FIVE-YEAR REVIEW REPORT
SECOND FIVE-YEAR REVIEW REPORT FOR
YEOMAN CREEK LANDFILL SUPERFUND SITE
Lake County, Illinois

February 2012

Prepared by

United States Environmental Protection Agency
Region 5
Chicago, Illinois

Approved by:

Richard C. Karl, Director
Superfund Division
U.S. EPA, Region 5

Date:

2/24/12

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LIST OF ACRONYMS AND ABBREVIATIONS

ARAR	Applicable or relevant and appropriate requirement
CAL	Cleanup action level
CD	Consent Decree
CFR	*Code of Federal Regulations*
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
ComEd	Commonwealth Edison
FS	Feasibility study
IAC	*Illinois Administrative Code*
ICs	Institutional controls
ICIAP	Institutional Controls Implementation and Assurance Plans
IEPA	Illinois Environmental Protection Agency
LEL	Lower explosive limit
LFG	Landfill gas
LTS	Long Term Stewardship
MCL	Maximum Contaminant Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and maintenance
OMC	Outboard Marine Corporation
PCB	Polychlorinated biphenyl
PRP	Potentially responsible party
RA	Remedial action
RAO	Remedial action objective
RD	Remedial design
RI	Remedial investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SARA	Superfund Amendments and Reauthorization Act of 1986
START	Superfund Technical Assessment and Response Team
TBC	To be considered
UAO	Unilateral Administrative Order
U.S. EPA	U.S. Environmental Protection Agency
UU/UE	Unlimited use or unrestricted exposure
UECA	Uniform Environmental Covenants Act
VOC	Volatile organic compound
WESTON	Weston Solutions, Inc.
YCL	Yeoman Creek Landfill

EXECUTIVE SUMMARY

The United States Environmental Protection Agency (U.S EPA) is conducting this second Five-Year Review of the remedy at the Yeoman Creek Landfill (YCL) Site, which occupies approximately 70 acres in Waukegan, Lake County, Illinois. The triggering action for this statutory review is the completion of the last review on February 27, 2007. The five year review is mandated by Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The YCL Site was placed on the National Priorities List (NPL) for site cleanup on March 31, 1989. The YCL Site operated as a landfill between 1958 and 1969, reportedly accepting both municipal and industrial wastes. The YCL Site largely was constructed within wetlands and also within the flood plain of Yeoman Creek. Leachate was observed discharging to Yeoman Creek as early as 1969.

Interim and removal actions were implemented to address imminent and substantial threats posed by the Site, including fencing, improvement of the soil cover, and construction of a building ventilation system and a landfill gas (LFG) collection system. Long-term response actions have been implemented at the Site as required by the Record of Decision (ROD) as modified, including: (1) removal of contaminated sediment from Yeoman Creek and nearby wetlands; (2) consolidation of wastes under a flexible, dual-barrier cover; (3) continuation of measures to address LFG; (4) long-term monitoring; and (5) institutional controls (ICs).

The remedy at the YCL Site is not protective because the LFG collection system is not operating as designed in the northern portion of the site. Specifically, LFG above 50 percent of the lower explosive limit (LEL) continues to migrate beyond the landfill boundary. This migration was evident during the first Five-Year Review. Since then, a secondary LFG system has been installed in the northern portion of the site consisting of a slurry wall and a perimeter gas collection system on top of the slurry wall. Although the secondary LFG system has somewhat reduced the LFG, the system has not been able to address most of the off-site LFG present at the Terrace Nursing Home and Evoy property. In addition, to address LFG on the Evoy property, perforated pipe that was installed in a trench on the Evoy property during remedial construction has been reconnected to the existing LFG system. The Yeoman Creek Remediation Group (YCRG) has performed an investigation on the Terrace Nursing Home property to determine the source of the LFG. During this investigation, it was determined that the LFG is present in debris fill material present on the Terrace Nursing Home property. Currently, the YCRG is designing a system to collect LFG from the debris fill material at the Terrace Nursing Home property. Additional remedial action (RA) is necessary to ensure short- and long-term protectiveness as well as implementation and compliance with land and resource use restrictions that prohibit (1) interference with the dual-barrier cover and LFG collection system and (2) groundwater use.

The LFG contains methane, which is flammable and can form explosive mixture with air. The LFG has the potential to enter into neighboring buildings and cause methane gas fire and explosion risk. A study indicates LFG is most likely present in buried debris beyond the landfill boundary. To address this LFG and the potential fire and explosion risk, the following interim measures have been implemented and are currently in place: methane sensors located within the

basement of the neighboring structures for continuous methane monitoring. In addition, all sensors are on auto-dialers with direct connection to the fire department and the YCRG contractor. The sensors are factory calibrated for methane. Also, the detectors will detect carbon monoxide, propane, butane and other explosive hazards. The sensor/auto-dialer is set at 20% of the LEL for methane.

The U.S. Environmental Protection Agency (U.S. EPA) and the responsible parties are negotiating the details of additional remedial actions to effectively and efficiently remove LFG that has been detected at the neighboring properties. However, if additional remedial actions fail to solve the recurring LFG issue in a reasonable time-frame, U.S EPA would evaluate other options available under CERCLA such as Evaluation of Significant Difference (ESD) or Record of Decision (ROD) amendment.

Sediments at the Yeoman Creek and wetland soil have been re-contaminated with PCBs. Additional investigation and action is necessary to address the contaminated sediment and wetland soil.

Finally, long-term protectiveness also requires compliance with effective Institutional Controls (ICs). Hence, effective ICs must be implemented, monitored, maintained and enforced along with maintaining site remedy components so that the remedy will function as intended. Long-term protectiveness will be ensured by implementing effective ICs and through long term stewardship of ICs. To that end, an Institutional Controls Implementation and Assurance Plan (ICIAP) must be prepared to conduct additional IC evaluation activities, to plan for additional ICs, as needed, and ensure long-term stewardship.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Yeoman Creek Landfill (YCL)		
EPA ID: ILD980500102		
Region: 5	**State:** IL	**City/County:** Waukegan/Lake County

SITE STATUS	
NPL Status: Final	
Multiple OUs? No	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA **If "Other Federal Agency" was selected above, enter Agency name:** Click here to enter text.
Author name (Federal or State Project Manager): Syed M Quadri
Author affiliation: EPA
Review period: February 28, 2007 - February 24, 2012
Date of site inspection: August 9, 2011
Type of review: Statutory
Review number: 2
Triggering action date: February 27, 2007
Due date *(five years after triggering action date)*: February 27, 2012

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
None

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 1	Issue Category: Remedy Performance			
	Issue: Landfill Gas (LFG) Collection System Failure			
	Recommendation: Implement further remedial actions to address the LFG and exposure.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
Yes	Yes	PRP	EPA	08/27/2012
OU(s): 1	**Issue Category: Remedy Performance**			
	Issue: The LFG migration presents a health risk to residents of the neighboring buildings: as the methane in LFG could potentially cause fire or explosion hazard.			
	Recommendation: Implement and operate a LFG collection system to effectively and efficiently remove LFG from migrating to the neighboring properties.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
Yes	Yes	PRP	EPA	08/27/2013
OU(s): 1	**Issue Category: Monitoring**			
	Issue: Groundwater sample results exceed MCLs and sediment samples exceed CALs			
	Recommendation: Continued monitoring until MCLs are attained in groundwater. Submit an evaluation report on the efficacy of natural attenuation for the remediation of groundwater contaminants of concern at the site. Additional investigation and action to address the contaminated sediment and wetland soil. Continued monitoring of groundwater, surface water, sediment, and soil will be necessary to ensure that there is no leakage from the landfill that would affect these media.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	N/A

OU(s): 1	**Issue Category: Institutional Controls**			
	Issue: Long Term Stewardship procedures are necessary at the site			
	Recommendation: Issue an IC Implementation Plan to address Long Term Stewardship at the Site			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	02/27/2013
OU(s): 1	**Issue Category: Operations and Maintenance**			
	Issue: Condensate traps with high oxygen levels			
	Recommendation: Thoroughly test condensate traps to ensure no leaks			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
Yes	Yes	PRP	EPA	02/27/2013
OU(s): 1	**Issue Category: Operations and Maintenance**			
	Issue: Drainage layer not exposed			
	Recommendation: Remove soil covering edge of layer			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	08/28/2012
OU(s): 1	**Issue Category: Operations and Maintenance**			
	Issue: Drummed Investigation-derived waste			
	Recommendation: Characterize and dispose of waste at U.S EPA-compliant facility			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	05/27/2012

Protectiveness Statement(s)
Include each individual OU protectiveness determination and statement. If you need to add more protectiveness determinations and statements for additional OUs, copy and paste the table below as many times as necessary to complete for each OU evaluated in the FYR report.

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
01	Not Protective	Click here to enter date.

Protectiveness Statement:

The remedy is not protective because the landfill gas (LFG) collection system is not operating as designed; i.e., LFG above 50 percent of the lower explosive limit (LEL) continues to be present beyond the landfill boundary. A study indicates presence of methane in buried debris beyond the landfill boundary. The LFG has the potential to enter into neighboring buildings and cause methane gas fire and explosion risk. To address this LFG and the potential fire and explosion risk, the following interim measures have been implemented and are currently in place: methane sensors are located within the basement of the neighboring structures (two sensors are installed at TNH, one sensor is installed at Evoy property, one sensor at 1401 W. Golf Road, and one sensor at 1451 W. Golf Road) for continuous methane monitoring. In addition, all sensors are on auto-dialers with direct connection to the fire department and the YCRG contractor. The sensors are factory calibrated for methane. Also, the detectors will detect carbon monoxide, propane, butane and other explosive hazards. The sensor/auto-dialer is set at 20% of the LEL for methane. The basements located at TNH, Evoy and 1401-1451 W. Golf Road are routinely monitored weekly and monthly. Thirty-six locations are monitored on weekly basis and 91 locations are monitored on monthly basis. In addition, sediments in Yeoman Creek have been re-contaminated, suggesting a potential leak from the landfill. Additional actions are necessary to ensure protectiveness as well as implementation and compliance with land-use restrictions that prohibit (1) interference with the dual-barrier cover and LFG collection system and (2) groundwater use. The U.S. Environmental Protection Agency (U.S. EPA) and the responsible parties are negotiating the details of additional remedial actions to effectively and efficiently remove LFG that has been detected at the neighboring properties.

Sitewide Protectiveness Statement (if applicable)
For sites that have achieved construction completion, enter a sitewide protectiveness determination and statement.

Protectiveness Determination:	*Addendum Due Date (if applicable):*
Not Protective	Click here to enter date.

Protectiveness Statement:

The remedy is not protective because the LFG collection system is not operating as designed; i.e., LFG above 50 percent of the lower explosive limit (LEL) continues to be present beyond the landfill boundary. A study indicates presence of methane in buried debris beyond the landfill boundary. The LFG migration has the potential to enter into neighboring buildings and cause methane gas fire and is also an explosion risk. To address this LFG and the potential fire and explosion risk, the following interim measures have been implemented and are currently in place: Methane sensors located within the basement of the neighboring structures for continuous methane monitoring (two sensors are installed at TNH, one sensor is installed at Evoy property, one sensor at 1401 W. Golf Road, and one sensor at 1451 W. Golf Road). In addition, all sensors are on auto-dialers with direct connection to the fire department and the YCRG contractor. The sensors are factory calibrated for methane. Also, the detectors will detect carbon monoxide, propane, butane and other explosive hazards. The sensor/auto-dialer is set at 20% of the LEL for methane. The U.S. Environmental Protection Agency (U.S. EPA) and the responsible parties are negotiating the details of additional remedial actions to effectively and efficiently remove LFG that has been detected at the neighboring properties. The basements located at TNH, Evoy and 1401-1451 W. Golf Road are routinely monitored weekly and monthly. Thirty-six locations are monitored on weekly basis and 91 locations are monitored on monthly basis. In addition, sediments in Yeoman Creek have been re-contaminated, suggesting a potential leak from the landfill. Additional actions are necessary to ensure protectiveness as well as implementation and compliance with land-use restrictions that prohibit (1) interference with the dual-barrier cover and LFG collection system and (2) groundwater use. The U.S. Environmental Protection Agency (U.S. EPA) and the responsible parties are negotiating the details of additional remedial actions to effectively and efficiently remove LFG that has been detected at the neighboring properties. Finally, long-term protectiveness also requires compliance with effective ICs. Hence, effective ICs must be implemented, monitored, maintained and enforced along with maintaining site remedy components so that the remedy will function as intended. Long-term protectiveness will be ensured by implementing effective ICs and through long term stewardship of ICs. To that end, an ICIAP must be prepared to conduct additional IC evaluation activities, to plan for additional ICs, as needed, and ensure long-term stewardship. Finally, long-term protectiveness also requires compliance with effective ICs.

