FIFTH FIVE-YEAR REVIEW REPORT FOR LACKAWANNA REFUSE SUPERFUND SITE LACKAWANNA COUNTY, PENNSYLVANIA

September 2014

Prepared by
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Region III
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SEP 24 2014

Date

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LIST OF ACRONYMS	
ATV	All-Terrain Vehicle.
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act.
CFR	Code of Federal Regulations.
COC	Contaminant of Concern.
EPA	U.S. Environmental Protection Agency.
ESD	Explanation of Significance Difference.
GPRA	Government Performance and Results Act.
HSCA	Hazardous Site Cleanup Act (PA).
IC	Institutional Control.
MCL	Maximum Contaminant Level.
MW	Monitoring Well.
NCP	National Oil and Hazardous Substances Pollution Contingency Plan.
NPL	National Priorities List.
O&M	Operation and Maintenance.
OU	Operable Unit.
PADEP	Pennsylvania Department of Environmental Protection.
PADER	Pennsylvania Department of Environmental Resources.
ppb	parts per billion.
RA/RD	Remedial Action/ Remedial Design.
RAO	Remedial Action Objective.
RCRA	Resource Conservation and Recovery Act.
RI/FS	Remedial Investigation / Feasibility Study.
ROD	Record of Decision.
RPM	Remedial Project Manager.
SARA	Superfund Amendments and Reauthorization Act (1986)
USACE	US Army Corp of Engineers.
VOC	Volatile Organic Compound.

EXECUTIVE SUMMARY

The United States Environmental Protection Agency (EPA) Region III has conducted the fifth Five-Year Review of the Lackawanna Refuse Superfund Site. This Five-Year Review consisted of reviewing monitoring data obtained from the sampling performed under the current operation and maintenance (O&M) plan which included collecting groundwater, surface water, sediment and vent gas data. Several issues were identified during this review and recommendations are included.

The remedy for the Lackawanna Refuse Superfund Site included: construction of a clay cap that met the Resource Conservation and Recovery Act (RCRA) requirements over three pits; extraction of buried drums; installation of surface water drainage diversions around all three pits where the cap was constructed; construction of a gas venting system and removal of contaminated soil from the Site. The Record of Decision (ROD) for this Site was signed on March 22, 1985. The Remedial Action was completed with the Final Closeout Report on March 28, 1994. The site was deleted from the National Priorities List (NPL) on September 28, 1999.

Based on the data reviewed and the site inspections, the remedy is functioning as intended by the decision documents. The remedy currently protects human health and the environment in the short term. In order for the remedy to be protective in the long term, sampling must be conducted in accordance with the approved O&M plan and ATVs must be discouraged from trespassing on the Site.

GPRA Measures:

The Government Performance and Results Act (GPRA) holds federal agencies accountable for using resources wisely and achieving program results. As part of this fifth Five-Year Review the GPRA measures have also been reviewed. The GPRA measures and their current status are provided as follows.

Environmental Indicators

Human Health: Human Exposure Under Control (HEUC)

Groundwater Migration: Groundwater Migration is Under Control (GMUC)

Sitewide Ready for Anticipated Use (RAU):

The Site was determined Site-Wide Ready for Anticipated Use on January 15, 2008.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Lackawanna Refuse Superfund Site		
EPA ID: PAD980508667		
Region: 3	**State:** PA	**City/County:** Old Forge, Lackawanna County

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

REVIEW STATUS
Lead agency: EPA
Author name (Federal or State Project Manager): José R Redmond Girón
Author affiliation: USEPA, Region 3
Review period: 10/01/2013 – 09/24/2014
Date of site inspection: 11/15/2013
Type of review: Policy
Review number: 5
Triggering action date: 06/10/2009
Due date *(five years after triggering action date)*: 06/10/2014

Five-Year Review Summary Form (continued)

Issues/Recommendations

Issues and Recommendations Identified in the Five-Year Review:

OU(s): OU-01	Issue Category: Operations and Maintenance			
	Issue: Sampling is not being performed in accordance with the approved O&M plan.			
	Recommendation: Perform sampling in accordance with the approved O&M plan.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PADEP	EPA	06/30/2015

OU(s): OU-1	Issue Category: Operations and Maintenance			
	Issue: Presence of unauthorized all-terrain vehicles (ATVs) at the Site may compromise the engineered cap.			
	Recommendation: Identify additional measures which can be used to discourage trespassers from damaging the fence to obtain access to the Site.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	06/30/2017

Protectiveness Statement(s)

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date*
OU-1	Protective	*Not applicable*

Protectiveness Statement:

Based on the data reviewed and the site inspections, the remedy is functioning as intended by the decision documents. The remedy currently protects human health and the environment in the short term. In order for the remedy to be protective in the long term, sampling must be conducted in accordance with the approved O&M plan and ATVs must be discouraged from trespassing on the Site.

