

EPA Region 5 Records Ctr.




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Five-Year Review Report
Fourth Five-Year Review Report
for
Oakdale Dump, a.k.a. Oakdale Disposal Sites
City of Oakdale,
Washington County, Minnesota
September 2009
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for 

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Date

9/17/09

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List of Acronyms

3M	Minnesota Mining and Manufacturing
AMR	Annual Monitoring Report
ARAR	Applicable or Relevant and Appropriate Requirements
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CO 1983	Consent Order signed between MPCA, EPA and 3M, 7/26/83
EPA	United States Environmental Protection Agency
GAC	Granular Activated Carbon
GMP	Groundwater Monitoring Plan
HRL	Health Risk Limit
HBV	Health Based Value
IC	Institutional Control
IPE	Isopropyl Ether
MCES	Metropolitan Council Environmental Services
MCL	Maximum Contaminant Level
MDD	Minnesota Decision Document
MDH	Minnesota Department of Health
MERLA	Minnesota Environmental Response and Liability Act
MPCA	Minnesota Pollution Control Agency
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operations and Maintenance
OU	Operable Unit
PCB	Polychlorinated Biphenols
PFC	Perfluorochemicals
PFBA	Perfluorobutanoic acid
PFOA	Perfluorooctanic acid
PFOS	Perfluorooctanesulfonate
POTW	Publicly Owned Treatment Works
ppm	Parts Per Million
ppb	Parts Per Billion
QAPP	Quality Assurance Project Plan
RAO	Response Action Objective
RAP	Remedial Action Plan
ROD	Record of Decision
RP	Responsible Party
SACO	Settlement Agreement and Consent Order signed by MPCA and 3M, 05/22/07
SARA	Superfund Amendments and Reauthorization Act of 1986
SVE	Soil Vapor Extraction
UECA:	Universal Environmental Covenants Act
µg/L	Micrograms per Liter

VOC

Volatile Organic Compound

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Executive Summary

In consultation with the United States Environmental Protection Agency (EPA), the Minnesota Pollution Control Agency (MPCA) has completed this five-year review of CERCLA response actions implemented at the Oakdale Dump Site (Site) a.k.a 3M Oakdale Disposal Site, Oakdale Disposal Sites located in Oakdale, Minnesota. This is the fourth five-year review for the Site that evaluates the effectiveness of the CERCLA response actions to date.

The Site consists of three separate properties (Abresch, Brockman and Eberle) that were historically utilized to dispose of industrial and non-industrial wastes. Initial investigations for the Site identified the presence of volatile organic compounds (VOC) in the soil and groundwater at the Site. The selected CERCLA remedy, as prescribed by the 1983 Consent Order (CO) included: identification and removal of buried wastes and contaminated soil; containment of contaminated groundwater with extraction and discharge to the sanitary sewer; identification and abandonment of multi-aquifer wells; and long-term groundwater monitoring. Removal of buried wastes and contaminated soil were conducted in 1983 and 1984. The excavation and removal of buried wastes were required under the CO at the Abresch and Brockman properties. The response action plan required by the 1983 CO did not require response actions at the Eberle property. In 1984 thirty nine multi-aquifer wells were abandoned. The groundwater extraction system was completed in August 1985 and is currently in use and its performance is evaluated through the monitoring well network.

During this review period, perfluorochemicals were identified in soil and groundwater at the Site. Perfluorochemicals (PFCs) are a family of compounds developed to be incorporated into products that resist heat, oil, stains, grease, and water. Additional investigation of the extent and magnitude of PFC impacts was conducted and additional action was determined to be necessary and actions to address PFCs are under planned construction during this review period.

In 2007, 3M and the MPCA signed a Settlement Agreement and Consent Order (SACO) to address PFC contamination at the Site. Although EPA is investigating PFCs, PFCs are not currently listed as CERCLA hazardous substances. EPA was not a signatory to the 2007 SACO.

In November 2008, the MPCA approved the Minnesota Decision Document (MDD), selecting the remedy which outlined the response actions required by 3M to respond to PFC releases from the Site. The selected response actions include the excavation and off-site disposal of remaining PFC wastes, enhancement of the current groundwater recovery system, long-term ground and surface water monitoring, and institutional controls. While the PFC response actions are not being implemented under CERCLA, the process to review and select the PFC response actions was not inconsistent to that prescribed in the National Contingency Plan. Also, certain components of the MPCA approved response action plan (soil vapor extraction and groundwater treatment) will enhance the response actions implemented under the 1983 CO.

Protectiveness Statement(s)

Soil

The remedy required under the 1983 CO addressing VOC contamination in soil at the Site currently is protective of human health and the environment because identified source areas of soil contaminants have been removed. Response actions to address PFC contaminants in soils at the Site include additional source area response actions and soil vapor extraction to reduce concentrations of VOCs in soils prior to excavation and off-site disposal.

Groundwater

The remedy required under the 1983 CO addressing VOC contamination in groundwater is currently protective of human health and the environment, exposure pathways that could result in unacceptable risks are being controlled by the groundwater extraction system and by abandoning impacted wells. Additional response actions to address PFC contamination in groundwater at the Site will enhance this protectiveness as extracted groundwater will be treated with carbon prior to discharge to the sanitary sewer system. In addition, 3M has provided funding to the city of Oakdale for the installation and maintenance of a carbon treatment system to remove PFCs found in two of the city's municipal supply wells and reimburses MPCA costs for the installation/maintenance of whole house Granular Activated Carbon (GAC) systems at residential homes in Lake Elmo, which have shown PFC contamination impacts from the Oakdale Disposal Site. 3M is also required under the 2007 SACO to treat or replace any public or private drinking water supply well which is impacted by PFCs above MDH drinking water standards. MDH has developed HRLs for PFOA and PFOS, and a HBV for PFBA.

Site Wide

The remedy required under the 1983 CO addressing VOC contamination at the Site is protective of human health and the environment in the short-term, exposure pathways that could result in unacceptable risks are being controlled by the selected remedy. However, in order for the remedy to be protective in the long-term relative to VOC contamination, institutional controls for the Site need to be completed. The selected remedy under the 2007 SACO requires that appropriate institutional controls be in place at the Site. An Environmental Restrictive Covenant which meets the State Universal Environmental Covenants Act (UECA) under State Statute 114E, between 3M and the MPCA is required by the MPCA MDD.

