



FOURTH FIVE YEAR REVIEW REPORT
SEYMOUR RECYCLING CORP. SUPERFUND SITE

Seymour, Indiana

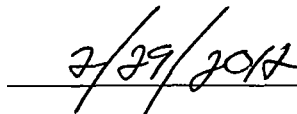
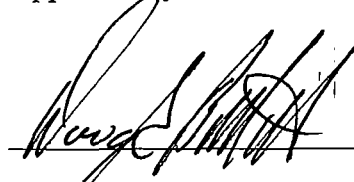
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PREPARED BY:

United States Environmental Protection Agency
Region 5
Chicago, Illinois

Approved by:

Date:



for

Richard C. Karl
Director
Superfund Division, Region 5

Table of Contents

List of Abbreviations.....	iv
Executive Summary	v
Five Year Review Summary Form	vi
1.0 INTRODUCTION	1
2.0 SITE CHRONOLOGY	2
3.0 BACKGROUND	3
3.1 Physical Characteristics	3
3.2 Land and Resource Use	3
3.3 History of Contamination	3
3.4 Initial Response.....	3
3.5 Basis for Taking Action	4
4.0 REMEDIAL ACTIONS.....	5
4.1 Remedy Selection	5
4.2 Remedy Implementation.....	5
4.3 Institutional Controls	7
4.4 System Operations/Operation and Maintenance (O&M)	8
5.0 PROGRESS SINCE LAST FIVE YEAR REVIEW	10
6.0 FIVE YEAR REVIEW PROCESS.....	11
6.1 Administrative Components	11
6.2 Community Notification and Involvement	11
6.3 Document Review.....	12
6.4 Data Review.....	12
6.5 Site Inspection.....	13
7.0 TECHNICAL ASSESSMENT	14
7.1 Question A: Is the remedy functioning as intended by the decision documents?	14
7.2 Question B: Are the assumptions used at the time of remedy selection still valid? ...	15
7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?	15
8.0 ISSUES	15
9.0 RECOMMENDATIONS AND FOLLOW-UP ACTION	16
10.0 PROTECTIVENESS STATEMENT(S).....	16
11.0 NEXT REVIEW	16

Attachments

Figure 1	Site Location Map
Figure 2	Site IC Review Map
Figure 3	Groundwater Treatment System Map
Attachment 1	List of Documents Reviewed
Attachment 2	Five Year Review Advertisement

Tables

Table 1	Chronology of Site Events
Table 2	Institutional Controls Summary Table
Table 3	Annual System Operations/ O&M Costs
Table 4	Actions Taken Since Last Five Year Review
Table 5	Identified Issues that Impact Protectiveness (N/A)
Table 6	Recommendations and Follow-up Actions (N/A)

Abbreviations

Agencies	IDEM and EPA	ppb	Parts per Billion
ARARs	Applicable or Relevant and Appropriate Requirements	ppm	Parts per Million
CD	Consent Decree	PRP	Potentially Responsible Party
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	RA	Remedial Action
CFR	Code of Federal Regulations	RD	Remedial Design
ESD	Explanation of Significant Differences	RI	Remedial Investigation
FS	Feasibility Study	RI/FS	Remedial Investigation/ Feasibility Study
IC	Institutional Control	ROD	Record of Decision
IDEM	Indiana Department of Environmental Management	RPM	Remedial Project Manager
IN	Indiana	SARA	Superfund Amendments and Reauthorization Act
MCL	Maximum Contaminant Level	Site	Seymour Recycling Corp. Site
mg/kg	milligrams per kilogram	SWRAU	Sitewide Ready for Anticipated Use
MI	miscellaneous instrument	EPA	United States Environmental Protection Agency
N/A	Not Applicable	UU/UE	Unrestricted Use/ Unlimited Exposure
NCP	National Contingency Plan	µg/L	Micrograms per Liter
NPL	National Priorities List	VES	Vapor Extraction System
O&M	Operation and Maintenance	VOCs	Volatile Organic Compounds

Executive Summary

This is the fourth five year review for the Seymour Recycling Corp. Site. The first five year review was completed and signed in March 1997, the second five year review was signed in March 2002, and the third was signed in March 2007. The components of the remedies selected in the 1986 Seymour Recycling Corp. Site Interim Record of Decision (ROD), 1987 ROD and 2002 Explanation of Significant Differences (ESD) have been implemented, and remain effective under the 1988 Seymour Site Remedial Design/Remedial Action Consent Decree (RD/RA CD). The Site became designated Sitewide Ready for Anticipated Use (SWRAU) in April 2008, and remains in long term operation and maintenance.

A review and analysis of the groundwater monitoring system in 2010 found that 1-4 dioxane in the aquifer had expanded since the review of the monitoring system during 2006, and was most likely related to the increased levels of 1-4 dioxane previously observed in deep monitoring well 224 near the landfill cap. As a result of this continued trend, it was determined that monitoring well 224 needed to be decommissioned and abandoned, additional groundwater monitoring was needed, and the groundwater pump and treatment system needed to be restarted. These items were all completed in 2010 and 2011 with the recommissioned groundwater pump and treatment system becoming operational in December 2011. The restarting of the groundwater pump and treatment system was included as a contingency in the 2002 ESD.

The Site landfill cap remains in place and continues to provide an adequate barrier to the surface, while containing the consolidated wastes below the cap. The Site landfill vapor extraction system was converted to a passive ventilation system in September 2009. Previously, the VES had been operated by being pulsed annually from September to November. The pulsing was discontinued after determining that pulsing was no longer the most efficient remedial method for volatile organic compound (VOC) removal. Institutional Controls implemented under the 1987 ROD which restrict land use, restrict groundwater use and assure integrity of the remedy remain in place at the Site.

The Seymour Recycling Corp. Site remedy is functioning as intended and is protective of human health and the environment in the short-term. Continued protectiveness of the remedy requires continued Site operation and maintenance (O&M) and long-term stewardship of institutional controls (ICs).

Five Year Review Summary Form

SITE IDENTIFICATION		
Site Name : Seymour Recycling Corp. Superfund Site		
EPA ID : EPA ID# IND040313017		
Region: 5	State: IN	City/County: Seymour, Jackson
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	Has the site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name (Federal or State Project Manager): Jeff Gore		
Author affiliation: EPA, Region 5		
Review period: 9/1/2011 to March 2012		
Date of site inspection: 9/20/2011		
Type of review: Statutory		
Review number: 4		
Triggering action date: 3/20/2007		
Due date (five years after triggering action date): 3/20/2012		

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:

Sitewide

Issues and Recommendations Identified in the Five-Year Review: = N/A

Protectiveness Statement(s)

Operable Unit:

Sitewide

Protectiveness Determination:

Short-term Protective

Addendum Due Date

(if applicable):

N/A

Protectiveness Statement:

The Seymour Recycling Corp. Site remedy is functioning as intended and is protective of human health and the environment in the short-term. Continued protectiveness of the remedy requires continued Site O&M and long-term stewardship of ICs.

