Five-Year Review Report
Niagara County Refuse Site
Town of Wheatfield
Niagara County, New York

Prepared by
U.S. Environmental Protection Agency

November 2008

EXECUTIVE SUMMARY

This is the second five-year review for the Niagara County Refuse Superfund site, located in the Town of Wheatfield, Niagara County, New York. Based upon a review of monitoring data, a site inspection, and other site information, the remedy for the Niagara County Refuse Superfund site was found to be fully implemented consistent with the site's decision documents and protective of human health and the environment.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name *(from CERCLIS)*: Niagara County Refuse

EPA ID *(from CERCLIS)*: NYD000514257

Region: 2	**State:** NY	**City/County:** Wheatfield/Niagara

SITE STATUS

NPL status: ☐ Final ■ Deleted ☐ Other (specify)

Remediation status (choose all that apply): ☐ Under Construction ■ Constructed ■ Operating

Multiple OUs?* ☐ YES ■ NO	**Construction completion date:** 6/30/00

Are portions of this site in use or suitable for reuse? ■ YES ☐ NO ☐ N/A

REVIEW STATUS

Lead agency: ■ EPA ☐ State ☐ Tribe ☐ Other Federal Agency

Author name: Michael J. Negrelli

Author title: Remedial Project Manager	**Author affiliation:** EPA

Review period:** 11/06/2003 to 11/05/2008

Date(s) of site inspection: 10/22/2008

Type of review:
☐ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only
☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead
☐ Regional Discretion ■ Statutory

Review number: ☐ 1 (first) ■ 2 (second) ☐ 3 (third) ☐ Other (specify)

Triggering action:
☐ Actual RA Onsite Construction at OU #1 ☐ Actual RA Start at OU#____
☐ Construction Completion ■ Previous Five-Year Review Report
☐ Other (specify)

Triggering action date *(from CERCLIS)*: 11/05/2003

Does the report include recommendation(s) and follow-up action(s)? ☐ yes ■ no
Is human exposure under control? ■ yes ☐ no ☐ not yet determined
Is contaminated groundwater under control? ■ yes ☐ no ☐ not yet determined
Is the remedy protective of the environment? ■ yes ☐ no ☐ not yet determined
Acres in use or suitable for reuse: 65 acres ■ restricted ☐ unrestricted

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in CERCLIS.]

Five-Year Review Summary Form (continued)

Recommendations and Follow-Up Actions

The Site has ongoing operation, maintenance, and monitoring activities. As anticipated by the decision documents, these activities are subject to routine modification and adjustment. Table 4, attached, contains one comment and suggestion for improving these activities. This suggestion is consistent with the selected remedy and does not impact the short-term or long-term protectiveness of the site remedy.

Protectiveness Statement

The remedies implemented at this Site are protective of human health and the environment. The landfill has been capped removing direct contact exposures to the public, and ecological receptors. Institutional controls are in place to further prevent potential exposures to the public. The potential impacts to groundwater are addressed by the cap, which reduces or prevents leachate generation. Groundwater impacts are further mitigated through a leachate collection and conveyance system to prevent potential off-site migration.

I. Introduction

This five-year review was conducted pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §9601 *et seq.* and 40 CFR 300.430(f)(4)(ii) and in accordance with the Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P (June 2001). The purpose of a five-year review is to ensure that implemented remedies are protective of public health and the environment and that they function as intended by the decision documents. This document will become part of the site file.

This is the second five-year review for the Niagara County Refuse site. Following the initiation of construction of the site remedy on October 19, 1998, the first five-year review was completed in 2003 and the report was issued by EPA on November 5, 2003. Because contaminants remain on-site, a statutory review is required every five years successively. In accordance with the Section 1.3.3 of the five-year review guidance, subsequent five-year reviews are triggered by the signature date of the previous five-year review report. The trigger for this five-year review is the date of the previous five-year review report, which is November 5, 2003.

II. Site Chronology

Table 1, attached, summarizes site-related events from discovery to present.

III. Background

Site Location

The Niagara County Refuse site is located in the Town of Wheatfield in Niagara County, New York.

