Proposed Plan

Hagen Farm Superfund Site
Groundwater Control Operable Unit

Town of Dunkirk
Dane County, Wisconsin

May 2017

The Public Comment Period for this Proposed Plan will run from

May 22, 2017 to June 21, 2017

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Glossary

Administrative Order on Consent (AOC)
A legal agreement under the authority of the Superfund law between the U.S. Environmental Protection Agency (EPA) and potentially responsible parties (PRPs). Under an AOC, the PRPs agree to perform or pay the cost of investigations and/or cleanup actions to be taken at a site.

Administrative Record
A file maintained by EPA that contains all information used by EPA to make a cleanup decision pursuant to its authority under the Superfund law. EPA makes the administrative record available for public review.

Cap
An impermeable engineered barrier placed on landfills to contain hazardous waste. Capping involves placing layers of clean material over buried waste to isolate it from the surrounding environment and keep rain or snowmelt from leaching contaminants into the groundwater.

Cleanup or Remedial Action (RA)
Actions taken to deal with a release or threatened release of hazardous substances that could affect public health or the environment. The term is often used broadly to describe various response actions or phases of responses.

Clean-up Levels
A set of target concentration levels to be attained for site contaminants at the end of a cleanup.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
Also known as "Superfund," CERCLA is a federal law that directs the President to investigate and clean up abandoned or uncontrolled hazardous waste sites.

Hazard Index
A numerical index used to summarize the noncancer health effects of chemicals to which an individual may be exposed. A Hazard Index value of 1.0 or less indicates that no adverse human health effects are expected to occur. The index provides a cumulative assessment of potential or adverse health effects from a variety of chemicals that can cause health effects such as liver damage, neurotoxicity, reproductive toxicity, etc.

National Contingency Plan (NCP)
EPA's regulatory framework for implementing the CERCLA law.

National Priorities List (NPL)
EPA's roster of uncontrolled hazardous waste sites with contaminant levels that may present an actual or potential threat to human health or the environment. NPL sites are eligible for investigation and cleanup under the federal Superfund program.

Potentially Responsible Party (PRP)
Entities (persons or companies) that EPA believes to be legally responsible for contamination and/or cleanup at a Superfund site. Under Superfund, PRPs can include past or current owners or operators of Superfund sites, those who arranged for disposal of hazardous substances at a Superfund site, or those who transported hazardous substances to a Superfund site.

Parts-Per-Billion (ppb)
A unit commonly used to quantify the amount of a contaminant in water, soil, or sediment. In the case of water, 1 ppb is equivalent to one millionth of a gram (microgram) of a substance in 1000 grams (1 liter) of water (µg/L).

Parts-Per-Million (ppm)
A unit commonly used to quantify the amount of a contaminant in water, soil, or sediment. In the case of water, 1 ppm is equivalent to one thousandth of a gram (milligram) of a substance in 1000 grams (1 liter) of water (mg/L).

Proposed Plan
A document EPA releases for public comment that describes the clean-up alternatives evaluated for a Superfund site and identifies the Preferred Alternative and the rationale for the preference.

Record of Decision (ROD)
A legal document signed by EPA that describes the cleanup remedy selected for a Superfund site and why it was chosen, how much it will cost, and any public comments on the remedial action.

Resource Conservation and Recovery Act (RCRA)
A federal law that governs how industry and municipalities safely manage and dispose of the huge volumes of municipal and industrial waste being generated nationwide.

ROD Amendment
A legal document signed by EPA that describes a fundamental change to a remedy previously selected in a ROD. Changes can involve the scope, performance, or cost of the original remedy.

Remedial Investigation/Feasibility Study (RI/FS)
A two-part study conducted at a Superfund site. The Remedial Investigation (RI) is a determination of the nature and extent of contamination and the Feasibility Study (FS) is an evaluation of different methods of dealing with the problem. The FS report recommends a cleanup method that will effectively protect public health and the environment.

Remedial Design and Remedial Action (RD/RA)
After EPA selects a cleanup remedy in a ROD, the Remedial Design (RD) is developed to lay out the elements and details, such as engineering specifications to construct the remedy. The RA then involves the constructing and operating the remedy until the cleanup goals are met.

Risk Assessment

A study conducted during the RI to determine the threats posed to human health and/or the environment by site contaminants if left unaddressed. The study takes into account such factors as contaminant toxicity, exposure pathways, and the likelihood of exposure.

Volatile Organic Compounds (VOCs)

Chemical compounds primarily composed of carbon, oxygen, and hydrogen and characterized by their tendency to evaporate quickly. VOCs may be found in liquid solvents, paint thinners, gasoline, etc.

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Proposed Plan

Hagen Farm Superfund Site

Town of Dunkirk, Wisconsin

A. Introduction

The United States Environmental Protection Agency (EPA), in consultation with the Wisconsin Department of Natural Resources (WDNR), is issuing this Proposed Plan to amend the selected remedy for contaminated groundwater at the Hagen Farm Superfund site (Hagen Farm site or "site") in Dane County, Wisconsin. This Proposed Plan discusses the rationale for the recommended changes.

EPA previously had divided the Hagen Farm site into two operable units (OU) - the Source Control Operable Unit (SCOU) and the Groundwater Control Operable Unit (GCOU). The SCOU addresses a refuse disposal area (landfill) and on-site contaminated soil, including a waste mass that was the source of a groundwater contaminant plume. A remedial action was taken at the SCOU prior to the GCOU remedy and it continues to operate effectively. Therefore, EPA does not propose to make any changes to the SCOU remedy.

In 1992, EPA selected a groundwater control remedy for the GCOU in a Record of Decision (ROD) and then modified the remedy in 1996 in an Explanation of Significant Differences (ESD). A potentially responsible party (PRP), Waste Management of Wisconsin (WMWI), implemented the groundwater control remedy at the site in 1996, which consisted of pumping and treating contaminated groundwater with discharge of the treated water back into the aquifer via an on-site infiltration gallery. EPA is now proposing to fundamentally change the pump-and-treat remedy to a Low Flow Air Sparge (LFAS) system. Under the proposed LFAS system, air and oxygen is injected into the groundwater aquifer to treat the contaminants below-ground. EPA is proposing the remedy change because WMWI has demonstrated that the LFAS system is more effective in addressing contaminated groundwater at the site than a pump-and-treat remedy.

EPA is issuing this Proposed Plan as the lead agency for site remedial activities. WDNR is the support agency and it concurs with this Proposed Plan. EPA, in consultation with WDNR, will select a final remedy for the GCOU after reviewing and considering all information submitted during a 30-day public comment period. EPA may modify its Preferred Alternative or select another response action based on new information or public comments. The public is encouraged to review and comment on the alternatives presented in this Proposed Plan.

EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended, 42 U.S.C. §§ 9601-9675, and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Proposed Plan summarizes information that can be found in greater detail in the 1991 Remedial Investigation

(RI) report and the 1992 Feasibility Study (FS) report, the 1992 ROD, the 1996 ESD, the 2011 and 2016 Five-Year Review reports, and other documents contained in the Administrative Record file for the Hagen Farm site. EPA and WDNR encourage the public to review these documents to gain a more comprehensive understanding of the site and of the Superfund activities that were conducted.

The Administrative Record file is available for review at the Stoughton Public Library, 304 S. Fourth Street, Stoughton, Wisconsin (Hours: Monday – Thursday, 9 am - 9 pm; Friday – Saturday 9 am – 5 pm, Sunday 1 - 5 pm) and at the EPA Region 5 office, 7th Floor Record Center, 77 W. Jackson Blvd., Chicago, Illinois (Hours: Monday – Friday, 8 am- 4 pm).

B. Site Background

1. Site Location and Description

The 28-acre Hagen Farm Superfund site is located at 2318 County Highway A in the Town of Dunkirk, approximately one mile east of Stoughton, Dane County, Wisconsin (Figure 1). The site includes the now-capped 10-acre former waste disposal area and is bounded on the south by Highway A and on the north by an adjacent gravel pit. A private 3,000-foot landing strip ends directly at the northwest corner of the site and the Yahara River is located about 1.5 miles to the west (Figure 2).

The Town of Dunkirk is unincorporated and is primarily a rural farming community. Most of its land is agriculturally used and Dunkirk, together with the nearby Towns of Rutland, Dunn, and Pleasant Springs, has adopted Dane County's exclusive agricultural zoning ordinance that limits non-farm development in rural areas (Figure 3). As of the mid-1990s, over 40 percent of each town's farmland was enrolled in Wisconsin's Farmland Preservation Program.

2. Site History

The Hagen Farm site was operated as a sand and gravel pit prior to the late 1950s. From the late 1950s to the mid-1960s, the gravel pit was used for municipal waste disposal. However, solvents and other organic materials such as acetone, butyl acetate, 1-2-dichloroethene (1,2-DCE), tetrahydrofuran (THF), solid vinyl, methyl ethyl ketone, xylenes, and toluene were dumped in the pit as well as hazardous wastes as defined under the Resource Conservation and Recovery Act (RCRA), 42 U.S.C.§6901 (but the site stopped accepting waste prior to regulation of hazardous waste disposal under RCRA Subtitle C).

EPA listed the Hagen Farm site on the National Priorities List (NPL) on July 22, 1987. Two PRPs, Uniroyal Corp. and WMWI, conducted a Remedial Investigation and Feasibility Study (RI/FS) from 1988 to 1992 under a July 27, 1987 Administrative Order on Consent (AOC) with EPA. The RI defined the two OUs at the site - the SCOU, which addresses the hazardous waste

and refuse disposal area, and the GCOU, which addresses the groundwater contaminant plume that has moved downgradient off of the site property.