I. Introduction

The purpose of the Five-Year Review is to determine if 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 identify recommendations to address them.

The U.S. Environmental Protection Agency (U.S. EPA) has prepared this second Five-Year Review report pursuant to (1) Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and (2) Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 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 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."*

U.S. EPA interpreted this requirement further in light of the NCP at Title 40 of the *Code of Federal Regulations* (CFR), Section 300.430(f)(4)(ii), which 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."*

U.S. EPA, Region 5 conducted the second Five-Year Review of the remedy implemented at the Yeoman Creek Landfill (YCL) Site in Waukegan, Lake County, Illinois. This report documents the results of this review, which was conducted by Syed Quadri, Remedial Project Manager (RPM) for the site. The review was initiated in August 2011 and completed in February 2012. The Illinois Environmental Protection Agency (IEPA) also reviewed this report. The triggering action for this statutory review is the start of actual on-site remedial action (RA) construction on February 28, 2002. Five-Year Reviews are required because hazardous substances, pollutants, or contaminants remain at the site at concentrations exceeding levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1 below summarizes the site chronology of events.

TABLE 1
SITE CHRONOLOGY OF EVENTS

Event	Date
Initial discovery of problem or contamination	1969
NPL Listing	March 31, 1989
Interim actions and RAs, including installation of a fence around the site, construction of a building ventilation system, and construction of an LFG system	1990-1998
RI/FS complete	1995
ROD signed	September 30, 1996
UAO issued to PRPs for LFG building ventilation system	April 28,1996
CD for RD/RA	April 7, 1999
Pre-design investigation	1999-2000
RD approved	July 2001
Memorandum documenting minor changes to the remedy	February 2002
On-site RA construction begins	February 28, 2002
RA completed	September 2005
PCOR	September 23, 2005
First Five-Year Review	February 28, 2007
Design of the Lovinger Gas System	September 2008
Installation of Evoy sewer to drain surface water – (Completion)	October 2009
Flare system blower overhaul	March 2008
Changes to long-term monitoring plan (Addition of sediment/surface water sampling)	Mid-2008
Completion of slurry wall and LFG collection trench on north side of the site- (System Activated)	October 2009
Installation of sump pump lift station to discharge water collecting atop the landfill liner to the Evoy sewer	August 2009
Connection of Evoy Parking Lot gas collection trench to Lovinger Gas System	September 2010
Large Blower and additional carbon vessel installed for Lovinger Gas System	June 2010
Additional Terrace Nursing Home Subsurface Investigation/Pilot Test Design Work	May 2011

Event	Date
Direct Connection of Evoy parking lot collection trench to Lovinger Gas blower through above ground HDPE piping	June 2011

Notes:

CD	Consent Decree
FS	Feasibility study
LFG	Landfill gas
NPL	National Priorities List
PCOR	Preliminary close out report
PRP	Potentially responsible party
RA	Removal action
RD	Remedial design
RI	Remedial investigation
ROD	Record of Decision
UAO	Unilateral Administrative Order

III. Background

Physical Characteristics

The YCL Site occupies about 70 acres in the City of Waukegan, Lake County, Illinois. The site's geographical coordinates are 42° 23' 20" North latitude and 87° 50' 55" West longitude. The YCL is located between Sunset Avenue (W. Golf Road) on the north, Glen Flora Avenue on the south, Lewis Avenue on the west, and Butrick/Western Avenue on the east in the City of Waukegan, Illinois. (See **Figure 1** in the Site Maps attachment). As Figure 1 shows, the YCL Site includes the following units:

- Yeoman Creek Landfill (both East and West portions) located north of a Commonwealth Edison (ComEd) right-of-way (marked by a series of high-voltage transmission towers)
- Edwards Field Landfill, formerly a baseball park
- North Rubloff Landfill
- South Rubloff Landfill

The Edwards Field and both Rubloff Landfills are located south of the ComEd right-of-way and east of the Waukegan Shopping Plaza and the Bank of Waukegan.

The YCL Site is next to a large wetland and residential and commercial developments, including single-family residences, apartment buildings, a nursing home, offices, a shopping center, and restaurants. According to the 2010 U.S. Census Bureau, approximately 11,821 people live within a l-mile radius of the site, of which 19.2 percent are African-American and 53.4 percent are Hispanic. Waukegan, Illinois, is an environmental justice community. Homes in the area are 58.8 percent owner-occupied. The median household income (2005-2009) of the area is $48,397.

Land and Resource Use

The current land uses of the surrounding area are residential, commercial, and recreational. Nearby residents use a municipal water supply.

History of Contamination

The YCL Site operated as a landfill between 1958 and 1969, reportedly accepting both municipal and industrial wastes. The YCL Site largely was constructed within wetlands and also within the flood plain of Yeoman Creek. The landfill is thought to be fairly shallow, with a maximum depth of waste burial of 19 feet. The total volume of waste at the YCL Site is estimated to exceed 1 million cubic yards. The landfill has no bottom liner, and underlying soils are permeable.

More than 67,000 people in Waukegan use drinking water from a Lake Michigan intake located approximately 3 miles downstream from the site. Yeoman Creek flows south through the YCL Site into the Waukegan River 1.75 miles downstream from the site. From that point, the Waukegan River flows another 2.25 miles to Lake Michigan. Leachate from the YCL Site has been observed seeping into Yeoman Creek since 1969, although the quantity decreased substantially after the site's soil cover was upgraded in 1980.

Contaminants of concern at the site include volatile organic compounds (VOC), polychlorinated biphenyls (PCB), bis(2-ethylhexyl)phthalate, and elevated concentrations of lead, manganese, iron, chloride, and ammonia in leachate. Some groundwater samples contained low concentrations of VOCs, bis(2-ethylhexyl)phthalate, and elevated concentrations of lead, chloride, and ammonia. Sediments in Yeoman Creek at and downstream of the site contain PCBs and other organic chemicals.

Landfill gas (LFG) was detected migrating beyond the YCL Site boundary, and combustible gases containing a number of VOCs were detected entering a building (1401-1451 W. Golf Road) near the site. Results from the risk assessment indicate that future residential use of groundwater near the site and future site development would present an unacceptable health risk. There may also be significant adverse effects on wildlife in the adjacent wetland. In addition, VOC-contaminated gases present a health risk to residents of the building where they were detected, and the LFG gas could cause fire or explosions.

Initial Response

In 1980, the City of Waukegan added additional soil to the cover over most areas of the landfill under an agreement with the IEPA. The additional soil was intended to reduce leachate production and subsequent discharges. On March 31, 1989, the YCL Site was listed on the National Priorities List (NPL).

In 1990, the potentially responsible parties (PRP) installed a fence around the site under an agreement with the U.S. EPA to limit site access and improve site security. In mid-1994, the PRPs installed a ventilation system in a building next to the site under an agreement with the U.S. EPA to mitigate exposure to LFG entering the building. The ventilation system was designed to maintain positive pressure within the building. The performance of the ventilation system was monitored, and its inadequacy was demonstrated, leading to a removal action in 1998. In 1995, under U.S. EPA oversight, the PRPs conducted a remedial investigation (RI) involving an ecological assessment and groundwater, leachate, and stream sampling to determine the nature and extent of contamination at the site. The RI culminated in a Record of Decision (ROD) for the site signed in 1996.

Basis for Taking Action

Potential exposure to soil, LFG, and groundwater associated with the Site could cause human health risks. The health risks result from the presence of hazardous substances at concentrations exceeding U.S. EPA's risk management criteria for either the average or reasonable maximum exposure scenarios. Risks from soil are associated with direct contact, dermal absorption, and

incidental ingestion. Risks from LFG are associated with inhalation of the gas, which contains hazardous substances, as well as the potential for fire and explosion. Risks from groundwater are associated with various organic and inorganic hazardous substances present at concentrations exceeding state and federal drinking water standards and surface water quality standards. The ecological evaluation indicated that risks to ecological receptors is due to the potential contact with soil and sediments associated with the site that are contaminated with PCBs, lead,polyaromatic hydrocarbons, lead, and zinc. In addition, surface water contaminated with cyanide and acetone may have a detrimental impact on some ecological receptors.

IV. Remedial Actions

Remedy Selection

The U.S. EPA Region 5 Regional Administrator signed the ROD for the YCL Site on September 30, 1996. The ROD specifies the following remedy:

1. Removal of contaminated sediment from Yeoman Creek and nearby wetlands to meet site-specific cleanup action levels (CAL)
2. Consolidation of wastes under a newly –constructed flexible, dual-barrier cover
3. Continuation of measures to address LFG
4. Natural attenuation of contaminants in groundwater to meet state and federal drinking water standards
5. Long-term monitoring
6. Institutional controls (ICs)
7. Fencing
8. Additional groundwater investigation

Figure 2 in the Site Maps attachment shows the long-term monitoring locations. The ROD also required significant additional investigation of sediments, soils, and groundwater to determine the extent of contamination. These investigations were completed during 1999 and 2000. The final remedy selected in the ROD is a source-control remedy to contain or control the landfill waste materials, contaminated soils and sediments in the landfill, and releases of leachate and LFG from the landfill. The remedy addresses all media and migration pathways considered to present an unacceptable risk, including landfilled wastes; contaminated soil and sediment; and releases to surface water, ambient air, air within adjacent buildings, groundwater, surface sediments, and wetlands. This remedy does not include treatment that reduces the toxicity, mobility, or volume of contaminants as a principal element. The ROD specifies the performance standards and the RA is expected to achieve them.

As stated in the ROD, the remedial action objectives (RAOs) include addressing the following risks:

- Human health risks in case of future development of the YCL Site
- Human health risks from off-site LFG migration
- Human health and ecological risks from the continuing release of hazardous substances to wetlands, Yeoman Creek, and groundwater (including meeting drinking water standards in aquifers at the YCL Site)
- Human health risks from off-site soil contamination
- Ecological risks from the contamination of sediments and limited wetland areas

On April 28, 1998, a Unilateral Administrative Order (UAO) was issued to the PRPs requiring a time-critical removal action, including the installation of an interim LFG collection system to remove LFG that had migrated to adjacent soils and basements of buildings north of the site at concentrations exceeding 25 and 50 percent, respectively, of the lower explosive limit (LEL). LFG at the site is known to contain VOCs in addition to methane gas. The LFG collection system was installed, modified several times, and able to achieve compliance in the basements of nearby occupied buildings. The system was removed during the construction of the final remedy, and off-site LFG migration is intended to be addressed by removing LFG through the final cover's ventilation layer and additional collection trenches outside the final cover.

On April 7, 1999, the court entered a Consent Decree (CD) for the site RA and remedial design (RD). The Yeoman Creek Remediation Group (YCRG) includes the following major settling work defendants:

1. Browning Ferris Industries of Illinois, Inc.
2. City of Waukegan, Illinois
3. Outboard Marine Corporation (OMC)
4. Waukegan Community School District No. 60
5. Goodyear Tire & Rubber Company
6. Dexter Corporation

In December 2000, OMC filed for bankruptcy protection under Chapter 13, leaving a letter of credit to fund its share of the work. U.S. EPA's Office of Regional Counsel tracked down proceeds from the letter of credit and placed them into an escrow account as partial financial assurance for the remedy. The escrow account, known as the OMC Trust account, was established to hold and disburse financial assurance funds provided on behalf of OMC. U.S. EPA established the minimum OMC Trust account financial assurance obligation as corresponding to the YCRG's 1999 allocation agreement: 22.975 percent of the most recently revised total financial assurance required. U.S. EPA has agreed to disbursements from the OMC Trust account for all amounts exceeding OMC's 22.975 percent share of the total financial assurance obligation.

In July 2001, the final (100 percent) RD was approved with conditions. In February 2002, U.S. EPA documented three minor remedy changes in a memorandum to the project file. These changes were implemented during the RA and are summarized below.

1. The ROD and the 1999 CD for the RD/RA for the YCL Site require the remedy to meet the following applicable or relevant and appropriate requirements (ARAR) during implementation of final remedial activities for LFG control:

   - Clean Air Act Section 101 –specifies odor free operation of LFG
   - 40 C.F.R. Part 52 – requires the filing of air pollution emission notice
   - 40 C.F.R. Part 61 – provides limits on hazardous air pollutants
   - Title 35 of the *Illinois Administrative Code* (IAC) 811.311 – requires active gas control system
   - 35 IAC 312 – requires treatment of landfill gas
   - 35 IAC 211, 212, 214, 215, 216, and 217 – sets emissions regulations

   The remedy selected in the ROD includes an active gas collection system for the Yeoman Creek Landfill and Edwards Field Landfill. Based on current data, the YCRG showed that due to the age of the Edwards Field and North and South Rubloff Landfills, an active system is not necessary to evacuate gas generated by these landfills. The YCRG further provided calculations to demonstrate that passive venting would control any LFG produced by the landfills. U.S. EPA allowed construction of the wind-assisted ventilator system proposed in the final design at the Edwards Field and Rubloff Landfills. The system was designed to be easily converted to an active system, with minimal additional construction. Monitoring of the system began in spring 2007 to ensure achievement of all performance standards and other requirements listed in the CD and ROD. If the wind-assisted ventilator system fails to meet performance standards at any time, the YCRG will submit to U.S. EPA within 30 days an addendum to the RA work plan providing for conversion of the system to an active gas collection system.