Physical Characteristics

The Niagara County Refuse site (Site) is a former municipal landfill, comprised of approximately 65 acres, located along the eastern border of the Town of Wheatfield, New York and the western border of the City of North Tonawanda. The Site lies approximately 500 feet north of the Niagara River. To the west of the Site lies former farmland, currently undeveloped but planned for residential housing; to the north is wooded wetlands, a Niagara-Mohawk Power Corporation transmission line, and a right-of-way owned by the New York State Department of Transportation; to the east are woodlands and low-density housing (approximately 1000 feet from the Site boundary); and to the south are access roads, railroad tracks, River Road, and the Niagara River.

Geology/Hydrogeology

Three overburden zones and one bedrock zone are present beneath the Site. The two uppermost overburden zones are characterized as a silt unit and clay/upper till unit. The silt unit is present across the Site outside the limits of the landfill cells, varying in thickness from one to eight feet, and exhibits

a low hydraulic conductivity, which has minimized the potential for horizontal migration of contaminants from the landfill. The clay/upper till unit is present beneath the silt unit with an average thickness of 30 feet; this unit is characterized as an aquitard due to low hydraulic conductivities measured in the unit and similarly has minimized the potential for vertical migration of contaminants from the landfill.

The bedrock zone and the overlying overburden zone (lower till unit) are the primary water-bearing formations. The lower till unit is present beneath the clay/upper till unit with an average thickness of 15.7 feet. The bedrock unit beneath the lower till unit is a highly fractured water-bearing unit characterized as a usable aquifer by the New York State Department of Environmental Conservation (NYSDEC). The ground water in these two aquifers generally flows in a south/southwesterly direction towards the Niagara River beneath the southern half of the Site and in a north/northwesterly direction towards Black Creek beneath the northern half of the Site.

Surface water runoff is channeled through a network of drainage swales, primarily to a municipal storm water sewer system which discharges to the Niagara River, although some surface water runoff flows to the wetlands at the north end of the Site.

Land and Resource Use

Since the completion of the remedial action, Niagara County has given some consideration to potential reuse or redevelopment scenarios for the Site within the restrictions of the institutional controls that have been put in place at the site (discussed in Section VI, below). Although there has not been any formal planning in this regard at this time, the long grasses maintained as cap cover and the revitalized wetland area at the north end of the Site have attracted various wildlife species, particularly native and migrating birds. There has been some preliminary discussion about setting up blinds for bird watching. Regardless of any formally planned reuse or redevelopment, the long grasses of the cap and the wetlands along the north end of the Site serve a useful environmental purpose.

History of Contamination

During the landfill's operational period (1968-1976), the Niagara County Refuse Disposal District (NCRDD) accepted municipal refuse and industrial wastes, which are commingled throughout the landfill. More than 100 waste generators or transporters are thought to have used the Site. Disposed materials included heat-treatment salts, plating-tank sludge, tetrachloroethylene, polyvinyl chloride skins and emulsions, thiazole polymer blends, polyvinyl alcohol, phenolic resins, and brine sludge containing mercury. The Site was capped with 20 inches of dirt and clay at the time that it was closed by the NCRDD in 1976. Illegal dumping of rubbish and hard fill, as well as the erosion of the clay cap, had been concerns at the Site since its closure. The Town of Wheatfield acquired ownership of the Site from the NCRDD in June 1977.

Initial Response

Beginning in 1980, the Site became the focus of several investigations by EPA, NYSDEC, and the United States Geological Survey. The investigations were comprised of limited sampling of on-site soils, groundwater, drainage swale surface water and sediments, as well as some off-site soil, surface water, and sediment sampling. Volatile organic compounds (VOCs) (primarily methylene chloride), semi-volatile organic compounds (SVOCs) (primarily phenolic compounds, phthalates, and polycyclic aromatic hydrocarbons (PAHs)), pesticides, and metals were detected at varying concentrations on Site. Based on the results of these investigations, the Site was placed on the National Priorities List (NPL) in September 1983. In 1987, EPA initiated a Remedial Investigation/Feasibility Study (RI/FS) for the Site to determine the nature and extent of site contamination and to evaluate alternatives for the mitigation of any risks associated with the contamination. Under EPA oversight, the performance of the RI/FS was taken over by a group of fourteen potentially responsible parties (PRPs) in 1989. The investigation was concluded in 1991 and the RI/FS Report became final upon issuance of the Record of Decision (ROD) in 1993.

