with ARARs, U.S. EPA and the State have determined that the selected remedy provides the best balance of tradeoffs in terms of long-term effectiveness and permanence, reduction in toxicity, mobility or volume achieved through treatment, short-term effectiveness, implementability, cost, also considering the statutory preference for treatment as a principal element and considering State and community acceptance.

Alternative 3 reduces the toxicity, mobility, and volume of the contaminants in the Waste/sub-Soils; complies with ARARs; provides long-term effectiveness; and protects human health and the environment equally as well as Alternatives 4 and 5. In terms of short-term effectiveness, Alternative 3 has the shortest time to implement because there are no substantive permit requirements, as needed for Alternatives 4 and 5. Alternative 3 also poses minimal risk to remediation workers and the community during the implementation period because it does not involve excavating the waste. Alternative 3 will be easier to implement technically because it requires less construction, and administratively because it will require less coordination with relevant agencies. Finally, Alternative 3 costs the least of the protective alternatives that utilize treatment. The major tradeoffs that provide the basis for this selection decision are short-term effectiveness, implementability, and cost. The selected remedy is more reliable and can be implemented more quickly, with less difficulty and at less cost than the other treatment alternatives and

is therefore determined to be the most appropriate solution for the contaminated Waste/sub-Soils at the Hagen Farm site.

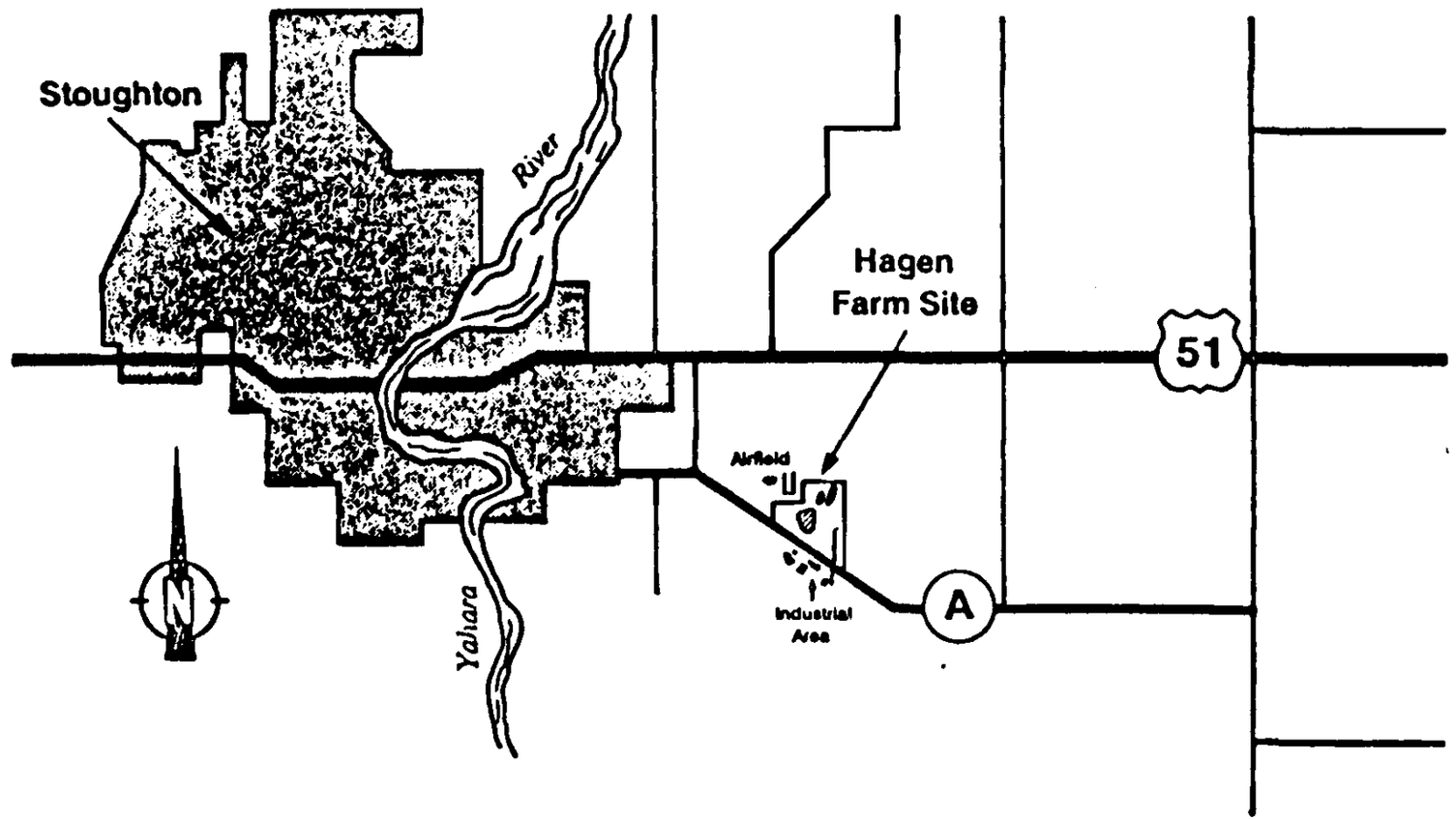
The State of Wisconsin is in concurrence with the selected remedy. A public comment was received concerning the cost of the remedy, and this comment is fully addressed in the Responsiveness Summary.