3. Early Environmental Investigations and Response Actions

Uniroyal disposed of wastes on site from the late 1950s to the mid-1960s. The former disposal area was approximately five acres of land located in the southwestern portion of the site that had been used as a gravel quarry. The site consisted of one main disposal and two smaller disposal areas. These areas had been covered with soil and the area was vegetated with grasses and 10 to 15-foot tall trees. The disposal areas have since been consolidated and covered with a new clay cap. Documentation of waste quantities is not available. Waste disposed of at the site may include solvents, other organic materials including acetone, 2-butanone 1,2-DCE, vinyl chloride (VC), THF, and scrap vinyl.

In June 1981, Uniroyal indicated that an undetermined quantity of RCRA F003 and F005 wastes were disposed of at the site. F003 waste includes spent non-halogenated solvents such as xylene, acetone, ethyl acetate, ethylbenzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol. F005 waste includes toluene, methyl ethyl ketone, carbon disulfide, isobutanol, and pyridine.

WDNR sampled area groundwater from 1980 through 1985 in response to complaints from local residents. Uniroyal sampled private water supply wells and on-site monitoring wells from 1982 through 1986. Sampling of private water supply wells was later conducted by the United States Geological Survey (USGS). Sampling of on-site monitoring wells during the period 1980 to 1986 indicated the presence of organic solvent contamination in the groundwater at the site.

In 1984, USGS conducted a geophysical investigation to determine the location and distribution of buried wastes. A second investigation included the installation of additional monitoring wells. Six of the new wells were sampled and benzene, chlorobenzene, THF and xylenes were detected in some of them. At the time, groundwater immediately beneath the site was determined to flow to the south, east, and west. Regional groundwater flow is to the southwest.

WDNR performed a Preliminary Assessment in 1984, followed by an EPA Site Inspection. After EPA listed the site on the NPL in July 1987, Uniroyal and WMWI entered into an AOC with EPA (Docket No. VW 87-C-016) on July 27, 1987 to conduct an RI/FS for the site. EPA approved the RI report in 1989 and based on the results, decided to addresses the site under two OUs—the SCOU and GCOU. Consequently, the FS, remedy selection, remedy construction, and operation of the cleanups at the OUs were handled separately.

SCOU

In 1990, EPA signed a ROD for the SCOU that included consolidating and capping the landfill waste masses, installing an *in-situ* vapor extraction (ISVE) system to remove volatile organic

chemicals (VOCs) from the landfill, and installing gas probes to monitor landfill gas migration. EPA then issued a Unilateral Administrative Order (UAO) to WMWI in 1991 to complete the Remedial Design and Remedial Action (RD/RA) for the SCOU.

WMWI consolidated and capped the waste masses and installed a security fence around the landfill that was posted with warning signs. The cap complies with § NR 504.07 WAC and it and other areas of bare soil were fully vegetated.

In April 1991, EPA issued an ESD to further refine the ISVE cleanup standard and conducted a pilot study between spring and summer 1992 in order to complete the design of the full-scale in-situ vapor extraction (ISVE) system. WMWI installed eight gas extraction wells through the waste soils and down to groundwater to remove the VOC gases from the landfill. Twenty-nine gas probes were installed to monitor any gas migration in and around the landfill. The ISVE discharges VOCs to the air in compliance with a Wisconsin air-use permit (§ NR 445 WAC). WMWI has been operating the ISVE system since January 1994.

GCOU

The 1989 RI report made the following conclusions and observations for groundwater contamination at the site:

1) The contaminants causing the most concern in groundwater are VOCs. The most prevalent VOC in groundwater was THF with a maximum detected concentration of 630,000 parts per billion (ppb).

2) The occurrence, concentration, and distribution of THF suggested that there was a THF plume originating from the disposal area and extending approximately 3,600 feet downgradient (south).

3) VOCs were not detected in samples collected from private wells during the investigation.

4) The results of a treatability study indicated that THF and other VOCs in groundwater could be effectively treated above-ground using activated biological sludge (ABS).

5) Groundwater contamination posed an unacceptable risk to human health, primarily from the potential ingestion of contaminated groundwater near the site under current- and future-use scenarios.

6) The occurrence, concentration, and distribution of benzene, ethylbenzene, toluene and xylenes suggested a second plume originating from the same general area as the THF plume. The second plume extended about 800 feet downgradient or about half the distance traveled by the THF plume.

In 1992, EPA signed a ROD for the GCOU that selected the following remedial actions:

- Extract and treat on- and off-property[1] groundwater until Wisconsin PALs (§ NR 140 WAC) are met at the waste boundary in accordance with the NCP;
- Treat extracted on-property groundwater using activated biological sludge (ABS) and treat extracted off-property groundwater using a separate technology to be determined during the RD phase;
- Discharge treated groundwater to neighboring wetlands or into the Yahara River;
- Treat and dispose of sludges generated from the groundwater treatment, and treat off-gases emitted from the treatment process;
- Conduct a study to determine the effect of nutrients and/or oxygen on contaminated groundwater in order to enhance bioremediation in the aquifer;
- Monitor all private wells located around the site; and
- Use deed and access restrictions to prevent the installation of drinking water wells within the vicinity of the disposal area and off-property.

WMWI completed RD/RA activities under a 1992 UAO. With EPA oversight, WMWI completed the RD for the groundwater extraction and treatment system in May 1995 and constructed the system between November 1995 and April 1996. Under the RA work plan, the groundwater extraction and treatment system was to be operated until cleanup standards were achieved in the aquifer at the point of compliance (at the waste boundary and downgradient), which was anticipated to be over a 30-year time period.

In 1996, EPA issued an ESD to document the following changes it made to the 1992 ROD-selected remedy for the GCOU:

- Combine extracted on- and off-property groundwater into one influent stream to be treated in an on-property treatment facility, as opposed to two separate facilities;
- Use fixed film biological treatment (FFBT) instead of ABS to treat all extracted groundwater for VOCs and metals contaminants; and
- Discharge treated groundwater back into the ground via an infiltration gallery (IG) located on-property and upgradient of the capped waste area, instead of to the river or wetlands.

The groundwater extraction system consisted of four extraction wells within the contaminant plume, three on-property near the landfill and one off-property about 800 hundred feet south of the property boundary. The system was designed to pump between 80 and 130 gallons per minute (gpm).

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[1] "On-property groundwater" is defined as contaminated groundwater on and in the immediate vicinity of the main waste disposal area. "Off-property groundwater" is defined as contaminated groundwater at any location within the plume downgradient of the property boundary.

The treatment plant, constructed on the property along the southern edge of the landfill, was designed to treat 70 - 100 gpm of moderately to highly contaminated groundwater, such as THF concentrations greater than 2,000 micrograms-per-liter (µg/L) or parts-per-billion (ppb). The treated groundwater was discharged to the IG, in compliance with the substantive requirements of a Wisconsin Pollutant Discharge Elimination System (WPDES) permit. Design studies had shown that the IG may speed the cleanup by flushing contaminants through the ground into the pumping wells. This also brings dissolved oxygen (DO) into the aquifer to enhance the breakdown of organic contaminants.

WMWI operated the extraction and treatment system 5.5 years before it became inefficient and costly, leading WMWI to conduct to the following activities in order to find a more efficient cleanup approach:

- August 2000 – WMWI proposed to pilot test a LFAS system to ultimately replace groundwater extraction and treatment system. The proposed LFAS system would enhance natural degradation by raising the DO levels in the groundwater. Studies have shown that THF will degrade in an oxygen-rich (aerobic) environment, whereas VC can degrade in either aerobic or anaerobic environments;

- Fall 2000 – EPA, in consultation with WDNR, permitted WMWI to install the LFAS system. Six shallow air sparge wells were installed to a depth of 50 feet, configured in a line about 60 feet apart, just downgradient of the landfill;

- January 2001 – Once the air sparge monitoring data showed some increase in DO levels, WMWI proposed to shut down the extraction and treatment system temporarily in order to pilot test full-scale operation of the LEAS system. At that time, both the extraction and treatment and the LFAS systems had been operating in tandem for about eight months;

- September 2001 – EPA approved temporary shutdown of the extraction and treatment system to determine effectiveness of LFAS system as an exclusive technology for restoring the groundwater. Studies estimated that cleanup goals would be achieved in approximately 5-10 years by the LFAS alone;

- March 2005 – At EPA's request, WMWI installed four deeper sparge wells perpendicular to the plume and downgradient from the source area generally in the area of the shallow sparging wells after a data showed that DO levels had not increased sufficiently, and that VC, THF, and benzene levels were of concern;

- April 2005 – WMWI began operating the expanded LFAS system;

- April/May 2007 – WMWI added an oxygen generator and air dryer to the expanded LFAS system to enhance the LFAS system operating time, reliability, and DO concentrations in groundwater;

- September 2007 – EPA and WMWI signed a consent decree (CD) requiring WMWI to perform studies and remedial response work at the site for continued groundwater restoration. If EPA determines that the LFAS cannot remove remaining groundwater contamination at an acceptable rate, then WMWI must implement corrective measures to ensure the remedy continues to be protective of human health and the environment;

- July 2011 to July 2014 – WMWI evaluated options to further improve the LFAS system by reconfiguring some of the existing extraction and/or monitoring wells into LFAS wells;

- November 2014 – WMWI implemented the EPA-approved modifications to the LFAS system and began operating the expanded LFAS system which included three additional sparge wells.

The current LFAS system includes 13 sparge points oriented in a line perpendicular to the direction of groundwater flow, downgradient of the capped waste mass (Figure 4). The modified system now creates a better "aerobic treatment zone" for groundwater flowing from beneath the waste mass to downgradient on-property and off-property areas. The LFAS system has, and is expected to continue promoting aerobic conditions in the aquifer to accelerate the degradation of the VOCs in the groundwater.

Community Involvement

From 1987 to 1992, EPA conducted major community involvement activities at the site in conjunction with the start and completion of the RI/FS and issuance of Proposed Plans for the SCOU and GCOU. EPA developed fact sheets, held public meetings, issued press releases, and placed advertisements in the local papers, the *Stoughton Courier-Hub* and *Madison Capital Times,* to announce meeting times or the availability of new information.