Basis for Taking Action

Based on the results of the RI report, which measured the levels of VOCs, SVOCs, pesticides, and metals in various site media, EPA determined that although contamination was present in the landfill, the low permeability clays beneath and around the Site had prevented the vertical and horizontal migration of contaminants. An analysis of the groundwater around the site perimeter showed little or no impact from the landfill. Additionally, residents nearby the Site receive municipal water. However, EPA performed a risk assessment for the Site based on the data collected during the RI and the risk assessment determined that uncontrolled leachate outbreaks, caused by the infiltration of rainwater through the landfill and subsequent seeping out from the sides of the landfill cells, would continue to degrade the quality of perimeter site groundwater, resulting in a potential future risk from groundwater ingestion. This formed the basis for the decision to cap the landfill and to continue monitoring the groundwater around the perimeter of the Site after the remedial action was completed.

Enforcement Activities

The performance of the RI/FS by the group of fourteen PRPs was accomplished through an Administrative Order on Consent (AOC), issued by EPA on March 30, 1989. EPA published its ROD for the Site in September 1993 which identified the remedial actions that needed to be undertaken to mitigate risks to human health and the environment as a result of site contamination. These actions are summarized below. An agreement was reached with twelve PRPs to perform the actions identified in the ROD and was memorialized in a Consent Decree for remedial design/remedial action (RD/RA) entered by the court on February 3, 1995. EPA also issued a unilateral administrative order on July 18, 1995 requiring a recalcitrant PRP to coordinate and cooperate with the PRP group in performing the RD/RA. In addition, EPA entered into an AOC on September 23, 1994 with eleven PRPs which were determined to be minor volume contributors of waste to the Site, resulting in a cash settlement of $793,866.

IV. Remedial Actions

Remedy Selection

Based on the findings of the RI/FS, EPA signed a ROD for the site on September 24, 1993, selecting the following remedy:

- Construction of a New York State Part 360 Standard Landfill Cap;
- Construction of a clay perimeter barrier wall;
- Construction of a gas venting system beneath the cap;
- Construction of a leachate collection system;
- Removal of the field tile drains located to the west of the landfill;
- Performance of an ecological assessment of the adjacent wetlands;
- Implementation of deed and access restrictions;
- Implementation of a long-term operation & maintenance program for the cap, and gas venting and leachate collection systems; and
- Implementation of long-term air and water quality monitoring.

The remedy also calls for an evaluation of site conditions at least once every 5 years, beginning from the start of construction, to determine if any modifications to the selected remedy are necessary.

The remedy selected in the ROD meets the remedial action objectives (RAOs) for the site. The RAOs, as noted in the ROD, are:

- Preventing direct contact with landfill contents;
- Controlling surface water runoff and erosion;
- Collecting and treating landfill leachate;
- Controlling landfill gas;
- Preventing the infiltration of contaminants into groundwater; and
- Remediating contaminated wetland areas, if necessary.

Remedy Implementation

EPA negotiated a Consent Decree with the PRP group to develop a remedial design to meet the requirements of the ROD and to implement the design through a remedial action. The Consent Decree became effective on February 3, 1995. Pre-design activities commenced shortly thereafter, culminating in the Final Design Report which was approved by EPA in 1997. The design was prepared by Conestoga - Rovers & Associates under contract with the PRP group. The completed design included the use of modern geotextiles for the cap in place of a traditional clay barrier layer and sand drainage layer. The cap liner was tied directly into native clay material outside the leachate collection system, eliminating the need for a clay barrier wall. A call for bids for remedial construction was issued and a contract was awarded to Haseley Construction Company, Inc. for remedial construction in June 1998.