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Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): Oakdale Dump Site, a.k.a., Oakdale Disposal Sites		
EPA ID (from WasteLAN): MND980609515		
Region: 5	State: MN	City/County: City of Oakdale/Washington County
SITE STATUS		
NPL status: Final		
Remediation status (choose all that apply): Operating		
Multiple OUs?* NO	Construction completion date: August 1985	
Has site been put into reuse? No, except use of the Eberle parcel as a park and part of the Brockman parcel for commercial use.		
REVIEW STATUS		
Lead agency: State		
Author name: Gary L. Krueger		
Author title: Project Leader	Author affiliation: Minnesota Pollution Control Agency	
Review period:** 5/4/2004 to 9 / 8 / 2009		
Date(s) of site inspection: 10/13/2008		
Type of review: Pre-SARA - Policy Review		
Review number: Fourth (4)		
Triggering action: Report Previous Five-Year Review		
Triggering action date (from WasteLAN): 5/4/2004		
Due date (five years after triggering action date): 5/4/2009		

* ["OU" refers to operable unit.]

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

Five-Year Review Summary Form, cont'd.

Issues:

Issues identified during this five-year review include the absence of institutional controls for the Site.

Compliance with effective ICs must be ensured by implementing, maintaining, monitoring, and enforcing effective ICs and maintaining the site remedy components. To that end, an IC work plan will be requested from 3M to address the additional IC activities, including evaluation of effectiveness of existing ICs, exploring whether additional ICs are needed, and planning for long-term stewardship.

Recommendations and Follow-up Actions:

Recommendations identified in this five-year review to address VOCs include: continued operation and maintenance of the groundwater extraction system; continued groundwater monitoring; establishing institutional controls for the Site; and considering the existing protectiveness of the site in future response actions and decision documents if any are required.

Protectiveness Statement:

The remedy as required under the 1983 Consent Order concerning releases of VOCs at the Site is protective of human health and the environment in the short term. Exposure pathways that could result in unacceptable risks are being controlled by the selected remedy. However in order for the remedy to be protective in the long-term regarding VOC contamination, appropriate Institutional Controls need to be in place. An Environmental Covenant pursuant to the State Statute 114E UECA, is required by the MDD and was approved by the MPCA in 2008 regarding PFC releases from the Site. A long term groundwater monitoring plan is also required under the 2008 MDD. Response actions to be implemented in response to PFC releases will enhance the VOC remedy. Once these actions are implemented, all terms and conditions specified under the 1983 Consent Order will be completed except for certain continuing obligations, and no further CERCLA response actions are expected to be necessary.

Other Comments:

None.

Five-Year Review Report

I. Introduction

The Purpose of the Review

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

Authority for Conducting the Five-Year Review

The MPCA, as the lead agency for oversight of the response action at the Site, is preparing this five-year review pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

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

The MPCA interpreted this requirement further in the National Contingency Plan (NCP); 40 CFR §300.430(f)(4)(ii) states:

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

The 1983 Consent Order was approved on July 26, 1983, under MERLA State Statute 115B and CERCLA Section 106 authority. This was before the enactment of SARA, therefore this five-year review is not a regulatory requirement, but is being conducted as a matter of EPA policy. The 1983 Consent Order was also approved prior to the Site being listed on the Final NPL, which occurred on September 8, 1983. The 1983 Consent Order is the controlling CERCLA document concerning the response actions responding to releases of VOCs from the Site. A Record of Decision (ROD) has not been completed. The 1984 Consent Order Amendment,

which primarily dealt with schedule adjustments, was also approved under MERLA 115B and CERCLA 106 authority.

Who Conducted the Five-Year Review

The MPCA, in consultation with the EPA, has conducted a five-year review of the actions implemented at the Site in Oakdale, Minnesota. This review was conducted from October 2008 through September 2009. This report documents the results of the review conducted with the assistance of MPCA's contractor. The MPCA is the lead environmental regulatory agency for the implementation and oversight of response actions at the Site.

Other Review Characteristics

This is the fourth five-year review for the Site. The triggering action for this review is the date of the previous five-year review, as shown in EPA's WasteLAN database: May 4, 2004. This five-year review was conducted by the MPCA following EPA policy to conduct a five-year review when contaminant levels remaining on-site do not allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1: Chronology of Significant Site Events

Event	Date
Event Investigation Performed by MPCA.	1980
MPCA sent letters to potential responsible parties.	November 14, 1980
Administrative Order by Consent and Response Order by Consent (Consent Order) signed by Minnesota Mining and Manufacturing (3M) and the MPCA. (An amendment to the Consent Order was approved on May 22, 1984, which primarily adjusted the schedule to implement response actions)	July 26, 1983
Site was placed on the National Priorities List (NPL).	September 8, 1983
Removal of buried wastes and contaminated soil.	1983 through 1984
Abandonment of 39 privately owned wells.	1984
Implementation of groundwater containment and monitoring.	August 1985

Table 1: Chronology of Significant Site Events

Event	Date
Ongoing operation, maintenance and monitoring of the groundwater remedy. 3M is required to operate the VOC ground water containment system for 30 years, under terms of the 1983 Consent Order.	1985- Present
Completion of the first five-year review by the EPA.	March 31, 1993
Completion of the second five-year review by the MPCA.	March 27, 1998
MPCA adopts Minnesota Department of Health (MDH) Health Based Value for Isopropyl Ether (IPE) of 80 micrograms per liter ($\mu\text{g/L}$) This was used as performance criteria for evaluating containment of the VOC plume, not as a cleanup goal for the Site. No cleanup goal was identified in the Consent Order.	May 14, 2001
MPCA approved the updated Quality Assurance Project Plan (QAPP).	January 24, 2003
Perfluorochemicals (PFC) identified at the Site	Fall 2004
Settlement Agreement and Consent Order[2007 Consent Order(SACO)] addressing PFC waste at the site signed by 3M and MPCA.	May 22, 2007
Minnesota Decision Document (MDD) addressing PFCs at the site is signed by the MPCA	November 4, 2008

III. Background

Physical Characteristics

The Site consist of three separate properties (sites) that are located west of Hadley Avenue and north and south of Highway 5 in the City of Oakdale, Minnesota (Figure 1). The sites are referred to as the Brockman, Abresch and Eberle sites. The sites are named for the property owners at the time the sites were used. The land use surrounding all sites consists of commercial, light industrial, and residential properties.

