



FIVE-YEAR REVIEW REPORT

JOHNSTOWN CITY LANDFILL SUPERFUND SITE

TOWN OF JOHNSTOWN, FULTON COUNTY, NEW YORK

Prepared by:
U.S. Environmental Protection Agency
Region II
New York, New York

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**U.S. Environmental Protection Agency
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Emergency and Remedial Response Division
Five-Year Review (Type I)**

**Johnstown City Landfill Superfund Site
Town of Johnstown, Fulton County, New York**

I. INTRODUCTION

The U.S. Environmental Protection Agency (EPA) Region II conducted this statutory five-year review pursuant to Section 121 (c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), Section 300.430 (f) (4) (ii) of the National Oil and Hazardous Substances Pollution Contingency Plan and OSWER Directives 9355.7-02 (1991), 9355.7-02A (1994) and 9355.7-03A (1995). The purpose of a five-year review is to ensure that a remedial action remains protective of public health and the environment and is functioning as designed. This document will become part of the site's Administrative Record file. This review (Type I) is applicable to a site at which remedial action activities have been constructed.

II. SITE BACKGROUND

The Johnstown City Landfill was a municipally-operated, unlined landfill, situated in a 68-acre gravel pit in the Town of Johnstown, Fulton County, New York. The site is located approximately 1.5 miles northwest of the City of Johnstown and 1.75 miles west of the City of Gloversville.

The 34-acre landfill consists of two, generally flat terraces. A remnant of a pit once used as a demolition debris and metals disposal area, approximately 30 feet deep, exists on the westward side of the landfill at the base of a steep ridge.

The surrounding area has a mixed residential, agricultural, and recreational land use. Approximately 10 homes are located within 1,000 feet of the site and an estimated 80 homes are located within one mile downgradient of the site. All of these homes had private wells before the public water supply was extended to them as part of the selected remedy. The population within a one mile radius of the site is approximately 1,000 persons.

The surface-water drainage in the vicinity of the landfill flows generally to the southeast. Surface waters flow from the upland areas, north of the site, via intermittent drainage ways toward the south-southeast. The primary surface-water feature in the immediate vicinity of the landfill is Mathew Creek. The headwaters of Mathew Creek (LaGrange Springs) are located approximately 1,000 feet southeast of the site. Mathew Creek flows southeasterly until it converges with Hall Creek prior to discharging into Cayadutta Creek. The flow of Mathew Creek is interrupted by a man-made pond (Hulbert's Pond) before it converges with Hall Creek. Cayadutta Creek

ultimately discharges to the Mohawk River.

The landfill was used as an open refuse disposal facility from 1947 to 1960 before being converted to a sanitary landfill. The landfill accepted industrial wastes from local tanneries and textile plants until April 1979, and sludge from the Gloversville-Johnstown Joint Sewage Treatment Plant from 1973 to April 1979. Landfill operations ceased in June 1989. Much of the tannery wastes were disposed of as chromium-treated hide trimmings and other materials. Sewage sludge was disposed of in open piles at a rate of approximately 20,000 cubic yards per year. The sludge contained concentrations of chromium, iron, and lead. There are no records available which detail the amounts of industrial wastes accepted by the landfill.

On June 10, 1986, the Johnstown City Landfill site was placed on the Superfund National Priorities List.

On June 5, 1987, the State of New York filed suit against the City of Johnstown, the Gloversville/Johnstown Joint Sewer Board, Bruce Miller Trucking Company, and about a dozen waste generators. Several of the defendants subsequently impleaded approximately 52 third-party defendants, including additional generators, transporters, and a number of area municipalities. When the defendants declined to fund a remedial investigation and feasibility study (RI/FS), the State and the City of Johnstown entered into an interim consent order, which was approved by the Federal Court on October 4, 1988. Under the terms of the interim order, the City agreed to conduct an RI/FS.