In October 1998, EPA approved the Remedial Action Work Plan for site construction. An ecological assessment of the adjacent wetlands was performed prior to the start of construction and a wetland mitigation plan, calling for limited wetland replanting at the Site and wetland creation off-site at the nearby Gratwick Park site, was approved in October 1998. The remedial contractor began mobilization at the Site on October 19, 1998.

On-site construction commenced in November 1998 under the direction of Niagara County with EPA providing oversight of the construction activities through an interagency agreement with the U.S. Army Corps of Engineers. The Site was surveyed, cleared and grubbed, a security fence was erected, and erosion and sediment control measures were put in place. Installation of the leachate collection system and its tie-in to the City of North Tonawanda sanitary sewer by forcemain was completed over the winter months. Early spring was devoted to grading the Site and filling the central swales of the landfill with clean fill. Placement of the first layer of the cap (gas vent stone), began in May 1999 and the leachate collection system became operational during the summer of 1999, eliminating any potential pathway for leachate to migrate off-site. The tile drains on the west side of the landfill were removed during the summer. An unusually dry season, along with contractor efficiency, allowed for relatively uninterrupted construction activity throughout the summer and fall. The key trench was constructed concurrently with the multi-layered cap as the two were tied in to complete a uniform seal around the landfill. By November 1999, the cap had been placed over the entire Site and seeding had been completed.

The construction contractor reconvened at the Site in May 2000 to assess the remaining work to be done. The wetland plantings and some tree perimeter plantings were completed at that time. It was determined that cleaning the drainage swales of accumulated silt and debris, some erosion repair work to the cap surface, and some spot reseeding were the only activities remaining to be completed. This work was completed during the summer months and in September 2000, EPA conducted a final inspection with NYSDEC and the PRPs. In December 2000, EPA issued its approval of the Remedial Action Report, signifying that the remedial action had been completed in accordance with the ROD and Remedial Design, and the project entered the operation, maintenance, and monitoring phase.

Operation and Maintenance

The Operation, Maintenance and Monitoring Manual was approved by EPA on December 29, 2000. It should be noted that air monitoring is not an included activity in the approved manual in that during the development of the manual, an evaluation of the air around the gas vents was performed and indicated that the gas generation rate in the landfill is very low, primarily due to the age and composition of the wastes. In addition, lateral subsurface gas migration is prevented by the perimeter barrier system. The operation and maintenance (O&M) activities outlined in the manual are being performed by Parsons (formerly Parsons Engineering Science, Incorporated) under contract to Niagara County. O&M activities were initiated in January 2001. The Site is inspected monthly and monitoring data are collected on a pre-set schedule. A summary of O&M data collection activities and the corresponding report containing the results is provided in Table 2, attached.

Additionally, maintenance is performed on the cap on both a scheduled and as-needed basis. For example, pumps are routinely inspected and pressure-washed, repairs are made to the perimeter fence when needed, weeds and tall grass are trimmed around wells and manhole covers, and the grass cover of the cap is cut once yearly in the late summer. The leachate collection system is monitored both from a control building and a visual inspection of the wet wells and the gas vents are regularly inspected for integrity. The wetland replacement area of the site, representing 0.17 acres, is routinely monitored for habitat health and vegetation data is recorded and provided in the annual monitoring report.

The O&M monitoring results indicate that the remedial system, as designed and constructed pursuant to the 1993 ROD, is performing satisfactorily. Based on the sampling results obtained during the first two years of O&M, and in accordance with the O&M Manual, quarterly groundwater sampling was replaced with semi-annual sampling in 2003 and surface water sampling was discontinued. Semi-annual groundwater sampling continued for three years and, based on the uniform monitoring results obtained during this period and in accordance with the O&M Manual, sampling frequency became annual in 2006. A revised Industrial Wastewater Discharge Permit was issued by the City of North Tonawanda for the treatment of site leachate in February 2007. Based on previous years sampling data, the revised permit reduced the analytical parameter list and established a semi-annual effluent sampling frequency. Additionally, the wetland replacement area of the site, inspected monthly, is determined to be a productive and diverse wetland community.