The largest of the three sites (approximately 27 acres) is the Abresch site, located both north and south of Highway 5 (Figure 2). The Abresch site contains wetlands, ponds, wooded areas and a stream leaving the Site to the east. Currently the Abresch site is entirely fenced except to the north east where the site is adjacent to commercial properties owned by 3M.

The Brockman site is located immediately south west of the Abresch site. A portion of the Brockman site is currently utilized for commercial purposes and land use at the remaining portion of the Brockman property is wooded vacant land.

The Eberle site is located roughly 2,500 feet north of the Abresch site. The site has been redeveloped as residential properties and a city park. Response actions were found to not be necessary at the Eberle site and were not required under the 1983 CO. No further CERCLA response actions are expected to be necessary at the Eberle portion of the Site at this time, nor are any institutional controls required.

History of Contamination

The Site was utilized for the disposal of industrial wastes. The Abresch site was utilized as a waste burial and drum reclamation site from the 1940's through 1961. During disposal operations various wastes including scrap materials (tape and paper), plastics, resins and solvents in drums and smaller containers were deposited in trenches and buried on-site. Waste disposal practices utilized at the Brockman site were similar to methods utilized at the Abresch site. Waste disposal methods at the Eberle site reportedly included open burning of combustible waste.

A 1980 investigation of the Site by the MPCA indicated the presence of a variety of hazardous substances, specifically volatile organic compounds (VOC) within disposal trenches at the Abresch and Brockman sites. Soil sampling at the Eberle site reportedly revealed heavy metals contamination. Further investigation identified nine nearby wells were impacted with hazardous substances, particularly isopropyl ether (IPE).

Initial Response

In 1983, based on the findings of a hydrogeologic study of the Site, the MPCA, EPA and 3M entered into an Administrative Order by Consent and Response Order by Consent (Consent Order). The three phase study identified that contaminants were confined to soil and groundwater within the glacial drift and in the Platteville aquifer in and near the sites. The glacial drift and Platteville aquifers are separated by a confining layer of Decorah shale over most of the Site. The hydrogeologic investigation also identified the Platteville aquifer (a fractured limestone formation beneath the glacial drift) as the most likely pathway for contaminant migration. The St. Peter and Jordan sandstone formations are found below the Platteville aquifer and are protected by a layer of Glenwood Shale that underlies the three disposal sites. The studies also identified multi-aquifer wells in the vicinity of the Site as possible contaminant migration pathways to the St. Peter and Jordan aquifers.

The hydrogeologic investigations recommended that a plan be developed for the selective removal of wastes from the Abresch and Brockman sites, the multi-aquifer wells be properly abandoned, and that a monitoring well network be established for a groundwater monitoring program.

The Remedial Action Plan (RAP) developed for the Site identified the selected remedy for the Site. The RAP was included as Exhibit A to the 1983 Consent Order. The selected remedy was developed to address VOC contamination of groundwater at the Site. The plan proposed the

following:

- Reconstruction or abandonment of the multi-aquifer wells near the site;
- Removal of all containers and barrels of hazardous waste that were identified through the geophysical survey;
- Removal and/or treatment of heavily contaminated soils in the Abresch and Brockman sites;
- Construction and operation of a shallow groundwater pump out system to contain contaminated groundwater; and
- Establishment of a long term monitoring well network that will detect changes in groundwater quality at the Site.

The 1983 Consent Order and RAP have been adopted as decision documents to address VOC contamination at the Site by the MPCA, EPA and 3M. A ROD was not completed for this Site.

Burial trenches and buried drum stockpiles were identified in a September 1982 geophysical investigation report. A report documenting the results of the 1982 investigation is documented as Attachment A to the RAP. 3M commissioned a surface cleanup of wastes at the Abresch site beginning in the winter of 1983. 55 gallon drums and five gallon pails containing residual material were removed from the site and disposed of at the 3M Chemolite incinerator in Cottage Grove, Minnesota. During the excavation activities, a total of 11,500 cubic yards of waste material was removed, including 4,200 empty drums, 8,700 empty 5 gallon pails, 4,660 cubic yards of contaminated soil and 15 intact containers that were overpacked. Most of the waste, 11,800 tons, was transported to the 3M Chemolite facility in accordance with the 1983 Consent Order. An additional 6,500 tons of excavated waste containing more than 50 parts per million (ppm) of polychlorinated biphenols (PCB) were transported to a hazardous waste landfill for disposal. Excavated soil with low levels of contamination were treated on-site utilizing construction aeration pads. Additionally 173,000 gallons of contaminated water was collected during excavation activities and transported for treatment at the 3M Chemolite facility waste water treatment system. Abandonment of multi-aquifer wells was completed in 1984. There had previously been 44 multi-aquifer wells identified within the groundwater plume. Of these 44 wells, 39 were abandoned, three were added to the monitoring well network and 2 were found to be single aquifer wells completed within an unaffected aquifer. Wells were abandoned in accordance with the Minnesota Department of Health (MDH) Water Well Construction Code.

Construction of a groundwater extraction system was completed in August 1985. The system was initially completed utilizing 12 pumping wells, completed in the glacial drift aquifer, that discharged impacted groundwater to the sanitary sewer for treatment at the Metropolitan Wastewater Treatment Facility, a publicly owned treatment works (POTW) facility operated by the Metropolitan Council Environmental Services (MCES).

A groundwater monitoring well network was established to monitor response action progress at and near the Site. The March 1985, Groundwater Monitoring Plan describes the initial monitoring plan and has since been updated for operational improvements. The groundwater

monitoring plan and groundwater extraction system were updated in 2003 to optimize system performance. Changes were implemented based on previous data collected, previous performance and trend analysis performed for specific monitoring and extraction wells. The 2003 changes to the groundwater extraction system included reducing the number of extraction wells from 11 to 7. PW-7, PW-8 and PW-9 were converted from extraction wells to monitoring wells while PW-5 was abandoned. The decision to change the purpose of these wells or abandon them was based on well performance and existing operational redundancy.