e. Preference for treatment as a principal element

The groundwater contaminant plume will be addressed in a second operable unit. Because the selected alternative treats the VOCs, which are the continuing source of groundwater contamination, it will address the principal threat for the SOU at the Site through treatment and satisfies the preference for treatment as a principal element. In addition, during full-scale implementation of ISVE, enhanced biological treatment of semi-VOCs will be investigated and if feasible, implemented as part of this remedy.

# Figure 1
## Site Location Map
## Hagen Farm Site
## Dunkirk Township, Wisconsin

(Not To Scale)

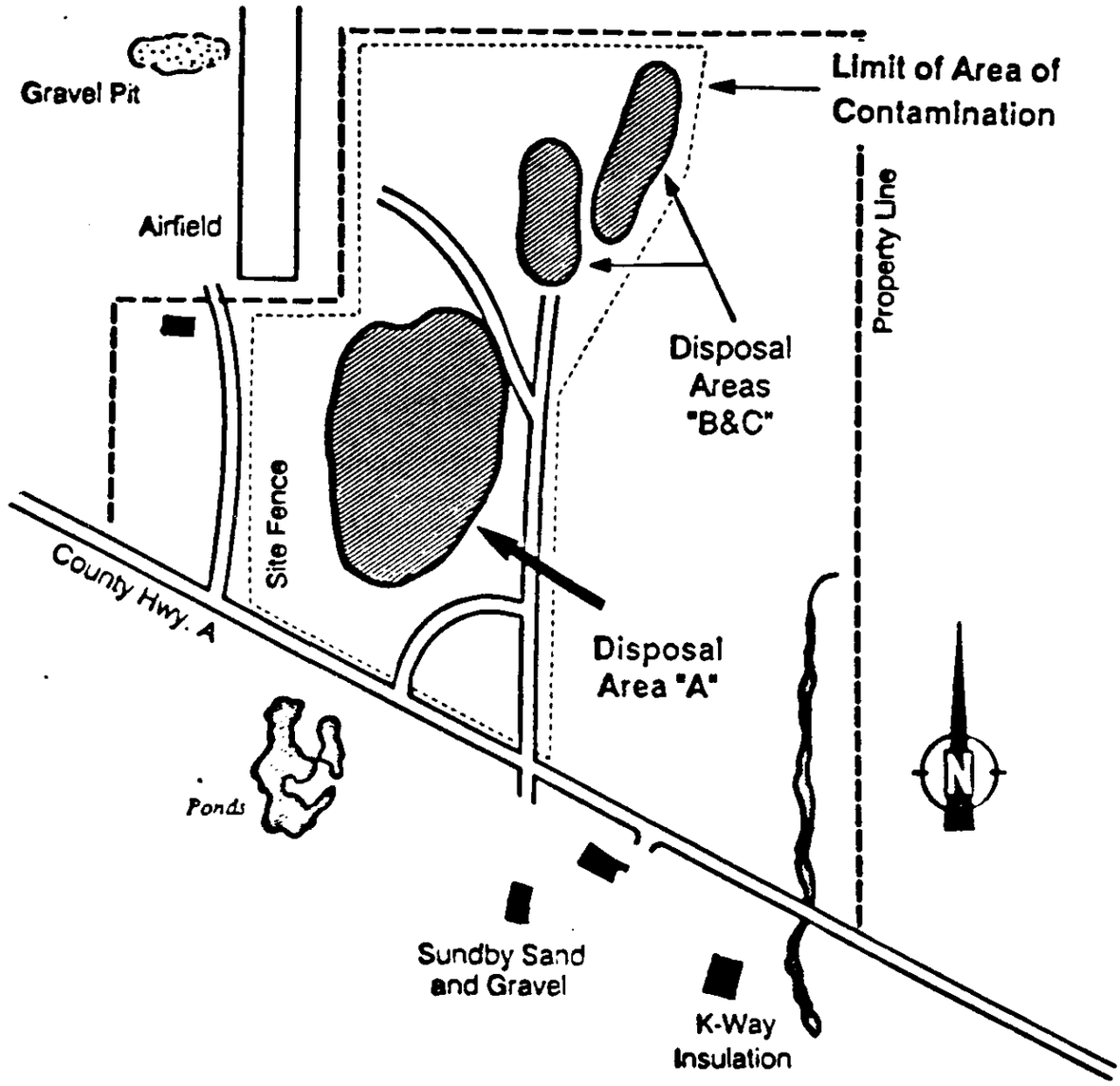



Prepared by Jacobs Engineering Group Inc. Chicago
for the U.S. Environmental Protection Agency, 7/22/90

Drawn AH
Checked DS

# igure 2
# Site Diagram
# Hagen Farm Site
# Dunkirk Township, Wisconsin

( Not To Scale)

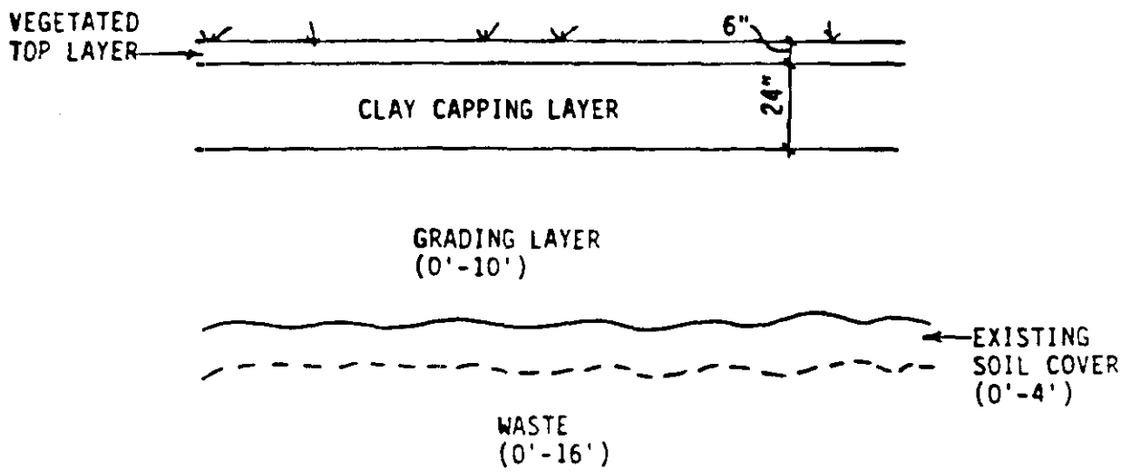



Prepared by Jacobs Engineering Group Inc. Chicago
for the U.S. Environmental Protection Agency, 7/22/90