Remedial Investigation

Based upon the results of the RI, which was carried out between June 1989 and March 1992, it was determined that the soil located beneath the landfill was contaminated with volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and pesticides. The contamination detected in the shallow downgradient ground water aquifer included VOCs and SVOCs at concentrations ranging up to 62.0 micrograms per liter ($\mu\text{g/L}$) and 150 $\mu\text{g/L}$, respectively. Eight metals (iron, manganese, sodium, arsenic, lead, chromium, copper, and zinc) exceeded EPA and/or NYSDEC standards in downgradient monitoring wells. Acetone and bis(2-ethylhexyl)phthalate were the primary contaminants detected within the bedrock aquifer at concentrations generally much greater than those found at the source (landfill wells). Some VOCs were detected in residential well samples, but at concentrations below state and federal drinking water standards.

Inorganic compounds found in surface water samples collected from Mathew Creek were generally higher at the headwater springs than at other locations. Six VOCs, acetone, methylene chloride, toluene, trichloroethylene, tetrachloroethylene, and chlorobenzene were also detected in Mathew Creek samples at concentrations ranging up to 24 $\mu\text{g/L}$. Three phthalate ester compounds were detected in Mathew Creek samples at concentrations ranging up to 16 $\mu\text{g/L}$. Seven of the eight

surface water samples collected in Mathew Creek had detectable concentrations of bis(2-ethylhexyl)phthalate that exceeded the NYSDEC surface water standard of 0.6 µg/L.

Sediment contamination in Mathew Creek included metals, ammonia-nitrogen, VOCs, SVOCs, and pesticides. Concentrations of arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, and nickel exceeded NYSDEC Sediment Criteria Guidance Values in one or more sediment samples from Mathew Creek.

Record of Decision

On March 31, 1993, a Record of Decision (ROD) was signed, selecting as the remedy for the site:

- ! Excavation of the LaGrange Gravel Pit sediments and placing the excavated materials on the existing landfill. The pit will be filled with clean fill, so that it may be used as an infiltration basin and/or stormwater collection basin;
- ! Regrading and compacting the landfill mound to provide a stable foundation for placement of the various layers of the cap and to promote rapid runoff;
- ! Construction of a multilayer closure cap over the landfill mound and excavated sediments as per New York State 6 NYCRR Part 360 regulations. The cap, by reducing leachate generation, will act to improve the groundwater quality in the upper (overburden) and lower (bedrock) aquifers and surface-water quality in Mathew Creek through natural attenuation of contaminants;
- ! Expansion of the Johnstown City water-supply system to provide potable water to all private water supplies potentially impacted by the landfill. Providing city water will require the extension of the City's water lines and construction of a booster pump station;
- ! Imposition of property deed restrictions by the appropriate state or local authorities. The deed restrictions will include measures to prevent the installation of drinking water wells at the Site, and restrict activities which could affect the integrity of the cap; and
- ! Erection of approximately 6,800 feet of conventional chain-link fencing surrounding the entire landfill mound, with placement of appropriate warning signs.

The ROD also indicated that the effectiveness of the landfill cap would be evaluated through post-construction monitoring of groundwater and surface water quality. The evaluation would be conducted within five years following initiation of construction of the landfill cap, and at any time as needed thereafter, during the long-term monitoring of the site. Should the monitoring results indicate that either groundwater quality in the upper (overburden) aquifer or the lower (bedrock) aquifer, or surface water quality in Mathew Creek, is not being restored to acceptable levels

through natural attenuation as a result of reduced leachate generation, the following will be implemented:

- ! Extraction of contaminated groundwater from either of the aquifers, as necessary. The extraction system would utilize extraction wells which would induce flow to the wells through draw down of the groundwater table. Operation of the groundwater extraction system would reduce the migration of contaminants away from the site;
- ! Treatment of groundwater by a treatment system located permanently on-site that would use physical/chemical processes such as pH adjustment, chemical precipitation, and carbon adsorption, to remove inorganic and volatile organic contaminants; and
- ! Discharge of treated groundwater by returning it to the aquifer via percolation ponds or injection wells, or by discharging it to a stream, the nearest being Mathew Creek. The discharge standards would be established by NYSDEC.