3M proactively performed a passive soil gas survey and follow-up investigation in 2000 and 2001 to investigate the possibility of additional source areas at the Abresch site. Results of the investigations identified residual contamination in previously defined areas as a suspected source of ongoing groundwater contamination. Upon review of the information provided by the passive soil gas survey and the follow-up investigation the MPCA issued a letter dated July 2, 2002, stating additional soil gas investigation was not necessary.

Basis for Taking Action

The initial discovery of drums and smaller containers containing VOC buried at the Site led to additional investigations. Further assessment of the site indicated that there was VOC impacted soil and groundwater present at the Site.

Compounds detected in soil at the Site during the initial investigation include; IPE, Acetone, PCBs, and heavy metals. Contaminated soil along with debris and drums were removed from burial trenches onsite. The 1983 Consent Order identified treatment or removal of contaminated soil as part of the selected remedy for the Site. Trenches and drum stockpile locations were identified through the geophysical investigation conducted prior to the completion of the RAP. VOC-contaminated soil, drums and containers identified as source areas contributing to downgradient groundwater impacts were removed and disposed of as described above in the Initial Response portion of this section.

Compounds detected in groundwater during the initial investigation of the Site include IPE, acetone, isopropyl alcohol, methyl ethyl ketone, methyl isobutyl ketone, toluene, 2-butyl alcohol, 4-methyl-2-penanol, benzene and xylenes. Initial investigations identified VOC impacts at nearby supply wells. The final reports for the investigations identified contaminated groundwater was present within the glacial drift and Platteville aquifers.

Additionally multi-aquifer wells nearby were identified as potential pathways for contaminants to migrate to the lower St. Peter Sandstone aquifer. Wells constructed partially or completely within the Jordan aquifer were identified as potential receptor pathways.

In a May 2001 memorandum, at the request of the MPCA, the MDH established a Health Based Value (HBV) for IPE of 80 micrograms per liter ($\mu\text{g/L}$). HBVs are utilized for advisory purposes only and are not enforceable criteria for groundwater contaminants.

IV. Response Actions

Remedy Selection

The Consent Order signed on July 26, 1983, stated that 3M shall implement the program designed to protect the public health, welfare and environment from threatened or actual release of hazardous substances associated with the Oakdale disposal Sites. The program, identified in the RAP is included as Exhibit A to the 1983 Consent Order. The stated purpose of the RAP is:

“to further define the extent and location of wastes on the Oakdale disposal sites; to delineate procedures for implementing the selective removal of waste; to develop disposal options; to carry out a monitoring program while the work is underway; to implement a system to control contaminated groundwater; and to define a long term monitoring system to ascertain if all contaminants have been removed or confined to the Site.”

The RAP identifies two VOC-contaminated media at the Site; Soil and Groundwater. The RAP documents the selected remedies addressing both soil and groundwater contamination related to the Site.

Soil

The selected remedy identified in the RAP addressing VOC contamination in soil is source removal by excavation with on-site and off site treatment. Source areas were identified in a Technos, Inc. report for Barr Engineering and 3M in September 1982. The report is identified as Attachment A to the RAP. Source areas were identified utilizing magnetometry and electromagnetic conductivity techniques and separated into two classes of buried materials. Class 1 areas consisted of “massive concentrations of steel drums.” Class 2 areas consisted of “areas of numerous isolated steel drums.” The areas of the site identified as Class 1 and Class 2 were removed during 1983 and 1984. The RAP also specifically identified site air quality monitoring that was to be conducted during excavation activities and specifications required to determine soil disposal or treatment methods. During the excavation activities drums and containers were removed from disposal trenches and disposed of utilizing methods previously discussed in Section III of this review.

Groundwater

The selected remedy identified in the RAP addressing VOC contamination in groundwater consists of groundwater containment, extraction and treatment, groundwater monitoring, and abandonment of supply wells that could potentially impact human health and the environment.

Groundwater supply wells within a one-mile area identified as multi-aquifer wells connecting the Platteville and St. Peter aquifers were to be abandoned or reconstructed. The abandonment or reconstruction of these multi-aquifer wells eliminated suspected pathways for VOC impacted

groundwater to migrate to the St. Peter aquifer.

Groundwater extraction wells were installed on the northern portion of the Abresch site during the excavation activities. Initially, eleven groundwater extraction wells were completed in the glacial drift aquifer to the south of Highway 5 and one extraction well was completed in the isthmus area of the site. The extraction wells are identified as PW1 through PW12. PW12 was abandoned in 1999 due to insufficient groundwater pumping rates. According to the 2007 Annual Monitoring Reports (AMR), PW5 was abandoned in 2003 when changes to the monitoring plan were implemented. The groundwater extraction system discharges to the sanitary sewer for treatment at the Metropolitan Wastewater Treatment Facility. The purpose of the groundwater extraction system is to contain impacted groundwater movement laterally through the site and to limit the vertical movement of groundwater between the glacial drift and the Platteville aquifers.

A groundwater monitoring well network was installed with the purpose of assessing the effectiveness of the response actions, detect future contaminant migration into deeper aquifers, and prevent any future receptor exposure. Additionally the monitoring well network can be utilized to identify any need for modifications to the groundwater extraction system.

Remedy Implementation

The selected remedy as documented in the 1983 Consent Order addresses VOC contamination in both soil and groundwater at the Site. The selected remedy was implemented beginning in 1983 and continues through the present.

Soil

Soil, debris, and waste containers identified as being impacted with VOCs were removed from disposal ditches at the Site. Highly contaminated soil and debris was transported for treatment at the 3M Cottage Grove Chemolite facility. Soil identified with lower concentrations of VOCs was treated on-site and utilized as fill. Containers containing waste, including drums and five gallon pails, were overpacked, characterized and transported for incineration at the 3M Chemolite facility. Excavation of the disposal trenches was completed during the winters of 1983 and 1984.

Groundwater

Implementation of the groundwater remedy began in 1983 with the identification of multi-aquifer wells and impacted supply wells within a one mile radius of the Site. Wells identified as possessing a potential risk to the protectiveness of the remedy selected for the site or identified as a risk to human health and environment were abandoned. Additionally, when necessary, connection to municipal water was utilized to replace impacted water supply wells. Wells identified as possible risks were abandoned in 1984.