V. Progress Since Last Five-Year Review

The first five-year review was completed on November 5, 2003, pursuant to OSWER Directive 9355.7-03B-P. That review, conducted after the remedial action had been completed and operation, maintenance, and monitoring activities had commenced, determined that the remedial action as designed and constructed pursuant to the 1993 ROD was performing satisfactorily and that the remedy implemented was protective of human health and the environment. Following its

determination that all appropriate response measures had been taken at the Site and that the remedial action conducted at the Site was protective of public health and the environment, EPA deleted the Site from the NPL on July 30, 2004. However, it should be noted that the decision to delist the Site does not preclude future actions under Superfund should they become necessary.

Aside from the continuation of operation, maintenance, and monitoring activities, the 2003 five-year review had no specific recommendations or follow-up actions to cite. Similarly, based on the monitoring activities and data collection since the last five-year review, there has been no change in site conditions or the protectiveness of the remedy.

VI. Five-Year Review Process

Administrative Components

Michael J. Negrelli, EPA Remedial Project Manager (RPM), conducted the five-year review. This is a PRP-lead site. EPA, in reviewing site records and reports, and in consultation with NYSDEC and the PRP O&M contractor, has provided the information necessary for this review.

Community Involvement

The EPA Community Involvement Coordinator for the Niagara County Refuse site, Michael Basile, published a notice in the *Niagara Gazette*, a local newspaper, on October 30, 2008, notifying the community of the initiation of the five-year review process. The notice indicated that EPA would be conducting a five-year review of the remedy for the site to ensure that the implemented remedy remains protective of human health and the environment and is functioning as designed. It was also indicated that once the five-year review was completed, the Five-Year Review Report would be made available in the local site repository. The notice, which includes the RPM's mailing address, email address, and telephone number, solicits public comments or questions related to the five-year review process or to the site.

Document Review

The following documents, data, and information were reviewed in completing the five-year review:

- Record of Decision, EPA, September 24, 1993;
- Administrative Order on Consent, Index No. II CERCLA-90209, March 30, 1989;
- Administrative Order on Consent, Index No. II CERCLA-94-0213, September 23, 1994;
- Consent Decree, Docket No. 94-CV-849, entered in U.S. District Court for the Western District of New York on February 3, 1995;
- EPA CERCLIS database;
- Superfund Final Closeout Report, Niagara County Refuse Superfund Site, August 14, 2003;
- 2001 Annual Monitoring Report, Niagara County Refuse Superfund Site, February 2002;

- 2002 Annual Monitoring Report, Niagara County Refuse Superfund Site, March 2003;
- 2003 Annual Monitoring Report, Niagara County Refuse Superfund Site, February 2004;
- 2004 Annual Monitoring Report, Niagara County Refuse Superfund Site, February 2005;
- 2005 Annual Monitoring Report, Niagara County Refuse Superfund Site, February 2006;
- 2006 Annual Monitoring Report, Niagara County Refuse Superfund Site, February 2007;
- 2007 Annual Monitoring Report, Niagara County Refuse Superfund Site, February 2008;
- 2008 Quarterly Data Summary Report, Niagara County Refuse Superfund Site, April 2008;
- 2008 Semi-Annual Data Summary Report, Niagara County Refuse Superfund Site, August 2008;
- EPA Comprehensive Five-Year Review Guidance, June 2001;
- Niagara County Refuse Five-Year Review Report, November 5, 2003;

Monitoring and Data Review

As discussed in the Operation and Maintenance section above, the Site is inspected monthly and monitoring data are collected according to a pre-set schedule, the results of which are contained in the quarterly, semi-annual, and annual monitoring reports. The sampling program was developed to ensure that the perimeter collection system and the perimeter barrier system of the landfill cap effectively prevent the migration of contaminants from the Site. Additionally, effluent from the leachate conveyance system is sampled for compliance with the City of North Tonawanda Industrial Wastewater Discharge Permit and water levels are measured within the landfill to ensure that the operation of the perimeter collection system keeps water levels within the landfill reduced. Inspections of the landfill occur monthly and include visual inspections of the perimeter collection system, off-site forcemain, wetlands, perimeter fence, drainage ditches, swale outlets, culverts, gas vents, monitoring wells, and the cap surface.