Remedial Design and Remedial Action

Landfill Closure

The City of Johnstown retained Malcolm Pirnie to conduct the RD, obtain bids for the landfill closure, and provide construction administration and resident engineering. The contract for the construction of the City of Johnstown's landfill closure was competitively bid and awarded to Delaney Construction Corporation of Mayfield, New York on October 17, 1995.

During December 1995 and January 1996, Delaney Construction set up the support facilities, installed the perimeter site access controls, determined the limits of the waste, completed the majority of waste relocation and placed the intermediate cover where required. Delaney Construction was forced to suspend the waste relocation activities in January 1996 due to inclement weather conditions. When the project resumed in May 1996, the remaining portion of the waste relocation activities were completed and the separation fabric, gas vent material, 60-mil geomembrane, barrier protection material, and topsoil were placed and the site was seeded. Construction was completed in November 1996.

Waterline Extension

The contract for the construction of the City of Johnstown's waterline extension was competitively bid and awarded to Syracuse Constructors of Syracuse, New York on June 26, 1996. The construction of the waterline began on September 30, 1996 and was completed on May, 21, 1997.

Final Inspection

On June 11, 1997, a final inspection of the landfill and waterline was conducted. One area of the landfill in the vicinity of the LaGrange Gravel Pit remained to be seeded. No other major punch list items were identified for the closure of the landfill. Along the waterline route, a few areas still required surface restoration. A subsequent inspection conducted on July 23, 1997 determined that the punch list items had been completed and that the work was both satisfactory and complete.

A Remedial Action (RA) Report associated with the landfill closure was approved on September 2, 1997. An RA Report for the waterline extension was approved on September 24, 1997. A Preliminary Close-Out Report for the site, demonstrating and documenting that physical construction at the site was completed, was approved by EPA on September 29, 1997.

III. REMEDIAL OBJECTIVES AND MONITORING RESULTS

The objective of capping the landfill was to reduce the infiltration of water, thereby reducing the generation of contaminated groundwater.

Groundwater and surface water monitoring at the site was performed on a quarterly basis beginning in 1996. Groundwater samples were analyzed for baseline and routine parameters in accordance with 6 NYCRR Part 360-2.11(d)(6). In 1999, NYSDEC approved a revision of the environmental monitoring schedule from quarterly monitoring to semiannual monitoring. Air quality monitoring conducted at the perimeter of the landfill is conducted on a quarterly basis in conjunction with quarterly site inspections.

VOC compounds (benzene, chloroethane, and chloroform) were detected above federal or state Maximum Contaminant Levels (MCLs) in groundwater in samples collected in August 1998 at 0.9 micrograms per liter (: g/L), 13 : g/L, and 8 : g/L, respectively¹. These compounds were not detected in subsequent samples.

Inorganic parameters detected above federal or state MCLs in groundwater included iron, manganese, chromium, antimony, lead, and sodium. Iron and manganese were detected at concentrations as high as 63,300 : g/L and 2,890 : g/L, respectively, in downgradient samples collected through October 1999 (the detected concentrations exceed the NYSDEC Class GA

¹ The Class GA standards for benzene, chloroethane, and chloroform are 0.7 : g/L, 5 : g/L, and 7 : g/L, respectively.