Sitewide Protectiveness Statement

For sites that have achieved construction completion, enter a sitewide protectiveness determination and statement.

Protectiveness Determination:

Short-term Protective

Addendum Due Date (if applicable):

N/A

Protectiveness Statement:

The Seymour Recycling Corp. Site remedy is functioning as intended and is protective of human health and the environment in the short-term. Continued protectiveness of the remedy requires continued Site O&M and long-term stewardship of ICs.

1.0 INTRODUCTION

The United States Environmental Protection Agency (EPA) Region 5 has conducted a five year review of the remedial actions implemented at the Seymour Recycling Corp. Superfund Site in Seymour, Indiana. EPA conducted the review between September 2011 and March 2012. This report documents the results of the five year review. The purpose of five year reviews is to determine whether the remedy at a site is protective of human health and the environment. Five year review reports document the methods, findings, and conclusions of the review, as well as identifying issues found during the review, if any, and making recommendations to address them.

This review is required by statute. EPA must implement five year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA § 121(c), as amended, 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.

The NCP at title 40, part 300, section 430(f)(4)(ii) of the Code of Federal Regulations (CFR) 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.

EPA, Region 5, along with the Indiana Department of Environmental Management (IDEM) completed the five year review of the remedy implemented at the Seymour Recycling Corp. Site. The review was conducted by Jeff Gore, EPA Remedial Project Manager (RPM); and Prabhakar Kasarabada, State Project Manager with IDEM, assisted in the review. This report documents the results of the review.

This is the fourth five year review for the Seymour Recycling Corp. Superfund Site. The third five year review report was completed and signed in March 2007. A statutory five year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

2.0 SITE CHRONOLOGY

Table 1. Chronology of Site Events	
Date	Event
1978	Initial discovery by State of Indiana of waste handling problems at Site.
February 1980	Site placed under receivership by State of Indiana court.
December 1982	EPA proposes Seymour Site for NPL.
December 1982	Surface cleanup removal action started.
September 1983	NPL final listing for the Site.
January 1984	Surface cleanup removal completed.
1985	Municipal water supply extension to 100 homes near the Site.
September 1986	Interim ROD signed.
September 1987	Final ROD signed.
December 1988	RD/RA Consent Decree entered.
September 1989	Remedial Action start.
September 1993	Site remedy construction completion report.
March 1997	First five year review.
September 1998	Vapor extraction system cycling begins.
December 2001	Groundwater treatment system shut-down with contingency plan.
March 2002	Second five-year review.
December 2002	Explanation of Significant Differences (ESD) signed.
March 2007	Third five year review.
April 2008	Sitewide Ready for Anticipated Use completed.
September 2009	Vapor extraction system passive venting begins.
December 2011	Groundwater treatment system re-started.

3.0 BACKGROUND

3.1 Physical Characteristics

The Seymour Recycling Corp. Superfund Site covers approximately 14 acres and is located two miles southwest of Seymour, Indiana, near the northwest corner of Freeman Municipal Airport and Industrial Park. (See Site location map). The Site is located on a nearly level plain with surface drainage toward the East Fork of the White River, which is approximately 1 ½ miles to the northwest.

3.2 Land and Resource Use

Most of the land near the Site is used for agriculture. About 100 homes are located within a one-mile radius of the Site, most of which are in the Snyder Acres subdivision to the north. The Freeman Municipal Airport and Industrial Park contains a number of industrial buildings to the southwest of the Seymour Site.

3.3 History of Contamination

From 1970 to early 1980, the Seymour Recycling Corporation (SRC) processed, stored, and incinerated chemical wastes at the Site. Hazardous and toxic wastes including solvents and metal finishing wastes accumulated on the site property over the years, stored in 55-gallon drums, bulk tanks, and other containers. These wastes leaked and spilled from their containers creating fire and odor problems.

The Site was closed when SRC failed to follow a 1978 agreement with the State of Indiana to cease receiving wastes and institute better waste management practices. In February 1980, a State of Indiana court placed the Site under receivership.

3.4 Initial Response

In late 1980 and 1981, the EPA fenced the Site to restrict access, constructed dikes to control Site runoff, installed an on-site carbon unit to treat surface water, and sampled the contents of drums, tanks, and soil. In 1982, EPA entered into an agreement with a small group of complying potentially responsible parties (PRPs) to handle the "surface cleanup", or the cleanup of hazardous substances or contaminants considered to be of greatest risk to the public. Under this agreement, these PRPs were free from future liability at the Site, after paying for and completing this cleanup.

The "surface cleanup" was conducted from December 1982 to January 1984. The cleanup involved removing all stored surface wastes--roughly 50,000 drums and 100 storage tanks--and taking them to off-site hazardous disposal facilities. In addition, the top foot of contaminated soil was removed from about 75 percent of the Site area and transported to disposal sites. These soils contained high levels of numerous organic contaminants. Clean fill and clay was brought in to replace the removed soil, creating a protective cover.

Agreements in 1982 and 1983 with additional PRPs established a fund which allowed for the 1985 extension of Seymour's municipal water system to the nearby Snyder Acres subdivision,

which contained about 100 homes, and to a nearby farm. This municipal water extension agreement also included the sealing and abandonment of the private residential groundwater wells for the subdivision and farm.

3.5 Basis for Taking Action

Remedial planning began as the Seymour Site was proposed for the National Priorities List on October 22, 1981. The Site became a final NPL listing on September 9, 1983.

A remedial investigation (RI) was carried out from August 1983 to May 1986. A summary of the major results of the Seymour Site RI found:

- A shallow and deep aquifer existed with a confining layer between them. The confining layer narrowed and disappeared moving to the north and northwest direction. In some areas around the Site, groundwater in the shallow aquifer could be found less than 10 feet below the surface. Groundwater in the shallow aquifer flowed to the north/northwest.
- The deep aquifer, located from about 55 to 70 feet below the surface, flowed primarily to the south. The area immediately to the south of the Site contained no wells or streams which could provide an exposure pathway for site chemicals in the deep aquifer to contact humans or wildlife. However, there were deep wells located at Freeman Municipal Airport to the east of the Site.
- The shallow aquifer was highly contaminated with more than 35 different hazardous organic chemicals, including 1,2-dichloroethane, benzene, vinyl chloride and 1,1,1-trichloroethane. As of June 1985, the major portion of the contaminant plume extended 400 feet beyond the Site boundary. However, studies detected lower concentrations of organic chemicals as far as 1,100 feet downgradient of the Site boundary.
- Soil beneath the surface of the 14 acre site was heavily contaminated with the hazardous chemicals found on Site. Topsoil in the nearby northwest drainage ditch was also contaminated but at much lower concentrations.
- Exposure pathways of concern at the Site were off-site migration of contaminated groundwater, and residual contaminated soils beneath or beyond the temporary protective clay and clean fill cover. Exposure to chemicals from the Site through air was unlikely in the short term unless the protective clay soil cover placed on the Site during the 1982-84 surface cleanup was disturbed.