The groundwater extraction system was installed during the excavation activities and completed in August 1985. The groundwater extraction system was installed to contain VOC contaminated groundwater and currently operates with seven extraction wells. The groundwater extraction system discharges to the sanitary sewer for treatment at a POTW operated by the MCES. The discharge is monitored to comply with the discharge permit issued by the MCES. Evaluation of data provided in the 2007 AMR has indicated the extraction system is functioning as intended.

A monitoring well network was established at the site to monitor the groundwater VOC contaminant plume at and downgradient of the site. The monitoring plan as described in the 2003 QAPP consists of a monitoring program for extraction wells and monitoring wells. Extraction wells are completed within the glacial drift and are sampled annually. Monitoring wells are completed in the glacial drift, Platteville aquifer and St. Peter Aquifer. The groundwater monitoring schedules vary for each monitoring well and are discussed in Section VI of this report. Groundwater monitoring schedules were revised in the 2003 QAPP from the 1985 monitoring plan based on data collected over the life of the site. At this time the groundwater monitoring network is performing as intended by the 1983 Consent Order.

System Operations and Maintenance

3M conducts ongoing operation and maintenance of the groundwater extraction system. Maintenance is performed proactively to reduce the amounts of biological growth and particulate matter that accumulate in the wells. Containment system maintenance includes cleaning, repairing or replacing pumps, flow meters, chemical well treatment and cleaning discharge lines. The system is visited three times per month by 3M or their consultant to monitor and maintain the groundwater extraction system. Frequent monitoring and proactive maintenance reduces system down time, increases system life and optimizes system operation.

Approximate annual O&M costs during 2004-08: \$200,000 (as stated by Jim Kotsmith of 3M)

Institutional Controls

Institutional controls (ICs) are required to ensure the protectiveness of the remedy. ICs are non-engineered instruments, such as administrative and legal controls, that help to minimize the potential for human exposure to contamination and that protect the integrity of the remedy. ICs are required to assure the long-term protectiveness for any areas which do not allow for unlimited use or unrestricted exposure and are required to maintain the integrity of the remedy.

ICs in the form of a restrictive covenant were in progress at the time of the previous five-year review. Since the previous five-year review, additional chemicals of concern have been identified at the site. Perfluorochemicals (PFC) were identified within the groundwater at the Site in 2004. Subsequent investigations have also identified PFC contaminated soil at the Abresch Site. Additional response action was determined to be necessary to address PFCs. ICs have not yet been implemented for VOC contamination due to this new development at the site and the interest for ICs to be fully protective of all identified issues at the Site. Institutional

controls when implemented will control potential access to all areas identified with VOC and PFC contamination and be inclusive of all contaminated media at the site. ICs in the form of restrictive covenants have been identified in the previous five-year review as the preferred IC for the Site due to their ability to ride with the land for future protectiveness of human health and the environment.

The cleanup for the Abresch site requires that ICs would be implemented to ensure the future use of the area is limited to industrial/commercial purposes. The response action performance standards for groundwater are the Safe Drinking Water Act MCLs for public water supplies and the MDH RALs for contaminants of concern. Once those levels are met, the Abresch site could attain Unlimited Use/ Unlimited Exposure status for reuse. The cleanup of the Brockman site assumes that the site can be used for light industrial purposes. The Eberle site did not require any response actions, already has the UU/UE status, and has park and residential uses.

Media, Engineered Controls & Areas that Do Not Support UU/UE	IC Objective	IC Instrument Implemented or Planned
Areas A, B, C, D at the Abresch site	Prohibit construction, excavation, or placement of any structure or any other item Prohibit installation of any drinking water wells on the property	<u>Planned</u> : MPCA is creating an IC plan as part of the MDD. The plan will evaluate the effectiveness of MN. Statute 114E (2007 Universal Environmental Covenants Act) that imposes activities and use restrictions. The plan will determine if additional ICs are needed/required.
Groundwater	Restrict construction, maintenance, sealing, or disturbal of groundwater wells	<u>Planned</u> : IC plan will evaluate 2007 UECA; determine if additional ICs are needed/required <u>Implemented</u> : Washington County Special Well Construction Area was established pursuant to MN. Rules Part 4725.3650 MN. Stat. Section 103I.236 requires sellers to disclose special well construction areas (under review)
Brockman site	Current use is commercial and wooded.	Will be evaluated.

Table 2. Institutional Controls Summary Table		
Media, Engineered Controls & Areas that Do Not Support UU/UE	IC Objective	IC Instrument Implemented or Planned
Eberle site	Current use is recreational	Will be evaluated.
Surface Water	This is under evaluation to determine if the use of surface water should be restricted.	Will be evaluated.
Other Response Action Components	Prohibit Inconsistent Uses and protect the integrity of the remedy components	Will be evaluated.

As part of the IC evaluation activities discussed below, maps will be developed which depict the current conditions of the site and areas which do not allow for UU/UE.

Current Status of Access and Use Restrictions (Institutional Controls)

The Abresch site is fenced. A portion of the Brockman site is under commercial reuse; the remaining (vacant) portions are owned by 3M. The Eberle site is currently a city park and never required access restrictions.

The MPCA is responsible for periodic inspections and oversight over 3M's O&M activities. The MPCA notified the surrounding community of the contaminated GW and limited exposure possibilities by connecting residences to city water supplies. In March 2007, the MDH issued a Special Well Construction Area notice where no nearby residents may construct, maintain, seal or disturb drinking water wells without the Commissioner's prior approval. There have been no unanticipated disturbances at the ODS. Based on inspections and interviews, EPA is not aware uses that are inconsistent with the stated objectives of the ICs. The remedy is functioning as intended.

Follow-up Actions

Implementing, maintaining, monitoring and enforcing effective ICs will be required to assure protectiveness of the remedy. Some of the required ICs have not been implemented and the existing ICs have not been evaluated. The need for additional ICs requires further evaluation. An IC workplan will be required from 3M to address the additional IC activities including evaluating the effectiveness of existing ICs, implementing additional ICs, exploring whether additional ICs are needed and planning for long-term stewardship. These IC activities are

needed to assure that the remedy is functioning as intended with regard to the ICs and to ensure effective procedures are in-place for long-term stewardship at the Site. The IC workplan will be subject to review and approval by MPCA and EPA. If necessary, the MPCA and EPA will prepare an IC plan to follow-up on specific activities.