Drawn AH
Checked DS

**FIGURE 3**

**SPECIFICATION OF NR 181.44(12) CAP**

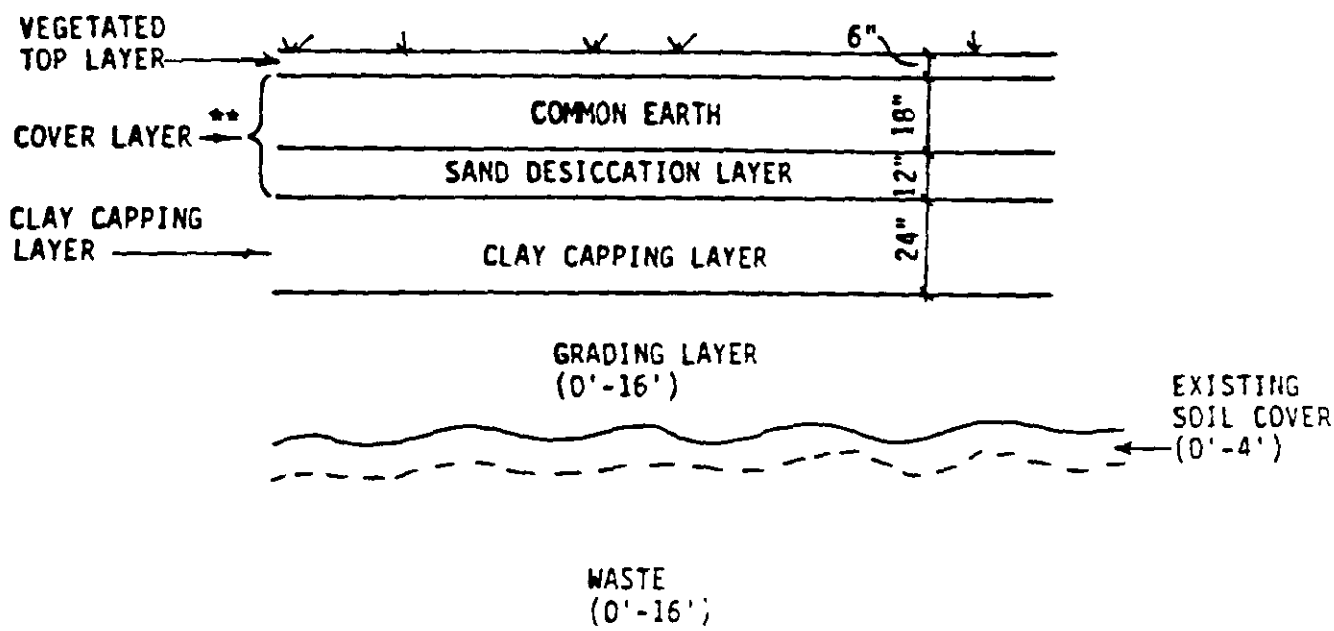



SCALE: 1" =

| | | | |
|---|---|---|---|
| WARZYN | STRUCTURE OF CAP REPAIR PER NR 181.44 (12) | Drawn KEL | Checked MGJ | App'd. JEA |
| | REMEDIAL INVESTIGATION AND FEASIBILITY STUDY | Revisions | | Date 5-4-90 |