Since that time, little to no community involvement activities have been conducted, except for those required under Five-Year Reviews (FYRs) conducted in 2001, 2006, 2011, and 2016. This involved notifying the public via the *Stoughton Courier-Hub* of the start of all upcoming FYRs, the completion of the FYRs, as well as the location of the FYR reports. WMWI continues to send letters with the sample results to private well owners after each monitoring event. WMWI currently monitors the potentially affected private wells on an annual basis due to the fact that no site-related chemicals have been detected in private wells.

C. Site Characteristics

1. Regional Setting

The Hagen Farm Site is located in the Yahara River watershed in an area of flat to gently rolling topography. The river is about 1.5 miles to the west and flows in a southerly direction. The site

does not lie within the 100-year flood plain. The topography in the area of the site has been altered as a result of historical sand and gravel mining, and waste disposal activities. Mining operations were terminated approximately 14 - 18 feet below ground surface (bgs) due to the presence of groundwater. The land surface generally slopes toward the river from topographically high areas located to the northeast and east.

Surface-water drainage in the area is generally poor due to permeable surface soils. The only substantial surface water bodies in the area are Sundby Pond located approximately one-half mile south of the site and the river. An on-site ditch, located at the southeast corner of the property, flows to a wetland directly south of the site. There is no designated Wisconsin State significant habitats or historic landmarks directly or potentially affected by the site. The landfill cap supports a variety of vegetation and the site area is frequented by wildlife, notably birds, small mammals and deer. Sensitive ecological habitats or rare or endangered species have never been observed.

Sand and gravel glacial outwash deposits dominate the site and extend about one-half mile to the northeast. Beyond these, ground moraine and occasional drumlins are encountered. Lacustrine deposits from Glacial Lake Yahara are located approximately one-eighth mile south.

Bedrock, primarily sandstone and dolomite, underlie the glacial deposits in this area. Bedrock generally slopes from the west to southwest, toward a pre-glacial valley associated with the river. The depth to bedrock ranges from 50 to 80 feet near the site. Groundwater is present approximately 10 to 40 feet bgs near the site and about 20 feet bgs in the disposal area. Groundwater flow is predominantly to the south-southwest toward the river, which is a regional groundwater discharge zone.

Current land use surrounding the site includes a private 3,000-foot landing strip adjacent to the northwest corner of the site (landfill) property. To the east, land is zoned rural residential with a prescribed density of 1 - 35 acres per residence. Planned neighborhood areas are to the northeast of the site. WMWI sold a parcel of land, located directly west and adjacent to the site ("Lot 3") in about 2003. The lot was planned for future residential development; however, nothing has been constructed to date and the plans have been delayed indefinitely. Other adjacent land is zoned agricultural. Land south of Highway A and directly across from the site property is occupied by Wingra Redi-Mix, an operating concrete facility. The Hagen Farm site property is and will remain zoned as industrial.

The City of Stoughton urban service area provides the public water supply and sanitary sewer systems, includes parts of the Town of Dunkirk. The Stoughton municipal wells are located about two miles west of the site. Residents living near the site obtain their water from private wells. Three private wells are located approximately 1,000 feet west of the site, and eight private wells are located within 4,000 feet downgradient of the site based on hydrogeology information obtained during site investigations. (See Section 2 below). WMWI annually samples a number of private wells downgradient of the site property.

2. Nature and Extent of Groundwater Contamination

The groundwater contaminant plume has been shrinking over time due to the remedial activities taking place at the site. A number of contaminants were originally identified as chemicals of concern (COCs) in the RI report, however, due to the ongoing treatment only VC and THF remain as COCs at this time. In order to understand the nature and extent of contamination with respect to groundwater quality and health implications, the groundwater cleanup criteria are defined below.

The State of Wisconsin has promulgated groundwater quality standards in § NR 140 WAC, which the WDNR consistently applies to all facilities, practices, and activities that may affect groundwater quality. The promulgated groundwater quality standards are applicable or relevant and appropriate requirements (ARARs) for the site groundwater cleanup action. § NR 140 WAC contains PALs and ESs for common hazardous compounds. PALs are contaminant-specific limits that signify a potential groundwater contamination problem. When PALs are exceeded for any contaminant measured at a groundwater monitoring point, WDNR is required to take action to manage or control the contamination so that the respective ESs are not exceeded.

Under the federal Safe Drinking Water Act, EPA has promulgated Maximum Contaminant Levels (MCLs), which are measured at the point of use from public water supplies. MCLs are developed for each chemical using conservative assumptions to arrive at a concentration in water that does not pose adverse effects to humans when the water is used on a daily basis over a lifetime. It is likely that concentrations below the MCL will not cause adverse effects.

With the exception of VC, the ESs are set at the same concentration as MCLs for each site COC. The PAL for VC is 0.02 µg/L, the ES is 0.2 µg/L and the MCL is 2.0 µg/L. In the case of THF, the PAL is set at 10 µg/L and the ES is 50 µg/L. There is currently no MCL for THF.

Below is a discussion of the COCs that have been detected at the site over the course of the Remedial Action. The referenced wells can be identified on Figure 5. Table 2 at the end of this document provides a comparison of cleanup criteria with the maximum concentrations detected during 2016, as well as the preceding five years.

Tetrahydrofuran (THF)

THF has historically been found in concentrations in the thousands of micrograms per liter (µg/L) at the waste boundary, with values that decrease with distance from the boundary. In recent years, substantial progress has been made in reducing THF concentrations in groundwater. In 2011 and 2012, THF concentrations exceeding the PAL and ES were detected on site well P7B at levels ranging from 210 µg/L to 2,300 µg/L; however, no exceedances have been seen since 2012. Similarly, THF concentrations above the PAL and ES were detected in on-site well

MW7 ranging from 690 µg/L to 9,200 µg/L from 2011 to 2014, but no exceedances have been detected since 2014. These decreases occurred after the upgrade of the LFAS system in October 2014. Both wells are located adjacent to the waste boundary.

Vinyl Chloride (VC)

A number of samples located on-property within about 300 feet of the waste boundary showed VC concentrations ranging from 2.2 µg/L to 5.0 µg/L. The levels have been slowly and consistently declining since 2007 when the oxygen generator was added to the system. In 2016, after the 2014 LFAS expansion, two wells within 300 feet of the waste boundary showed levels above the ES ranging from 0.21 µg/L to 0.65 µg/L.

Monitoring well OB08M has shown VC concentrations ranging between the ES and MCL for the entire life of the remedy. Well OB08M is located outside the zones of influence of both the LFAS and the original extraction and treatment systems, but is aerobic as DO concentration usually exceeds 3 mg/L. The well is about 1,900 feet downgradient from the waste boundary, in a location outside of § NR 812.08(4)(g) WAC requirements, which prohibit installation of a water supply well in a known contaminated aquifer or within 1,200 feet of a landfill. In 2016, VC concentrations in the well ranged from 0.57 µg/L to 0.85 µg/L.

EPA estimated that it would take roughly six years for treated groundwater to travel from the sparge line to well OB08M; however, it may take as long as about 18 years. Though the LFAS localized treatment of the groundwater plume has reduced VC levels that currently extend off-property to OB08M, it could take a number of years to remediate the contamination at OB08M. The LFAS system improvements in 2007 and 2014 show promise in reducing VC concentrations due to various biochemical and hydrogeological factors.

Benzene

The LFAS has reduced benzene levels significantly. The only consistent benzene concentrations in excess of the PAL (0.5 µg/L) were from samples collected from well PI7C in 2011. The maximum concentration was 2.3 µg/L in 2011. Since 2011, benzene levels have declined and no values greater than PAL have been found since May 2014 when 0.63 µg/L was detected in PI7C.

Trichloroethene (TCE)

Since 2011, TCE has not been found in any of the site-related monitoring wells. Of the 11 private wells that have been annually sampled by WMWI, TCE was found twice in well PW3 on the former Sundby property, but was not detected in other annual samples. The concentrations were 1.0 and 1.4 µg/L in 2012 and 2013, respectively. While these levels exceed the PAL of 0.5 µg/L, they are below the ES and MCL (5 µg/L). TCE has not been found at other private wells nor have degradation products of TCE, such as *cis*-l,2-DCE and VC.

Inorganics

Since 2011, arsenic concentrations exceeding the PAL (1 µg/L) have been observed at 21 of the on- and off-site monitoring wells, as well as in upgradient wells. In the same period, arsenic concentrations consistently greater than current ES (10 µg/L) and MCL were observed at monitoring wells P22B (waste area) and P27B (off-property). Annual sampling in 2011 and 2012 at private wells showed arsenic at wells PW6, PW9, and PW10 at concentrations greater than the PAL and less than both the ES and MCL (1 µg/L). Arsenic occurs naturally in some Wisconsin groundwater and there is no evidence that the arsenic is site-related.

No samples showed lead concentrations greater than the ES (15 µg/L) or MCL (15 µg/L) since 2011. During the annual sampling of private wells, lead was detected once at 2.8 µg/L in PW2, which is greater than the PAL but less than both the ES and MCL. This detection is likely related to plumbing impacts and not from contamination at the landfill. No other private wells have ever shown lead detections. WMWI monitors well PW3 annually.

Iron and manganese levels greater than the PAL, and in some locations the ES and MCL, are common. Similar results are also found in the private wells. In locations where iron is found at two different depths, the deeper wells show more detections above the ES and MCL. Manganese shows a similar pattern.

Nitrate-plus-nitrite is found in levels typically greater than the ES and MCL (10 mg/L) in several off-property monitoring wells. Private wells also show values greater than 10 mg/L. These results are common, and likely result from agriculture, fertilizer use, or other human activities.

D. Scope and Role of GCOU Amended Remedy

This Proposed Plan recommends a fundamental change to the groundwater remedy originally selected and implemented at the Hagen Farm site under the 1992 GCOU ROD and the 1996 ESD. The recommended change is described in more detail in Section I (Preferred Alternative). At the end of the review and public comment period for this Proposed Plan, the selected remedy alternative will be documented in a ROD Amendment.