EPA and the Indiana Department of Environmental Management (IDEM) prepared a Record of Decision (ROD) in September of 1986 that outlined an interim groundwater pump and treatment system for the Seymour Site. A second ROD was signed in September of 1987, which outlined the elements of a comprehensive cleanup at the Seymour Site and incorporated the 1986 interim ROD. In December of 1988, EPA, IDEM, the City of Seymour and approximately 150 PRPs entered into a Consent Decree for the Seymour Site remedial design/remedial action cleanup.

4.0 REMEDIAL ACTIONS

4.1 Remedy Selection

Remedial action objectives for the groundwater remedy are to reduce and eliminate excess groundwater contamination beyond the Site boundary, so that groundwater quality is restored to the levels of EPA and IDEM drinking water standards. Remedial action objectives for the source area remedy are to consolidate, reduce, and contain soil contamination beneath the multi-media landfill cap.

The components of the Seymour Site remedy involve design, construction, and implementation of the following:

1986 Interim ROD

- Groundwater pump and treatment for plume stabilization with discharge to the Seymour waste water treatment plant.

1987 Final ROD

- Groundwater pump and treatment system with long-term monitoring.
- Vapor extraction system with long-term monitoring.
- Multi-media landfill cap installation including bioremediation of landfill source area with on-site contamination, buildings and debris buried beneath the cap.
- Institutional controls to prevent future development of the Site and adjacent property, and to assure the integrity of the remedial action.

2002 ESD

- Shut-down the groundwater pump and treatment system with a contingency to re-start the pump and treatment system if the groundwater plume expands in the future.

4.2 Remedy Implementation

Groundwater Response Action

Implementation of the response action for groundwater restoration at the Seymour Site involved the following components: 1) design and construction of an interim groundwater pump and treatment system which began in 1987 and was completed in 1989; and 2) an enhanced groundwater pump and treatment system that was completed in February of 1991.

The groundwater contamination at the Seymour Site consisted of a variety of chemicals, but the plume itself was defined by the constituent 1-4 dioxane, which initially extended up to 3/4 mile

northwest from the Site boundary. Tetrahydrofuran initially extended about 1/4 of a mile, and chloroethane, vinyl chloride and benzene a few hundred feet from the Site. During the remedial design of the project, additional placement of monitoring wells and groundwater sampling were performed to help define the components of the groundwater treatment system.

Two extraction wells were constructed about 300 and 1000 feet from the northern Site boundary as part of the groundwater treatment system completed in 1991. Historically, the combined pumping rate of the two extraction wells was approximately 140 gallons per minute, but in order to maximize efficiency the system pumping rates have been adjusted as necessary by the plant operator.

Water from the two extraction wells was collected and run through the Site's pre-treatment plant. The plant process involves pre-treatment of the groundwater for removal efficiency, before air stripping and additional filtering, which includes activated carbon. The processed groundwater is then pumped to the City of Seymour's wastewater treatment works plant.

Source Area Response Action

Implementation of the Site source area response action involved a group of components. Remedial action activities consisting of the excavation and consolidation of any contaminated topsoil from the Site perimeter and northwest ditch area near the Site boundary, construction of the vapor extraction system (VES) and multi-layer cap, and bioremediation of soils were initiated in September of 1989 and were completed in May of 1991. The vapor extraction system at the Seymour Site is unique in that the laterals in the system run horizontal instead of vertical. The vapor extraction system itself lies underneath the length of the multi-layer site cap. The laterals are connected to headers at the north and south end of the cap. A vacuum pump system connected to the north header draws air from vertical inlets on the south side header, and volatile laden air from the contaminated area flows through the system to an exhaust.

A multi-layer cap with perimeter security fence was built in order to cover Site and excavated contamination, building debris, and drummed drill-cuttings. The cap also provides a barrier for future surface-water run-on, which in turn reduces underground leaching. The cap's seven layers consist of the following materials: the layer at the surface is a two foot thick seeded soil layer; the second layer is a geotextile filter fabric; the third layer is for drainage, consisting of 12 inches of sand; the fourth layer consists of a high density polyethylene liner; the fifth layer consists of four successive 6-inch-thick compacted clay/till layers; the sixth layer is another geotextile filter; and the final layer just above the contaminated soil consists of compacted clean fill.

Bioremediation was utilized before the multi-layer cap was constructed at the Seymour Site in 1990 and 1991. A solution of nitrogen, phosphorous, potassium and sulfur was added to the consolidated soils to help break down the contaminants biologically. The nutrients were land-farmed using a tractor, plow and storage tank, injecting the mixture 12 to 24 inches below grade in the soils.

4.3 Institutional Controls

Institutional Controls (ICs) are non-engineered instruments, such as administrative and legal controls, that help to minimize the potential for 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 (UU/UE). ICs are required by the 1987 Site ROD to restrict property use and maintain the integrity of the remedy. The ROD requires deed and access restrictions, and other institutional controls to prevent future development of the Site, and to assure the integrity of the remedial action. An IC study was completed for the Site in January 2007, and the Site became designated Sitewide Ready for Anticipated Use (SWRAU) in April 2008. A summary of the ICs for the Site is listed in table 2.

Table 2. Institutional Controls Summary Table		
Media, Engineered Controls & Areas that Do Not Support UU/UE on Current Conditions	IC Objective	IC Instrument Implemented or Planned
Site area: On-site soil area—multi-media landfill cap & soil vapor extraction on former Seymour Recycling Company facility. Property owned by the City of Seymour, IN (~14 acres).	Prohibits residential or commercial use of land, groundwater underlying Site, and assures integrity of landfill, VES & other RA components.	Owner's Declaration of Restrictions on Current & Future Uses (attached to RD/RA CD), MI Record 28 page 445-449 (Instrument #5938) at Jackson County Recorder's Office on December 15, 1988, (implemented).
Site area: Groundwater underlying on-site area. Property owned by the City of Seymour, IN (~14 acres).	Prohibits use of land, groundwater underlying Site, and assures integrity of landfill, VES & other RA components.	Owner's Declaration of Restrictions on Current & Future Uses (attached to RD/RA CD), MI Record 28 page 445-449 (Instrument #5938) at Jackson County Recorder's Office on December 15, 1988 (implemented).
Adjacent to Site/ Ground-water & Real Estate Use: Groundwater that is within the remedial action property surrounding the Site, property also owned by the City of Seymour, IN.	Prohibits use of groundwater until RA completion, and restricts land use to assure remedy integrity.	Owner's Declaration of Restrictions on Current & Future Uses (attached to RD/RA CD), MI Record 28 page 450-453 (Instrument #5939) at Jackson County Recorder's Office on December 15, 1988 (implemented).