Site perimeter groundwater is sampled from four monitoring wells strategically located at the north, south, east, and west boundaries of the landfill. The data collected from these monitoring wells are important in determining the effectiveness of the remedy, as the basis of the remedy is to prevent landfill leachate from degrading the quality of site perimeter groundwater. The groundwater monitoring program data show that no VOCs or SVOCs have impacted the groundwater in the immediate vicinity of the landfill. A few inorganic elements, particularly aluminum, iron, magnesium, manganese, and sodium, have been detected above drinking water standards, generally by no more than one order of magnitude, but many of these metals are naturally occurring in the silts and clays of the native material and typically exceed drinking water standards in the regional groundwater. Most notably, the results have remained uniform throughout the evaluation period, indicating that the landfill constituents are not impacting the surrounding groundwater.

Effluent sampling has consistently demonstrated compliance with the requirements of the City of North Tonawanda Industrial Wastewater Discharge Permit, which was revised in 2007. Water level measurements generally vary between one and two feet per year, indicating that the operation of the perimeter collection system keeps water levels within the landfill reduced. Two annual surface water sampling events were completed in 2001 and 2002 in accordance with the O&M Manual for the Site,

with results consistent with the groundwater monitoring results. Monthly inspections of the landfill occasionally show need for minor erosion repair of the cap or repair to components of the leachate collection system; for example, a float switch in one of the wet wells was repaired in June 2008 following the monthly site inspection. Inspections of the wetland creation area of the Site have shown that the wetlands are well established, exhibiting substantial growth and propagation.

Due to the uniform consistency of the monitoring data collected and in accordance with the O&M Manual, since 2006, groundwater sample collection is performed on an annual basis. EPA may, however, require an increase in the frequency of sampling if warranted by the analytical results. With the issuance by the City of North Tonawanda of a revised Industrial Wastewater Treatment Permit in 2007, effluent sampling is now conducted on a semi-annual basis. Site inspections and water level monitoring will continue monthly for an indeterminate time.

Site Inspection

Michael J. Negrelli, RPM, conducted a site inspection on October 22, 2008. During the site inspection, the RPM did not observe any problems or deviations from the on-going operation and maintenance activities being implemented at the Site.

Interviews

No specific interviews were conducted for this review. However, prior to conducting the site inspection, a discussion was held with the PRPs O&M contractor to ensure that no problems or issues had arisen since the preparation of the most recent monitoring report. Contact was also made with NYSDEC officials prior to the site inspection. NYSDEC conducted an inspection of the site in September 2008 and found the site to be in good condition and the remedy elements to be operational and effective as designed.

Institutional Controls Verification

Institutional controls have been put in place at the Site. Counsel for the PRP group has provided EPA with a copy of the cover page of the Consent Decree bearing the stamp of the Niagara County Clerk's Office, showing that the Consent Decree was recorded in that office on January 30, 2001. Counsel has also provided EPA with a copy of restrictive covenants placed on the real property at the site by Niagara County and the Town of Wheatfield, which were filed with the land records on March 19, 2001 and March 23, 2001, respectively. These items complete the institutional controls requirement of the ROD.

VII. Technical Assessment

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

Yes. The landfill cap, fence, drainage system, and monitoring wells are intact and in good repair. Operation and maintenance of the remedy has been performed on a regular basis since January 2001. Monitoring data collected during this operation and maintenance period indicate that the remedial system as designed and constructed pursuant to the 1993 ROD is performing satisfactorily. Additionally, the wetland replacement area of the site is determined to be a productive and diverse wetland community. The RAOs, identified in Section IV, above, are being met by the implanted remedy.