I. Introduction:

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

The United States Environmental Protection Agency ("the Agency" or "EPA") is preparing this Five-Year Review Report pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") and the National Contingency Plan ("NCP"). CERCLA §121(c) provides:

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

EPA interpreted this requirement further in the NCP, in the Code of Federal Regulations ("CFR") at 40 CFR §300.430(f)(4)(ii) which provides:

> *"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."*

This is the fifth Five-Year Review for the Lackawanna Refuse Superfund Site. The signing of the fourth Five-Year Report on June 10, 2009 is the trigger action for this statutory review. This review was conducted for the entire Site by the Remedial Project Manager from October 2013 through September 2014. This report documents the results of the review.

This Five-Year Review is conducted as a matter of EPA policy because the ROD was signed prior to October 17, 1986, the effective date of the Superfund Amendments and Reauthorization Act (SARA) and because hazardous waste remains at the Site at concentrations which do not allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1 Chronology of Site Events

Event	Date
Commonwealth of Pennsylvania issued a permit for the disposal of solid waste at the Site.	1973
Permit was modified to allow disposal of sludges.	1978
Pennsylvania Department of Environmental Resources (PADER) issued an order suspending the permit for solid waste disposal for the landfill and requiring the cessation of landfill operations after discovering evidence of dumping of industrial waste into Pit #5.	March 1979
PADER issued a second order requiring Lackawanna Refuse to construct and operate a leachate collection system. The company failed to comply and was found guilty and fined.	1979
PADER investigated conditions in Pit #5 by excavating some of the area and drums.	1979
EPA excavated 200 drums. Analysis on 20 of the drums containing liquids and sludges showed high concentrations of solvents and paints and waste material with high metal and solvents contents.	1980
EPA completes Site Investigation.	1982
The Site is proposed to the National Priorities List (NPL).	December 1982

The Site is listed on the NPL.	September 1983
Removal activities were conducted by EPA to install a fence around the Site.	September 1983
Remedial Investigation (RI) report is issued.	November 1984
Record of Decision (ROD) is issued for the Site.	March 22, 1985
Remedial Design (RD) for the Site is completed.	March 31,1987
Start of Remedial Action.	June 2,1987
Explanation of Significant Difference (ESD) to eliminate the leachate treatment system is issued.	September 28, 1993
Final Close Out Report is issued.	March 28, 1994
First Five Year Report for the Site is issued.	September 28, 1995
Second Five Year Report is issued.	March 5, 1999
Site deleted from the NPL.	September 28, 1999
Third Five Year Report is issued.	June 10 2004
Third Five Year Report Addendum is issued.	December 29, 2004
Pennsylvania Department of Environmental Protection (PADEP, formerly known as PADER) issued a Hazardous Site Cleanup Act (HSCA) 512 Order to implement institutional controls (ICs) on the property.	December 13, 2006
Fourth Five Year Report is issued.	June 10, 2009
ESD #2 is issued to add institutional controls (ICs) to the remedy.	February 9, 2010

III. Background

Physical Characteristic;

The Site is located in Northeast Pennsylvania (See Figure 1). It consists of 258 acres and is located along the border between Old Forge Borough and Ransom Township, in Lackawanna

County, Pennsylvania (See Figure 2). The Site is above the floodplain of the St. John Creek and the Lackawanna River. The Site consists of five strip mine pits excavated in the nineteenth century. Three of the mines were used as permitted municipal refuse landfills, during the 1970's.

Land and Resources Use

Historically, the land surrounding the Site has been both residential and forested area. The Site is closely bordered by several houses to the south and the east. Austin Heights, a residential section of Old Forge Borough, is northeast of the Site. The area west of the Site is forested. To the south/southeast of the Site approximately 40 homes were developed by the current Site property owner, but independently built. All of the residences in the area are connected to public water which is supplied from reservoirs north of the Site.

History of Contamination

Five strip mine pits between five to six acres each were excavated at the Site during the late nineteenth century and mined until the mid-twentieth century. Three of the five pits were used for waste disposal during the 1970's. Two of the pits were used for the disposal of municipal and commercial refuse (Pit #2 and Pit #3). The third pit, which was known as Pit#5, contained thousands of buried drums of hazardous waste, as well as municipal refuse. The drums contained various solvents, paints and thinners, sludge, organic acids and toxic metals.