2. The ROD requires that the final cover minimize infiltration of precipitation through the landfill. The cover consists of the following components:

   - A 3-foot-thick frost protection layer, including a top vegetated layer
   - Geosynthetic drainage layer overlain by protective geonet providing a hydraulic conductivity of 28 centimeters per second
   - Barrier layer consisting of a 3-foot-thick compacted clay liner that meets Illinois Solid Waste Landfill closure standards or an equivalent primary barrier layer (such as a barrier consisting of a 40- mil very low-density polyethylene or equivalent)
   - Secondary barrier layer consisting of a geosynthetic clay liner or a compacted clay liner that meets Illinois Solid Waste Landfill closure regulations
   - Gas ventilation layer
   - Grading layer to provide a minimum 2 percent slope after settlement.

The CD clarifies that YCRG may propose alternative materials provided they achieve equivalent performance. YCRG has used tire chips instead of gravel for the ventilation and drainage layers. U.S. EPA allowed use of the alternative materials and is monitoring the performance of the materials against performance standards.

3. The ROD requires enclosing a portion of Yeoman Creek in a steel pipe during the landfill cover construction. YCRG used alternatives to the steel pipe, including earthen berms that protected the creek during excavation of contaminated sediments and construction activities. As detailed in the final design and approved RA work plan, U.S. EPA allowed YCRG to use these alternatives to the extent they provided an adequate level of protection and reliability.

Remedy Implementation

YCRG initiated site work in March 2002 after selecting its remediation contractor, T.J. Lambrecht. To minimize the cost of importing fill materials, YCRG's design required significant excavation and regrading of waste. In late 2002, hundreds of drums were discovered, causing the contractor to halt intrusive activities due to health and safety concerns. YCRG considered replacing the contractor or using additional contractors familiar with waste handling. YCRG's contractor removed, over-packed, and properly disposed of the drums off site.

In May 2003, at the request of YCRG and the U.S. Army Corps of Engineers, major activities at the YCL Site were halted through a stop-work order to allow time to negotiate the possible placement of dredged material from Waukegan Harbor (Outboard Marine Corp. Site) to enhance the remedy. YCRG and the U.S. Army Corps of Engineers entered into negotiations facilitated by U.S. EPA. After long negotiations, the City of Waukegan confirmed in early April 2004 that it would not allow the placement of dredged material at the YCL Site in spite of the many related benefits. YCRG signed contracts with Heritage Industrial Services on April 16, 2004, providing for construction of the final remedy at the YCL Site without placement of harbor sediment. In late 2005, major construction activities were completed and documented in a Preliminary Closeout Report dated September 2005.

In July and August 2006, various repairs and improvements were made at the site that included the following components:

- Northern drainage system
- Condensate trap CT-14
- Vertical gas collection wells
- Headers connecting the vertical gas collection wells to CT-ll and CT-12

Institutional Controls

ICs are non-engineered instruments, such as administrative or legal controls, that help minimize the potential for exposure to contamination and protect the integrity of the remedy. Compliance with ICs is required to ensure long-term protectiveness for areas that do not allow for unlimited

use or unrestricted exposure (UU/UE). Table 2 below identifies the areas that do not support UU/UE and the land-use restrictions associated with these areas.

The ROD required access restrictions and ICs to ensure the protectiveness of the remedy. The ICs were to include deed restrictions to prohibit future development of the Site that would be incompatible with the remedial action. Institutional controls will also include restrictions on usage of the contaminated ground water near the site. The cost of institutional controls is very minor compared to the total cost of the remedial action.

The 1998 Unilateral Administrative Order and 1998 Partial Consent Decree also had specific IC requirements for the Site. The cleanup goals for soils/ landfill were based on limited commercial or industrial (containment); cleanup goals for groundwater were based on (eventual) unlimited use/unrestricted exposure (UU/UE); cleanup goals for sediments and surface water were based on unlimited use. Additionally, EPA is reviewing the remedy with regard to the landfill gas, sediments and leachate to ensure protectiveness of the remedy.

Table 2 below summarizes institutional controls for the areas that do not support UU/UE and thus require ICs or the areas which are under investigation may require ICs.

TABLE 2
INSTITUTIONAL CONTROL SUMMARY

Media, Engineered Controls, & Areas that Do Not Support UU/UE Based on Current Conditions.	**IC Objective**	**Title of Institutional Control Instrument Implemented (note if planned)**
Yeoman Creek Landfill Site Property – Yeoman Creek Landfill; Dual-barrier cover and LFG collection system ; ***Groundwater*** - current areas beneath the landfill that exceed groundwater cleanup standards.	Prohibit residential use or other uses that may impact the integrity of the remedy; Prohibit groundwater use; Prohibit activities that may disturb the integrity of the engineered components	Proposed UECA covenant (under review by U.S. EPA); City of Waukegan Municipal Ordinance 10-0-58), September 10, 2010 (under review by U.S. EPA)
Yeoman Creek Landfill Site Property – Edwards Field Landfill; capped; ***Groundwater*** - current areas beneath the landfill that exceed groundwater cleanup standards.	Prohibit residential use or other uses that may impact the integrity of the remedy; Prohibit groundwater use; Prohibit activities that may disturb the integrity of the engineered components	Declaration of restrictions dated 4/12/94; Document #3524718 Proposed UECA covenant (under review by U.S. EPA). City of Waukegan Municipal Ordinance 10-0-58), September 10, 2010 (under review by U.S. EPA).

Yeoman Creek Landfill Site Property – North Rubloff Landfill; capped. ***Groundwater*** - current areas beneath the landfill that exceed groundwater cleanup standards	Prohibit residential use or other uses that may impact the integrity of the remedy; Prohibit groundwater use; Prohibit activities that may disturb the integrity of the engineered components	Proposed UECA covenant (under review by U.S. EPA). City of Waukegan Municipal Ordinance 10-0-58), September 10, 2010 (under review by U.S. EPA).
Yeoman Creek Landfill Site Property – South Rubloff Landfill; capped. ***Groundwater*** - current areas beneath the landfill that exceed groundwater cleanup standards	Prohibit residential use or other uses that may impact the integrity of the remedy; Prohibit groundwater use; Prohibit activities that may disturb the integrity of the engineered components	Proposed UECA covenant (under review by U.S. EPA). City of Waukegan Municipal Ordinance 10-0-58), September 10, 2010 (under review by U.S. EPA).
Other Remedy Components such as LFG system, wells, slurry wall, perimeter gas collection system and fencing	Prohibit interference of remedy components and ensure maintenance.	(under review by U.S. EPA)
Terrace Nursing Home and Evoy Properties	Investigate to determine whether area requires additional actions including ICs	Under Review
Waukegan School District ; PIN: 08-08-403-028 PIN: 08-08-403-022	Under Review	Proposed UECA covenant (under review by U.S. EPA).
Ms. Ruth Jacobs Beneficiary of Cosmopolitan National Bank Trust #26660 PIN: 08-08-400-12	Allow Access and No Interference with Remedy	Agreement Executed (November 11, 1999) Agreement Executed (June 25, 2002)
Sheldon Lovinger Norman Kramer PIN: 08-08-403-012 PIN: 08-08-403-013	Allow Access and No Interference with Remedy	Agreement Executed (May 26, 1998)
The Terrace Nursing Home Beneficiary of Trust Agreement dated March 11, 1988, known as Trust No. 25-9142; PIN: 08-08-403-011	Allow Access and No Interference with Remedy	Agreement Executed (August 20, 1998, Recorded on August 15, 2008)
Trust Agreement No. 55858. James E. Evoy, Beneficiary Paul E. Kamshulte, Jr., Beneficiary Allan J. Jacobs, Beneficiary; PIN: 08-08-403-016	Allow Access and No Interference with Remedy	Agreement Executed (August 13, 1998)
Waukegan Park District; PIN: 08-08-400-014 PIN: 08-17-200-009 PIN: 08-17-200-024 PIN: 08-17-200-026 PIN: 08-17-200-002	Allow Access and No Interference with Remedy	Agreement Executed (July 28, 1999)

Bank of Waukegan, solely as Trustee under Trust Agreement dated October 1, 1993, and known as Trust No. 230944; PIN: 08-17-200-052	Allow Access and No Interference with Remedy	**Agreement Executed (February 25, 2002)**
Groundwater – current area beyond Landfill property that exceeds groundwater cleanup standards identified in Figure 2.	Prohibit groundwater use until cleanup standards are achieved	City of Waukegan Municipal Ordinance 10-0-58), September 10, 2010 (under review by U.S. EPA)
Surface Water (on Site within fence) – Remedy under review by U.S. EPA	Does not appear to exceed cleanup standards. Investigate to determine whether area requires additional actions including ICs .	Under Review
Sediments (on Site within fence) – Sediment information is being reviewed	Access is limited. Investigate to determine whether area requires additional actions including ICs	Under Review- UECA can be modified to include area if needed
Landfill Gas on Adjacent Properties – Remedy under review by U.S. EPA	Investigate to determine whether area requires additional actions including ICs	Under Review
Wetlands- (on Site within fence)	Investigate to determine whether area requires additional actions including ICs	Under Review. Under Review- UECA can be modified to include area if needed

Maps depicting current site conditions and areas that do not allow for UU/UE will be developed in the Institutional Control Implementation and Assurance Plan (ICIAP) discussed below.

Existing and Planned ICs: Implementing, maintaining, monitoring and enforcing of the ICs will be required to assure protectiveness of the remedy. On January 6, 2012, the YCRG submitted an IC study, which summarizes existing ICs (after conducting some of the required IC evaluation activities) along with proposed ICs discussed below. U.S. EPA is in the process of reviewing the IC evaluation activities or IC study and proposed ICs. The review will ensure comprehensive maps are available. Once review of the IC study is complete, then EPA will require the PRPs to submit an ICIAP to incorporate the results of the evaluation plan for additional IC evaluation activities as needed including planning for IC implementation and long-term stewardship as discussed below.

Based on preliminary review, it has been determined that some ICs have been implemented; however all the required ICs have not been fully implemented at the Site. Implementing, maintaining and monitoring of the ICs will be required to assure protectiveness of the remedy. Also, the existing ICs have not been fully evaluated. A review is 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. U.S. EPA will review the existing and proposed ICs to ensure that it complies with the objectives articulated in the ROD and the requirements specified

in the UAO and CD. U.S. EPA will review the ICs, including existing maps, to ensure the objectives and physical boundaries of the ICs are clear and effective, the terms are enforceable and run with the land or are otherwise reliable in the long-term.

On January 6, 2012, the YCRG submitted the proposed Environmental Covenants (ECs) under the Uniform Environmental Covenants Act (UECA) for all parcels owned by the YCRG parties. The UECA allows the creation of environmental covenants that run with the land and are enforceable by third parties, in this case, U.S. EPA and IEPA. Properly drafted UECA covenants will ensure that the restrictions are enforceable and run with the land to ensure long-term Site stewardship. The UECA has numerous benefits such as providing that an owner of property may enter into a restrictive covenant and also be a "holder" of the covenant, with the right to enforce it against a third party even after it sells the property. This PRP submittal also includes negotiated access agreements. U.S. EPA is currently reviewing the IC study and the IC instruments, both proposed and implemented, to ensure appropriate objectives are listed, that the physical area is appropriate, to ensure effectiveness and to ensure compliance with other requirements. Also, additional work may be necessary such ensuring comprehensive maps exist describing all areas which will not allow UU/UE. Review of title work should be conducted to ensure no other encumbrances can interfere with the ICs. If there are property interests superior to the covenants that might cause problems, e.g., utility rights of way, etc., then the ICIAP should describe what efforts will be made to obtain subrogation agreements. Further, review of the effectiveness of the city ordinance should be conducted.

On September 10, 2011, the City of Waukegan approved a municipal ordinance prohibiting the use of groundwater as a potable water supply within the corporate limits of the City of Waukegan. The ordinance will be re-evaluated to confirm that it is functioning as intended with regard to the ICs and to ensure effective procedures are in-place for long-term stewardship at the Site. Additionally, the areal limits of the ordinance must be confirmed to encompass the areas where groundwater contamination exists. Although YCRG has previously confirmed in 1992 that there are no potable water wells within 0.25 miles of the Site in all directions, or within 1.5 miles down gradient of the Site, more work should be done to ensure that no exposures are occurring. For example, the private well inventory should be updated to confirm no exposures, including potable and non-potable uses, are occurring from groundwater wells in the area.