This Proposed Plan provides the rationale for amending the extraction and treatment remedy, based on operational and groundwater monitoring data collected since September 2001 when the LFAS began operating as the sole groundwater remedy. The data have indicated that while the groundwater extraction and treatment system was effective during the time it operated, its efficiency had diminished as contaminant concentrations decreased. This resulted in a projected longer period to achieve groundwater cleanup goals and greater operation and maintenance (O&M) costs than anticipated. The data collected during the 16 years of testing and optimizing the LFAS system indicate that it is a more efficient groundwater cleanup technology at the site and is the basis for this proposed remedy change to replace the extraction and treatment system.

The remedy for the SCOU selected in the 1990 ROD is not affected by this proposed ROD Amendment. The SCOU was the first OU for the site and was implemented to address the principal threat to human health and the environment - the on-site waste mass that contributed to the groundwater contamination. The SCOU remedy continues to address residual on-site waste contained by the landfill.

E. Summary of Site Risks

1. Human Health Risk Assessment

The NCP states that the purpose of the remedial process for a contaminated site under Superfund is to implement remedies that reduce, control, or eliminate risks to human health and the environment. A Baseline Risk Assessment (BRA) is used to evaluate the current and future threats to public health and the environment from a site.

EPA calculates the probability of non-carcinogenic (not cancer-causing) and carcinogenic (cancer-causing) health effects due to human exposure to site contaminants in human health risk assessments. For noncarcinogenic chemicals, EPA calculates a hazard quotient (HQ) for each COC. The HQ is the ratio of the estimated exposure level to a chemical compound over a specified period of time. EPA recommends that the HQ for exposure to a COC at a site be limited to one (1.0) or less, which signifies that the exposure level at the site would not cause adverse health effects. For carcinogenic health risks, EPA calculates the estimated lifetime cancer risk (ELCR) from exposure to carcinogenic chemicals at a site. EPA recommends that site cleanups achieve a target ELCR range of one in one million ($1x10^{-6}$) to one in ten thousand ($1x10^{-4}$).

The initial BRA for the Hagen Farm site was part of the 1992 RI. This information helped EPA decide to divide the site into two separate OUs - the SCOU and the GCOU. Separate FSs and RODs were prepared for each OU.

The risks at the site identified at that time were assessed for exposures to contaminants at the landfill and in the on-property and off-property groundwater. Groundwater risks were based on the assumption that the principal threat would be contained under the SCOU. Hence, exposure pathways pertaining to the SCOU are not discussed in this document. The risk assessment used to develop the ROD for the GCOU only included groundwater contamination on-property and off-property, not source material.

Data collected during the RI determined the chemicals of potential concern (COPC) to human health and the environment. For each COPC, toxicity information was compiled and an exposure assessment was conducted to identify potential exposure under current and future site and surrounding land use conditions.

The following pathways were evaluated:

- Ingestion of groundwater if a resident were to live on the Hagen Farm property; and
- Inhalation of VOCs while showering if a resident were to live on the Hagen Farm property.

Each of these pathways were evaluated using the maximum exposure that could reasonably occur. This results in a conservative estimate of the potential risks, meaning that the risk may very well be overestimated. For example, this assessment assumed that a resident living on the Hagen Farm property would be regularly exposed to the highest COPC levels in on-site groundwater.

The ECLR was then calculated for each pathway for a hypothetical resident on the Hagen Farm property (adjacent to the landfill cap). These risks were within or exceeded EPA's target cancer risk range or the HI for the pathways described above. The chemicals that accounted for the majority of these risks were:

- VC, chloromethane, arsenic, 2-butanone, acetone, 2,4-dimethylphenol, ethylbenzene, 4-methylphenol, benzene, and xylenes (in on-site shallow wells);
- THF (in on-site shallow and deep wells); and
- 1,1-DCE (in on-site deep wells).

The ELCR through the ingestion of groundwater in shallow wells was 2×10^{-3}. The HI from shallow wells located on site was 6,000.

2. Current Site Risks

Groundwater was and continues to be the migration pathway with the greatest potential to release contaminants from the on-site waste based on data collected since the 1989 RI; however, updated exposure pathways for ingestion and showering only apply to off-site groundwater, since the on-property area is zoned industrial. This zoning eliminates residential exposure pathways to site contaminants.

As mentioned in Section B-3, the original GCOU remedy under the 1992 ROD and 1996 ESD operated for 5.5 years. After that period, EPA approved pilot testing the LFAS system. Both remedial systems operated together for eight months before EPA allowed the LFAS to operate as the sole remedy during a pilot test. By that time, contaminant levels had been reduced significantly. After 16 years of LFAS operation, the contaminant levels have been further reduced such that the associated risks are judged to be insignificant. The only COC detected in off-property groundwater is VC. As mentioned in Section C-2, these levels ranged from 0.57 µg/L to 0.85 µg/L and are above the ES but below the MCL. These concentrations are not expected to pose a potential risk from residential use of groundwater.

EPA's current judgement is that the Preferred Alternative identified in this Proposed Plan is necessary in order to continue protecting human health and the environment from past releases of contaminants from the site, as well as to restore the groundwater to beneficial use.

3. Ecological Assessment

An ecological BRA was also conducted during the RI to evaluate potential impacts on nonhuman receptors at the site. This evaluation identified potential receptors and exposure pathways, and also determined whether endangered or threatened species inhabited the area. Based on information obtained during the RI, exposure of terrestrial plants and soil organisms (earthworms) to COPCs in soil showed that these receptors were not adversely affected. As contaminant levels have decreased over time, no ecological risks are present. Further, no endangered species have been seen at the site or in the surrounding areas.

F. Remedial Action Objectives for Groundwater Contamination

The purpose of this proposed change to the GCOU remedy is to address any residual site risks associated with current and future groundwater use to ensure the protection of human health and the environment. EPA anticipates that this can be accomplished this via the following specific Remedial Action Objectives (RAOs):

- Restore groundwater quality so that contaminant levels meet state or federal groundwater quality standards;
- Stop the flow of contaminated groundwater downgradient of the site property to private wells; and
- Restore the groundwater to beneficial use.

G. Summary of Remedial Alternatives

EPA evaluated three alternatives in this Proposed Plan to achieve the RAOs for the GCOU:

- Alternative 1 – No Action
- Alternative 2 – Extraction and Treatment
- Alternative 3 – Low Flow Air Sparge

EPA's Superfund guidance generally requires that the "No Action" alternative be evaluated to establish a baseline for comparing the action alternatives. Under Alternative 1, EPA would take no further action at the site to address groundwater contamination beyond the what has already been achieved to date by operating the groundwater extraction and treatment system and then pilot-testing the LFAS system over the past 20 years. The LFAS system would be turned off and both the LFAS and existing extraction and treatment systems would be left in place.

Both Alternatives 2 and 3 are treatment alternatives designed to achieve RAOs for the groundwater and both rely on groundwater monitoring to ensure that the alternatives prevent the further migration of contaminants off site.

None of the proposed treatment alternatives rely exclusively on institutional controls[2] (ICs) to achieve protectiveness. However, both Alternatives 2 and 3 include ICs as part of the overall remedial approach.

Institutional Controls

Both the 1990 SCOU ROD and the 1992 GCOU ROD required that ICs and access restrictions be implemented as part of the site remedy. The GCOU remedy also specifies that off-property ICs should be used as needed in order to:

- Prevent the installation of drinking water wells in the vicinity of the disposal area;
- Prevent interference with construction, O&M, monitoring and efficacy of any components or improvements resulting from the RA;
- Prevent inappropriate use of the landfill cap area or other areas containing RA components;
- Prevent the construction, installation, or use of any buildings, wells, roads or structures on the facility property that could affect the integrity, O&M, or efficacy of the remedy; and
- Safeguard human health and the environment while implementing the remedy.

In 1991, WMWI installed a security fence around the on-property area to protect the cap and treatment facility and to prevent public access. In 1991 and 1993, WMWI filed deed restrictions on portions of all three parcels it owns at the site. The entire contiguous restricted area is smaller area than the WMWI property and lies within the property boundary that it currently owns, or has owned in the past, to prevent exposure to site contaminants (Figure 6).

ICs include state and local regulations that can affect potential development in the area of the site. § NR 8I2.08(4)(g) WAC prohibits the installation of a water supply well in a known contaminated aquifer or within 1,200 feet of a landfill without prior approval from WDNR. Additional mechanisms that provide notice of the site and the potential risks from contact with

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[2] ICs are non-engineered instruments, such as administrative and legal controls that help to minimize the potential for exposure to contamination. The ICs may consist of governmental or proprietary controls such as zoning ordinances, deed restrictions and environmental covenants. ICs are required to assure long-term protectiveness for any areas that do not allow for Unlimited Use and Unrestricted Exposure, as well as to protect and maintain the integrity of the remedy.

contaminated media include the WDNR's Bureau for Remediation and Redevelopment Tracking System (BRRTS). This system identifies the site on an internet accessible database called the DNR Database (formerly the GIS Registry). Both closed and open hazardous waste sites are placed on this system, which provides detailed site-specific information and maps.

Description of Remedial Alternatives

Alternative 1: No Action

Estimated Capital Cost: $0
Estimated Annual O&M Cost: $0
Estimated Present Worth Cost: $0
Estimated Construction Timeframe: None

Under Alternative 1, EPA would take no further action at the site for groundwater cleanup beyond what has already been achieved to date by operating the groundwater extraction and treatment system and then pilot-testing the LFAS system over the past 20 years. The LFAS system would be turned off and both the LFAS and existing extraction and treatment systems would be left in place.