The Site IC map (Figure 2) attached to this document outlines the landfill property boundary and adjacent areas that are addressed by institutional controls at the Site.

Current and Planned Institutional Controls

Site Declaration of Restrictions on Current and Future Uses: An Owner's Declaration of Restrictions on Current and Future Uses that runs with the land was recorded as MI (miscellaneous instrument) Record 28 page 445-449 (Instrument #5938) at Jackson County

Recorder's Office on December 15, 1988, on the approximately 14 acre Site landfill property area owned by the City of Seymour, IN; and prohibits residential or commercial use of the land, prohibits use of groundwater underlying the Site, and assures the integrity of the Site remedy.

An Owner's Declaration of Restrictions on Current and Future Uses that runs with the land was recorded as MI Record 28 page 450-453 (Instrument #5939) at Jackson County Recorder's Office on December 15, 1988, on surrounding property adjacent to the 14 acre Site landfill property area, which is also owned by the City of Seymour, IN (see Figure 2); and prohibits use of the groundwater until RA completion when drinking water standards are met, prohibits residential or commercial land use, and assures the integrity of the Site remedy.

Current Compliance

Based on the Site inspection conducted by EPA and IDEM in September 2011, compliance with the existing implemented use restrictions was observed. No Site uses inconsistent with the intended uses and restrictions as depicted in the implemented ICs were observed. ICs should be reviewed, as appropriate, to assure that they remain consistent and enforceable under Indiana environmental codes.

4.4 System Operations/Operation and Maintenance (O&M)

Groundwater Response Operations

The interim groundwater pump and treatment system for the Seymour Site began operating in 1989, and the final system began operating in 1991. The final pump and treatment system included extraction wells about 300 and 1,000 feet from the northern Site boundary. Over time, the extraction wells flow rates tended to decrease due to clogging in the well screens and aquifer formations. As a result, the extraction well 1,000 feet from the northern Site boundary was replaced in 1993 and located near the original extraction well location. A third extraction well was added in 1995 and placed approximately 400 feet from the Site boundary. In 2001, the three groundwater extraction wells typically produced a flow rate of approximately 100 gallons per minute through the Site groundwater treatment plant.

Hydrogen peroxide and hydrochloric acid pre-treatment plant processes were added in 1995 to improve removal efficiency and prevent biomass buildup in the Site treatment plant air stripper and other plant components. These additions also reduced iron scaling in the groundwater treatment plant as well as reduced the amount of plant maintenance required.

A document submitted by the PRPs proposing the shut-down of the groundwater pump & treatment plant was approved by EPA and IDEM in January 2001, as outlined in the 2002 Site ESD. EPA and IDEM's document approval was based on the reasoning that the groundwater extraction system was no longer efficient in removing the lower levels of groundwater contaminants still above cleanup standards, and no longer efficient in containing the plume after 12 years of pump and treatment. The approval for shut-down required increased groundwater monitoring and contained a contingency to re-start the groundwater treatment system if: (1) the groundwater plume extent was no longer stable; (2) contaminant mass in the groundwater does not continue to be reduced; and (3) there are additional risks to human health and the

environment. The groundwater extraction system shut-down was completed between October and December 2001. The plant re-start contingency requires a review of the groundwater monitoring system every five years until the groundwater cleanup standards outlined in the ROD are met.

EPA and IDEM's review of the groundwater monitoring system in 2006 found that the lateral extent of the plume of volatile organic compounds (VOCs) continued to remain stable. Total VOC concentrations toward the end of the plume continued to decrease, while certain VOC compounds concentrations were increasing underneath the landfill cap. The areal extent of concentrations of tetrahydrofuran continued to slowly recede toward the Site boundary. The overall extent and concentration distribution of 1,4-dioxane in the shallow aquifer had not changed significantly since 2001. 1,4-dioxane concentrations in deep aquifer well 224 near the landfill cap exhibited a significant increase in recent years before 2006, although low or non-detectable levels were found in other monitoring wells. As a result, deep aquifer monitoring wells 356, 357 and 358 were installed in 2007, and monitoring wells 359 and 360 were installed in 2008.

EPA and IDEM's review and analysis of the groundwater monitoring system in 2010 found that 1-4 dioxane had expanded in the shallow aquifer since the review in 2006. The expansion was most likely related to seepage from the increased levels of 1-4 dioxane previously observed in deep monitoring well 224 near the landfill cap. As a result of this continued trend, EPA decided that monitoring well 224 needed to be decommissioned and abandoned, three additional monitoring wells needed to be installed, and the groundwater treatment system needed to be restarted. In December 2010, monitoring well 224 was decommissioned and monitoring wells 361-LS, 362-LS, and 363-LS were installed downgradient of the Site landfill cap. The review also found the extent of the VOC groundwater plume continued to remain stable. EPA sent a letter to the PRPs in June 2011 granting EPA and IDEM approval to restart the Site groundwater pump and treatment system, based on the contingency conditions outlined in the 2002 Site ESD. The recommissioned groundwater treatment system was inspected and put on-line in December 2011. The restarted groundwater pump and treatment system operates at a flow rate capacity of approximately 45 gallons per minute containing both upper and lower sand unit extraction wells in the shallow aquifer at three locations downgradient of the Site landfill. The extraction wells are SA-RW-1 and LS-RW-1, SA-RW-2 and LS-RW-2, and SA-RW-3 and LS-RW-3. (See Figure 3)

Source Area Response Operations

The vapor extraction system operated continuously, except for maintenance, until the beginning of 1998. The flow rate through the system has ranged from less than 10 cubic feet per minute (cfm) to up to 100 cfm, depending on factors such as groundwater level. The VES removed most of the contaminant mass during the first year of operation with over 20,000 pounds of volatile organic compounds being vented. The system began reaching asymptotic levels after approximately 34,000 pounds of VOCs were removed.

The vapor extraction system began being cycled to operate intermittently as needed in 1998. The system began to be turned off for up to a year to allow volatile compounds to build up or be

removed naturally. The VES was then pulsed on an annual basis, usually from September to November of each year.

A major repair of the Site multilayer cap took place in 1999 to address erosion and improve drainage. A cutoff trench was installed around the perimeter of the surface and directed to drainage trenches. In addition, modifications were made to the Site fencing to reduce entry of burrowing animals onto the cap area.