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

Some chemical specific toxicity values have changed since the site was originally assessed. In order to account for changes in toxicity values since the baseline human health risk assessment was performed, the maximum detected concentrations of the contaminants of concern identified during the 2003 through 2008 sampling period were compared to residential groundwater Preliminary Remediation Goals (PRGs) and National Primary Drinking Water Standard Maximum Contaminant Levels (MCLs). The MCL is the highest level of contaminant that is allowed in drinking water. MCLs are promulgated standards that apply to public water systems and are intended to protect human health by limiting the levels of contaminants in drinking water. PRGs are a human health risk based value that is equivalent to a cancer risk of 1×10^{-6} or a hazard index of 0.1. The results indicate that the concentrations of some inorganics exceed their respective criteria in some wells that are used to monitor the groundwater quality outside the boundaries of the landfill. Specifically, the inorganic elements aluminum, copper, iron, magnesium, manganese, and sodium have been detected above drinking water standards in some of the monitoring wells, however generally by no more than one order of magnitude. Many of these metals are naturally occurring in the silts and clays of the native material and typically exceed drinking water standards in the regional groundwater. Most notably, the results have remained generally uniform throughout the evaluation period, indicating that the landfill constituents are not impacting the surrounding groundwater. As such, the RAO of preventing the infiltration of contaminants into groundwater remains valid. Table 3, attached, provides the most recently reported groundwater monitoring results from the January 2008 sampling event.

As noted in the 2003 Five-Year Review Report, based on the absence of buildings on-site or in near proximity to the site, it was determined that vapor intrusion was not an issue. Over the past five years, no new buildings have been constructed and vapor intrusion is not an issue for the Site.

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

No. All data indicate that the remedy is operating efficiently and effectively and remains protective of human health and the environment.

Technical Assessment Summary

Based upon the results of the five-year review, it is concluded that:

- Direct contact with landfill contents is prevented by the landfill cap;
- Surface water runoff and erosion is controlled through regular maintenance of the landfill cap (*i.e.,* keeping the drainage swales free of debris and repairing eroded areas of the cap surface);
- The leachate collection and treatment system effectively manages leachate generated by the landfill;
- Landfill gas is controlled through the gas venting system;
- The fence around the site is intact and in good repair;
- The groundwater monitoring wells are functional;
- The leachate collection system and perimeter barrier system are effective in preventing the infiltration of contaminants into groundwater;
- Institutional controls to prevent disturbance of the cap and the use of site groundwater are in place; and
- Wetlands at the northern end of the site are productive and diverse.

VIII. Recommendations and Follow-up Actions

The Site has ongoing operation, maintenance, and monitoring activities. As anticipated by the decision documents, these activities are subject to routine modification and adjustment. Table 4, attached, contains one comment and suggestion for improving these activities. This suggestion is consistent with the selected remedy and does not impact the short-term or long-term protectiveness of the site remedy.

IX. Protectiveness Statement

The remedies implemented at this Site are protective of human health and the environment. The landfill has been capped removing direct contact exposures to the public, and ecological receptors. Institutional controls are in place to further prevent potential exposures to the public. The potential impacts to groundwater are addressed by the cap, which reduces or prevents leachate generation. Groundwater impacts are further mitigated through a leachate collection and conveyance system to prevent potential off-site migration.

X. Next Review

The next five-year review for the Niagara County Refuse site should be completed by November 2013.

Approved:

Walter E. Mugdan, Director
Emergency and Remedial Response Division

Nov. 5, 2008
Date

Table 1: Chronology of Site Events	
Event	**Date**
Initial Investigations by EPA, NYSDEC, and U.S. Geological Survey	1980
Site Placed on National Priorities List (NPL)	09/08/83
EPA Initiates Remedial Investigation/Feasibility Study (RI/FS)	09/23/87
Administrative Order on Consent with Potentially Responsible Parties (PRPs) for RI/FS	03/30/89
RI/FS Completed	09/24/93
Record of Decision (ROD) Issued by EPA	09/24/93
Consent Decree between EPA and PRPs for Remedial Design/Remedial Action (RD/RA) Entered with Court	02/03/95
RD Completed/RA Started	09/30/97
Construction Started	10/19/98
Preliminary Close-Out Report Issued	06/30/00
RA Completed	12/29/00
Operation and Maintenance (O&M) Started	12/29/00
First Five-Year Review Report Completed	11/05/03
Deletion from NPL	07/30/04