FIGURE 4

SPECIFICATION OF NR 504.07 SOLID WASTE CAP



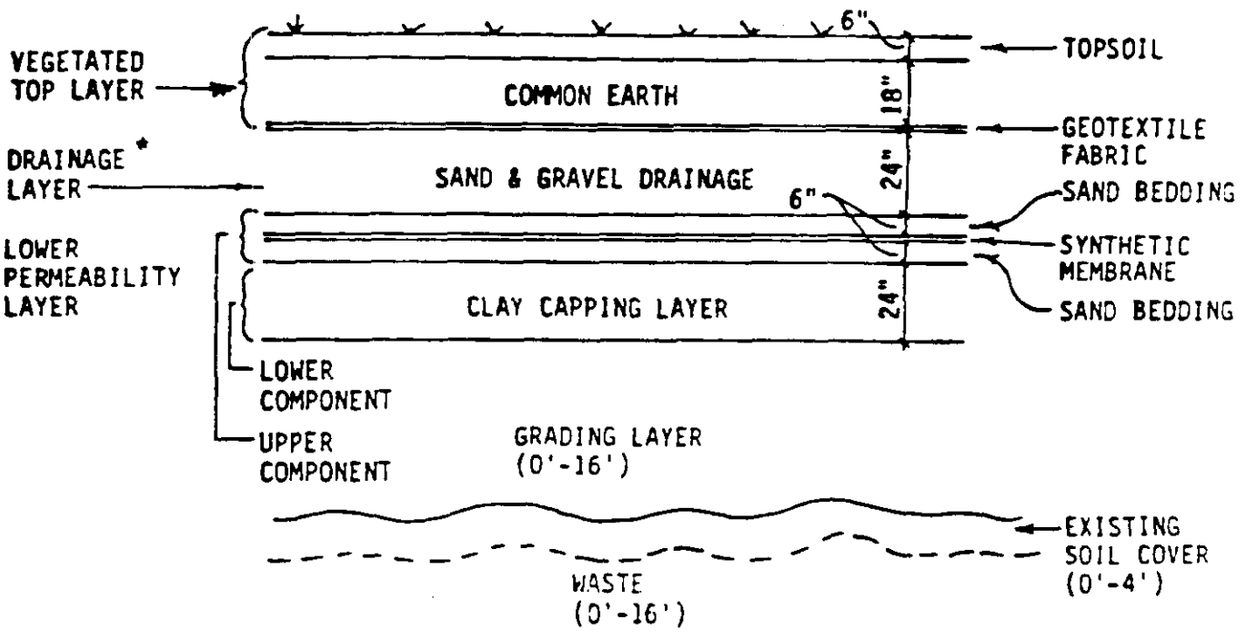

** THE COVER LAYER WAS SPECIFIED AT 30 IN. AS A WORST CASE SCENARIO TO ADDRESS THE CONCERNS OF NR 504.07 (5).

SCALE: 1" =

| | | | |
|---|---|---|---|
| WARZYN | STRUCTURE OF SUBTITLE D CAP (NR 500) PER NR 504.07 | Drawn | Checked | Appd GCA |
| | REMEDIAL INVESTIGATION AND FEASIBILITY STUDY HAGEN FARM SITE | Revisions | | Date 5-4-90 |

**FIGURE 5**

**SPECIFICATION OF RCRA SUBTITLE C CAP**




* THE DRAINAGE LAYER WAS SPECIFIED AT 24 IN. TO MEET THE REQUIREMENT THAT THE UPPER COMPONENT OF THE LOW PERMEABILITY LAYER BE LOCATED AT LEAST 12 IN. BELOW THE MAXIMUM RECORDED DEPTH OF FROST WHICH WAS ESTIMATED TO BE 36 IN.