Long-Term Stewardship and Land Use Plans

Long-term protectiveness at the site requires compliance with effective ICs to assure the remedy continues to function as intended. Since compliance with ICs is necessary to assure the long-term protectiveness of the remedy, planning for long-term stewardship is required. Long-term stewardship will ensure that effective ICs are maintained, monitored and enforced, and that the remedy continues to function as intended with regard to ICs. The O&M Plan will be reviewed and revised by 3M, as needed, to ensure long-term stewardship procedures are in place. The plan would include regular inspection of ICs at the site and annual certification to EPA that ICs are in-place and effective. Additionally, use of a communications plan and use of a one-call system should be explored for long-term stewardship.

V. Progress Since the Last Five-year Review

The protectiveness statement from the previous five-year review dated May 4, 2004 is as follows:

“The groundwater containment remedy is controlling plume migration both laterally and vertically. The remedy is functioning as intended and is protective of human health and the environment in the short term. Long term protectiveness will be ensured once the institutional controls are in place.”

Table 3: Actions Taken Since the Last Five-Year Review

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome
Institutional controls are not in place.	Institutional controls are required by the MDD addressing PFCs identified at the site since the previous five-year review.	MPCA and 3M	June 30, 2010	Institutional controls have not yet been finalized.

Recommendations from the previous five-year review and follow-up actions are as follows:

Previous recommendation #1:

“Finalize the institutional controls which will consist of a restrictive covenant. 3M has submitted a draft restrictive covenant for MPCA review and will record the final document with Washington County once it is approved by MPCA.”

Institutional controls have not yet been finalized for the Site. The MDD concerning PFCs for the Site identifies institutional controls in the form of restrictive covenants as a portion of the site wide remedy to meet response action objectives (RAO). A Restrictive covenants pursuant to State Statute 114E (Uniform Environmental Covenants Act) will need to be developed for the Site

Previous recommendation #2:

“Continue to operate, maintain and monitor the groundwater containment system to the extent necessary to maintain protectiveness of human health and the environment. The effectiveness of the groundwater containment system should continue to be evaluated on an annual basis in the AMR with the intent of revising the system as needed.”

The groundwater containment system has continued to operate as intended. Modifications to the groundwater extraction system were implemented in 2003; modifications were approved by the MPCA as finalized in the 2003 QAPP. Modifications to the groundwater extraction system included abandonment of extraction well PW5 and converting extraction wells PW7, PW8, and PW9 to monitoring wells. The converted extraction wells are sampled in accordance with the schedule and objectives identified in the 2003 QAPP. AMRs submitted during this review period indicate the selected remedy is meeting objectives identified in the 1983 Consent Order and RAP for the Site.

Previous recommendation #3:

“Recommend to EPA that the Site be deleted from the NPL once institutional controls are in place.”

Steps to delete the Site from the national priorities list (NPL) were initiated in 2003; however, since 2004 new information and additional chemicals of concern have been identified at the Site. PFCs were identified in the groundwater and soil at the site in 2004. PFCs are a family of chemicals developed to be incorporated into products that resist heat, oil, stains, grease and water. The selected remedy to address PFC contamination addresses impacted soil and groundwater at the Site. While PFCs are not CERCLA hazardous substances, the additional response actions to address PFC contamination are consistent with and enhance the response actions to address VOC contamination. Once response actions specified by the 2008 MDD concerning PFCs, which include appropriate institutional controls and a long term groundwater plan be approved, all necessary and appropriate CERCLA response actions specified under the 1983 Consent Order will have been implemented. At that time, the MPCA and EPA may consider terminating the 1983 Consent Order and 1984 Consent Order Amendment, and re-evaluate delisting the Site from the NPL as no further CERCLA response actions are expected to be necessary.

VI. Five-Year Review Process

Administrative Components

The responsible party (RP) was notified and given the opportunity to contribute to the content of this report. A public notice was published in the St. Paul Legal Ledger on October 28, 2008. This document was initially drafted by Delta Consultants on behalf on the MPCA and submitted to the MPCA for finalization.

Components associated with this review include the following:

October 13, 2008	Site Inspection
October 28, 2008	Public Notice Published
October 29, 2008	File Review
November 4, 2008	Interview with RP
November 20, 2008	Interview with POTW
January 14, 2009	Interview with City of Oakdale

Community Involvement

A public notice announcing this five-year review was published in the St. Paul Legal Ledger on October 28, 2008. A copy of the notice is included in Appendix A. No comments or concerns were received from the public concerning the Site.

Representatives of 3M, MCES and the City of Oakdale were notified by a telephone interview that a five-year review was being performed. Interview documentation is provided in Appendix B.

A telephone interview with James Kotsmith, Environmental Engineering Specialist, with 3M was conducted on November 11, 2008. Mr. Kotsmith indicated that he thought the remedy selected to address VOC contamination at the site continues to be protective of human health and the environment and was functioning as intended by the site decision documents. He also indicated that future response actions planned to address PFC contaminants would enhance protectiveness provided by the selected VOC remedy.

Tina Nelson with MCES was interviewed by telephone on November 20, 2008. She did not express concern for the selected remedy at the Oakdale Disposal Site. She also indicated that the discharge from the Site was meeting permit requirements.

Chris Sonterre, Utility Supervisor for the City of Oakdale, was contacted by telephone and email on January 14, 2009. Mr. Sonterre did not express that he had any concerns regarding the Site and stated that he was well informed about progress at the Site.

Document Review

All relevant documents associated with this Site were reviewed. A complete list of documents reviewed is included in Appendix C. Documents relevant to the PFC investigation and response action is included in Appendix D.

Data review

Groundwater extraction system operational data and groundwater monitoring data from AMRs submitted to the MPCA were reviewed during this five-year review. Groundwater monitoring data, including groundwater elevation measurements presented in the 2007 AMR, are included in Appendix E.

The 2006 AMR identified a laboratory error that resulted in corrections to concentrations reported between 2001 and 2005. The laboratory error resulted in some of the original VOC concentrations being reported lower, by roughly 50 percent, than actual concentrations. The error resulted in incorrect trend analysis and mass removal calculations for a portion of this review period. The concentrations of contaminants affected by this error have been recalculated and the correct concentrations have been reported in the 2006 and 2007 AMRs. Data discussed in Appendix G utilizes the corrected concentrations.