In addition, unknown quantities of bulk liquids were dumped into an adjacent depression known as the Borehole Pit.

Initial Response Activities

In 1978, a cloud of vapors was released from the Site when a truck driver allegedly dumped his cargo of waste into one of the pits. The cloud moved down the mountainside causing health problems to residents in the adjacent area of Old Forge. In 1979, PADER, issued an order suspending the Site's solid waste permit and requiring immediate cessation of the landfill after discovering evidence of the illegal dumping of industrial waste and pollutants into Pit #5. The order also required Lackawanna Refuse, the site operator and owner, to dig up and properly dispose of any buried drums containing hazardous waste and all contaminated soil. PADER issued a second order in 1979 requiring Lackawanna Refuse to construct and operate a leachate

collection system. Due to failure to comply with the orders, the Owner, Peter Icavazzi,Sr., was brought to trial in 1982 in State court on criminal charges and found guilty of illegal dumping. He was subsequently released based on his poor health and advanced age, and required to pay a $30,000 fine.

In 1980, EPA excavated 200 drums from Pit #5. The majority of drums were either broken or crushed, but 20 drums were analyzed and found to contain either liquids or sludge with high concentrations of solvents and paint waste with high metal and solvent contents. Further investigation in 1982 revealed volatile organic vapors being released at low levels from Pit #5. The site was proposed to the National Priorities List (NPL) on December 30, 1982 and added to the NPL on September 8, 1983 and the RI was completed in November of 1984. A Removal Action was implemented to construct a fence around the three pit areas to control access to the Site in September 1983. Table 2 lists the contaminants found during the RI.

Table 2. Contaminants detected during RI (1984)

Pit #5, MW-4	Pit #5 Soil	Pit #5 Leachate	Pit #5 Seep	Borehole Pit Soils
Magnesium	Cadmium	2-Butanone	Acetone	Cadmium
Manganese	Chromium	4-Methylphenol	Benzene	Copper
Nickel	Copper	Isophorone	2-Butanone	Nickel
Zinc	Lead	Diethyl Phthalate	2-Hexanone	Tin
Acetone	Nickel		Toluene	Zinc
2-Butanone	Mercury		Vinyl chloride	Tetrachloroethylene
1,2-Dichloroethane	Titanium		Xylene	Toluene
Methylene Chloride	Benzene			
Phenol	Ethylbenzene			
Toluene	Toluene			
	Methylene Chloride			
	Trichloroethylene			

Basis for Taking Action

Both organic and inorganic contaminants were present at the Site at elevated levels prior to the cleanup. These contaminants were presenting an unacceptable risk to both human health and the environment. Potential risk included direct contact with contaminated soil and drums and the release of contaminated leachate into the environment.

IV. Remedial Actions

Remedy Selection.

In March 1985, EPA issued a Record of Decision (ROD) for the Site. The contaminants of concern (COCs) are volatile organic compounds (VOCs), semi VOCs, metals and organic acids. The Remedial Action Objectives were developed after conducting the removal action and considering the results of the RI. The ROD specifically states that "The major objective of remedial action at the Lackawanna Refuse Site is to eliminate or at least mitigate environmental contamination: (1) in the pits No.2, No.3 and No.5; (2) in the borehole pit; (3) in the surface soil and in the paint spill along portions of the access road; (4) in leachate affected areas through the Site: and (5) in the intermittent drainage ditches adjacent to the site".

The selected remedy for the Site consisted of:

- Removal of all drums and highly contaminated municipal refuse from Pit #5 for offsite disposal at a qualifying Resources Conservation and Recovery Act (RCRA) facility.
- Construction of a clay cap over Pit 2, 3 and 5 that meets RCRA requirements.
- Installation of surface water drainage diversion around all three pits and construction of a leachate collection and treatment system for Pits 2, 3 and 5.
- Construction of a gas venting system through the caps of all three pits.
- Removal of the top layer of contaminated soil from the borehole pit for offsite disposal at a qualifying RCRA facility and returning the grade with a soil cover.
- Removal of the top layer of contaminated soil in the paint spill area and reconstruction of the road with the appropriate drainage and sedimentation controls.
- Removal of dried paint and contaminated soil in the paint spill area for offsite disposal at a qualifying RCRA facility.

- Development of a monitoring program during the remedial action to include the monitoring of existing wells onsite, the gas venting system, and the leachate collection and treatment system.
- O&M of the cap and the leachate collection and treatment system to be implemented by the State.