SCALE: 1" = 4'

| | | | |
|---|---|---|---|
| WARZYN | STRUCTURE OF SUBTITLE C CAP (NR 181) PER NR 181.44 (13) | Drawn JK/KK | Checked MAT | Appd GEA |
| | REMEDIAL INVESTIGATION AND FEASIBILITY STUDY | Revisions | | Date 5-4-90 |

TABLE 1

Groundwater Quality Summary
VOCs and Semi-VOCs at Source Characterization Wells
Hagen Farm FS

Concentrations (ug/L)

| | Maximum | Average(1) | No. Wells With Detection(2) |
|---|---|---|---|
| **VOCs** | | | |
| 2-Butanone | 4,400,000 | 2,620 | 3 |
| Toluene | 20 | 20 | 1 |
| Ethylbenzene | 2,400 | 99 | 3 |
| Xylenes | 35,000 | 1,066 | 5 |
| Tetrahydrofuran | 630,000 | 5,695 | 5 |
| **Semi-VOCs** | | | |
| Benzoic Acid | 29,000 | 780 | 2 |
| 2,4-Dimethylphenol | 330 | 153 | 2 |
| 4-Methylphenol | 6,100 | 243 | 2 |
| Phenol | 5,600 | 3,816 | 1 |
| 1,4-Dichlorobenzene | 10 | 10 | 1 |
| Benzyl Alcohol | 26 | 26 | 1 |
| Bis(2-Chloroisopropyl)Ether | 19 | 19 | 1 |
| Naphtalene | 8 | 8 | 1 |
| 4-Chloro-3-Methylphenol | 7 | 7 | 1 |
| Diethylphthalate | 5 | 4.5 | 1 |
| Bis(2-Ethylhexyl)Phthalate | 34 | 18 | 3 |
| Di-n-Octyl Phthalate | 5 | 5 | 1 |

Notes

(1) Geometric averages for positive detects at each well are calculated for duplicate analysis and multiple rounds, where applicable. Geometric average were then calculated using one single or, where more than one sample was obtained from a given well, average value for each well (5 wells).

(2) Out of five wells. Some wells had more than one sample analyzed as indicated in (1).

TABLE 2

Source Characterization Summary
Analytical Results of Refuse Samples
Hagen Farm FS

| Compound | Concentration: Geometric Mean | Concentration: Maximum | Number of[1] Samples |
|---|---|---|---|
| **Inorganic (mg/kg)** | | | |
| Aluminum | 7,690 | 13,000 | 10 |
| Arsenic | 3.1 | 4.6 | 10 |
| Barium | 96.8 | 2,550 | 10 |
| Cadmium | 1.3 | 1.8 | 8 |
| Calcium | 23,100 | 43,900 | 10 |
| Chromium | 10.7 | 16 | 10 |
| Cobalt | 296 | 296 | 1 |
| Copper | 15.6 | 160 | 10 |
| Iron | 11,100 | 15,900 | 10 |
| Lead | 24.4 | 107 | 10 |
| Magnesium | 14,800 | 26,500 | 10 |
| Manganese | 329 | 660 | 10 |
| Mercury | 0.12 | 0.42 | 6 |
| Nickel | 21.6 | 387 | 10 |
| Pottasium | 659 | 1,140 | 10 |
| Sodium | 1,550 | 4,920 | 2 |
| Vanadium | 18.4 | 29.8 | 10 |
| Zinc | 74.8 | 499 | 10 |
| **Semivolatiles (ug/kg)** | | | |
| 1,4-Dichlorobenzene | 280 | 280* | 2 |
| Naphthalene | 46 | 46* | 1 |
| Diethylphthalate | 48 | 48* | 1 |
| Di-n-Butylphthalate | 130 | 690 | 3 |
| Fluoranthene | 67 | 67* | 1 |
| Butylbenzylphthalate | 220 | 18,000 | 8 |
| bis(2-Ethylhexyl)Phthalate | 3,410 | 120,000 | 9 |
| Di-n-Octyl Phthalate | 320 | 5,300 | 7 |
| Phenanthrene | 53 | 67* | 2 |
| Unknown Semivolatiles[2] | 2,120 | 1,261,985 | 10 |