Alternative 2: Extraction and Treatment via Air Stripping

Estimated Capital Cost: $100,000
Estimated Annual O&M Cost: $193,000
Estimated Present Worth Cost: $1,750,000 (10 years of operation)
Estimated Construction Timeframe: 3-5 months
Estimated Time to Achieve RAOs: Within 1-2 years

Under Alternative 2, the existing groundwater pump-and-treat system would be recommissioned and retrofitted with an air stripper to treat pumped groundwater. One to two new extraction wells would be installed as none of the existing wells can be retrofitted or converted. Treated water would be discharged to the existing infiltration gallery located just north of the landfill. The system would operate at about 50 gallons per minute.

The major system components, including extraction wells, pumps and piping, the air-stripping system, the treatment building, and infiltration gallery would require routine O&M to maintain effectiveness. Groundwater monitoring will also be required until cleanup levels are met.

Alternative 3: Low Flow Air Sparge (LFAS)

Estimated Capital Cost: $0
Estimated Annual O&M Cost. $126,000
Estimated Present Worth Cost: $1,020,000 (10 years of operation)

Estimated Construction Timeframe: None
Estimated Time to Achieve RAOs: Within one year

Under Alternative 3, the existing LFAS system is used to inject air into the groundwater aquifer via air sparge wells. Air injection raises DO levels in groundwater to promote the natural degradation of VOCs. The existing LFAS system consists of a total of 13 air sparge points that include six shallow points and four deeper points spaced 60 feet apart and oriented in a line perpendicular to the direction of groundwater flow and installed downgradient of the on-site waste mass. Three on-site monitoring wells also act as sparge points to further promote aerobic conditions in the subsurface. The LFAS system contains an oxygen generator to increase the oxygen concentration in the air delivered by the sparge points to further increase the DO levels in the groundwater and several other components that are used to optimize the system's effectiveness.

No capital costs are estimated because the LFAS system is already built. The major system components, including the air compressor, injection wells, pumps and piping, and the treatment building would require routine O&M to maintain effectiveness. Groundwater monitoring will also be required until cleanup levels are met.

H. Evaluation of Alternatives

This section of the Proposed Plan evaluates the relative performance of each alternative against the nine criteria listed in Table 1. Of the nine criteria, the selected alternative must meet the threshold criteria of protecting human health and the environment and compliance with ARARs. If a proposed alternative meets these two criteria, it is then evaluated against the balancing criteria and the modifying criteria in order to arrive at a final recommended alternative.

Table 1: The Nine Criteria

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
Threshold Criteria
1. **Overall Protection of Human Health and the Environment** determines whether an alternative eliminates, reduces, or controls threats to the public health and the environment through engineering controls, treatment, or ICs.
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirement that pertain to the site, or whether a waiver is justified.

Balancing Criteria
3. **Long-term Effectiveness and Performance** considers the ability of an alternative to maintain protection of human health and the environment over time.
4. **Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment** evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
5. **Short-term Effectiveness** considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
6. **Implementability** considers the technical and administrative feasibility of implementing the alternative, including factors such as relative availability of goods and services.
7. **Cost** includes estimated capital and annual operation and maintenance costs, as well as present worth cost. Present worth cost is the total of an alternative over time in today's dollar value. Cost estimates are expected to be accurate within a range of +50% to -30%.
Modifying Criteria
8. **State Acceptance** considers whether the State agrees with EPA's analyses and recommendations, as described in the RI/FS and the Proposed Plan.
9. **Community Acceptance** considers whether the local community agrees with EPA's analyses and Preferred Alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Comparative Analysis of Groundwater Remedial Alternatives

1) Overall Protection of Human Health and the Environment

Alternative 1 is not protective of human health and the environment because taking no action to address groundwater would allow unabated, unmonitored movement of contaminants beyond the property boundary. Both Alternatives 2 and 3 would be protective of human health and the environment because they use active groundwater treatment methods to achieve groundwater cleanup levels downgradient of the site. In addition, ICs would be used to prevent residential use of contaminated water from on-site wells.

2) Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Alternative 1 would not comply with ARARs because no action would be taken to achieve the federal and state requirements (see Section C-2 [Nature and Extent of Groundwater Contamination]) with respect to groundwater cleanup goals.

Both Alternatives 2 and 3 would need to comply with ARARs pertaining to groundwater cleanup standards. Applicable or relevant and appropriate groundwater cleanup requirements include Wisconsin PALs and ESs if they are more stringent than the federal Safe Drinking Water Act MCLs.

In addition, Alternative 2 would require compliance with the substantive requirements of a WPDES permit for the discharge of treated water to the onsite IG, as well as a Wisconsin air-use permit (§ NR 445, WAC) for the discharge of VOCs into the air from the air stripper.

Table 3 at the end of this document provides a detailed listing of ARARs for the site.

3) Long-term Effectiveness and Permanence

Alternative 1 would not be effective in the long term as it allows for the continued movement of groundwater contaminants present at the landfill boundary. Alternatives 2 and 3 are both effective in the long term, however, Alternative 2 may require a longer groundwater restoration time than Alternative 3. Alternative 2 as designed and implemented in the initial RA demonstrated ineffectiveness during its period of operation at the site, which is the reason Alternative 3 was introduced and retained and operating as a pilot study for a number of years. Long term effectiveness and permanence would need to be demonstrated under a redesigned and reconfigured extraction and treatment system described under Alternative 2.

4) Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 1 does not use treatment to reduce the toxicity, mobility, or volume of waste. None of the treatment alternatives use treatment technology to address principal threat waste, but each use treatment technology to address contaminants in the groundwater.

5) Short-term Effectiveness

Alternative 1 is effective over the short term because taking no action has no impact on site workers or the public. Alternative 3 provides better short term effectiveness than Alternative 2 because the LFAS system is already installed and operating at peak effectiveness, whereas the extraction and treatment system would need to be recommissioned/redeveloped and new treatment system equipment would need to be installed over a minimal three-month period, thus creating an interruption of treatment and creating slightly higher risks for on-site workers during the installation.

6) Implementability

Alternative 1 is the most easily implemented because it involves taking no action. Both action alternatives are easily implemented because they employ standard "off-the-shelf" technologies that have long histories of installation and operational experience.

7) Cost

Alternative 1 is the least expensive alternative because the LFAS system would no longer be operated. Of the treatment alternatives, Alternative 3 costs less that Alternative 2 because the LFAS system is already installed and operating, whereas the moth-balled extraction and treatment system must be recommissioned/replaced, and retrofitted with an air stripping system. O&M costs for Alternative 3 are less that Alternative 2 because the LFAS system has already been optimized and is operating efficiently, but the extraction and treatment system must first be tested and optimized after installation, which would cost more.

8) State Acceptance

WDNR has reviewed the Proposed Plan and the site Administrative Record and has indicated that it concurs with the Preferred Alternative (Section I).

9) Community Acceptance

EPA will evaluate community acceptance of the Preferred Alternative after the public comment period ends. EPA will evaluate and consider public comments and place a summary of all comments received and EPA's responses to the comments in the Responsiveness Summary section of the ROD Amendment.

I. Preferred Alternative

Based on information currently available, EPA's Preferred Alternative for amending the 1992 ROD is Alternative 3 (Low Flow Air Sparge) or LFAS. The Preferred Alternative will meet site RAOs by protecting human and environmental receptors from exposure to contaminated groundwater, protecting existing and future residential water supplies from the potential migration of contaminated groundwater, and restoring groundwater quality to comply with state and federal groundwater standards. However, LFAS does not address the SCOU, which contains principal threat wastes at the site.

The WDNR, as the support agency, concurs with EPA's Preferred Alternative. EPA may modify its Preferred Alternative in response to public comments or if new information is received.

Although both LFAS and Alternative 2 (Extraction and Treatment via Air Stripping) will be protective of human health and the environment and attain ARARs, EPA's Preferred Alternative

is LFAS because it will be more easily implementable, cost-effective, and effective over the short term than Alternative 2. The LFAS system has already been installed and was optimized during the pilot testing period; in contrast, many of the remedial components of Alternative 2 would need to be repurposed and/or purchased, constructed, and installed before that system would be operational.

EPA believes that LFAS is protective because it will achieve risk reduction by restoring groundwater quality to comply with state and federal groundwater standards. In the interim, ICs will be used to prevent groundwater use for drinking until cleanup levels have been met beyond the property boundaries.

Based on information currently available, EPA believes that LFAS meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. EPA expects LFAS will satisfy the following statutory requirements of CERCLA Section 121(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost-effective; 4) utilize permanent solutions and alternative treatment technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element.

J. Community Participation

This document presents EPA's proposed plan to address the GCOU by making a fundamental change to the remedy selected in the 1992 ROD and modified in the 1996 ESD. This document also describes the past community involvement activities that took place at the site. Throughout the cleanup process, EPA has maintained information repositories in the community at the Stoughton Public Library, 304 S. Fourth Street, Stoughton, Wisconsin and at the Dunkirk Town Hall, 654 County Road N, Stoughton. An opportunity for further community involvement is presented below.

Share Your Opinion

EPA encourages the public to comment on any aspects of the proposed changes to the GCOU remedy and will consider comments received during the 30-day public comment period. Your input helps EPA determine the best course of action. You may fill out and mail or fax the enclosed form, or use an electronic form on EPA's Website. Mailed comments must be postmarked by June 21, 2017 (the last day in the comment period) and sent to:

Susan Pastor
U.S. Environmental Protection Agency, Mail code SI-6J
77 West Jackson Blvd.
Chicago, IL 60604

Send comments via email to: pastor.susan@epa.gov

If requested, EPA will hold a public meeting on this Proposed Plan so that the public can provide oral and written comments. Contact Susan Pastor by May 30, 2017 to request a meeting.

For More Information

Background material for the Hagen Farm site is available on the following EPA Web page:

http://www.epa.gov/superfund/hagen-farm

The Administrative Record, which houses the legal documentation supporting EPA's proposal, is available for review at the Stoughton Public Library, 304 S. Fourth Street, Stoughton, Wisconsin. A copy is also at the EPA Region 5 office in Chicago at the 7th Floor Record Center.