standard of 300 : g/L for each of these parameters²). Elevated levels of iron and manganese were also detected in upgradient groundwater samples collected during the monitoring period. Although antimony was detected at a concentration of 68.4 : g/L in a downgradient groundwater monitoring well sample collected in May 1996 (the NYSDEC Class GA groundwater standard for antimony is 3 : g/L), antimony is not believed to be a site-related as it was not detected in landfill or downgradient groundwater samples collected during the RI. Antimony was also detected at an elevated level, 66.9 : g/L, in an upgradient sample collected in May 1996. Chromium (329 : g/L) and lead (30.2 : g/L) were detected above the NYSDEC Class GA standards for these compounds in one sample collected in May 1999 (the NYSDEC Class GA groundwater standards for chromium and lead are 50 : g/L and 25 : g/L, respectively). The elevated levels of these parameters may be attributable to the high turbidity level of the sample. Chromium, however, was also detected at 90.6 : g/L in one downgradient sample collected in August 1998. Chromium data is not available for this location since this sample was collected. Reported sodium concentrations exceeded the NYSDEC Class GA Standard of 20,000 : g/L in several monitoring well samples. The highest concentration of sodium was detected in June 1997 at a level of 97,900 : g/L. However, the sodium concentrations detected during the sampling events since the landfill was capped are similar to historical data.

Conventional parameters detected above federal or state MCLs in groundwater included ammonia nitrogen, total phenols, nitrate nitrogen, and color. Ammonia nitrogen and total phenols were detected at elevated levels in both upgradient and downgradient groundwater samples collected from several monitoring wells. Ammonia nitrogen and total phenols were detected in several monitoring well samples at concentrations as high as 99.4 milligrams per liter (mg/L) and 0.425 mg/L, respectively, which exceed the NYSDEC Class GA Standard of 2 mg/L for ammonia nitrogen and 0.001 mg/L for phenols. The highest level of total phenols was detected in a May 1999 downgradient sample and was significantly higher than previous results for this monitoring well. However, total phenols were not detected in a subsequent sample from this well. Total phenols were, in general, higher in most monitoring well samples collected in May and November 1999 than in previous samples, but concentrations returned to historical levels in May 2000. Nitrate nitrogen was detected at 10.1 mg/L and 11.1 mg/L in two samples collected in June 1997 and November 1998, respectively, from a downgradient monitoring well. The NYSDEC Class GA standard for nitrate nitrogen is 10 mg/L. The level of nitrate nitrogen has been recorded below the standard in the last three sampling rounds. The NYSDEC Class GA standard for color was exceeded in all of the upgradient and downgradient groundwater samples collected in May 1996 and in several samples collected in August 1998 and May 1999.

Three VOCs, benzene (2 : g/L), ethylbenzene (6 : g/L), and styrene (7 : g/L) were detected

² The standards for iron and manganese are secondary standards, since they affect the aesthetic qualities of drinking water (*i.e.*, taste, odor, staining of fixtures), rather than pose a health risk.

above NYSDEC Class A standards in a surface water sample collected from Mathew Creek in August 1998. No VOCs were detected in a subsequent sample from the same location. Iron was detected above the NYSDEC Class A standard of 300 : g/L in every Mathew Creek surface water sample. The highest detected level for iron was 45,000 : g/L in an October 1999 sample at a headwater spring. This is higher than the maximum iron level detected in RI surface water samples (4,940 : g/L). However, iron was also detected above the NYSDEC standard in all but one of the background surface water samples and was detected at historical levels in the other headwater and Mathew Creek samples. Manganese was detected above the NYSDEC Class A standard of 300 : g/L in every Mathew Creek surface water sample collected at the headwater spring, but was, generally, detected at lower levels in the downstream location. The highest detected level for manganese, 4,500 : g/L, was found in the June 1997 downstream Mathew Creek sample. This is higher than the maximum manganese level detected in RI surface water samples (557 : g/L). However, the maximum manganese level at this station was 172 : g/L in the subsequent five samples collected at this station. Cadmium was detected at 10.9 : g/L in a duplicate background surface water sample. The NYSDEC Class A standard for cadmium is 5 : g/L. Ammonia nitrogen and total phenols were detected in surface water samples at concentrations as high as 17.6 : g/L and 0.027 mg/L, respectively. This is consistent with historical levels of ammonia nitrogen (highest level at 33.5 : g/L), but phenols were not detected in RI surface water samples. However, the levels of total phenols also exceeded the NYSDEC Class A standard in 3 of the 7 background surface water samples collected. The NYSDEC Class A standards for ammonia nitrogen and total phenols are 2 : g/L, and 0.001 mg/L, respectively. The levels of ammonia nitrogen were detected below the Class A standard in all of the background surface water samples. Chloride was detected at a level of 8,061 : g/L in a surface water sample collected in May 1996. The NYSDEC Class A standard for chloride is 250 : g/L. The elevated level of chloride may have been attributable to the salting of nearby roads. All subsequent samples collected at this location contained chloride levels below the standard. The NYSDEC Class A standard for color was also exceeded in some of the Mathew Creek surface water samples and the background sample.