U.S. EPA, the City of Waukegan, and YCRG members have been evaluating potential future uses and their compatibility with the dual-barrier cover system. Previously, U.S. EPA also provided a grant to the City of Waukegan to explore compatible site reuses.

Additionally, since some of remedy compenents are not working as anticipated, additional investigations are underway which could include additional ICs to protect the remedy components and ensure the remedy functions as intended.

Since long-term protectiveness requires compliance with effective ICs, effective ICs must be implemented, monitored, maintained and enforced along with maintaining site remedy components so that the remedy will function as intended. To that end, an ICIAP must be submitted to conduct additional IC evaluation activities, to plan for additional ICs, as needed, and ensure long-term stewardship.

The PRPs will be directed to prepare an ICIAP which serves as a workplan to conduct additional IC evaluation activities, as needed, and to implement ICs and long-term stewardship. The IC Work Plan will include steps for IC evaluation activities that will be undertaken to evaluate the effectiveness of the existing ICs and to assure the effectiveness of the ICs that will be implemented; steps for completing the IC implementation activities that are underway; plan for any additional ICs are needed, and planning for long-term stewardship

Current Compliance: Based on inspections and interviews with city officials, EPA is not aware of any wells installed within the groundwater restricted area. The groundwater restriction ordinance appears to be functioning as intended. Additionally, based on recent inspections, there are not current uses of the landfills. However, EPA is reviewing other uses near the site to ensure no inconsistent uses are occurring.

Long-Term Stewardship: Long-term protectiveness at the Site requires continued compliance with use restrictions to assure that the remedy continues to function as intended. Once ICs are implemented, then long-term stewardship (LTS) must occur including maintenance, monitoring, and enforcement of ICs to ensure the ICs remain in place and function as intended. A long-term stewardship (LTS) plan will be required (or O&M Plan revision) to document long-term stewardship procedures. The LTS Plan will document long-term stewardship which includes maintaining and monitoring effective ICs. The plan must include the mechanisms and procedures. For example, ICs should be inspected regularly and annual certifications should be provided to U.S. EPA and IEPA that show that the required ICs are in place and effective. Additionally, a communication plan should be developed and use of the State's one-call system should be explored for long term stewardship.

System Operation and Operation and Maintenance

Operation of the LFG collection system began during construction and is ongoing. The LFG collection system components include a gas collection layer (tire chip layer), perimeter collection trenches with collection pipes, condensate traps, valves, a main vacuum blower, a flare, an air compressor, condensate tanks, and an automated control system.

The O&M costs for the Site have been compiled and summarized as noted below:

Cost Item	2007	2008	2009	2010	2011
O&M Cost	$442,280	$431,735	$406,377	$372,366	$390,021
Analytical and Report Preparation Cost	$65,200	$100,141	$76,569	$77,213	$80,000
Utilities	$8,426	$7,654	$17,725	$18,250	$19,569
Annual Totals	$515,906	$539,530	$500,671	$467,829	$489,590

The average annual O&M cost for this period has been $ 486,000. The O&M costs have remained constant over the latest five year review and are consistent with the annual $450,000 O&M projections stated in the ROD and the 2007 Five-Year Review.

The monitoring data for the LFG collection system show that the remedy has not been able to control off-site LFG migration from the northern portion of the YCL site. YCRG and its consultants have taken several steps to improve the LFG collection system; however, the actions so far have had limited success in controlling off-site gas migration in and around the Lovinger property north of the YCL Site. Probes LFG-326R, LFG-327R, LFG-328R, and LFG-329R (see Figure 4) have been consistently showing LFG readings above 50 percent of the LEL. Other probes at the Terrace Nursing Home and Evoy properties also have exhibited LFG readings above 50 percent of the LEL. Additionally, probes exhibiting LEL readings exceeding 50 percent of the LEL often showed positive pressure readings when negative vacuum readings were expected if the LFG collection system were effective. This finding indicates that the LFG collection system vacuum influence is not overcoming the naturally generated pressure build-up caused by LFG from the YCL Site.

YCRG has taken steps to improve LFG collection on the northern portion of the YCL site. One major action taken after the first Five-Year Review was installation of a secondary LFG system on the northern portion of the site. The secondary system consists of a slurry wall and active gas collection trench with a collection pipe on top of the slurry wall. The gas collected from the secondary active system is vented to the atmosphere.

Despite installation of the slurry wall and an active gas collection trench, off-site LFG migration has not been reduced significantly; therefore, based on a recommendation from the US EPA, YCRG conducted a Geoprobe investigation in the southeastern portion of the Terrace Nursing Home property. Based on this investigation results, YCRG has concluded that the LFG is located in debris fill present in the area investigated. Currently, YCRG is designing the LFG system to address gas located in the debris fill material. The design vacuum and flow of the venting system should provide adequate influence to consistently intercept and remove migrating LFG and reduce LFG methane below regulatory levels in existing and additional LFG probes to be installed later. Additionally, the design must consider potential shallow water table conditions in these areas, and the system must be able to run continuously under all site conditions. The system should meet substantive requirements for all state, local, and federal air emissions regulatory limits. The design should provide for extension and expansion of the LFG system if other probes in the vicinity yield LFG readings exceed 50 percent of the LEL. Furthermore, based on the fact that the condensate traps contained high levels of oxygen, the LFG collection system at the YCL Site should be thoroughly tested to ensure that there are no leaks.

In addition, during the five year review site walk through, it was noted that several wind turbines associated with the LFG system at the Edwards Field and Rubloff Landfills were not operational. On January 4, 2011, Aether DBS, contractor to the YCRG submitted a letter to Tom Thomas, Project Manager for the YCRG, which documented non-functional turbines were replaced and adjustable rubber boots were installed to level turbines. It is recommended that the wind turbines should be inspected regularly to ensure that they are operative and a determination should be made if they need to be balanced or replaced. In addition, Table 3 of this Five-Year Review document, which has been excerpted from Aether DBS' January 4, 2011 letter, identified the resolution of the items noted during the Five-Year Review site walkthrough.

V. Progress Since the Last Five-Year Review

The previous FYR, signed on February 27, 2007 found that:

The remedy at the YCL is not protective because the LFG collection system is not operating as designed; i.e., LFG above 50% of the lower explosive limit ("LEL") continues to migrate beyond the landfill boundary. Additional remedial action as well as implementation and compliance with land use restrictions that prohibit interference with the dual barrier cover and the LFG collection system and prohibit groundwater use are necessary to ensure protectiveness. U.S. EPA and the responsible parties are negotiating the details of the additional remedial action that is expected to include a separate gas collection system for the northern portion of the site.

Issue	Recommendations and Follow-Up Actions	Affects Protectiveness		Milestone Date	Current Status
		Current	Future		
1.Gas collection system failure	1. Further remedial action is necessary including a separate gas collection system	Y	Y	6/30/2007	A secondary LFG system (Lovinger Gas System) along with a number of activities highlighted in Table 1 have been implemented since 2007 through 2011. But the system and actions taken has not been able to address most of the off-site LFG present at the Terrace Nursing Home and Evoy property. In 2011, during a subsurface investigation on the Terrace Nursing Home Facility, it was determined that the LFG is most likely present in a debris fill material present on Terrace Nursing Home property. Currently, the YCRG is designing a system to collect LFG from the debris fill material at the Terrace Nursing Home property.
2a. Dual barrier cover LFG collection system and areas of groundwater contamination require restrictions	2. IC plan including provision for implementation of easements/restrictive covenants for all affected properties (including titlework and mapping) by YCRG.	N	Y	8/31/2007	On January 3, 2012, a document identifying the relevant access and IC requirements were submitted to the U.S EPA

2b. Long-term stewardship	**Update O&M Plan to ensure long-term stewardship which includes maintaining and monitoring effective ICs.**	**N**	**Y**	**12/30/07**	**Not Completed**
3. Fence and signs	**Repair the signs and openings in the fence and gate. Remove vegetative growth from fence**	**N**	**Y**	**6/30/07**	**Completed**
4. Grading	**Correct ponding, erosion, sparce vegetative cover and animal burrow problems**	**N**	**Y**	**6/30/07**	**Completed**
5. Wells and LFG	**Inspect the groundwater monitoring wells, probes and casings for integrity and repair as necessary. Label casings so they are easily identified from the landfill surface. Secure all wells and probes with locks**	**N**	**Y**	**6/30/07**	**Completed**

VI. Five-Year Review Process

Administrative Components

Syed Quadri, RPM for the YCL Site, conducted this Five-Year Review. In support of U.S. EPA's ongoing negotiations with YCRG regarding additional work, U.S. EPA's oversight contractor, Weston Solutions, Inc. (WESTON), reviewed existing data and the LFG collection system. The RPM incorporated WESTON's review findings into this report. IEPA also reviewed this report. YCRG first was verbally notified of the Five-Year Review in April 2011 and then reminded of the review in a letter dated April 12, 2011.

Community Notification and Involvement

The public was notified of the initiation of the Five-Year Review through advertisements placed in two separate newspapers with local circulation. On January 12, 2012, the advertisement ran in the Lake County News Sun. On January 13, 2012, the advertisement in the Spanish language ran in the Spanish newspaper, La Nueva Semana.

Community involvement activities have been minimal and there has been a relatively low level of public interest at the site. The repository at the public library in Waukegan provides site-related information to interested community members, and public meetings have been held in the past to inform and involve the community. The Community Involvement Coordinator (CIC),

Mike Joyce, regularly attends the Waukegan Community Advisory Group and provides updates about new developments at the site.

Document Review

This Five-Year Review consisted of a review of relevant documents, including legal documents, records, and monitoring data. Applicable groundwater cleanup standards also were reviewed. Since the last review none of the ARARs and criteria to be considered (TBC) have changed for the contaminants of concern, and there are no new standards or TBCs.

Data Review

This review summarizes analytical results from recently conducted monitoring from December 2007 through April 2011 for groundwater, sediment, wetland soil, and surface water. LFG measurements also were reviewed. Verification and compliance monitoring requirements and a summary of verification and monitoring results to date are discussed below.

Verification and Compliance Monitoring Requirements:

In accordance with the ROD, CD, memorandum documenting minor remedy changes, and the O&M plan, sampling and monitoring are being conducted to verify that performance standards are met. Specifically, the following activities are required:

1. Monitoring of LFG probes, basements, and discharges of LFG with or without treatment
2. Monitoring of groundwater, sediments, surface water, and soils

Summary of Verification and Compliance Monitoring Results to Date:

Groundwater

Based on 2009 and 2010 data, groundwater in the lower outwash aquifer flows east and northeast (see **Figure 3** in the Site Maps attachment); however, flow in the shallow aquifer is expected to be radial. The groundwater VOC data highlights a fluctuating trend in MW-210 and MW-215 without any definite conclusion that the groundwater concentrations are increasing or decreasing. The concentration of vinyl chloride in MW-103, MW-216 and MW-A appears to be trending lower. However, several contaminants in groundwater continue to exceed state and federal drinking water standards. These contaminants include arsenic, vinyl chloride, methylene chloride, benzene, cadmium, chloride, and sulfate. The concentrations of vinyl chloride (MCL of 2 ug/L) in groundwater monitoring wells MW-103 (5.5 - 8.0 ug/L), MW-210 (15 - 43 ug/L), MW-216 (2.6 – 4.7 ug/L), and MW-A (7.7 - 23 ug/L) and of benzene (MCL of 5 ug/L) in monitoring well MW-215 (up to 8.9 ug/L) are a potential concern (see **Figure 2**); therefore, ongoing monitoring of groundwater should continue.

Sediments in Yeoman Creek

Based on the sediments data collected between 2008 through 2011, sediments in Yeoman Creek have been re-contaminated, and sampling results exceeded Cleanup Action Levels (CALs) for PCBs, which is 3.4 mg/kg, during multiple sampling events. The sediment samples exceeding CALs were collected from CSD-2 (calculated PCB concentrations to compare with CALs 4.6 mg/kg, 5.4 mg/kg and 6.8 mg/kg), CSD-3 (calculated PCB concentrations to compare with CALs 3.8 mg/kg, 6 mg/kg, 10.5 mg/kg, CSD-4 (calculated PCB concentrations to compare with CALs 9.5 mg/kg, 19 mg/kg), CSD-D (calculated PCB concentrations to compare with CALs 4 mg/kg, 9.4 mg/kg, 20 mg/kg) , and I (calculated PCB concentrations to compare with CALs 4.4 mg/kg, 5.2 mg/kg, 5.9 mg/kg). Because extremely low levels of PCBs were detected in upstream samples compared to downstream samples, at this time, significant impact apparently is occurring from the Yeoman Creek Landfill, the Edwards Field and Rubloff Landfills, or some combination of the landfills. Because of the significant impact of PCBs on Yeoman Creek, further RA is required to address PCB contamination in the creek; therefore, an investigation should be performed along the Yeoman Creek between the upstream sample location and downstream sample location CSD-5 to determine where the landfill is leaking and re-contaminating the Yeoman Creek sediment with PCBs.