For further information on the Hagen Farm Superfund site, please contact:

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Wisconsin Department of Natural Resources
101 S. Webster Street
Madison, Wisconsin 53703
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Figures

Table 2: Comparison of Cleanup Criteria to Monitoring Results Showing Maximum Concentrations

Chemicals	Maximum Concentrations Found between 1/2016 - 11/2016 (ug/L)		Maximum Concentrations Found between 1/2010 - 11/2015 (ug/L)		Cleanup Standards (ug/L)					
					ES		PAL		MCL	
	Date	Concentration (Well)/Location	Date	Concentration (Well)/Location	GCOU ROD (1992)	2016	GCOU ROD (1992)	2016	GCOU ROD (1992)	2016
Organic										
Benzene	8/5/16	0.56 (P35B)/offsite	4/7/10; 6/7/10	3.1 (P17C)/onsite	5	5	0.067	0.5	5	5
1,1-DCE		ND		ND	7	7	0.024	0.7	7	7
cis-1,2-DCE		ND	2/17/10	0.53J (P7B)/onsite	NL	70	NL	7	NL	70
trans-1,2-DCE		ND		ND	NL	100	NL	20	NL	100
Ethylbenzene		ND	5/12/11	0.85J (MW26)/ onsite	1,360	700	272	140	700	700
Tetrahydrofuran		ND	8/17/12	9,700 (MW7)/onsite	50	50	10	10	NA	NA
Toluene		ND	8/27/15	1.3J (P35B)/offsite	343	800	68.6	160	1,000	1,000
Trichloroethene		ND	6/5/15	0.54J (P26B)/onsite	NL	5	NL	0.5	NL	5
Xylenes		ND	1/21/10	91 (P17C)/onsite	620	2,000	124	400	10,000	10,000
Vinyl Chloride	11/1/16	0.85 (OB8M)/offsite	6/7/10	6.7 (P17C)/onsite	0.2	0.2	0.0015	0.02	2	2
Inorganic (dissolved)										
Arsenic	8/4/16	37.9 (P22B)/offsite	2/22/12	8.5 (MW22)/onsite	50	10	5	1	50	10
Barium		ND	2/18/15	99.7 (OB8M)/offsite	1,000	2,000	200	400	2,000	2,000
Iron **(mg/l)**	8/5/16	5,100 (MW100)/offsite	2/18/10	5,740 (P22B)/onsite	300	300[3]	150	150[3]	300[1]	300[1]
Lead		ND	2/15/11	5.1 (MW27)/offsite	50	15	5	1.5	15[2]	15[2]
Manganese	8/5/16	332 (MW32)/offsite	2/10/16	99.6 (P32B)/offsite	50[3]	300 and 50[3]	25[3]	60 and 25[3]	50[1]	50[1]
Mercury			8/17/12	0.13J (P7B)/on-site	2	2	0.2	0.2	2	2

(Legend provided on reverse side)

Table 2: Comparison of Cleanup Criteria to Monitoring Results Showing Maximum Concentrations

ES	Enforcement Standard, WAC NR 140 (July 2015)
PAL	Preventative Action Limit, WAC NR 140 (July 2015)
MCL	Maximum Contaminant Level, Safe Drinking Water Act (EPA 816-F-09-004, May 2009)
NL	Not Listed in the ROD document
NA	Not Available, as MCLs have not yet been promulgated for this chemical
J	Estimated value between limits of detection and quantitation
1	Secondary MCL based on aesthetic qualities of drinking water
2	Action Level value
3	Wisconsin Public Welfare Groundwater Quality Standards
	Cleanup standard that was exceeded by the maximum groundwater concentration detected (1/2010 – 11/2016)
	Concentration that exceeded all cleanup standards except for MCLs.

Table 3: Summary of ARARs for Remedial Alternatives for the Hagen Farm Site

ARAR	REQUIREMENT/PURPOSE	APPLICABILITY
CHEMICAL SPECIFIC		
Federal		
Federal Safe Drinking Water Act Maximum Contaminant Levels (MCLs), 40 CFR Part 141	MCLs for Public Water Supply Systems measured at the tap.	Relevant and appropriate to ground water that is or could be used for drinking water (Alternatives 2, 3).
National Primary and Secondary Ambient Air Quality Standards (40 CFR Part 50.6).	Particulate standards which may apply to dust-generating construction activities.	Relevant and appropriate to activities related to reconfiguring and/or retrofitting the onsite treatment building and piping for air stripping (Alternative 2).
40 CFR 264.94	Enforceable Groundwater Concentration Limits	Applies to substances in groundwater released from a solid waste management unit permitted under RCRA. May be considered relevant and appropriate (Alternatives 2, 3)
National Emissions Standards for Hazardous Air Pollutants (40 CFR Part 61).	Addresses new and existing sources that emit air pollutants	Applicable to VOC emissions from air-stripping unit used to treat contaminated groundwater (Alternative 2).
State		
Groundwater Quality, § NR 140 WAC; Applicable to facility practices and activities which may affect groundwater quality.	Establishes health and welfare-based groundwater quality standards (ES and PALs) for substances detected in groundwater. Also applies to the reinjection of treated groundwater into an on-property aquifer.	Applicable to groundwater in the study area that is or could be used for drinking water (Alternatives 2, 3)
§ NR 809, WAC	Enforceable standards to protect public health and welfare by limiting contaminant levels in groundwater and drinking water. Secondary drinking water standards to protect the aesthetic quality in drinking water supplies.	Relevant and appropriate to groundwater that could be used for drinking water (Alternatives 2, 3).
§ NR 140.28, WAC exemption criteria for groundwater contaminants	Allows the establishment of a Wisconsin Alternative Concentration Limit (WACL) for groundwater if site-specific data gathered before and after implementation of the selected remedy shows is not technically and economically feasible to achieve the PALs for a specific substance.	Applicable to groundwater that is or may potentially be used for drinking water (Alternatives 2, 3).

ARAR	REQUIREMENT/PURPOSE	APPLICABILITY
§ NR 445, WAC for Wisconsin air-use permit	To control hazardous air pollutants by establishing emission rate limits for the discharge of pollutants into the air.	Applicable to the discharge of VOCs into the air from the air stripping treatment of contaminated groundwater (Alternative 2).
§ NR 400 through 499, WAC.	NR 400 series regulations cover the range of Wisconsin air quality management requirements. Requires treatment of emitted gases from waste water treatment system(s) to meet State air-quality standards in accordance with the Clean Air Act.	Applicable requirements related to treatment system emissions may apply (Alternative 2).
LOCATION SPECIFIC		
Federal		
NCP 40 C.F.R. 300 et seq.	Requires that groundwater cleanup standards be attained throughout the contaminant plume or at and beyond the edge of the waste management area when waste is left in place.	Applicable to treatment of groundwater onsite and downgradient offsite via in situ or ex situ methods. (Alternatives 2, 3).
State		
§ NR 140.22(3)(d) WAC, Establishment of a Design Management Zone (DMZ).	Groundwater contaminants must not exceed target cleanup levels beyond 300 feet of the landfill boundary.	Applicable to all solid waste disposal facilities regulated under ch. 289, Stats and hazardous waste disposal facilities, waste piles, landfills and surface impoundments subject to regulation under NR 665.0090 to 665.0094
Ch. 147, Statutes - Wastewater Management Programs and § NR 102, 104, 105, 106, 108, 200, 207, 219, and 220, WAC Surface Water Discharge Regulations (WPDES).	The substantive requirements of WPDES for discharge of wastewater (treated groundwater) to the land and/or surface waters; effluent limits; discharge permits; sampling/ testing methods.	Applicable to the discharge of treated groundwater to on-site infiltration gallery (Alternative 2).
ACTION SPECIFIC		
Federal		
40 CFR 50	Sets national primary and secondary air standards to protect public health and environment. Construction plans of new sources of air pollutants must be reviewed by the State to determine whether best available control technology is required.	Applicable to the construction of air stripping system to treat contaminated groundwater. The system will potentially release VOC air pollutants (Alternative 2).

ARAR	REQUIREMENT/PURPOSE	APPLICABILITY
State		
§ NR 141, WAC. Groundwater Monitoring Well Requirements	Provides standards for design, construction, installation, abandonment, and documentation of groundwater monitoring wells.	Applicable to modifications and maintenance of the monitoring well network (Alternatives 2 and 3).
Groundwater Monitoring and Recovery Well requirements include § NR 112, NR 141, NR 508, WAC.	Requirements for the design and construction of groundwater extraction and injection wells and pump installation. Establishes specific prohibitions on well use, including well disposal of solid waste, sewage or surface water drainage.	Various sections apply to groundwater extraction wells and extraction/injection systems. (Alternative 2).
§ NR 108, WAC	Specifications for Wastewater Facilities	Establishes procedures for submittal and review of plans and specifications for treatment facilities. Applies to groundwater treatment systems.
§ NR 149, WAC	Groundwater Sample Testing standards	Standards required for laboratories testing groundwater samples from the Site. (Alternatives 2, 3).
§ NR 724, WAC	Remedial and interim action design, implementation, operation, maintenance and monitoring requirements	Applicable to the design, implementation and operation and maintenance of remedial systems (Alternatives 2, 3).