Air quality monitoring has indicated that combustible or toxic gases are not present at the landfill perimeter nor in any nearby homes.

The site was inspected by NYSDEC on October 26, 2000. No evidence of leachate seeps was observed.

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

- C Historical and analytical data;
- C ROD;
- C Preliminary Close-Out Report;

- C Remedial Action Report;
- C Environmental Monitoring Plan;
- C NYSDEC Inactive Hazardous Waste Site Operations and Maintenance Review Reports; and
- C EPA Guidance for conducting five-year reviews and other guidance and regulations to determine if any new applicable or relevant and appropriate requirements relating to the protectiveness of the remedy have been developed since EPA issued the ROD.

There are no changes in standards or Applicable or Relevant and Appropriate Requirements known to the Remedial Project Manager which would affect the remedies selected at this site.

IV. RESULTS OF THE FIVE-YEAR REVIEW

Since the completion of the remedial action activities, the following site conditions relating to the implementation of the remedy have been achieved:

- C the fence around the site is intact and in good repair;
- C the monitoring wells installed within and around the site are functional; and
- C no evidence of trespassing or vandalism has occurred.

Based upon monitoring results and the site inspection, NYSDEC and EPA have determined that the implemented remedy continues to be protective of human health.

As was noted above, the ROD called for an evaluation of the effectiveness of the landfill cap through post-construction monitoring of groundwater and surface water quality. Should the monitoring results indicate that either groundwater quality in the overburden or bedrock aquifer, or surface water quality in Mathew Creek is not being restored to acceptable levels by reduced leachate generation, further actions would be taken. Only three and a half years of on-site groundwater and surface water data have been generated since the construction of the cap. Additional data will be needed to establish whether groundwater contaminant levels are being reduced as expected, and if any additional measures are needed to protect nearby residents and users of groundwater.

As discussed in the ROD, NYSDEC will obtain a property restrictive covenant to prevent the installation of drinking water wells at the site and restrict activities which could affect the integrity of the cap, and will implement the public awareness program to inform citizens of any remaining

site issues and to solicit feedback from the public. It is anticipated that the public awareness program will be put into place within six months of this five-year review. In addition, a biological monitoring program and ecological assessment of the sediments and aquatic species in Mathew Creek will be conducted. It is anticipated that the biological monitoring program and ecological assessment will commence within twelve months of this five-year review.

V. NEXT FIVE-YEAR REVIEW

In accordance with 40 CFR 300.430 (f) (4) (ii), the lead agency shall review the remedial action for the site no less often than every five years. Since hazardous substances, pollutants or contaminants remain at the Johnstown City Landfill site, which do not allow for unlimited use or unrestricted exposure, EPA will conduct another five-year review within five years of the date of this review.

VI. STATEMENT OF PROTECTIVENESS

The EPA Remedial Project Manager, Robert Nunes has completed a review of site documents and monitoring information and has been provided information from the NYSDEC, including an inspection of the site. Based on this information, it is concluded that the remedy at the site was implemented in accordance with the ROD and is protective of human health. However, the contingency groundwater remedy cannot be eliminated and protection of the environment has not been fully established. Continued groundwater and environmental monitoring are recommended.

for John S. Frisco
Richard L. Caspe, P.E., Director
Emergency and Remedial Response Division

12-11-00
Date