A hole causing a leak was discovered in the knockout tank upstream of the vent blower on the VES, during the sixth week of the VES pulsing in 2005. The hole enabled ambient air to mix with the gases being extracted by the VES, resulting in dilution of VOC concentrations being emitted from the system. The hole was subsequently repaired and the VES functioned normally during the 2006 pulsing. Pulsing of the VES was discontinued in September 2009, when the system began being operated more effectively by passive ventilation.

Current annual O&M costs at the Seymour Site are primarily attributable to operation, maintenance and management of the Site landfill, VES, and groundwater treatment and monitoring systems. Site estimated annual O&M costs have increased from approximately \$200,000 in 2009 to \$300,000 in 2011, due to increased groundwater monitoring and the re-start of the groundwater treatment system in December 2011. Increased additional costs were also incurred in 2010 and 2011 due to the recommissioning process of the groundwater treatment system. Annual O&M reports are submitted by the Site PRPs.

Table 3. Annual System Operations/ O&M Costs		
Dates		Total Cost Estimate
From	To	
Jan. 1, 2009	Dec. 31, 2009	\$200,000
Jan. 1, 2010	Dec. 31, 2010	\$250,000
Jan. 1, 2011	Dec. 31, 2011	\$300,000

5.0 PROGRESS SINCE LAST FIVE YEAR REVIEW

This is the fourth five year review for the Seymour Recycling Corp. Site. EPA completed the third five year review in March 2007. The 2007 review made the following recommendations to issues noted at the Site:

Table 4: Actions Taken Since the Last Five Year Review						
#	Issue	Recommendations/Follow-up actions	Party Responsible	Milestone Date	Action Taken	Date of Action
1	Monitoring well labels	Repair as needed	PRPs	Ongoing	Repaired/replaced	Ongoing
2	Monitoring well 224 and 1-4 dioxane	Additional monitoring & assessment	PRPs	2007	Install additional wells/	2007, 2008, & 2010

Table 4: Actions Taken Since the Last Five Year Review						
#	Issue	Recommendations/Follow-up actions	Party Responsible	Milestone Date	Action Taken	Date of Action
3	Site IC assessment, update and reporting	Update ICs consistent with IC 13-11-2-193.5 & 13-14-2-6	PRPs/EPA	2007	Sitewide Ready for Anticipated Use completed	April 2008

Actions taken at the Site after the 2007 recommendations:

- 1) Site monitoring well upkeep and labeling occurs by the PRPs at ongoing Site inspections and monitoring events, and is corrected by repairing or replacing labels on an as needed basis.
- 2) The PRPs installed additional deep aquifer monitoring wells 356, 357, and 358 in 2007, and monitoring wells 359 and 360 were installed in 2008. In December 2010, monitoring well 224 was decommissioned due to suspected poor condition, and monitoring wells 361-LS, 362-LS and 363-LS were installed in the lower sand unit of the shallow aquifer. The groundwater pump and treatment system was recommissioned in 2011 with a December start-up.
- 3) A Sitewide Ready for Anticipated Use determination was made by EPA in April 2008, after a review of the Site ICs showed that they were properly implemented and recorded with Jackson County, and were documented to run with the land.

6.0 FIVE YEAR REVIEW PROCESS

6.1 Administrative Components

The Seymour Recycling Corp. Superfund Site five year review report was prepared by Jeff Gore, EPA RPM. Prabhakar Kasarabada, State Project Manager with IDEM, assisted in the review. The five year review consisted of a Site inspection and review of relevant documents. The notice letter to IDEM regarding initiation of the five year review was signed September 1, 2011.

6.2 Community Notification and Involvement

The completed fourth five year review report will be available to the public in the Site information repository and the EPA Region 5 record center. A newspaper article regarding the Site five year review ran in the Seymour, Indiana Tribune on December 16, 2011. An advertisement notice regarding the five year review process was placed in the Seymour Tribune newspaper for public view on December 27, 2011 and is included as an attachment to this report. One phone call was received by RPM Jeff Gore and responded to regarding the five year review process at the Site.

Community relations ongoing at the Seymour Recycling Corp. Site include providing information on the ongoing operation & maintenance program currently being carried out to

assure the requirements outlined in the remedy are being maintained.

6.3 Document Review

In preparation for this five year review report, Seymour Recycling Corp. Site documents were reviewed including the following:

- Sitewide Ready for Anticipated Use, April 2008.
- Third Five Year Review Report, March 2007.
- Explanation of Significant Differences, December 2002.
- Second Five Year Review Report, March 2002.
- First Five Year Review Report, March 1997.
- RD/RA Consent Decree, December 1988.
- Second Record of Decision, September 1987.
- Interim Record of Decision, September 1986.
- Seymour Recycling Corp. Site file, and operation & maintenance reports.

6.4 Data Review

Based on EPA's review and analysis of the groundwater monitoring system reporting data in 2010, EPA found that the extent 1-4 dioxane in the shallow aquifer had expanded since the review in 2006, and this expansion was most likely related to seepage from the increased levels of 1-4 dioxane previously observed in deep monitoring well 224 near the landfill cap. Although 1-4 dioxane in the deep aquifer had not significantly migrated from the Site landfill boundary over time, the extent of 1-4 dioxane migration from the landfill cap was observed to expand in the upper aquifer. As a result of this continued trend, monitoring well 224 was decommissioned and abandoned and three additional monitoring wells 361-LS, 362-LS and 363-LS were installed in the lower sand portion of the shallow aquifer. In addition, the Site groundwater pump and treatment system was recommissioned in 2011 to provide an inward gradient and additional treatment for groundwater. The start-up of the recommissioned groundwater treatment system took place in December 2011.

Monitoring well 224 near the Site landfill cap boundary was abandoned in December 2010, due to EPA's concern over its poor condition and 1-4 dioxane migration from the landfill area to the shallow aquifer. Sample results of well 224 in November 2010 before well abandonment found 1-4 dioxane levels of approximately 3,400 ppb. Monitoring wells 361-LS, 362-LS and 363-LS, installed in December 2010, were placed in the lower sand portion of shallow aquifer to provide

additional information on 1-4 dioxane migration related to the high levels observed in well 224. These additional monitoring wells are located near the three extraction well areas for the groundwater treatment system, and provide a good representation of the 1-4 dioxane migration in the upper aquifer. The wells were sampled in February, May and October 2011, finding similar results for the three sampling events. 361-LS near the Site landfill cap found 1-4 dioxane levels of approximately 2,300 ppb, 362-LS near the center of the groundwater extraction system saw 170 ppb of 1-4 dioxane, and 363-LS near the third extraction well area found 1-4 dioxane at 3 ppb.