Figures

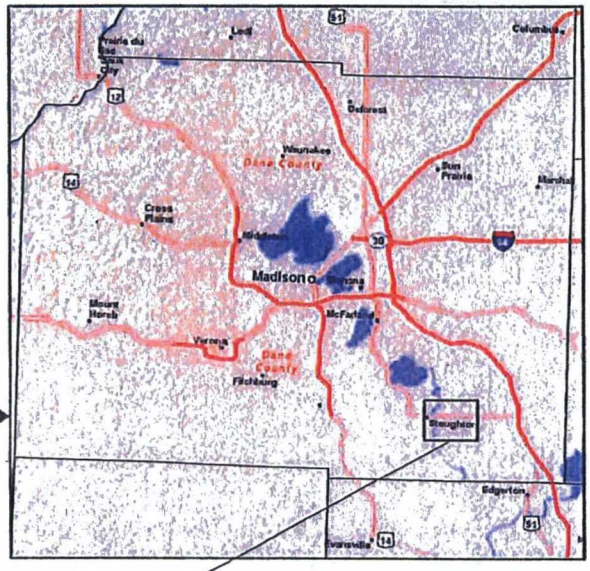
Site Location

Superfund
U.S. Environmental Protection Agency

Hagen Farm
Dane County, WI

EPA ID# WID980610059

State



County

Site

Legend

Fence

Landfill

N

0 90 180 360 540 720 Meters

Figure 1

Produced by Andrea Hicks
U.S. EPA Region 5 on May 6, 2011
Image Date: 2009/2010

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

GEOS
Geoscience Evaluation and Optimization System

Site Features

Superfund
U.S. Environmental Protection Agency

Hagen Farm
Dane County, WI

WID980610059

Legend

- Hagen Farm Property
- Fence
- Capped Main Disposal Area
- Groundwater Treatment Building
- Ditch
- Ponds
- Wisconsin and Southern Railroad

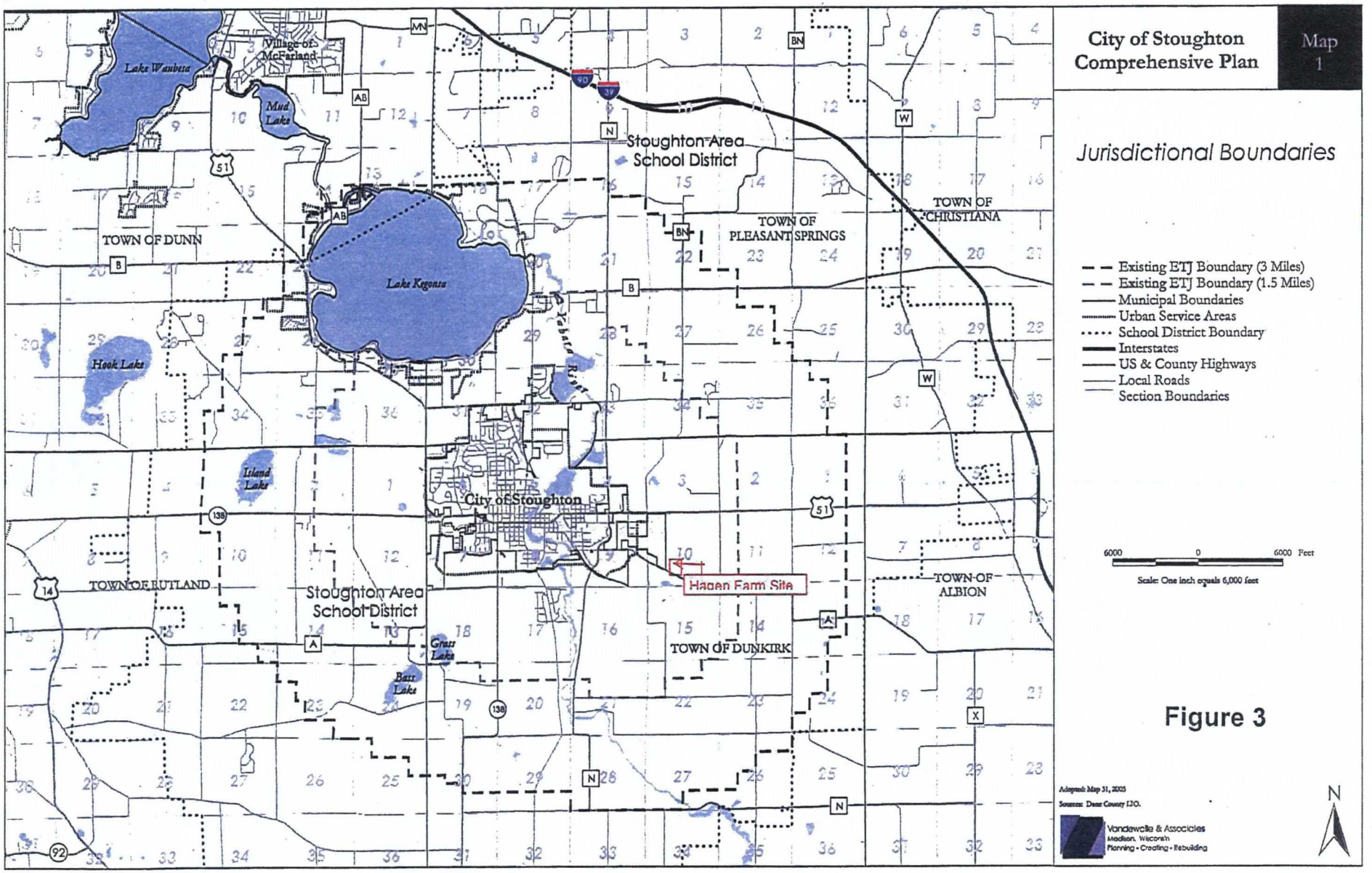
0 300 600 Feet

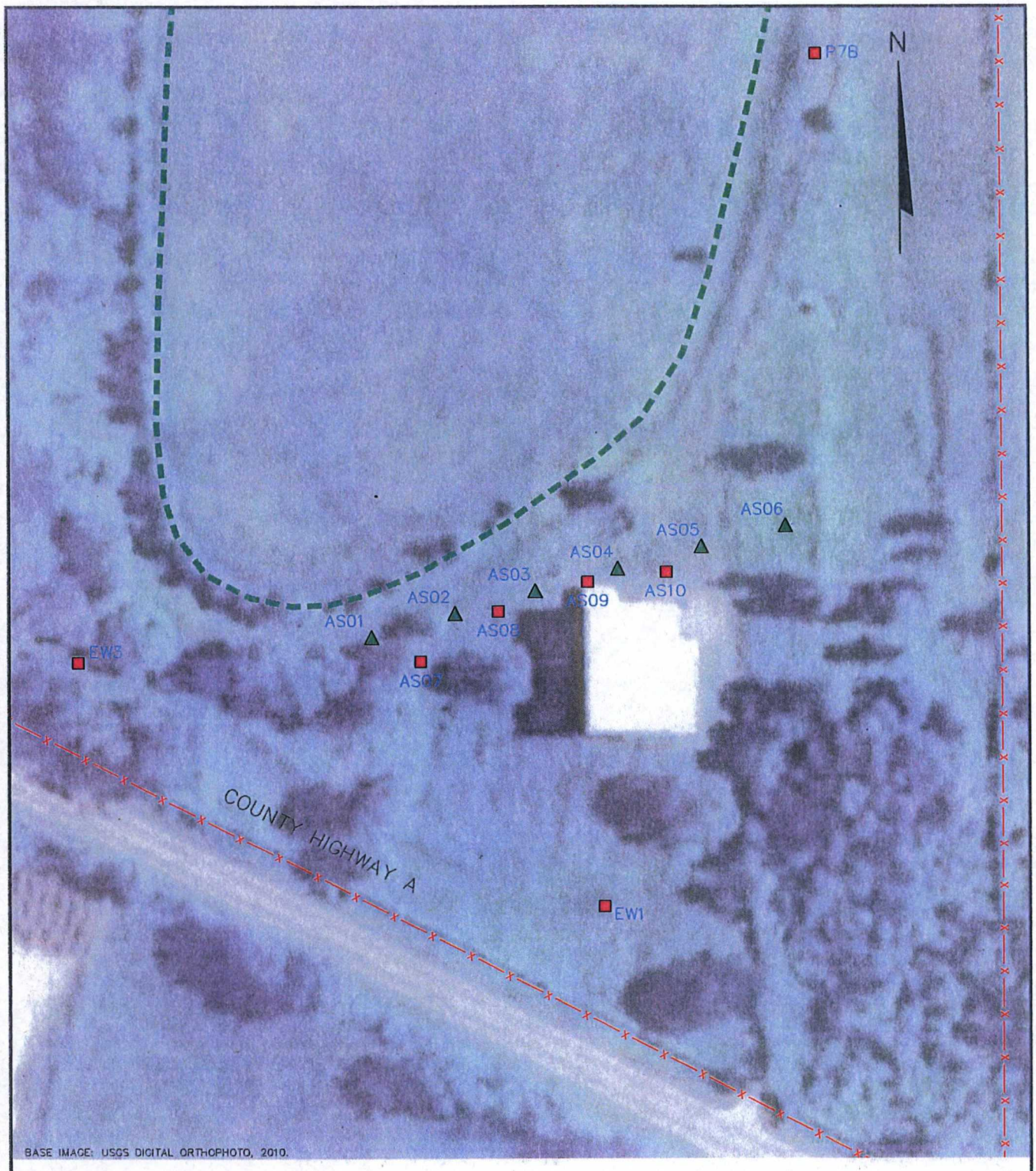
N

GEOS

Created by Sarah Backhouse
U.S. EPA Region 5 on 9/18/06

Figure 2


City of Stoughton
Comprehensive Plan
Map 1
Jurisdictional Boundaries
Existing ETJ Boundary (3 Miles)
Existing ETJ Boundary (1.5 Miles)
Municipal Boundaries
Urban Service Areas
School District Boundary
Interstates
US & County Highways
Local Roads
Section Boundaries
6000 0 6000 Feet
Scale: One inch equals 6,000 feet
Figure 3
Adopted: May 31, 2005
Sources: Dane County LIO.
Vandewalle & Associates
Madison, Wisconsin
Planning • Creating • Rebuilding
N
Lake Waubesa
Village of McFarland
Mud Lake
Lake Kegonsa
Hook Lake
Island Lake
Grass Lake
Bass Lake
Yahara River
TOWN OF DUNN
TOWN OF RUTLAND
TOWN OF DUNKIRK
TOWN OF PLEASANT SPRINGS
TOWN OF CHRISTIANA
TOWN OF ALBION
Stoughton Area School District
Stoughton Area School District
City of Stoughton
Hagen Farm Site