Site Inspection

A site inspection was conducted on October 13, 2008 at the Site by Fred Campbell and Gary Krueger of the MPCA, John Estes and Jacob Knapp of Delta Consultants, and James Kotsmith of 3M. A site inspection checklist is included in Appendix F and photographs from the site inspection are included in Appendix H. During the site inspection, the groundwater extraction system, including the treatment building and extraction wells, was observed. Site monitoring wells were also observed. Muddy conditions created by on-site construction activities and recent rain prevented close observation of wells located on the north side of Highway 5 and W205. These wells were observed from a distance. Well W80 could not be located during the Site inspection. James Kotsmith later reported that this well was formerly a private supply well and is currently utilized for non-potable (lawn watering) purposes. All monitoring wells, extraction wells and extraction system components observed appeared to be in good operating condition.

VII. Technical Assessment

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

Yes, the remedy is functioning as intended. The 1983 Consent Order describes the selected remedy for the Site. The selected remedy includes: 1) the removal of concentrated areas of waste; 2) reconstruction or abandonment of multi-aquifer wells; 3) operation of a shallow groundwater containment and extraction system and 4) the development of a groundwater monitoring well network.

Response actions addressing each portion of the selected remedy are described below.

1. Areas of concentrated wastes were identified and removed in 1983 and 1984 in accordance with the Site decision documents. The objective of the waste removal activities was to remove and dispose of known source areas.
2. Identification, reconstruction or abandonment of multi-aquifer supply wells was completed in 1984 when 39 privately owned supply wells were abandoned. The objective of well abandonment or reconstruction was to eliminate multi-aquifer migration pathways.
3. During waste removal activities a shallow groundwater extraction system was constructed and continues to operate. The objective of the groundwater extraction system, as stated on page 8 of the 1983 Consent Order, is to *"remove and contain highly contaminated groundwater beneath the disposal site, thus preventing its movement laterally and vertically into the deeper aquifers."* Data reviewed during this five-year review, as discussed in Section VI, indicate contaminated groundwater is being removed at this time. Data also indicate vertical and lateral containment is being achieved within the glacial till aquifer.
4. The monitoring well network is currently in place. The stated purpose of the groundwater monitoring well network is, *"to assess the effectiveness of the remedial program, determine if there is a need to modify the groundwater pump out system and detect any future contaminant migration into deeper aquifers."* The current monitoring well network satisfies these purposes and is discussed in Section VI of this review.

Changes implemented to the groundwater extraction system and groundwater monitoring schedule in 2003 have not affected the protectiveness of the selected remedy. Evidence indicating significant changes to groundwater capture or downgradient VOC concentrations have not been observed during this review period.

Issues with operational practices at the site have not been identified during this review period. Proactive system maintenance is performed on a regular basis and has proven useful in the early identification of operational problems.

At the time of this review institutional controls have not been implemented for the Site. Institutional controls related to contaminants at the Site are addressed in the MDD addressing PFC contamination. Institutional controls established will also be applicable to VOC contamination at the Site.

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

Applicable or relevant and appropriate requirements (ARARs) were not addressed in the 1983 Consent Order as the intent of the selected remedy to address VOC contamination is groundwater containment not aquifer restoration. However, response performance has been evaluated utilizing MCLs, HRLs, and HBVs as performance criteria. RAOs are clearly stated in the 1983 Consent Order, and remain valid since additional potential receptors to VOC

contaminated groundwater have not been identified at or downgradient of the Site.

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

No, new information identified at the Site does not provide evidence that would question the protectiveness of the selected remedy addressing VOC contamination. PFC contaminants identified at the site are being addressed utilizing response actions consistent to those already in place at the site to address VOC contamination.

In 2007, the MPCA and 3M entered into a Settlement Agreement and Consent Order (2007 Consent Order) to address PFC contamination at the Oakdale Site and two other Sites in Washington County, Minnesota. The 2007 Consent Order led to the implementation of the 2008 MDD. The MDD presents the selected response action for PFC contamination at the Oakdale Site.

The selected remedy addressing PFC contamination in soil at the site is to excavate a portion of the Abresch site located north of Highway 5. Prior to the excavation a soil vapor extraction (SVE) system was constructed within the area to be excavated. The SVE system was installed as an interim response action to reduce VOC concentrations within the soil to be excavated and control exposure risks to site workers and neighboring properties. VOC vapors were identified as a possible issue to neighboring residences during the public comment period for the MDD for the site. The SVE system was installed during the third quarter of 2008, in the area to be excavated. The SVE system was operating at the time of this review and is intended to operate until the Fall 2010, at which time soil excavation of PFC and any remaining VOC contaminated soil, will be implemented.

The selected remedy addressing soil contamination at the Site is to remove PFC contaminated soil from zero feet to four feet below ground surface (bgs) in all areas affected with PFCs. In addition, areas identified containing concentrations greater than six ppm of perfluorooctanesulfonate (PFOS) will be excavated from four feet bgs to the water table. PFC contaminated soil removed will be disposed of in a predetermined, isolated containment cell constructed specifically for PFC waste. The excavated area will be backfilled with clean soil.

PFC contaminated groundwater is also addressed in the MDD. Twelve additional groundwater extraction wells have been constructed in the glacial alluvium at the Site. The construction of the additional extraction wells is intended to control discharge of PFC contaminated groundwater to on-site surface water and limit vertical and lateral movement of contaminated groundwater. The expanded groundwater extraction system is also intended to remove and treat impacted groundwater from the Site. The new groundwater extraction system will utilize an air stripper to remove VOCs and a granular activated carbon (GAC) treatment system to remove PFCs prior to discharge to the sanitary sewer and POTW. The existing extraction wells will also be connected to the enhanced system for treatment prior to discharge. At the time of this review construction of the new groundwater extraction wells and treatment system was in progress.

VIII. Issues

Table 4: Issues

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Some of the required ICs have not been implemented and the effectiveness of existing ICs have not been evaluated. Implementing, maintaining, monitoring and enforcing effective ICs will be required to assure protectiveness of the remedy.	N	Y

This five-year review has identified issues that affect protectiveness at the Site.