Remedy Implementation

EPA entered into an Interagency Agreement with the U.S. Army Corps of Engineers (USACE) for the design and construction of the remedial action (RA) in 1985. The construction started in 1987 and continued until May 1991. Approximately 900 cubic yards of contaminated soils were excavated from the borehole area. It was later backfilled with clean soil. The area known as the paint spill area was also excavated (approximately 10 cubic yards) and backfilled with clean soil.

Pit #5 was excavated and the drums and trash analyzed. The refuse with elevated contamination was disposed off-site. A total of 8,253 drums were removed from Pit #5. Drums encountered were also disposed of off-site. The remaining refuse was redeposited into Pit #5.

After the excavation at Pit #5 was completed, Pit #2, Pit#3 and Pit #5 were covered with a multi-layered cap that included leachate collection lines. All components of the RA were constructed except the leachate treatment plant. After the construction of the cap, sampling demonstrated that the cap prevented rainfall infiltration into the landfill in a very effective manner, preventing the formation of leachate. As a result, EPA determined that it was not necessary to construct and operate a leachate treatment system. This decision was documented in an ESD issued on September 28, 1993.

A pre-final inspection was conducted in March 1990. Representatives from EPA, PADEP and USACE were present. The final inspection occurred on April 15, 1991.

EPA issued a Final Site Closeout Report on March 28, 1994. The First Five-Year Review report was issued on September 28, 1995. The rest of the Five-Year Reviews were prepared every five years thereafter. The Site was deleted from the NPL on September 28, 1999.

System Operation/Operation and Maintenance

PADEP developed an O&M Plan in February 1991 and accepted the Site for O&M from EPA on May 7, 1991. The O&M Plan was revised in July 2008 following the purchase of the Site property by Mr. Lou Ciucio. Routine maintenance is currently performed by the property owner with oversight by PADEP. There are no operating facilities and the remedy implemented at this Site does not constitute a Long-Term Remedial Action. The O&M requirements have two major components: (1) maintenance inspections (and necessary repairs) and (2) sampling. Below is a more detailed outline of those two components:

1. Maintenance Inspections:
    a. Facility Inspections
    b. Maintaining Cover and/or Vegetation
    c. Maintenance of Drainage Ditches
    d. Replacement of Cap System Material (as needed)
    e. Maintenance of Groundwater Monitoring System
    f. Planned Responses to Possible Post-Closure Occurrences
2. Sampling
    a. Data Collection and Documentation
    b. Quality Assurance
    c. Groundwater Sampling
    d. Groundwater Monitoring
    e. Leachate and Gas Vent Monitoring
    f. Sampling Results Notifications

Based on discussions with the PADEP inspection team member, the current site owner currently performs the following O&M activities with the oversight of PADEP:

1. Annual or semi-annual mowing of the landfill vegetative cover.
2. Monitoring of select groundwater wells (MW-1 A, 2, 11, 12, 13, and 14) with the groundwater samples being analyzed for VOCs and metals (see Figure 3).
3. Site inspections.
4. Maintenance of sediment/erosion controlsperformed approximately twice per year.

V. Progress Since the Last Five Year Review

This is the Fifth Five Year Review; the protectiveness statement from the previous Five-Year Review reads as follows:

"Based on the information in this Five-Year Review, the remedy for the Site currently protects human health and the environment. Excavation and off-site disposal of all drums and highly contaminated fill material and waste was performed, followed by the installation of a landfill cap to cover the waste and contaminated soil areas. However, significant issues regarding the maintenance of the landfill cap, recent exceedances of MCLs and freshwater screening benchmarks, and reporting should be addressed as soon as practicable to order for the remedy to be protective in the long-term."

Tables 3 and 4 summarize the Issues and Recommendations from the previous Five-Year Review report.

Table 3 Issues Identified during previous Five-Year Review

Issues	Affect Current Protectiveness	Affect Future Protectiveness
Evidence of damage to the vegetative cover, gas vents, and perimeter fencing due to trespassing by ATVs.	No	Yes
MCL exceedances in groundwater samples and sampling methods may cause inaccurate results.	No	Yes
Gas vent levels are not monitored at the Site boundary and are not occurring regularly.	No	Yes
Seep samples exceed the screening benchmarks and are not performed regularly.	No	Yes
O&M Reports not received annually and lack consistency.	No	Yes
Institutional Controls are not required in the ROD.	No	Yes