Wetland Soils

Based on 2008 through 2011 data, wetland soils have been impacted, and sampling results exceeded CALs for PCBs during at least one sampling event at locations WSW-4 (October 2009), WSD-2 (November 2008), and WSD-4 (November 2008). Although PCB contamination was detected only once during several sampling events at the same location, ongoing monitoring of wetland soils should continue.

Surface Water

Based on 2008 through 2011 data, surface water has not been significantly impacted; however, because sediments and wetland soil have been impacted and results exceeded CALs for PCBs, monitoring of surface water should continue.

Landfill Gas

Explosive levels of LFG appear to exist beyond across the northern site boundary, especially impacting the Terrace Nursing Home and Evoy properties next to the Lovinger property. This LFG was evident during the first Five-Year Review. Since then, a secondary LFG system has been installed in the northern portion of the site consisting of a slurry wall and perimeter gas collection system on top of the slurry wall. Although this LFG system has somewhat reduced the LFG, the system has not been able to address most of the off-site LFG present at the Terrace Nursing Home and Evoy properties. In addition, to address LFG on the Evoy property, the perforated pipe installed in the trench on the Evoy property during remedial construction has been reconnected to the existing system.

YCRG has performed an investigation on the Terrace Nursing Home property to determine the source of the LFG. During this investigation, it was determined that the LFG is present in debris fill material present on the Terrace Nursing Home property. Currently, the YCRG is designing a system to collect LFG from the debris fill material at the Terrace Nursing Home property.

If the actions discussed above at the Evoy and Terrace Nursing Home properties do not address the LFG issue, then additional response action may be necessary.

Site Inspection

A site inspection was conducted on Tuesday, August 9, 2011. The weather was sunny and windy with temperatures ranging in high 70s °F. The sunny weather allowed a full visual inspection of the cover and other site features during a walk-over of the entire site. Present at the inspection were Syed Quadri, U.S. EPA Remedial Project Manager; Erin Rednour of IEPA; Omprakash Patel and Steve Ryan of WESTON (U.S. EPA Superfund Technical Assessment and Response Team [START] Contractor); Tom Thomas, YCRG Project Manager; Eric Ballenger, BFI North America; Sharon Salinas, Dexter; Stan Levenger of Goodyear; and Bob Solak and Ray Hladovcak of Aether DBS. Aether DBS is conducting O&M activities at the site under subcontract to YCRG.

The LFG extraction and treatment system is operating and its components are in good condition. The treatment system includes a flare. Treatment system components are secured by a locked fence in addition to the perimeter fence. The large condensate tank requires emptying only a few times per month. The voltage conditioner has minimized voltage faults. The treatment building appears to be in good condition. Most records are maintained off site; however, the site health and safety and maintenance plans are located in the treatment building.

Issues noted during the inspection are summarized below.

1. Several wind turbine ventilators at the Edwards Field and Rubloff Landfills were damaged or otherwise needed maintenance.
2. Areas of ponding were observed on the cover. The area on the north side of the YCL Site needs to be graded and connected to the swale.
3. Minor fence damage was observed.
4. Standing water and significant vegetation growth were noted in the drainage ditches. In some places, vegetation in the ditch was causing water back-up in the drainage ditch.
5. Drummed investigation-derived waste and a Geoprobe sleeve were observed at the site.
6. The drainage layer was not exposed in some areas at the edge of cover.
7. Vegetation (including shrubs) was observed on the side slopes of the cover.
8. A bare area was observed on the cap in the northern portion of the Edwards Field Landfill.

On January 4, 2012, O&M Contractor to YCRG, Aether DBS, submitted a report to Tom Thomas, Project Manager for the YCRG, documenting the identification and resolution of the items noted during the August 9, 2011 site inspection (see Table 3).

Table 3 – 2011 Inspection Issues Resolved by YCRG

Yeoman Creek Landfill Site
2011 5-Year Review Inspection
List of Identified Issues

	Item	Status	Comments
1	Fence Signs – Not all are bilingual. Replace all that are not bilingual and confirm spacing is good	Completed	Five new signs installed in September. Report attached.
2	YCL – Regrade around CT-12 to drain to swale just west of there	Completed	Soil added and regraded for positive drainage to swale. Report attached.
3	YCL – Remove all vegetation but grass from drainage swales. Note that area just east of southern Creek exit from YCL will need extensive excavating/handwork to remove the cattails and rip rap, screen out the rip rap, and then replace the rip rap.	Completed	Swales clear of vegetation during mowing. Swale on northern west YCL had flood debris removed and vegetation cut down. Cattails in rip rap on southern perimeter of YCL near Creek have been removed. New rip-rap brought in and excavated rip-rap stockpiled onsite for future use. Report attached.
4	YCL – Fill around PV-4 to prevent ponding	Completed	Photos in attached report.
5	YCL – Need to clear rip rap along Yeoman Creek of growth (area around CT-15 on both sides for example)	Completed	Woody growth removed by hand and by torch. Photos in attached report.
6	West YCL – Barbed wire section is cut and needs repair	Completed	Wire repaired. Photos in attached report.
7	Edwards – Area on north end of property of poor growth needs to be topsoiled and seeded	Completed	Additional topsoil placed and seeded; some vegetation growth this season. Report attached.
8	Edwards – Fence Repair where cottonwood fell needs to be straightened/tightened	Completed	Fence repaired. See photos in attached report.
9	Edwards – Wind turbines should be made level. Confirm that all spin	Completed	Adjustable rubber boots installed to level turbines. Non-spinning turbines replaced. Report attached.
10	Edwards – Vegetation along eastern perimeter, inside fenceline should be cut down	Completed	Vegetation cut down by manual weed wacking. Area is too wet to use tractor. Too wet to grow grass. Will become part of the mowing scope to cut manually in late spring and late summer mowing.
11	List of Non-Routine Actions over the last 5 years	Completed	List of non-routine actions taken.
12	Update the previous 5-year review list and actions taken and when	Completed	Checklist Attached.

The site O&M plan requires modification to include the following:

- Mechanisms to ensure regular inspection of ICs at the site
- Annual certification of IC effectiveness
- Communication plan to ensure that ICs are properly monitored and reported

Interviews

On Monday, Oct. 17, 2011, Remedial Project Manager (RPM) Syed Quadri and Community Involvement Coordinator (CIC) Mike Joyce visited Waukegan, Illinois to conduct interviews concerning the Five-Year Review of the Yeoman Creek Landfill NPL site. Syed Quadri and Mike Joyce first interviewed Waukegan's Mayor, Robert Sabonjian. Several topics were discussed at length: the investigation of methane gas present in the groundwater in the northwest corner of the property; the concerns of the nearby businesses and nursing home; and the possible reuse of the property. The possibility of using the land for solar-collection and electrical generation was discussed at length. The Mayor was especially interested in this option.

In addition, Syed Quadri and Mike Joyce visited several nearby businesses to explain that the Five-Year Review was underway and to see if they had any concerns regarding the remediation of the site. None of the businesses visited had any concerns and all expressed satisfaction that the cleanup had been accomplished and that the site was being constantly monitored. The owner of the Sunset House Restaurant said he would like to see the land put back into productive use. Finally, the RPM and CIC visited several residences near the site. All seemed satisfied with the cleanup and none expressed any immediate concerns. The only exception was one long-time resident. She expressed concern the site may have affected her children's health because they had played on or near the landfill even before it had become an NPL site. Although, she explained that her children were now mature adults and admitted that none had any severe health problems presently. However, she indicated that she sometimes worries they may have possibly been affected by chemicals dumped in the landfill and that health problems might manifest in the future. On the other hand, she said she was happy that U.S EPA had remediated the site. All the residents interviewed said they would like to see the site's property put back into productive use.

VII. Technical Assessment

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

The remedy is not functioning as intended by the decision documents. The RAs at the site have failed to meet cleanup standards. LFG, groundwater, sediment, and wetland soil monitoring results indicate that properties beyond the site boundary continue to be impacted. LFG and groundwater contaminant levels exceed federal and state ARARs, and sediment and wetland soil contaminant levels exceed site-specific CALs. Long term protectiveness also requires compliance with effective ICs which will be ensured by implementing, monitoring, maintaining and enforcing them as well as maintaining the site remedy components. Long term stewardship must be ensured to verify compliance with ICs. Since long-term protectiveness requires

compliance with effective ICs, effective ICs must be implemented, monitored, maintained and enforced along with maintaining site remedy components so that the remedy will function as intended. To that end, an Implementation and Assurance Plan (ICIAP) must be submitted to conduct additional IC evaluation activities, to plan for additional ICs, as needed, and ensure long-term stewardship.

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

The exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still are valid. Potential federal ARARs of the ROD include the Clean Water Act, the Clean Air Act, National Ambient Air Quality Standards, and Occupational Safety and Health Administration and U.S. Department of Transportation standards. Potential state ARARs include the groundwater standards and other appropriate sections of the IAC.

Federal Maximum Contaminant Levels (MCL) and state groundwater standards have not changed significantly since the first Five-Year Review as amended. Federal and state standards for surface water quality and protection of aquatic life also have not changed significantly since the first Five-Year Review as amended.

Toxicity and other factors for some contaminants of concern have not changed significantly. Any minor changes in risk assessment methodologies since the time of the ROD do not significantly impact the protectiveness of the remedy. Based on site information, all federal and state environmental ARARs for on-site activities identified in the ROD are being substantially complied with except that: (1) LFG continues to migrate beyond the site boundary; (2) results for sediment samples from Yeoman Creek and for wetland soil exceed the PCB CALs; and (3) groundwater results exceed MCLs.

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

Other information has come to light that could call into question the protectiveness of the remedy. Since the ROD was issued, LFG migration has been further investigated and continues to be a significant problem in the northern portion of the site. LFG also continues to migrate beyond the landfill boundary.

Since the first Five-Year Review, results for sediment samples from Yeoman Creek and for wetland soil exceed the CALs for PCBs.

Technical Assessment Summary

Based on existing data, exposure assumptions, cleanup levels, and RAOs, the remedy is not protective because: (1) LFG continues to migrate beyond the site boundary; (2) results for sediment samples from Yeoman Creek and for wetland soil exceed the PCB CALs and are potentially resulting in unacceptable exposures to ecological receptors; and (3) groundwater results exceed MCLs. As indicated in the ROD, groundwater is expected to meet the MCLs within a reasonable period of time through natural attenuation. Groundwater is not used as a drinking water source in the vicinity of the site, so this potential pathway is not currently complete. On September 10, 2010, the City of Waukegan approved a municipal ordinance prohibiting the use of groundwater as a potable water supply within the corporate limits of the City of Waukegan. On January 6, 2012, the YCRG has submitted signed Environmental Covenants for all site parcels. This submittal includes the negotiated access agreements. U.S EPA is currently reviewing this submittal to ensure compliance.

VIII. Issues

An IC Implementation Plan is needed for long term stewardship at the site. Several condensate traps consistently have shown the presence of high levels of oxygen. These condensate traps should be thoroughly tested to ensure that they are not leaking atmospheric air. The drainage layer was not exposed in some areas at the edge of cover. Drummed investigation-derived waste and a Geoprobe sleeve were observed at the site. Table 4 below summarizes the issues and indicates if they affect current and future protectiveness of the remedy.

TABLE 4
SUMMARY OF ISSUES

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
1. LFG collection system failure	Y	Y
2. Yeoman Creek sediment and wetland soil sample results exceed CALs	Y	Y
3. Groundwater sample results exceed MCLs	N	Y
4. Need to formalize Long Term Stewardship procedures at the site	N	Y
5. Condensate traps with high oxygen levels	Y	Y
6. Drainage layer not exposed in areas at edge of cover	N	Y
7. Drummed investigation-derived waste observed	N	Y

IX. Recommendations and Follow-up Actions

Table 5 below summarizes recommendations and follow-up actions for the YCL Site.