Vinyl chloride and cis 1,2 dichloroethene are VOC groundwater contaminants that continue to remain elevated in monitoring wells near the Site landfill boundary. Although 1-4 dioxane rather than VOCs produces the concern of groundwater contaminant migration for the Site, sampling results thru 2011 found vinyl chloride fluctuating between 770 ppb to 370 ppb and cis 1,2-dichloroethene between 330 ppb and 130 ppb in wells near the landfill cap. EPA MCL drinking water standards are 2 ppb for vinyl chloride and 70 ppb for cis 1,2 dichloroethene.

The recommissioning and start-up of the Site groundwater pump and treatment system in December 2011 at approximately 45 gallons per minute assures that an inward groundwater gradient is in place, so that no further migration of 1-4 dioxane occurs at the Site. In addition, the system will provide additional treatment before the processed groundwater is discharged to the Seymour City treatment works plant. The Site and the City treatment works plant operate under a discharge authorization agreement to assure that processed groundwater continue to meet requirements for both the Site and City treatment plants.

The Site landfill vapor extraction system was converted to a passive ventilation system with rotating turbines on the vents in September 2009. Previously, the VES had been operated by being pulsed annually from September to November, until VOC removal decreased well below 100 lbs during annual pulsing events. Total VOC removal from the VES since inception in 1991 has been over 36,000 lbs. but has been minimal over recent years. Sample results of the passive VES in 2010 found VOCs in turbine vents at a range of 0.1 ppm to 3.5 ppm, which indicates that some biodegradation of VOCs continues to occur beneath the cap. These emission removal rates are well below the 25 ton per year VOC reporting requirement.

Landfill cap maintenance involves inspection and repair of any soil burrowing or erosion locations, and mowing of the landfill surface as needed. No major cap maintenance has been needed since the repair of the Site landfill cap took place in 1999 to control erosion and improve drainage. The multi-layer landfill cap continues to provide an adequate barrier for containment of Site residual contaminated soils and remains protective.

6.5 Site Inspection

The Site inspection for this five year review was performed on September 20, 2011 by RPM Jeff Gore of EPA and IDEM project manager Prabhakar Kasarabada. New Site plant operator Melvin Hunsucker and private party contractor representatives were also on-site regarding the ongoing recommissioning of the groundwater treatment system. The five year review site inspection checklist was used as a guideline for the Site inspection, and is available for record in the Site file. Overall, the Site was found to be in good condition with no significant issues.

Some standing water was on the entrance road to the Site due to recent heavy rains. The Site gate was unlocked and open as Melvin Hunsucker was already on-site. The Site fence was intact and there was no visual sign of any vandalism or animal burrowing. A walk over and around the landfill cover found it to be in good condition. There was heavy growth on the landfill surface as annual mowing was scheduled to take place in October, so had not yet occurred. The passive vents for the landfill vapor extraction system were also found to be in good condition.

An inspection of the groundwater monitoring wells found them to be in good condition and locked, except that one flush mounted well had a cracked cap. This well was repaired shortly after the issue was noted during the inspection and reported to Melvin Hunsucker. Due to the recent rains, three monitoring wells were not visually inspected due to poor field conditions. The groundwater treatment system was in the process of being recommissioned, so contractor personnel were performing work on it during the inspection.

7.0 TECHNICAL ASSESSMENT

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

RA Performance: The components of the remedies selected in the 1986 Seymour Recycling Corp. Site Interim ROD, 1987 ROD, and 2002 ESD have been implemented, and remain effective under the 1988 Seymour Site RD/RA Consent Decree. The Site groundwater pump and treatment system was recommissioned and started in December 2011 under EPA and IDEM approval, based on the contingency conditions outlined in the 2002 Site ESD. The Site landfill cap remains in place, providing a protective barrier over contained wastes on-site. The landfill vapor extraction system was modified to use passive turbine venting in September 2009, as VOC emissions continued to decrease over time.

Cost of System Operations/O&M: Current annual O&M costs at the Seymour Recycling Corp. Site are primarily attributed to operation, maintenance, and management of the Site multi-media landfill cap, and groundwater treatment and monitoring systems. 2011 Site estimated O&M costs are approximately \$300,000, as recommissioning of the groundwater pump and treatment system has recently increased O&M costs.

Opportunities for Optimization: The restarting of the groundwater pump and treatment system in December 2011 has provided an opportunity for optimization at the Site by utilizing containment and treatment to address the recent trend of an expanded area of 1-4 dioxane in groundwater downgradient of the landfill boundary.

Early Indicators of Potential Remedy Problems: There have been no indications of any additional potential issues with the Seymour Recycling Corp. Site remedy as the previous issue regarding 1-4 dioxane in groundwater has been addressed at the Site.

Implementation of Institutional Controls and Other Measures: ICs are required by the 1987 Site ROD to restrict property use, restrict groundwater use, and maintain the integrity of the

remedy. The ROD requires deed and access restrictions and other institutional controls to prevent future development of the Site and to assure the integrity of the remedial action. An IC study was completed for the Site in January 2007 and the Site became designated Sitewide Ready for Anticipated Use (SWRAU) in April 2008 verifying implementation of ICs required by the 1987 ROD. A summary of the implemented ICs for the Site is listed in table 2.

Current Use Compatibility with Land and Groundwater Use Restriction: Based on the Site inspection conducted by EPA and IDEM in September 2011, compliance with the current implemented use restrictions was observed. No Site uses inconsistent with the intended uses and restrictions as depicted in the implemented ICs were observed.

7.2 Question B: Are the assumptions used at the time of remedy selection still valid? Yes.

Changes in Standards and To Be Considered: Standards outlined and reviewed in the 1986 Interim ROD, 1987 ROD, 2002 ESD, and the three previous Seymour Recycling Corp. Site five year review reports are still valid at the Site. There have been no known changes in standards to be considered since the last review in the 2007 Five Year Review Report.

Changes in Exposure Pathways: The issue regarding expansion of 1-4 dioxane in groundwater downgradient of the Site landfill does not impact any change in exposure pathways or create any unacceptable risks for the remedy at the Site.

Changes in Risk Assessment Methodologies: Risk assessment methodologies used at the Seymour Recycling Corp. Site have not changed and do not call into question the protectiveness of the remedy.

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy? No.

There has been no other known information that could call into question the protectiveness of the remedy.

Technical Assessment Summary

According to the data reviewed and the Site inspection, the remedy is functioning as intended in the Seymour Recycling Corp. Site 1986 Interim ROD, 1987 ROD, and the 2002 ESD. The restarting of the Site groundwater pump and treatment system in December 2011 and the ongoing Site O&M monitoring program provide assurance that the remedy is functioning as intended. No other information has been identified which would call into question the protectiveness of the remedy.

8.0 ISSUES

No issues were identified during the five year review that affect the protectiveness of the remedy.