Recommendations

Table 4 Issues and Recommendations from the previous Five-Year Review						
Issues	Recommendations	Party Responsible	Overseeing Agency	Milestone Date	Affects Protectiveness	
					Current	Future
Evidence of damage to the cap cover, gas vents, and perimeter fencing due to trespassing by ATVs.	Repair damaged areas of vegetative cover, gas vents, perimeter fencing, and prevent unauthorized access to the landfill	PADEP	EPA	06/10/10	No	Yes
MCL exceedances in groundwater samples and sampling methods may cause inaccurate results.	Update O&M Plan to ensure accurate groundwater sampling procedures, and conduct additional groundwater sampling	PADEP	EPA	06/10/11	No	Yes
Gas vent levels not monitored at the site boundary and are not occurring regularly.	Conduct Soil Gas survey at the Site boundary, and incorporate gas monitoring into O&M Plan	PADEP	EPA	06/10/11	No	Yes

Table 4 Issues and recommendation during the last Five-Year Review (cont.)						
Issues	Recommendations	Party Responsible	Overseeing Agency	Milestone Date	Affects Protectiveness	
					Current	Future
Seep samples exceed the screening benchmarks and are not performed regularly.	Conduct additional sampling and incorporate seep sampling into O&M plan	PADEP	EPA	06/10/11	No	Yes
O&M Reports not received annually and lack consistency.	Update O&M plan to ensure consistency and regular delivery	PADEP	EPA	06/10/11	No	Yes
Institutional Controls are not required in the ROD.	Decision Document which incorporates ICs into the remedy	EPA	PADEP	06/10/11	No	Yes

The following is a summary of the progress that has been made in addressing the issues and recommendations from the 2010 Five Year Review report:

Issue #1: Evidence of damage to the vegetative cover, gas vents, and perimeter fencing due to trespassing by ATVs. This has been an ongoing issue at this Site. PADEP has repaired the fence on multiple occasions where the ATV riders have entered the Site. The trespassers damage the fence again at either the same place or a different location. PADEP has purchased boulders to locate along the fence to discourage the trespassers, but to no avail. Another problem at the Site has been the destruction of gas vents either by the ATV riders or trespassers that shoot firearms at the vents. The vents have been protected by placing stones around them to prevent any additional

damage to the vents while permitting any off gas through the vents and the rocks. The damage to the vegetative cover has been addressed by replacing gravel and soil where the ATV riders have eroded the vegetative cap. This is an ongoing annual effort to prevent damage to the cap. Preventing the illegal entry of persons to the Site has remained a challenging task with unsuccessful results.

Issue #2: MCL exceedances in groundwater samples and sampling methods may cause inaccurate results. The O&M plan was updated in May 2011 and established the parameters to be sampled annually.

Issue #3: Gas vent levels are not monitored at the site boundary and monitoring is not occurring regularly. Sampling of the gas vents in 2010 revealed little if any venting of gases at the Site. This is expected at a landfill of this age. Most biological and chemical processes have already occurred, with very little gas generation occurring. Monitoring still occurs once during each Five-Year Review Period and it is noted in the inspection report.

Issue #4: Seep samples exceed the screening benchmarks and sampling is not performed regularly. Sampling of seeps has been incorporated into the O&M plan. It should be noted that some of the contaminants are detected in the background sample and may not be associated with the Site.

Issue #5: O&M Reports not received annually and lack consistency. There has been some progress in this area. A revised O&M plan was issued in May of 2011. However, sampling is still not being performed on a consistent basis in accordance with the revised O&M plan.

Issue #6: Institutional Controls are not required in the ROD. On February 9, 2010 EPA issued an ESD detailing the ICs required at the Site. EPA recognized that the necessary restrictions were included in the PADEP 512 order issued in December 2006.

VI. Five-Year Review Process

Administrative Component:

This Five-Year Review was conducted by the EPA RPM, José R. Redmond and supported by EPA technical staff including Bruce Pluta, Biological Technical Assistance Group (BTAG); Jeff Tuttle, Toxicologist; Herminio Concepcion, Hydrogeologist and Carrie Dietzel, Community Involvement Coordinator. Susan French, Project Officer for PADEP, also collaborated with this report.

Notification of Interested Parties:

Both PADEP and the Site owner were notified of the Five Year Review process prior to the November Site visit. The local government was notified of the Five-Year Review during the May 2014 interview. Limited interest has been displayed by the local representatives and the community.

Document review:

This Five-Year Review consisted of a review of the relevant information on the Site which included the ROD (1985), ESDs (1993 & 2010), the previous Five-Year Review report (2009), Final Site Inspection and Evaluation Report (2009), PADEP 512 Order (2006), O&M plan (2011) and data provided by PADEP (2008-2014).