TABLE 5
RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issue	Recommendation and Follow-up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
LFG collection system failure	Further RA to collect LFG from Terrace Nursing Home	YCRG	U.S. EPA and IEPA	**8/27/12**	Y	Y
Yeoman Creek sediment and wetland soil exceed CALs	Further RA to remove sediment and soil exceeding PCB CALs from Yeoman Creek	YCRG	U.S. EPA and IEPA	**8/27/13**	Y	Y
Groundwater sample results exceed MCLs	Continue Monitoring. Submit an evaluation report on the efficacy of natural attenuation for the remediation of groundwater contaminants of concern at the site.	YCRG	U.S. EPA and IEPA	**N/A**	N	Y
Long Term Stewardship at the site	Issue an IC Implementation plan to address long term stewardship at the site	YCRG	U.S. EPA and IEPA	**2/27/13**	N	Y
Condensate traps with high oxygen levels	Thoroughly test condensate traps to ensure no leaks	YCRG	U.S. EPA and IEPA	**2/27/13**	Y	Y
Drainage layer not exposed	Remove soil covering to expose the drainage layer	YCRG	U.S. EPA and IEPA	**8/28/12**	N	Y
Investigation-derived waste	Characterize and dispose of waste at U.S. EPA-compliant facility	YCRG	U.S. EPA and IEPA	**5/27/12**	N	Y

X. Protectiveness Statement(s)

The remedy at the YCL Site is not protective because the LFG collection system is not operating as designed. LFG above 50 percent of the LEL continues to migrate beyond the site boundary. Additional RA is necessary to ensure protectiveness as well as implementation and compliance with land-use restrictions that prohibit (1) interference with the dual-barrier cover and LFG collection system and (2) groundwater use. The U.S. Environmental Protection Agency (U.S. EPA) and the responsible parties are negotiating the details of additional remedial actions to effectively and efficiently remove LFG that has been detected at the neighboring properties.

In addition, sediments in Yeoman Creek and wetland soil contain PCBs at concentrations exceeding CALs. Further investigation is necessary to determine the extent of sediment and wetland soil contamination and the source of contamination. Further RA is necessary to address sediments exceeding CALs in Yeoman Creek and wetland soil, and source containment or removal could be necessary.

XI. Next Review

The next Five-Year Review for the Yeoman Creek Landfill is required by February 27, 2017, five years from the date of this review.

Attachments

Site Maps/Figures
List of Documents Reviewed
Advertisements Announcing the Five-Year Review

Appendix

Comments received from Support Agencies and/or the Community

List of Documents Reviewed

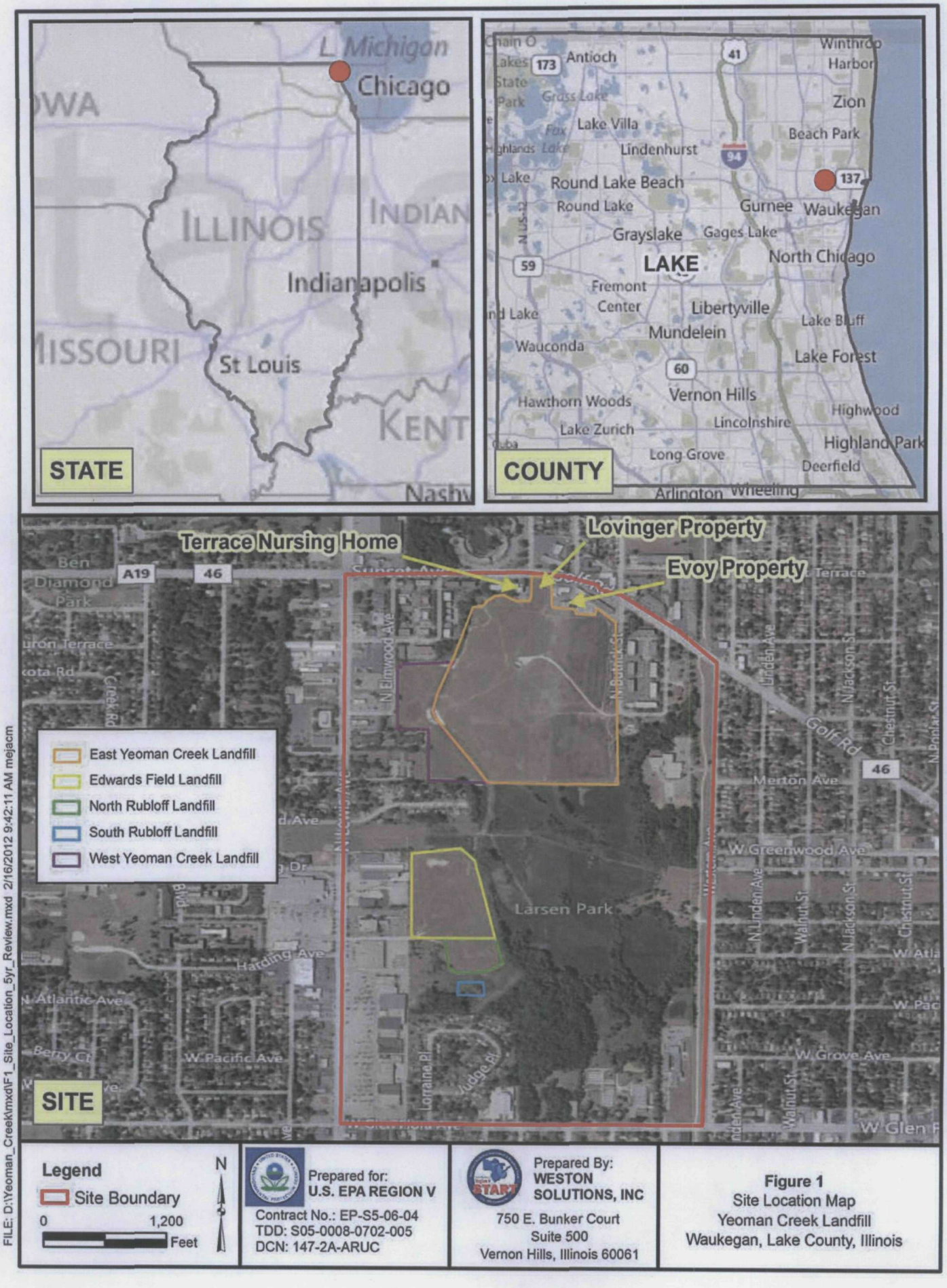
Record of Decision, U.S. EPA, 1996
Partial Consent Decree for Remedial Design/Remedial Action, U.S. EPA, 1999
Preliminary Close-out Report, U.S. EPA, 2005
First Five-Year Review Report, 2007
Monitoring Data, YCRG, 2008 through 2011
Landfill Gas Monitoring Data, YCRG, 2008 through 2011

Attachments

Site Maps/Figures
List of Documents Reviewed
Advertisements Announcing the Five-Year Review

Appendix

Comments received from Support Agencies and/or the Community



FILE: D:\Yeoman_Creek\mxd\F1_Site_Location_5yr_Review.mxd 2/16/2012 9:42:11 AM mejacm

Legend

Site Boundary

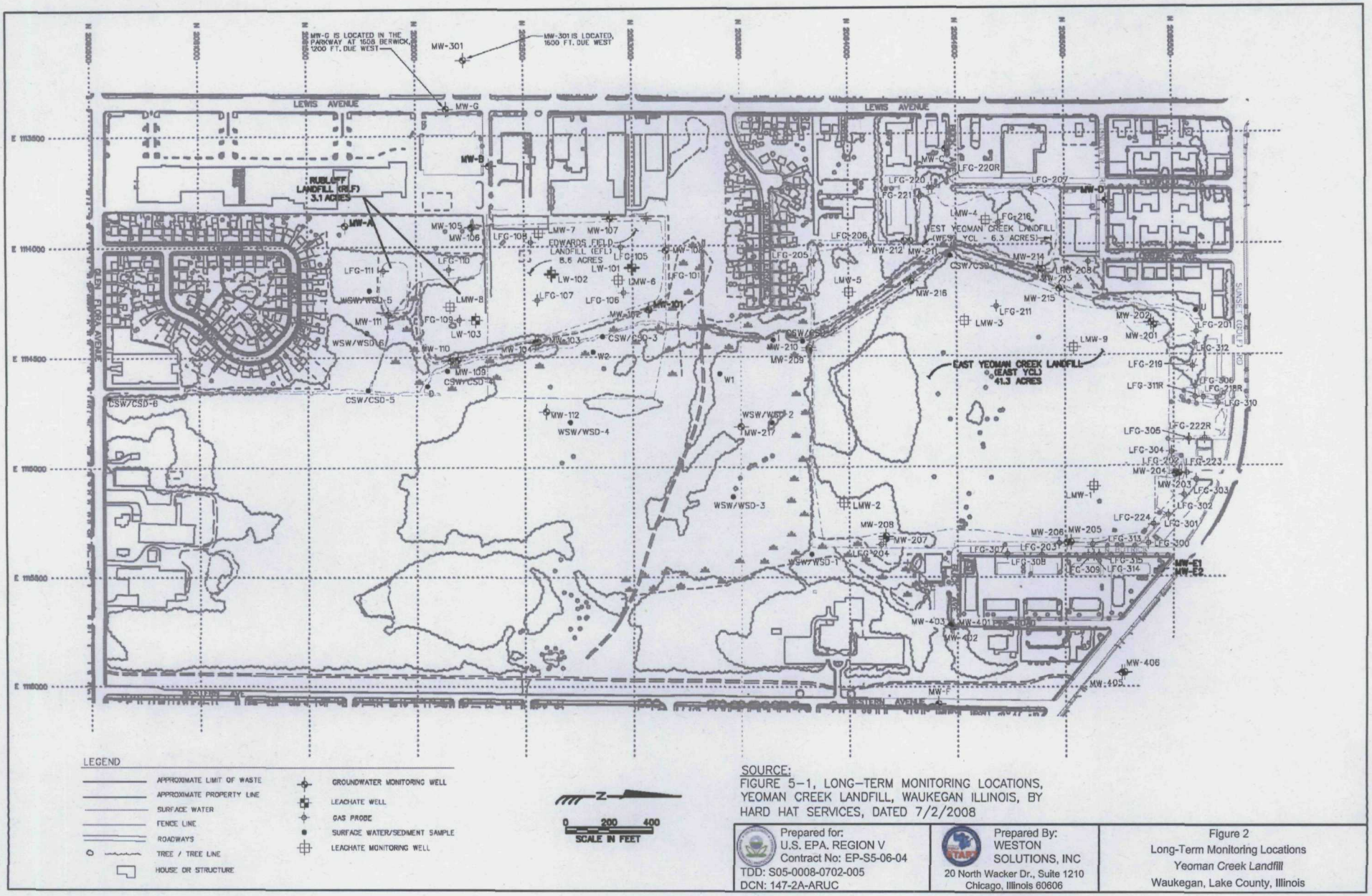
0 1,200 Feet

N

Prepared for:
U.S. EPA REGION V
Contract No.: EP-S5-06-04
TDD: S05-0008-0702-005
DCN: 147-2A-ARUC

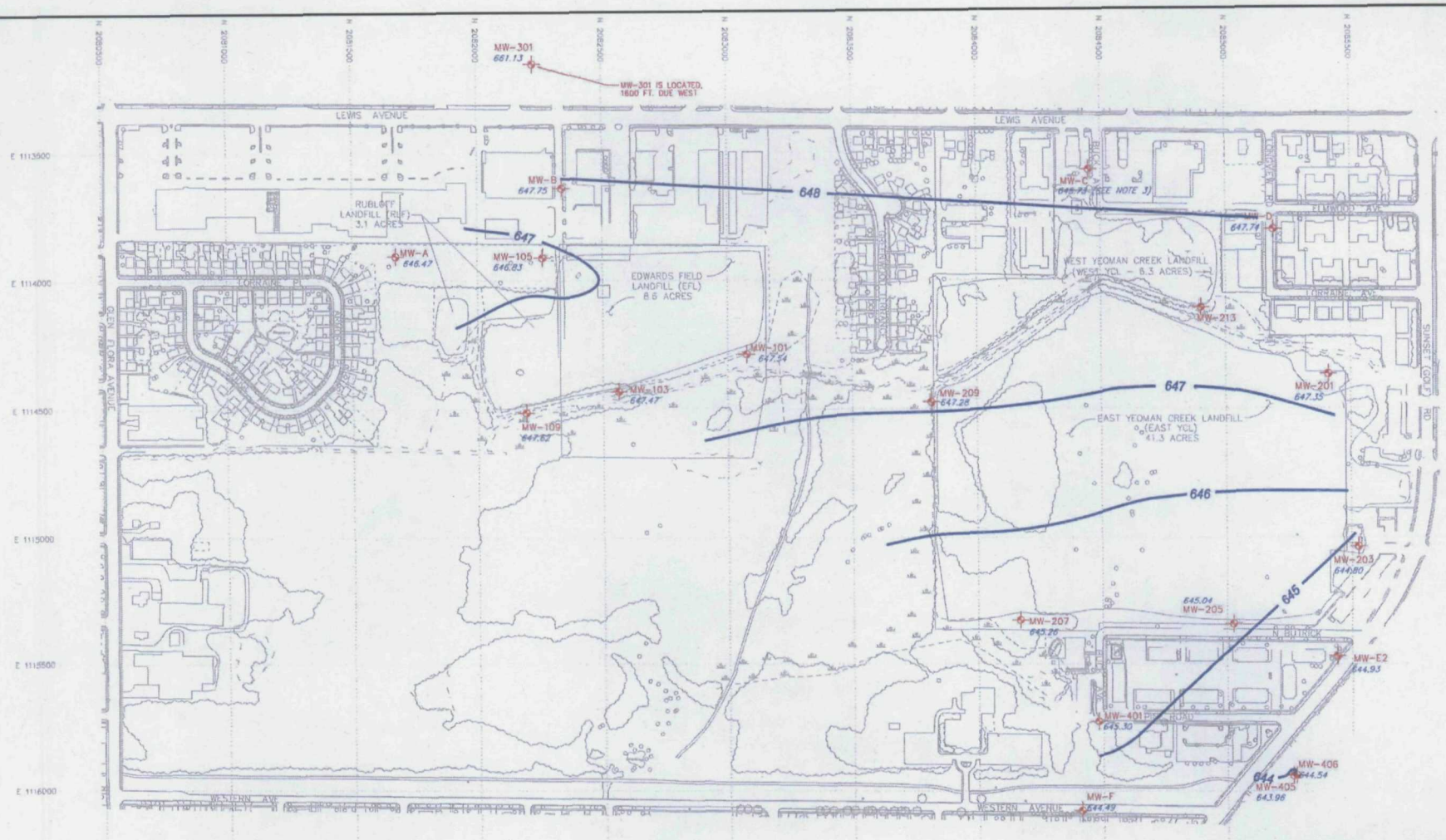
Prepared By:
WESTON SOLUTIONS, INC
750 E. Bunker Court
Suite 500
Vernon Hills, Illinois 60061