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

No recommendations were identified during the five year review.

10.0 PROTECTIVENESS STATEMENT(S)

The Seymour Recycling Corp. Site remedy is functioning as intended and is protective of human health and the environment in the short-term. Continued protectiveness of the remedy requires continued Site O&M and long-term stewardship of ICs.

11.0 NEXT REVIEW

Since the Seymour Recycling Corp. Site contains hazardous substances, pollutants or contaminants that will potentially remain above levels that allow for unlimited use and unrestricted exposure, the Site will require ongoing Five Year Reviews. Therefore, another report will be scheduled five years after this report is completed. The completion date of the current five year review is the signature date shown on the cover attached to this report.

Site Location

Superfund
U.S. Environmental Protection Agency

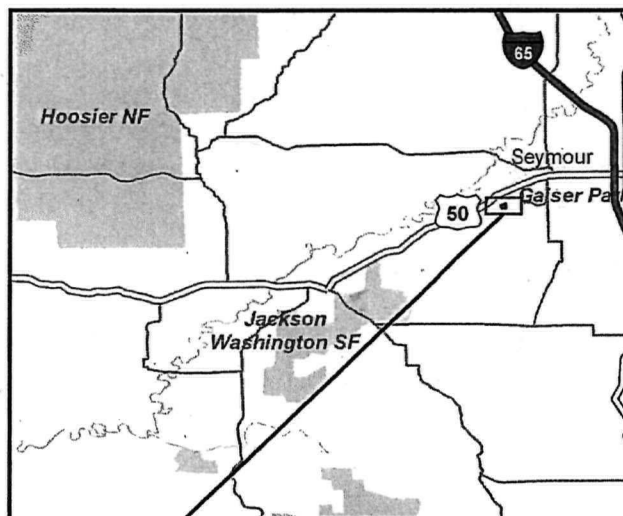


Seymour Recycling Jackson County, IN

IND040313017



State



County



Site

Figure 1

Created by Sarah Backhouse
U.S. EPA Region 5 on 3/5/07
Image Date: 2005



Institutional Control (IC) Review

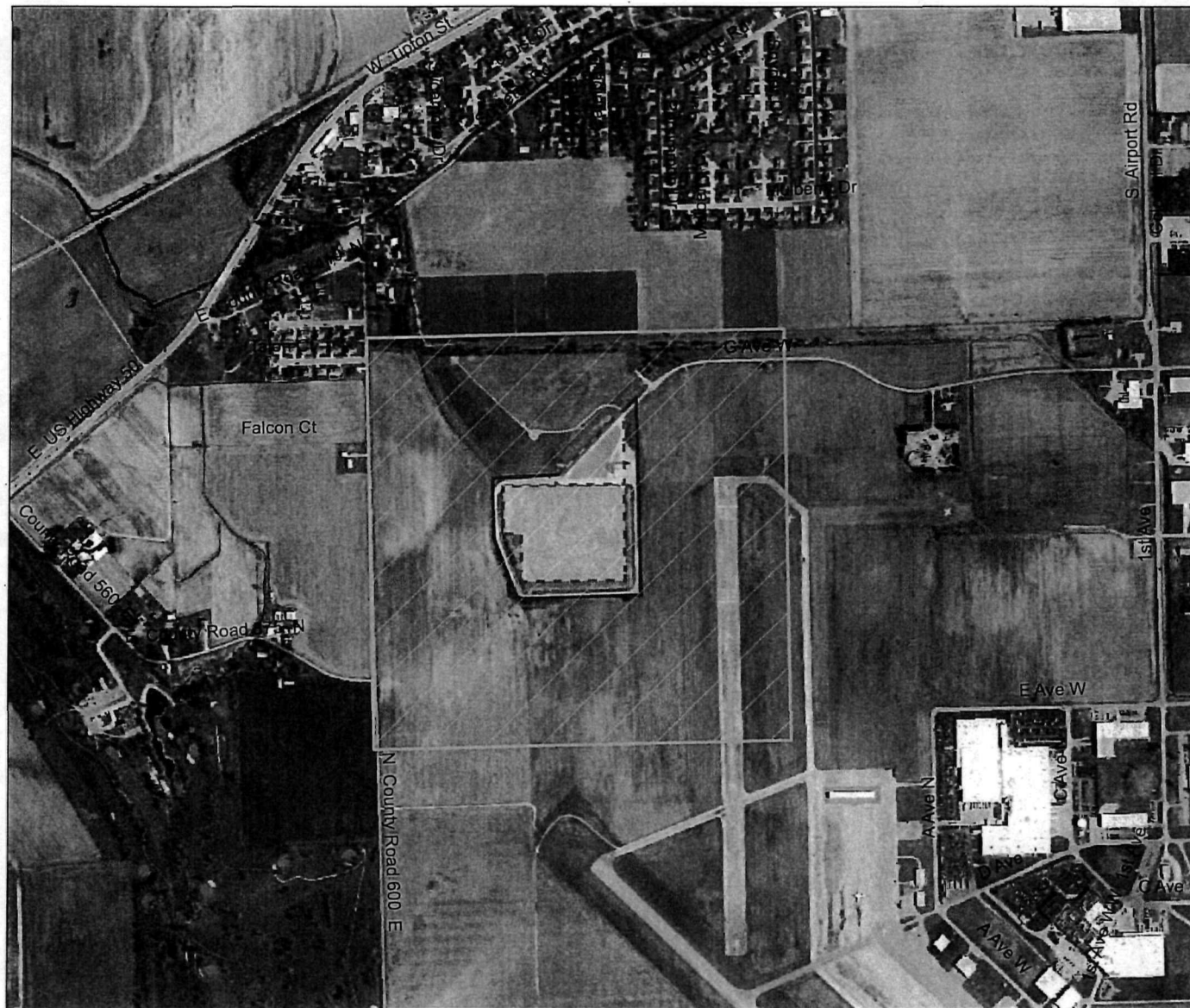
Areas Depicting Required and
Implemented Institutional Controls

Superfund
U.S. Environmental Protection Agency



Seymour Recycling Corporation
Jackson County, IN

IND040313017



Legend

-  Seymour Recycling Corporation Boundary
-  Land and Groundwater Use Restrictions (1988) - Required and Implemented IC*
-  Real Estate Land Use Restrictions (1988) - Required and Implemented IC*

0 600 1,200
Feet



* See the Seymour Recycling Corporation Deed Restrictions (1988), Jackson County, IN for the restriction details