Table 2: Summary of O&M Activities/Reports	
Report	**Data**
2001 Annual Monitoring Report	2 groundwater sampling events (May & Nov 2001); 1 surface water sampling event (Dec 2001); 12 effluent sampling events (Jan-Dec 2001); 14 monthly inspections (Nov 2000-Dec 2001); 7 water level measurements (May, Jun, Aug-Dec 2001)
2002 Annual Monitoring Report	3 groundwater sampling events (Mar, May, Dec 2002); 1 surface water sampling event (Dec 2002); 12 effluent sampling events (Jan-Dec 2002); 12 monthly inspections & water level measurements (Jan-Dec 2002)
2003 Annual Monitoring Report	2 groundwater sampling events (Apr, Oct 2003); 12 effluent sampling events (Jan-Dec 2003); 12 monthly inspections & water level measurements (Jan-Dec 2003)
2004 Annual Monitoring Report	2 groundwater sampling events (Apr, Oct 2004); 12 effluent sampling events (Jan-Dec 2004); 12 monthly inspections & water level measurements (Jan-Dec 2004)
2005 Annual Monitoring Report	2 groundwater sampling events (Apr, Oct 2005); 12 effluent sampling events (Jan-Dec 2005); 12 monthly inspections & water level measurements (Jan-Dec 2005)
2006 Annual Monitoring Report	1 groundwater sampling event (Oct 2006); 12 effluent sampling events (Jan-Dec 2006); 12 monthly inspections & water level measurements (Jan-Dec 2006)
2007 Annual Monitoring Report	3 effluent sampling events (Jan, Feb, Sep 2007); 12 monthly inspections & water level measurements (Jan-Dec 2007)
2008 Quarterly Data Summary Report	1 groundwater sampling event (Jan 2008); 1 effluent sampling event (Mar 2008); 3 monthly site inspections & water level measurements (Jan-Mar 2008)
2008 Semi-Annual Data Summary Report	3 monthly site inspections & water level measurements (Apr-Jun 2008)

Table 3: Detected Analytes in Groundwater Samples, Niagara County Refuse Site, January 11, 2008

COMPOUND	NYSDEC AWQS*	NYSDOH MCL	USEPA MCL	UNITS	MW NCR-3S	MW NCR-4S	MW NCR-5S	MW NCR-13S
VOLATILES:								
Acetone	50	50	-	ug/L	25U	25U	25U	25U
Toluene	5	5	100	ug/L	5U	5U	5U	0.54J
METALS:								
Aluminum	100	-	-	ug/L	200U	**2820J**	**910**	**254**
Barium	1000	2000	2000	ug/L	39.7	61.9	66.9	49
Calcium	-	-	-	ug/L	146000	103000	58100	126000
Chromium	50	100	100	ug/L	4U	5.2	8	9.9
Copper	5	-	-	ug/L	10U	**11.8**	10U	**13**
Iron	300^	300^	-	ug/L	**1210**	**9820**	**841**	**611**
Magnesium	35000(g)	-	-	ug/L	82300	32100	**44900**	33000
Manganese	300^	300^	-	ug/L	**342**	39	21.7	11.3
Nickel	100	-	-	ug/L	10U	10U	10.4	10U
Potassium	-	-	-	ug/L	2110	20100	1110	4300
Sodium	20000	20000	-	ug/L	13200J	**34600J**	**27400J**	**32600J**
Zinc	2000(g)	5000	-	ug/L	47.6	299	30.6	21.6

* NYSDEC Ambient Water Quality Standards
^ Sum of iron and manganese should not exceed value
(g) Guidance value
U Analyte not identified above analytical detection limit
J Estimated value
Bold indicates exceedance of one or more criteria

Table 4: Other Comments on Operation, Maintenance, and Monitoring	
Comment	**Suggestion**
The 2007 groundwater monitoring was postponed by three months due to the well network being dry.	The monitoring plan should be reviewed and modified if necessary.