Figure 1
Site Location Map
Yeoman Creek Landfill
Waukegan, Lake County, Illinois



SOURCE:
FIGURE 5-1, LONG-TERM MONITORING LOCATIONS, YEOMAN CREEK LANDFILL, WAUKEGAN ILLINOIS, BY HARD HAT SERVICES, DATED 7/2/2008

Prepared for: U.S. EPA. REGION V Contract No: EP-S5-06-04 TDD: S05-0008-0702-005 DCN: 147-2A-ARUC	Prepared By: WESTON SOLUTIONS, INC 20 North Wacker Dr., Suite 1210 Chicago, Illinois 60606	Figure 2 Long-Term Monitoring Locations Yeoman Creek Landfill Waukegan, Lake County, Illinois



NOTES:

1. GROUND WATER ELEVATIONS MEASURED WERE RECORDED APRIL 26, 2010.
2. DRAWING ADAPTED FROM DRAWING No. 2 OF 29 FROM GEOSYNTEC CONSULTANTS, JOB No. 000864-8.4, DATED APRIL 27, 2001 (REMEDIAL DESIGN, YEOMAN CREEK LANDFILL SUPERFUND SITE, WAUKEGAN, ILLINOIS.
3. GROUND WATER ELEVATION FOR MONITORING WELL MW-C WAS NOT USED TO GENERATE GROUND WATER CONTOURS.

SOURCE:
SHEET 2, APRIL 2010 POTENTIOMETRIC SURFACE MAP FOR LOWER OUTWASH WELLS, YEOMAN CREEK LANDFILL SUPERFUND SITE, WAUKEGAN ILLINOIS, BY HARD HAT SERVICES.

LEGEND:

MW-401 645.30 — GROUND WATER MONITORING WELL
GROUND WATER ELEVATION
645 — GROUND WATER ELEVATION CONTOUR

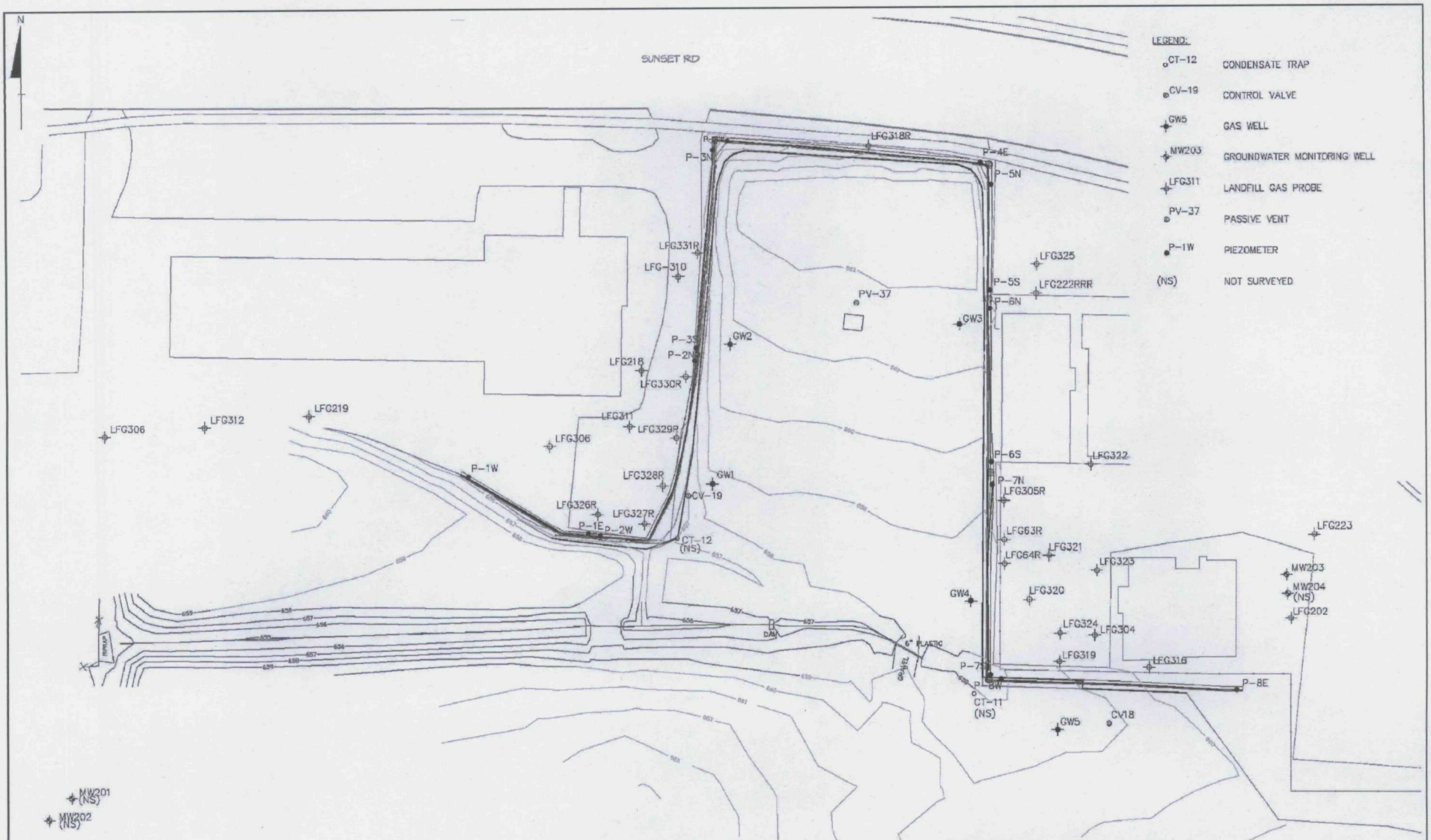
N

SCALE
200 0 200 400 FEET

Prepared for:
U.S. EPA. REGION V
Contract No: EP-S5-06-04
TDD: S05-0008-0702-005
DCN: 147-2A-ARUC

Prepared By:
WESTON SOLUTIONS, INC
20 North Wacker Dr., Suite 1210
Chicago, Illinois 60606

Figure 3
April 2010 Potentiometric Surface Map for
Lower Outwash Wells
Yeoman Creek Landfill
Waukegan, Lake County, Illinois



SOURCE:
SHEET 1, MONITORING POINTS, LOVINGER AREA, FIGURE 5-3, YEOMAN CREEK LANDFILL SUPERFUND SITE, WAUKEGAN ILLINOIS, BY HARD HAT SERVICES.

Prepared for:
U.S. EPA. REGION V
Contract No: EP-S5-06-04
TDD: S05-0008-0702-005
DCN: 147-2A-ARUC

Prepared By:
WESTON SOLUTIONS, INC
20 North Wacker Dr., Suite 1210
Chicago, Illinois 60606

Figure 4
Lovinger Area Monitoring Probes
Yeoman Creek Landfill
Waukegan, Lake County, Illinois

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Superfund Site Indicators Consistency Checklist

This Indicators Consistency Checklist serves to promote consistency among various indicators in the Superfund Remedial Program. It should be used as a tool and as guidance for understanding Indicators for all Final NPL, Deleted NPL, Proposed NPL and SAS sites.

The Checklist should be completed/updated whenever there is an initial determination or update on the following: Current Human Exposure Environmental Indicator, Contaminated Groundwater Migration Environmental Indicator, Site-Wide Ready for Anticipate Use, or Cross Program Revitalization Measure.

This Checklist should be reviewed and updated as appropriate as your site project develops, including at such milestones as: Record of Decision, ROD Amendment, Explanation of Significant Differences, Remedial Design, Preliminary Construction Completion, Final Construction Completion, Institutional Controls implementation, and Five Year Review (FYR) determinations, including FYR amendments.

The Checklist should be submitted as part of the sign-off package for the Superfund Division for all Five Year Reviews and Five Year Review Amendments.

Site Name: Yeoman Creek Landfill **RPM:** Syed Quadri

Environmental Indicators: Determinations are Site-Wide.

Scope of Indicator: Environmental Indicator Determinations are required at Final NPL, Proposed NPL, and Superfund Alternative sites.

HUMAN EXPOSURE

If the Human Exposure determination for this site is:

__X__ *Current Human Exposures Not Controlled*

Then:
The FYR protectiveness statement for at least one portion of the remedy must be *remedy is not protective.*
The site cannot be *Site-wide Ready for Anticipated Use.*

If the Human Exposure determination for this site is:

__ *Insufficient Data*

Then:
The FYR protectiveness statement for at least one portion of the remedy must be *protectiveness cannot be determined until further information is obtained.*
The site cannot be *Site-wide Ready for Anticipated Use.*

If the Human Exposure determination for this site is:

__ *Current Human Exposures Controlled*

Then:
The FYR protectiveness statement for all of the site remedy operable units must be *remedy is protective in the short term.*
The site cannot be *Site-wide Ready for Anticipated Use.*

If the Human Exposure determination for this site is:

__ *Current Human Exposure Controlled and Protective Remedy in Place* (Construction Complete, remedy operating as intended, ICs in place and effective)

Then:
The FYR protectiveness statement for all of the site remedy operable units must be *remedy is protective in the short term and is expected to be protective in the long term.*
ICs must be in place and effective for the entire site.
The site may be *Site-wide Ready for Anticipated Use.*

If the Human Exposure determination for this site is
__ Long-Term Human Health Protection Achieved (all human exposure-related cleanup goals met for the entire site)

Then:
FYR protectiveness statement for all of the site remedy operable units must be *remedy is protective (in the short term and the long term).*
ICs must be in place and effective for the entire site.
The site may be *Site-wide Ready for Anticipated Use.*

CONTAMINATED GROUNDWATER MIGRATION

If the Contaminated Groundwater Migration determination for this site is:

__ *Contaminated Groundwater Migration Not Under Control*

X *Insufficient Data*

__ *Contaminated Groundwater Migration Under Control*

The Contaminated Groundwater Migration Environmental Indicator does not have a direct bearing on the FYR protectiveness statement or the *Site-Wide Ready for Anticipated Use* indicator unless:

- There are current human exposures to the contaminated groundwater. Then the FYR protectiveness statement must be that the remedy is *not protective in the short or long term* and the Human Exposure Environmental Indicator should be *Current Human Exposures Not Controlled.* The site is then also not *Site-Wide Ready for Anticipated Use.*
- There are reasonably anticipated future human exposures to the contaminated groundwater. Then the FYR statement must be that the remedy is *not protective in the long term* (at least - there may be other site-specific reasons why the remedy may not be *protective in the short term*), unless ICs that will prevent future exposure to the contaminated groundwater are in place and effective. If there are reasonably anticipated future human exposures to contaminated groundwater and no effective ICs in place, then the Human Exposure Environmental Indicator cannot be *Current Human Exposure Controlled and Protective Remedy in Place* or *Long-Term Human Health Protection Achieved,* and the site is not *Site-Wide Ready for Anticipated Use.*

Institutional Controls:

Scope of ICs: ICs are required as determined by site decision document(s) and current evaluation. ICs may apply site-wide or for distinct parcels of land, and are not necessarily based on operable unit. In order for ICs to be considered in place and effective the following must be met (check all that apply):

__X__ the ICs cover all physical areas that do not support unlimited use/unrestricted exposure (UU/UE) and the ICs physical description of the non-UU/UE areas are accurate based on current conditions for the entire site (e.g., groundwater ordinance covers the entire plume area, legal description of cap in restrictive covenant has been mapped or undergone other verification);
___all needed land use restrictions/objectives are stated in and covered by the IC;
___title work shows recording and that no other existing property rights will interfere with the site remedy or cause undue exposure (for restrictive covenants and other proprietary controls only),
___there is current compliance with the land use restriction determined by a recent inspection; and
___further compliance with the restrictions is expected because: (1) there is a legal basis for enforcing the use restriction against current and future owners; or (2) ORC and Superfund Program Branch Chiefs concur that the totality of the circumstances support the expectation of future compliance with restrictions.