Data Review:

During this Five-Year Review period, there has been inconsistent sampling performed by the owner of the Site. EPA has a State Superfund Contract (SSC) with PADEP, who is ultimately responsible for O&M at the Site. PADEP has a separate agreement with the Site owner to conduct sampling and perform maintenance at the Site. For this review, EPA has reviewed all of the monitoring that it has received since the last Five-Year Review report.

The ROD identifies different contaminants for each of the media at the Site as summarized below.

Groundwater:

The contaminants in groundwater for the Site are:

Table 5: Contaminants in groundwater	
Magnesium	Manganese
1,2-Dichloroethene	Nickel
Methylene Chloride	Zinc
Phenol	Acetone
Toluene	2-Butanone

Groundwater was sampled during this Five-Year Review in 2009, 2012 and 2014. The Site contaminants detected were at low levels and the levels were below maximum contaminant levels (MCL) or levels of concerns. Residents in the area of the Site are connected to a public water supply. Groundwater contamination should not present a threat to nearby residences in the form of vapor intrusion since most of the groundwater migrates into the mine pools located below the site. Limited groundwater migrates to the surface via seeps. The seeps have shown very limited contamination both in surface water and sediments. See Figure 3 for location of groundwater sampling points.

Sediments:

The following contaminants in sediments were identified in the ROD from samples collected from the seeps and leachate areas.

Table 6: Contaminants in Sediment	
2-Butanone	Acetone
4-Methylphenone	Benzene
Isophorone	2-Hexanone
Diethyl phthalate	Toluene
Vinyl chloride	Xylene

Sediments samples were collected at areas where known seeps occurred (see Figure 4) and analyzed during the 2009 and 2010 sampling event. During the 2009 event, the only contaminant detected was acetone. However, acetone was also detected in blanks which may indicate equipment contamination. Methylene chloride was detected in sediment during the 2010 sampling event at concentrations ranging from 2.1ppb to 12.0 ppb, which is significantly less than

the freshwater screening level (98.1 ppb). Methylene choride was also detected at 7 ppb in the sample collected upstream of the Site. The concentration in sediment (solid phase) is compared to the fresh water screening level because it is thought that a fraction of the concentration is going to be available to the aquatic receptors. Since the concentration in sediment is less than what would cause a problem in water, they are not considered significant.

Surface Water:

Surface water was analyzed during the 2009 and 2010 sampling events. None of the contaminants recognized in the ROD were detected above the EPA Freshwater Screening Benchmarks.

Methane Gas:

The presence of methane gas was evaluated during the 2010 sampling event. Field measurements and laboratory samples were evaluated and the results were similar. The methane gas present at the Site is an order of magnitude less than PA Code maximum of 5% (25 Pa. Code §273.292). This is consistent with landfills of this age where most of the biochemical processes had been completed.

Community Involvement:

An ad regarding the issuance of the Five-Year was placed in the Scranton Times-Tribune on May 21, 2014. The notification was also posted on the EPA Region 3, website: (http://www.epa.gov/reg3hwmd/super/sites/PAD980508667/pn/Lackawanna5YRMar2014.pdf).

Local government representatives were interviewed by the CIC and informed EPA that no inquiries have been made regarding the Site. The local government representatives had no questions nor issues regarding the Site.

Site Inspection:

EPA and PADEP in coordination with the site owner performed the Five-Year Review inspection on November 15, 2013. The entrance gate was in working order. Runoff channels bordering the road to the top of the Site were clean and clear of vegetation or debris. Once on the Site, damage on the south side of the fence was evident. The vegetative cover was in place, but

there was evidence of ATV use on top of Pit #3. Vegetation was visible, but there was a noticeable difference compared to other areas. Gas vents remained protected by the rock piles that were constructed to prevent damage from ATVs and bullets.

Illegal entrance by ATVs continues to be a problem at the Site. The owner agreed to repair areas of the vegetative cover with additional soil in order to prevent damage to the engineered cover. Discussions are underway to identify additional means to discourage trespassing and ATV use of the Site.

VII. Technical Assessment:

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

Yes, the remedy is functioning as intended by the 1985 ROD as modified by the two ESDs (1995 and 2010). Contaminated soil from different areas and contaminated drums were excavated and removed for off-site disposal and an enginered cap was constructed over the impacted area.

Groundwater, surface water and sediment monitoring results support the observation that the remedy is working as intended. Institutional controls are in place to protect human health by prohibiting excavation into the engineered cap and preventing the use of groundwater.