LEGEND

- APPROXIMATE LIMITS OF WASTE
- SHALLOW AIR SPARGE WELL
- DEEP AIR SPARGE WELL

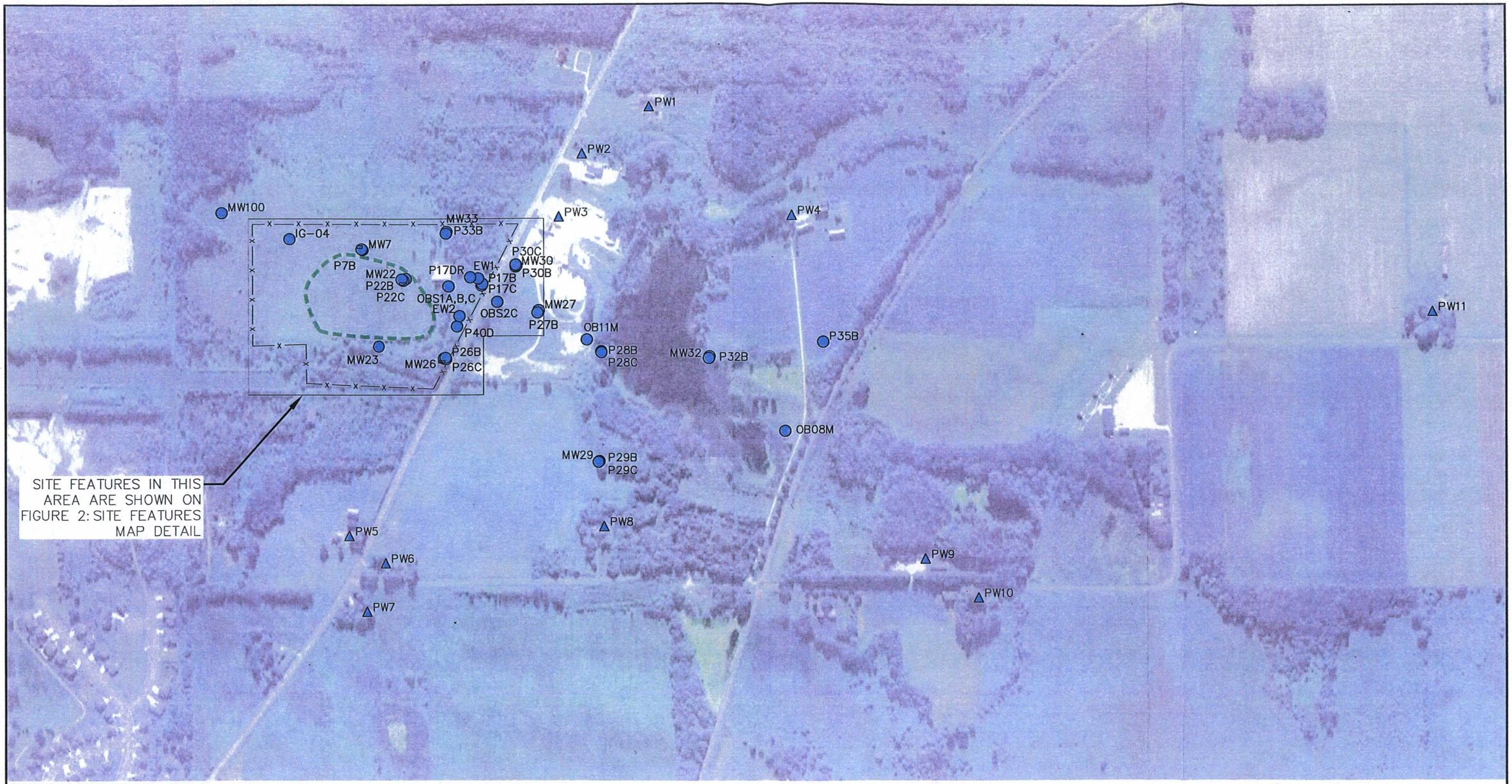
100 0 100

SCALE: 1" = 100'

CLIENT	WASTE MANAGEMENT	SITE	HAGEN FARM SITE TOWN OF DUNKIRK, DANE COUNTY WISCONSIN
			EXPANDED LOW FLOW AIR SPARGING SYSTEM LOCATIONS

PROJECT NO.	25212002.00	DRAWN BY:	RLH	ENGINEER	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-2 PHONE: (608) 224-2830
DRAWN:	11/09/12	CHECKED BY:	RJJ		
REVISED:	03/06/13	APPROVED BY:			

Figure 4



BASE IMAGE: USGS DIGITAL ORTHOPHOTO, 2010.

LEGEND

- APPROXIMATE LIMITS OF WASTE
- FENCE
- MONITORING WELL/PIEZOMETER
- PRIVATE WELL

N

500 0 500

SCALE: 1" = 500'

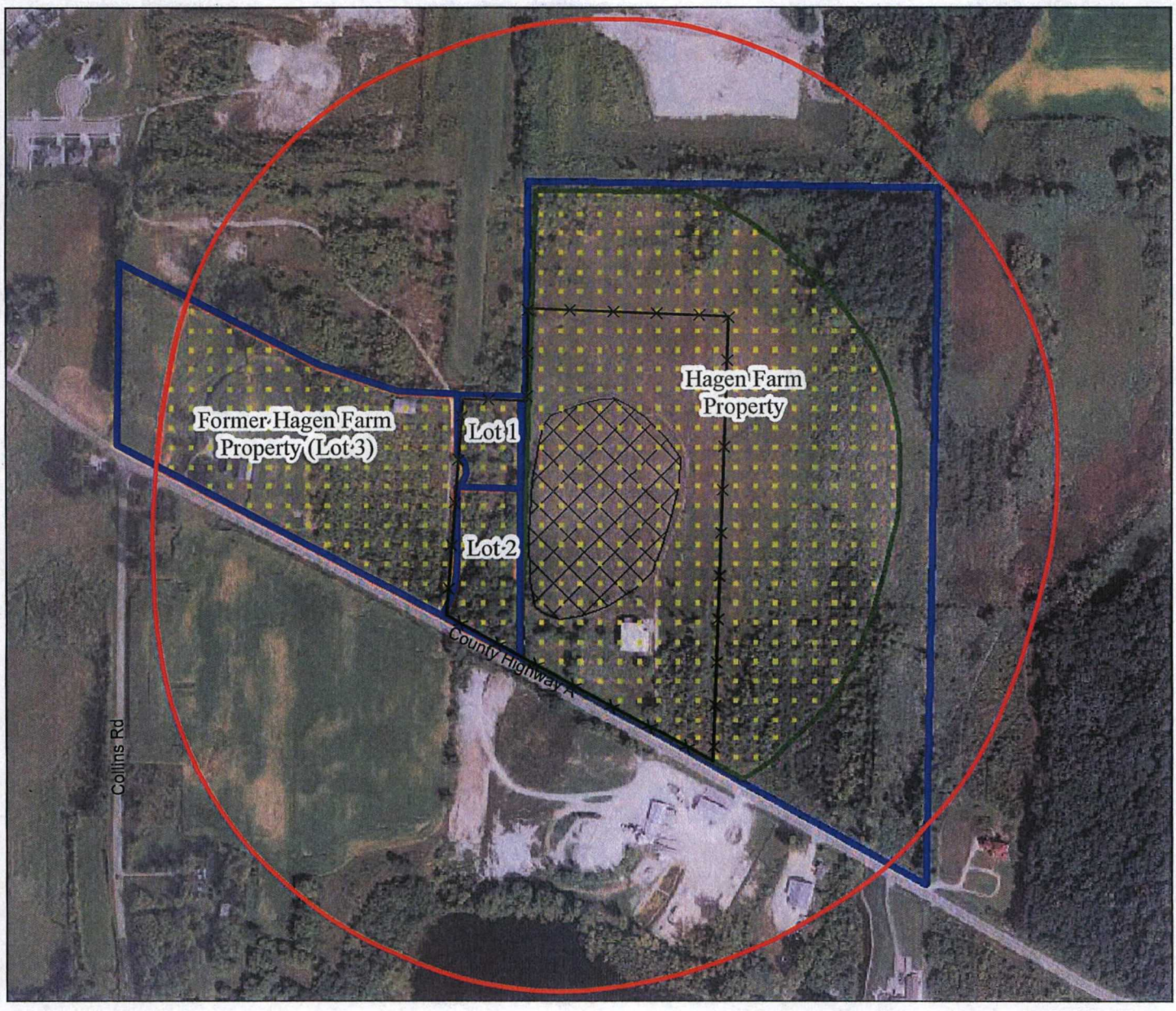
PROJECT NO.	25212002.00	DRAWN BY:	KP	ENGINEER	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT	SITE: HAGEN FARM SITE TOWN OF DUNKIRK, DANE COUNTY WISCONSIN
DRAWN:	11/09/12	CHECKED BY:	ZTW				SITE FEATURES MAP
REVISED:	1/19/16	APPROVED BY:					**Figure 5**

Institutional Control (IC) Review
Implemented Institutional Controls

Superfund
U.S. Environmental Protection Agency

Hagen Farm
Dane County, WI

WID980610059



Legend

- Land and Groundwater Use Restrictions *
- Well Restricted Area: 1200 feet from landfill **
- Well Restricted Area: 700 feet from landfill for exempted property only **
- Landfill
- Fence

0 50 100 200 300 400 Meters

N

GEOS
Groundwater Evaluation and Optimization System

* Deed Restrictions found in the "Hagen Farm Institutional Control Study, pg.33- 38" (2006)

** Well Restrictions found in the "WDNR Approved Private Water System Area" (1995)

Figure 6

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