IF:
__ ICs are NOT required based on site decision document(s) and the site is cleaned up to UU/UE;
THEN: The site may be *Site-Wide Ready for Anticipated Use*. The site HE EI should be *Long Term Human Health Protection Achieved*. The site FYR protectiveness statements should be *protective in the short-term* and *protective in the long-term.*

IF:
__ ICs are NOT required based on site decision document(s) and the site is not cleaned up to UU/UE;
THEN: The site is not *Site-Wide Ready for Anticipated Use*. The site Human Exposure Environmental Indicator may be *Current Human Exposures Not Controlled, Insufficient Data, Current Human Exposures Controlled,* or *Current Human Exposures Controlled/Protective Remedy in Place*. The site Human Exposure Environmental Indicator may not be *Long Term Human Health Protection Achieved*. The site FYR protectiveness statements may be *protective in the short term* and must be not *protective in the long term.*

IF:
X ICs are required based on site decision document(s) but are NOT in place and/or effective;
THEN: The site is not *Site-Wide Ready for Anticipated Use*. The site Human Exposure Environmental Indicator may be *Current Human Exposures Not Controlled, Insufficient Data,* or *Current Human Exposures Controlled*. The site Human Exposure Environmental Indicator may not be *Current Human Exposures Controlled/Protective Remedy in Place* or *Long Term Human Health Protection Achieved*. The site FYR protectiveness statements may be *protective in the short term* and must be not *protective in the long term.*

IF:
__ ICs are required based on site decision document(s) and are in place and effective;
THEN: The site may be *Site-Wide Ready for Anticipated Use*. The site HE EI may be any of the five categorizations. The site FYR protectiveness statements may be *protective in the short term* and may be *protective in the long term.*

IF:
__ ICs are required based on current evaluation, but are not properly documented In a decision document and not in place and effective;
THEN: The site is not *Site-Wide Ready for Anticipated Use*. The site HE EI may be any of the five categorizations. The site FYR protectiveness statements may be *protective in the short term* and must not be *protective in the long term*. The need for ICs should be properly documented in the site record as soon as possible.

IF:
__ ICs are required based on current evaluation, but are not properly documented in a decision document, and are in place and effective;
THEN: The site may be *Site-Wide Ready for Anticipated Use*. The site HE EI may be any of the five categorizations. The site FYR protectiveness statements may be protective in the short term and may be

protective in the long term. The need for ICs should be properly documented in the site record as soon as possible.

__ Other, please explain _____

Five Year Review Protectiveness Statements: Determinations are made for each Operable Unit Remedy.

Scope of FYRs: FYR are required at sites where a remedial action was selected post-SARA, and the remedial action leaves hazardous substances on site above health-based limits under one or more land use scenario(s). FYRs are also conducted at sites: (1) where a remedial action was selected pre-SARA, and the remedial action leaves hazardous substances on site above health-based limits under one or more land use scenario(s) and (2) where the remedial action is anticipated to take a long time (over 20 years) to reach the cleanup goals which will then allow unlimited use and unrestricted access.

FYR protectiveness statements are specific to an operable unit remedy. If there are multiple operable unit remedies at a site, there may be different FYR protectiveness statements for each operable unit remedy. In cases where there are different protectiveness statements for different operable unit remedies at a site, the "least protective" protectiveness statement in a FYR dictates the protectiveness of the site-wide Human Exposure EI determination. Considering the "least protective" protectiveness statement in the FYR...

If the FYR protectiveness statement is:

__ Remedy is protective

Then the site is considered *protective in the short term* and *protective in the long term*. The site must be categorized as *Long Term Human Health Protection Achieved*. The site may be *Site-Wide Ready for Anticipated Use*. If ICs are needed, they are in place and effective as documented by the IC checklist beginning on page 2.

If the FYR protectiveness statement is:

__ Remedy will be protective once the remedy is complete, and in the interim, exposure pathways that could result in unacceptable risks are being controlled...

Then the site is considered *protective in the short term* and not considered *protective in the long term*. The site must be categorized as *Current Human Exposures Controlled* or *Current Human Exposures Controlled – Protective Remedy in Place*. If ICs are needed, they may be in place and effective, as documented by the IC checklist beginning on page 2; and the site may be *Site-Wide Ready for Anticipated Use*.

If the FYR protectiveness statement is:

__ Remedy is protective in the short-term, however, in order for the remedy to be protective in the long-term, the following actions need to be taken...

Then the site is considered *protective in the short term* and is not considered *protective in the long term*. The site must be categorized as *Current Human Exposures Controlled* or *Current Human Exposures Controlled – Protective Remedy in Place*. If ICs are needed, they may be in place and effective, as documented by the IC checklist beginning on page 2; and the site may be *Site-Wide Ready for Anticipated Use*.

If the FYR protectiveness statement is:

__X__ Remedy is not protective, unless the following actions are taken to ensure protectiveness...

Then the site is *not protective in the short term* and *not protective in the long term*. The site must be categorized as *Current Human Exposures Not Controlled*. The site is not *Site-Wide Ready for Anticipated Use*.

If the FYR protectiveness statement is:

__ Protectiveness (short term) cannot be determined until further information is obtained

Then the site must be categorized as *Insufficient Data to Determine Human Exposure Control Status.* The site is not *Site-Wide Ready for Anticipated Use.*

Ready for Anticipated Use: Determination is Site-Wide.

Scope of Indicator: Ready for Anticipated Use determination is made for Final and Deleted NPL sites. Sites where there is impact to groundwater only and EPA has not assessed the land surface are not eligible for *Site-Wide Ready for Anticipated Use.* Sites that have been deferred to other programs without significant work by the EPA Superfund program are not eligible for *Site-Wide Ready for Anticipated Use.*

All answers below must be "Yes" in order for the site to meet the GPRA definition of Ready for Anticipated Use.

Is the site a Final or Deleted NPL site? _X_ Yes __No

Is the site Construction Complete? _X_ Yes ___ No

Have all cleanup goals in the site decision document(s) been achieved for media that may affect current or reasonably anticipated future land uses of the site, so that there are no unacceptable risks? ___Yes _X_ No

Have all ICs and other controls required in the decision document(s) or by current conditions been put in place and determined effective as determined by the IC checklist that begins on page 2? ___Yes _X_ No

Is the Human Exposure Environmental Indicator determination either *Current Human Exposures Controlled and Protective Remedy in Place* or *Long Term Human Health Protection Achieved*? ___Yes _X_ No

If cleanup goals for ecological exposures were established in the decision document(s), have they been met?

___Yes _X_ No ___Not Applicable

Cross Program Revitalization Measure (CPRM): Determination is made on acres of land by operable unit or property transfer parcel.

Scope of Indicator: The CPRM is made for the following universe of sites: Proposed NPL, Final NPL, Deleted NPL, Superfund Alternative Sites, Non-Time Critical Removal Sites (NTCR), certain non-NPL federal facilities, and Formerly Used Defense Sites.

If a land parcel is
____ *Protective for People (PFP)*

Then, in that parcel of land, all identified human exposure pathways from contamination at the site are under control and all possible exposures are below health-based levels for current land and/or groundwater use conditions. This determination, for this parcel of land, is consistent with one of the three following Human Exposure Environmental Indicator determinations: *Current Human Exposures Controlled, Current Human Exposures Controlled and Protective Remedy in Place, Long Term Human Health Protection Achieved.* The site-wide Human Exposure Environmental Indicator does not have to meet the criteria of these three Human Exposure Environmental Indicators.

If a land parcel is
___ *Ready for Anticipated Use*

Then, that parcel of land,
- Is PFP,

uses such that there is no unacceptable risk, and

- All ICs identified as part of the response action to help ensure long-term protection have been put in place and are currently effective.

This determination, for this parcel of land, is similar to the Site-Wide Ready for Anticipated Use indicator, however, the full site does not need to meet the criteria of this indicator.

Ready for Anticipated Use* Relationship *to Site-Wide Ready for Anticipated Use

If ...

- all of the land parcels at a site are *Ready for Anticipated Use,*
- the Human Exposure Environmental Indicator for the site is *Current Human Exposures Controlled/Protective Remedy in Place* or *Long Term Human Health Protection Achieved,* and
- all cleanup goals for ecological exposures established in the decision document(s) have been met

Then... the site is *Site-Wide Ready for Anticipated Use.*

RPM Signature — Date: 2/2/12

Section Chief Signature — Date: 2/2/12

Bonnie Eleder — Date

FYR, IE, SWRAU Coordinator Signature

(01/23/12 ble)

THE DAVID GROUP

Invoice Number:	117346
Order Number:	328662
Client Name:	Tetra Tech EM Inc.
Ad:	Yeoman Creek 5-yr Review
Publication:	Lake County News-Sun ROP
Run dates:	Jan 12 2012

EPA Reviews Yeoman Creek Landfill Superfund Site Waukegan, Illinois

U.S. Environmental Protection Agency Region 5 is reviewing the effectiveness of the cleanup at Yeoman Creek Landfill Superfund site in Waukegan. Superfund law requires five-year reviews of sites where the cleanup is either done or in progress, but hazardous waste remains managed on-site. These five-year reviews are done to ensure that the cleanup remains effective and protects human health and the environment.

The site, including Edwards Field and Rubloff landfills, continues to contain landfill wastes. However, landfill gas appears to be continuing to migrate north of the site and ground water contamination has not improved yet. Cleanup of the site consisted of:

- grading the waste surface to the correct slope
- limiting rainwater contact with the waste
- installing an active gas collection system at Yeoman Creek Landfill and a wind-assisted ventilator system at the Edwards Field and Rubloff landfills
- implementing construction controls to limit heavy truck traffic and dust
- placing a new engineered cover with several layers of material over the landfills

Five-year reviews look at site information; how the cleanup was done; how well the cleanup is working; and any future actions needed.

The review is scheduled to be completed by the end of February 2012, or earlier, and the results will be available for viewing at:

Waukegan Public Library
128 N. County St.

For more information on the review process and to make a comment or provide additional information about the site, please contact:

Mike Joyce
EPA Community Involvement Coordinator
312-353-5546
joyce.mike@epa.gov

THE DAVID GROUP

Invoice Number:	117346
Order Number:	328729
Client Name:	Tetra Tech EM Inc.
Ad:	Yeoman Creek 5-yr Review
Publication:	Nueva Semana
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Foba Fundraiser Martes 17 de enero de 3 a Chicago.

EPA Empieza La Revisión Quinquenal del Sitio de Superfund, Yeoman Creek Landfill Waukegan, Illinois

La Agencia de Protección Ambiental de EE.UU. (EPA por sus siglas en inglés) empieza la revisión quinquenal por el sitio de Superfund, Yeoman Creek Landfill, ubicada cerca de la intersección de las avenidas de Lewis y Sunset en Waukegan. La ley de Superfund obliga la EPA a verificar que el plan de limpieza sigue protegiendo la gente y el medioambiente con una revisión quinquenal.

El plan de limpieza de sitio consistió de varias partes: nivelación de la superficie de los desperdicios para corregir el grado de la cuesta de los vertederos, instalación de un sistema activo de colección de gas dentro del vertedero de Yeoman Creek, instalación de un sistema de ventilación asistido de viento, y colocación de tapas nuevas con varias capas para cubrir los desperdicios de los tres vertederos.

La revisión quinquenal se debe finalizar para el final de febrero 2012.

Puede ver documentos oficiales sobre el sitio en la Biblioteca Pública de Waukegan, 128 N. County St. Los documentos también estarán disponibles en inglés en www.epa.gov/region5/cleanup/yeoman/index.html. Esta revisión es una oportunidad para comunicar y comentar sobre las condiciones del sitio y expresar cualquier comentario que pueda tener. Puede comunicarse con:

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Llamadas gratis al: 800-621-8431, Ext. 36196, 8:30 a.m. – 4:30 p.m., días laborables

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8/9/2011

Yeoman Creek - Site Walkthrough / Inspection for 5-YR - Review

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