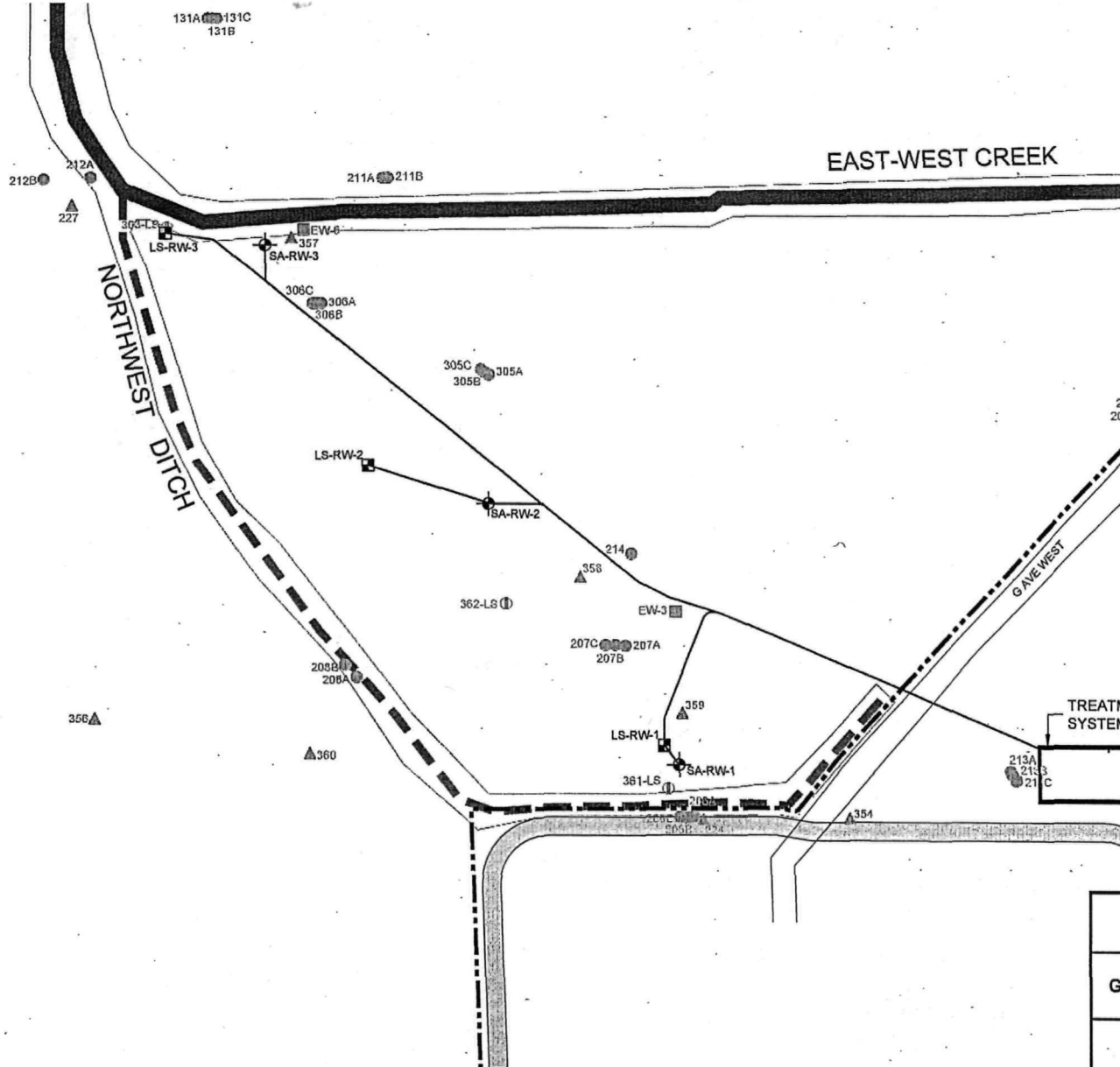


EPA Disclaimer: Please be advised that areas depicted in the map have been estimated. The map does not create any rights enforceable by any party. EPA may refine or change this data and map at any time.

Created by Sarah Backhouse
U.S. EPA Region 5 on 2/7/07
Image Date: 2005

CITY (Road) DIVISION (Road) DE (Road) LD (Road) PC (Road) PA (Road) TR (Road) LY (Road) OFF (Road) REF
 C:\ENVI\DATA\SEYMOUR\PROJECT\FIGURE\FIGURE1.DWG 12/11/2011 1:52 PM LAYOUT: 1 SAVED 12/14/2011 1:52 PM
 PROJECTNAME: SEYMOUR TRUST
 12/14/2011

CR-600 E



LEGEND:

- SITE BOUNDARY
- - - SEYMOUR ACCESS ROAD
- SURFACE WATER
- STORMWATER RUN-OFF/ DRAINAGE DITCH
- RECOVERY TRENCH
- ▲ DEEP AQUIFER MONITORING WELL
- SHALLOW AQUIFER MONITORING WELL
- ① LOWER SAND AQUIFER MONITORING WELL
- ⊕ SHALLOW AQUIFER RECOVERY WELL
- ⊞ LOWER SAND RECOVERY WELL

0 150' 300'
 SCALE IN FEET

SEYMOUR TRUST
 SEYMOUR SITE, SEYMOUR, INDIANA

GROUNDWATER TREATMENT SYSTEM



FIGURE
3

Attachment 1

List of Seymour Recycling Corp. Site Documents Reviewed for Five Year Review Report

- Sitewide Ready for Anticipated Use, April 2008.
- Third Five Year Review Report, March 2007.
- Explanation of Significant Differences, December 2002.
- Second Five Year Review Report, March 2002.
- First Five Year Review Report, March 1997.
- RD/RA Consent Decree, December 1988.
- Second Record of Decision, September 1987.
- Interim Record of Decision, September 1986.
- Seymour Recycling Corp. Site file, and operation & maintenance reports.



EPA Begins Review of Seymour Recycling Superfund Site Seymour, Indiana

The U.S. Environmental Protection Agency is conducting a five-year review of the Seymour Recycling Superfund site in Seymour, Indiana. The Superfund law requires regular checkups of sites that are in operation and maintenance – with waste managed on-site – to make sure the cleanup continues to protect people and the environment. This is the fourth five-year review of this site.

The cleanup of the site includes a multi-layer cap with venting over a 14 acre landfill, cap maintenance, long-term ground water treatment, monitoring, and limits on use of the site area. The EPA will evaluate site documents, results of periodic inspections, and operation and maintenance sampling activities.

More information is available at the Jackson County Public Library, 2nd and Walnut Streets, Seymour, Indiana. The review should be completed by the end of March, 2012.

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

Jeff Gore
Remedial Project Manager
312-886-6552
gore.jeffrey@epa.gov

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

You may also call the EPA toll-free at 800-621-8431, 9:30 a.m. to 5:30 p.m., weekdays.

**EPA
Superfund Division
77 W. Jackson Blvd.
Chicago, IL 60604**