Question B): Are the exposure assumptions, toxicity data, clean up levels, and remedial action objectives (RAO) used at the time of the remedy still valid?

Changes in Standards and TBCs

Have standards identified in the ROD been revised, and does this call into question the protectiveness of the remedy? Do newly promulgated standards call into question the protectiveness of the remedy? Have TBCs used in selecting cleanup levels at the site changed, and could this affect the protectiveness of the remedy?

The Integrated Risk Information System toxicity factor for TCE has been made more stringent since the signing of the ROD in 1985. TCE was detected in the soil during the RI/FS, but has not been detected in groundwater, surface water nor sediments. Although the standard has

been revised, it does not call into question the protectiveness of the remedy. The exposure assumptions, toxicity data, clean up levels, and remedial action objectives (RAO) used at the time of the remedy are still valid.

Changes in Exposure Pathways

Has land use or expected land use on or near the Site changed?

No. Local land use remains the same.

Have human health or ecological routes of exposure or receptors been newly identified or changed in a way that could affect the protectiveness of the remedy? Are there newly identified contaminants or contaminant sources? Are there unanticipated toxic byproducts of the remedy not previously addressed by the decision documents? Have physical site conditions or the understanding of these conditions changed in a way that could affect the protectiveness of the remedy?

No. Since the 1985 ROD, there have not been any changes to land use on or around the site. The Remedial Investigation and Record of Decision were completed prior to the development of the current ecological risk assessment guidance. The available data indicates that even with this deficiency, the remedial action is protective of ecological receptors. Surface water monitoring has been conducted in areas that would be reflective of any potential impacts of groundwater discharge. The sampling has demonstrated that the levels of contaminants are lower than the ecological risk assessment benchmarks. The resultant data does not indicate the potential for unacceptable ecological risk.

Changes in Toxicity and Other Contaminants Characteristics

Have toxicity factors for contaminants of concern at the site changed in a way that could affect the protectiveness of the remedy? Have other contaminant characteristics changed in a way that could affect the protectiveness of the remedy?

No toxicity factor or contaminant characteristics for COCs at the Site have changed in a way that could affect the protectiveness of the remedy.

Changes in Risk Assessment Methods

Have standardized risk assessment methodologies changed in a way that could affect the protectiveness of the remedy?

There have been significant changes in EPA's risk assessment guidance since the 1985 ROD. These include changes in dermal guidance, inhalation methodologies, exposure factors, and a change in the way early-life exposure to certain chemicals are evaluated. Some factors have become more astringent while other have become less astringent. None of those changes have affected the protectiveness of the remedy.

Expected Progress towards Meeting RAOs

Is the remedy progressing as expected?

The engineered cap system continues to work by preventing the infiltration of water. The Site is not contributing contaminants at levels of concern to groundwater, surface water or sediment. However, sampling and reporting are not being conducted in accordance with the schedule contained in the May 2011 O&M plan.

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

Yes. Despite efforts over the years to maintain the fence, trespassers continue to cut holes in the fence to gain illegal access to the Site. There is evidence of ATV activity at the Site, which in time could compromise the cover system. Further discussion with PADEP, the Site owner and local government officials should continue.

Technical Assessment Summary

Based on the data reviewed and the site inspections, the remedy is functioning as intended by the decision documents. Limited contamination in groundwater, surface water and sediments are well below levels of concerns. There have been no changes in the physical condition of the Site that would affect the protectiveness of the remedy. ICs are in place and functioning properly, with the exception of the illegal use of ATVs on the Site. The remedy is protective in the short

term. In order to achieve long term protectiveness, efforts must be made to prevent unauthorized access to the Site and monitoring must be performed in accordance to the approved O&M plan.

VIII. Issues

Table 7. Issues Identified

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Sampling is not being performed in accordance with the approved O&M plan.	N	Y
Presence of unauthorized ATVs at the Site which may compromise the engineered cap.	N	Y

IX. Recommendations and Follow-Up Actions

Table 8. Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Sampling is not being performed in accordance with the approved O&M plan.	Perform sampling in accordance with the approved O&M plan.	PADEP	EPA	June 30, 2015	N	Y
Presence of unauthorized ATVs at the Site which may compromised the engineered cap.	Identify additional measures which can be used to discourage trespassers from damaging the fence to obtain access to the Site	EPA	EPA	June 30, 2017	N	Y

X. Protectiveness Statement:

Based on the data reviewed and the site inspections, the remedy is functioning as intended by the decision documents. The remedy currently protects human health and the environment in the short term. In order for the remedy to be protective in the long term, sampling must be conducted in accordance with the approved O&M plan and ATVs must be discouraged from trespassing on the Site.