TABLE 2
(Continued)

| Compound | Concentration: Geometric Mean | Concentration: Maximum | Number of[1] Samples |
|---|---|---|---|
| **Pesticide/PCB's (ug/kg)** | | | |
| Dieldrin | 11.6 | 11.6 | 1 |
| 4,4'-DDE | 18.2 | 18.2 | 1 |
| 4,4'-DDD | 11.9 | 128 | 4 |
| 4,4'-DDT | 19.2 | 19.2 | 1 |
| PCB-1242 | 104.8 | 284 | 4 |
| PCB-1248 | 338 | 338 | 1 |
| PCB-1254 | 222 | 222 | 1 |

Notes

(1) Out of 10 total sampling locations (Test Pits RS01 to RS10), excluding RS08 duplicate.

(2) Sum of tentatively identified compounds.

* Indicates concentration is below method quantitation limit. Value is estimated.

TABLE 3
COMPARISON OF SITE CONCENTRATION DATA
WITH FEDERAL AND STATE STANDARDS (UG/L)

| Compounds | Maximum Concentration | Federal Standard (MCL) | State Standard (PAL) | State Standard (ES) | Source |
|---|---|---|---|---|---|
| 2-butanone | 4,400,000 | N/A | 90[1] | 460[1] | SCW |
| Ethylbenzene | 4,400 | 700[1] | 272 | 1360 | MW |
| Toluene | 550 | 2,000[1] | 68.6 | 343 | MW |
| Xylenes | 35,000 | 10,000[1] | 124 | 620 | SCW |
| Tetrahydrofuran | 630,000 | N/A | 10 | 50 | SCW |
| Vinyl chloride[2] | 77 | 2 | 0.0015 | 0.2 | MW |
| Arsenic[2] | 25.2 | 50 | 5 | 50 | SCW |
| Barium | 1,570 | 1,000 | 200 | 1000 | SCW |
| Lead | 6 | 50 | 5 | 50 | SCW[3] |
| Mercury | 6.5 | 2 | 0.2 | 2 | SCW |

1. Proposed standards
2. $10^{-6}$ cancer risk for vinyl chloride is 0.015 ug/l, and for arsenic is 0.03 ug/l.
3. Lead was detected at concentration of 997 ug/l in leachate well.

* MCL: Maximum Contaminant Level, Drinking Water Regulation
* PAL: Preventive Action Limit, Ch. NR 140
* ES : Enforcement Standard
* SCW: Source Characterization Well located at refuse disposal area
* MW : Monitoring well located at or around landfill
* N/A: Not Available

** All of above compounds were not detected above detection limit at background groundwater well.

# RESPONSIVENESS SUMMARY
# HAGEN FARM SITE
# SOURCE CONTROL OPERABLE UNIT
# DANE COUNTY, WISCONSIN

## PURPOSE

This responsiveness summary, required by the Superfund Law, provides a summary of citizen's comments and concerns identified and received during the public comment period, and U.S. EPA's responses to those comments and concerns. All comments received by U.S. EPA during the public comment period will be considered in the selection of the remedial alternative for the Site. The responsiveness summary serves two purposes: It provides U.S. EPA with information about community preferences and concerns regarding the remedial alternatives, and it shows members of the community how their comments were incorporated into the decision-making process.

This document summarizes one written comment received during the public comment period of July 11 to August 10, 1990. The public meeting was held at 7:00 p.m. on August 2, 1990 at Dunkirk Town Hall, Stoughton, Wisconsin. No comments were submitted during the public meeting.

## OVERVIEW

The preferred alternative for the Hagen Farm site was announced to the public just prior to the beginning of the public comment period. The preferred alternative includes:

* Installation of a WDNR required NR 504 solid waste cap over disposal area A after consolidation;

* In-Situ Vapor Extraction of the waste refuse and sub-surface soils in disposal area A;

* Off-gas treatment through carbon adsorption.