Institutional Controls

Institutional controls for the Site were not yet in place at the time of this review. Institutional controls are not required by the 1983 Consent Order addressing VOCs; however, the MDD requires that institutional controls are implemented to limit and prevent future exposure to contaminants associated with the Oakdale Site.

Soil

PFC contamination has been identified in soils found at the Site. The 2007 Consent Order and MDD identify the selected remedy to remove and dispose of PFC contaminated soil found at the Site. These soils have also been identified as possibly containing VOCs. The remedy selected to address PFC contamination will also be protective of human health and the environment with regard to VOC contamination since the remedy selected is consistent with the 1983 Consent Order. In addition, VOC concentrations found in the PFC contaminated soils to be excavated will be reduced by the SVE system installed as an interim response action. The operation of the SVE system will reduce VOC contamination in place and subsequently reduce exposure to Site personnel and neighboring properties during excavation activities.

Groundwater

PFC contamination has been identified in groundwater at the Site. The 2007 Consent Order and the MDD identify the selected remedy to extract and treat groundwater at the Site. At the time of this review construction of 12 additional groundwater extraction wells was underway. The extracted groundwater from new and existing wells is to be treated for VOC and PFC contamination prior to discharge to the sanitary sewer. The remedy selected to treat PFC contamination will also be protective of human health and the environment with regard to VOC contamination by reducing VOC concentrations in groundwater and preventing vertical and lateral migration as is identified as objectives in the 1983 Consent Order.

Surface Water

PFC contamination has been identified in surface water at the Site. The selected remedy to address surface water contamination is hydraulic containment of groundwater and surface water monitoring. Hydraulic containment of groundwater will reduce PFC concentrations in the surface water at the Site by reducing groundwater migration and discharge to the surface water at the Site. Surface water monitoring will be included in the future monitoring plan for the Site. Response action to reduce PFC contamination in surface water will also be protective with regard to VOC contamination at the Site.

IX. Recommendations and Follow-up Actions

Groundwater Extraction System

The groundwater extraction system is functioning as intended by the 1983 Consent Order. Construction of additional groundwater extraction wells and improvements to the treatment system are underway at the time of this review. In addition the placement of the new groundwater extraction wells was selected to reduce migration of groundwater containing PFCs to surface water at the Site. This placement will also reduce risk of VOCs reaching the on-site surface water. Continued operation of the groundwater extraction system utilizing new and existing components is recommended for continued protectiveness of human health and the environment.

Groundwater Monitoring

Groundwater monitoring over the life of the Site has established long term contaminant trends and meets the objectives of the selected remedy addressing VOC contaminants at the Site. The monitoring well network in place to monitor VOC contaminants and groundwater elevations meets objectives stated in the 1983 Consent Order. The relatively recent (i.e., 2004) discovery of PFC contamination in groundwater at the Site has not provided sufficient data to establish PFC contaminant trends. Long term groundwater monitoring is a requirement of the MDD approved in November 2008 regarding PFC contamination. It is recommended VOCs be included in the comprehensive groundwater monitoring plan. Surface water monitoring will be included in future revisions to the Site monitoring plan.

Institutional Controls

Institutional controls have not been implemented at the time of this review. The 2008 MDD requires that institutional controls for the Site are established. At this time the establishment of institutional controls is in progress. Efforts to implement institutional controls that are protective with regard to all contaminants related to the Site should continue.

Site Wide

PFC contamination identified in soil and groundwater at the Site has been addressed in the 2007 Consent Order and the MDD. The response action addressing the PFC contamination is also consistent with the 1983 Consent Order. Future response actions to address VOC and PFC contamination, if necessary, should also be protective with respect to decision documents established for the Site.

Table 5: Recommendations and Follow-up Actions

Recommendations and Follow-up Actions	Party Responsible	Lead Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
				Current	Future
Revise the Site groundwater and surface water monitoring program.	3M	MPCA	June 2010	N	Y
Institutional controls should be implemented for the Site.	3M MPCA	MPCA	June 2010	N	Y
Future response actions addressing VOC and PFC contamination should be consistent with existing decision documents.	3M MPCA	MPCA	Continuous	N	Y

X. Protectiveness Statement(s)

Soil

The remedy required under the 1983 CO addressing VOC contamination in soil at the Site currently is protective of human health and the environment because identified source areas of soil contaminant have been removed. Response actions to address PFC contaminants in soils at the Site include additional source area response actions and soil vapor extraction to reduce concentrations of VOCs in soils prior to excavation and off-site disposal.

Groundwater

The remedy required under the 1983 CO addressing VOC contamination in groundwater is currently protective of human health and the environment, exposure pathways that could result in unacceptable risks are being controlled by the groundwater extraction system and by abandoning

impacted wells. Additional response actions to address PFC contamination in groundwater at the Site will enhance this protectiveness as extracted groundwater will be treated with carbon prior to discharge to the sanitary sewer system. In addition, 3M has provided funding to the city of Oakdale for the installation and maintenance of a carbon treatment system to remove PFCs found in two of the city's municipal supply wells and reimburses MPCA costs for the installation/maintenance of whole house Granular Activated Carbon (GAC) systems at residential homes in Lake Elmo, which have shown PFC contamination impacts from the Oakdale Disposal Site. 3M is also required under the 2007 SACO to treat or replace any public or private drinking water supply well which is impacted by PFCs above MDH drinking water standards. MDH has developed HRLs for PFOA and PFOS, and a HBV for PFBA.

Site Wide

The remedy required under the 1983 CO addressing VOC contamination at the Site is protective of human health and the environment in the short-term, exposure pathways that could result in unacceptable risks are being controlled by the selected remedy. However, in order for the remedy to be protective in the long-term relative to VOC contamination, institutional controls for the Site need to be completed. The selected remedy under the 2007 SACO requires that appropriate institutional controls be in place at the Site. An Environmental Restrictive Covenant which meets the State Universal Environmental Covenants Act (UECA) under State Statute 114E, between 3M and the MPCA is required by the MPCA MDD.

XI. Next Review

Hazardous substances, pollutants or contaminants will remain at the Site and will not allow for unlimited use or unrestricted exposure. The presence of hazardous substances, pollutants or contaminants will require additional five-year reviews of the Site. The next five-year review is scheduled for completion five years from the signature date of this review.