XI. Next Review:

The next five-year review for the Lackawanna Refuse Superfund Site is due five years from the signing of this document.

Figures

Approximate Site Location = ■

Lackawanna Refuse Site
Old Forge, Lackawanna County, Pennsylvania

Figure 1. Lackawanna Refuse Superfund Site Location

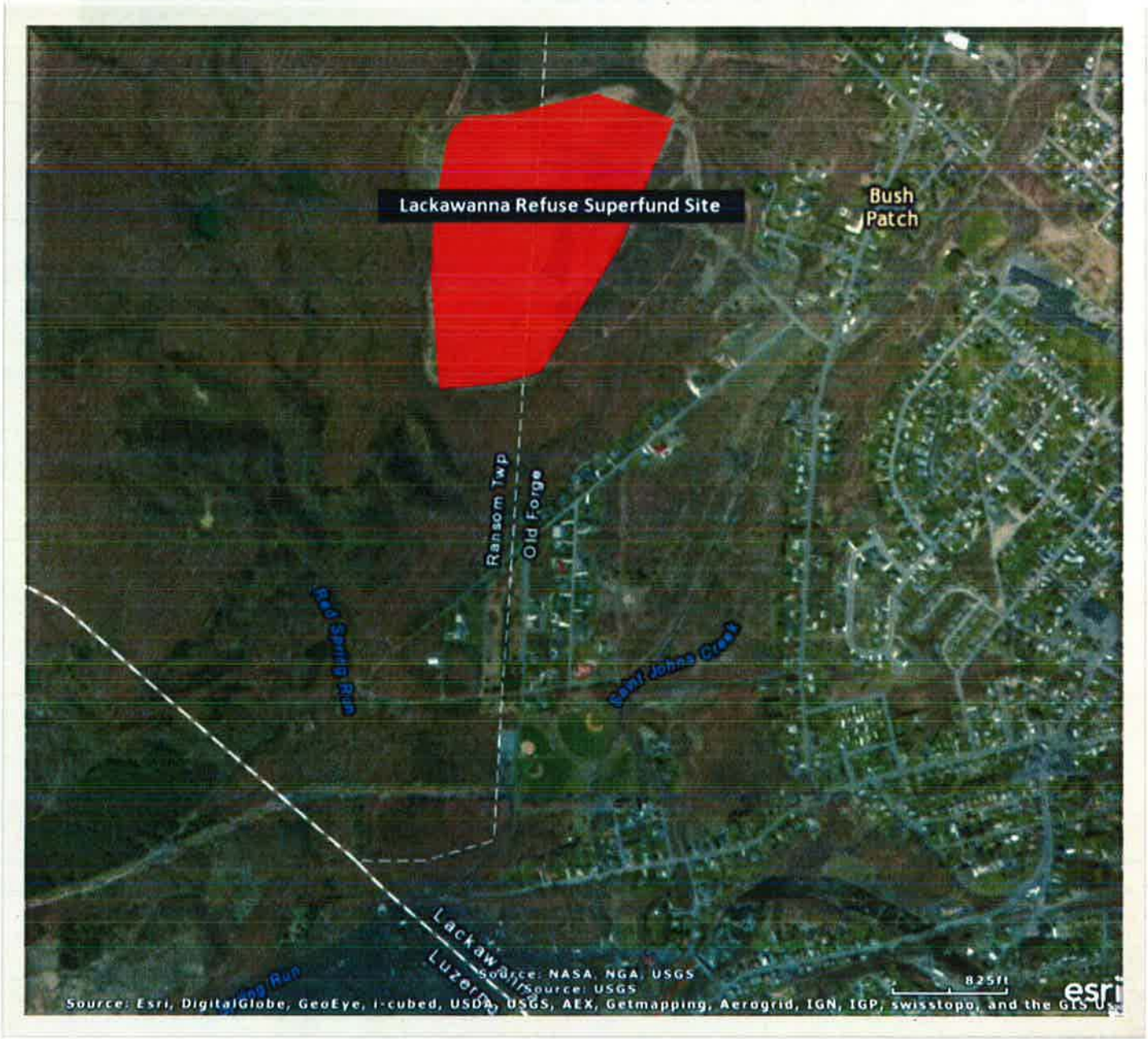

Figure 2. Lackawanna Site Location

Figure 3: Location of Monitoring Wells and Pits

Figure 4: Seep Sampling Location and Pits.