## PUBLIC COMMENT AND AGENCY RESPONSE

COMMENT: It is unwise to spend more than $2 million of the taxpayers' money to remediate the Hagen Farm site which will not affect anyone. The money should be spent to control cigarette smoking which kills thousands of people each year. In addition, the commentor stated U.S. EPA should be active in alleviating "drunk drivers."

RESPONSE: It is believed that the wastes in the Hagen Farm landfill have been contaminating the groundwater at the site. If the Agency does not remediate this contaminated landfill now, the landfill would contaminate the groundwater continuously in the future, and people who use this groundwater as their drinking

water will be affected. Therefore, it is important and wise to remediate the contaminated landfill. We expect that the funds to remediate this site will come from the parties determined to be potentially responsible for the contamination, not from the taxpayers. The issue of a referendum concerning smoking in public places is not within the scope of the Superfund program. Instead, this is a local matter and should be addressed to the city council. U.S. EPA also cannot address the commentor's statement on "drunk drivers" because that subject is not within the scope of the Superfund program. Such concerns should be brought to the attention of State or Local lawmakers.

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Carroll D. Besadny, Secretary
Box 7921
Madison, Wisconsin 53707
DNR TELEFAX NO. 608-267-3579
TDD NO. 608-267-6897
SOLID WASTE TELEFAX NO. 608-267-2768

September 6, 1990 IN REPLY REFER TO: 4440

Mr. Valdas V. Adamkus, Regional Administrator
U.S. Environmental Protection Agency
230 S. Dearborn Street
Chicago, IL 60604

O: WMD
CC: RF
FREEMAN

SUBJECT: Selected Superfund Remedy
Hagen Farm Site
Dunkirk Township, Dane County, WI

Dear Mr. Adamkus:

The Department is providing you with this letter to document our position on the proposed source control operable unit for the Hagen Farm Site. The proposal, as identified in the draft Record of Decision, includes the following:

**Alternative 3:** **In-Situ Vapor Extraction and Capping**

Non-native waste materials from disposal areas B and C would be consolidated to disposal area A. The waste and contaminated sub-soil materials in disposal area A would be treated using In-Situ Vapor Extraction (ISVE). A low permeability cap meeting the Wisconsin requirements for capping municipal landfills will be placed over disposal area A.

Estimated Costs: Construction - $2,679,400
Operation and Maintenance - $29,530
30 Year Present Worth - $3,299,000

The total 30 year present net worth for the Hagen Farm Source Control Operable Unit is approximately $3,299,000. The Department concurs with Alternative 3, as described in the Record of Decision for this operable unit.

RECEIVED

SEP 12 1990

U. S. EPA REGION 5
OFFICE OF REGIONAL ADMINISTRATOR

The State of Wisconsin will contribute 10% of the remedial action costs associated with this source control operable unit at the Hagen Farm Site if the potentially responsible parties (PRPs) do not agree to fund the remedy. This assurance assumes that EPA will pursue all legal action against the PRPs, including issuance of a unilateral order and litigation of such order, prior to expending the Fund.

We also understand that our staff will continue to work in close consultation with your staff during the remaining Remedial Investigation/Feasibility Study work associated with the groundwater control operable unit at the Hagen Farm Site, as well as during the design and construction of the source control operable unit remedy.

Thank you for your support and cooperation in addressing this contamination problem at the Hagen Farm Site in Dunkirk Township. If you have any questions regarding this matter, please contact Mr. Paul Didier, Director of the Bureau of Solid and Hazardous Waste Management, at (608) 266-1327.

Sincerely,

C. D. Besadny
Secretary

CDB:SB

cc. Lyman Wible - AD/5
Linda Meyer - LC/5
Paul Didier - SW/3
Joe Brusca - SOD
Pat McCutcheon/Mike Schmoller - SOD
Jae Lee - EPA Region V (5HS/11)
Mark Giesfeldt/Sue Bangert/Terry Evanson - SW/3