

**Five-Year Review Report
Jones Sanitation Superfund Site
Town of Hyde Park
Dutchess County, New York**

Prepared by:

**U.S. Environmental Protection Agency
Region 2
New York, New York**

June 2006

Five-Year Review Report Table of Contents

List of Acronyms	4
Executive Summary	5
Five-Year Review Summary Form	6
I. Introduction	8
II. Site Chronology	8
III. Background	8
Site Location	8
Land and Resource Use	9
History of Contamination	9
Basis for Taking Action	9
Initial Response	10
IV. Remedial Actions	10
Remedy Selection	10
Remedy Implementation	11
Operation, Maintenance and Long-Term Monitoring	12
Institutional Controls Implementation	12
V. Five-Year Review Process	13
Administrative Components	13
Community Involvement	13
Document Review	13
Data Review	13
Site Inspection	16
VI. Technical Assessment	16
Question A: Does the remedy function as intended by the decision documents?	16
Question B: Are the assumptions used for the remedy selection still valid?	17
Question C: Any other information that questions the protectiveness of the remedy?	18
Technical assessment Summary	18
VII. Issues, Recommendations and Follow-up Actions	19
VIII. Protectiveness Statement	19
IX. Next Review	19

Tables

- Table 1** - Chronology of Site Events
- Table 2** - Documents, Data, and Information Reviewed in Completing the Five-Year Review
- Table 3** - Comparison of the maximum detected concentrations of COPCs detected in the on-site monitoring wells to their respective human health risk based screening criteria (Preliminary Remediation Goal), Primary Drinking Water Standard (Maximum Contaminant Level) and New York Department of Environmental Conservation Water Quality Regulations (NYSDEC WQR)
- Table 4** - Comparison of the maximum detected concentrations of COPCs detected in the residential wells to their respective human health risk based screening criteria (Preliminary Remediation Goal), Primary Drinking Water Standard (Maximum Contaminant Level) and New York Department of Environmental Conservation Water Quality Regulations (NYSDEC WQR)
- Table 5** - Comparison of the maximum detected concentrations of COPCs detected in the monitoring wells to their respective vapor intrusion screening criteria
- Table 6** - Site RAOs (ppb) established for soil in the outlying trenches

List of Acronyms

COC	Contaminant of Concern
DCHD	Dutchess County Health Department
EPA	United States of Environmental Protection Agency
FS	Feasibility Study
gpm	gallons per minute
LMS	Lawler Matusky & Skelly Engineers LLP
NPL	National Priorities List
NYDOH	New York State Department of Health
NYSDEC	New York Department of Environmental Conservation
NYCRR	New York Code of Rules and Regulations
O&M	Operation and Maintenance
OU	Operable Unit
ppm	Parts per Million
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SVOC	Semi Volatile Organic Compound
VOC	Volatile Organic Compound WRS
WRS	Infrastructure and Environment, Inc.

EXECUTIVE SUMMARY

This is the first five-year review for the Jones Sanitation Superfund Site. This site is located in Hyde Park, Dutchess County, New York. Currently the remedy is functioning as intended by the decision documents and is protecting human health and the environment.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name (from WasteLAN): Jones Sanitation Superfund Site		
EPA ID (from WasteLAN): NYD 980534556		
Region: 2	State: NY	City/County: Town of Hyde park, Dutchess County
SITE STATUS		
G NPL Status: <input type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
Remediation Status: <input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input type="checkbox"/> Construction Complete		
Multiple OUs? <input type="checkbox"/> YES <input type="checkbox"/> NO		Construction completion date: 12/6/2002
Are portions of this site and/or investigated adjacent properties in use or suitable for reuse? yes		
REVIEW STATUS		
Lead agency: <input type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency		
Author name: Isabel Rodrigues		
Author title: Remedial Project Manager		Author affiliation: EPA
Review period:** 6/27/2001 to 6/27/2006		
Date(s) of site inspection:		
Type of review: <input type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion <input type="checkbox"/> Statutory		
Review number: <input type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify)		
Triggering action: <input type="checkbox"/> Actual RA Onsite Construction at OU # <u>1</u> <input type="checkbox"/> Actual RA Start at OU# <u>1</u> <input type="checkbox"/> Construction Completion <input type="checkbox"/> Other (specify)		
Triggering action date (from WasteLAN): 6/27/2001		
Due date (five years after triggering action date): 6/27/2006		
Does the report include recommendation(s) and follow-up action(s)? <input type="checkbox"/> yes <input type="checkbox"/> no Is human exposure under control? <input type="checkbox"/> yes <input type="checkbox"/> no		
Acres in use or available for use: restricted: <u>57</u> unrestricted: <u>0</u>		

Five-Year Review Summary Form (Continued)

Issues, Recommendations, and Follow-Up Actions

The selected remedy has been fully implemented. Institutional controls to protect the landfill remedy and to prevent installation of potable water wells in the vicinity of the landfill were implemented. This Site has ongoing operation, maintenance and monitoring activities as part of the selected remedy. As anticipated by the decision documents, these activities are subject to routine modification and adjustments. The existing groundwater quality data indicate that the site does not impact the off-site groundwater quality and only minimal impact was noted on-site in several of the monitoring wells.

Protectiveness Statement

The remedy for the Jones Sanitation Superfund site protects human health and the environment. There are no exposure pathways that could result in unacceptable risks and none expected as long as the engineered and institutional controls currently in place continue to be properly operated, monitored and maintained.

I. INTRODUCTION

This five-year review for the Jones Sanitation Superfund site, located in Hyde Park, Dutchess County, New York, was conducted by the United States Environmental Protection Agency (EPA) Remedial Project Manager (RPM) Isabel Rodrigues. The 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 done in accordance with the Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P (June 2001). The purpose of five-year reviews is to ensure that implemented remedies protect public health and the environment and that they function as intended by the site decision documents. This report will become part of the site file.

In accordance with Section 1.3.1 of the five-year review guidance, a five-year review is triggered by the initiation of the first remedial action that leaves hazardous substances, pollutants, or contaminants on-site above levels that allow for unlimited use and unrestricted exposure. The trigger for this five-year review is the on-site construction start associated with capping the landfill areas, which was June 27, 2001.

This site which was addressed as one operable unit includes a landfill area and on- and off-property groundwater monitoring wells.

II. SITE CHRONOLOGY

See Table 1 for site chronology.

III. BACKGROUND

Site Location

The Jones Sanitation site consists of a 57 acre parcel of land located approximately one-half mile northeast of the intersection of Crum Elbow Road and Cardinal Road in Hyde Park, New York. The Maritje Kill flows from northeast to southeast across the eastern side of the site. Another unnamed stream enters the northern side of the site, flows into wetlands on the western side of the property, and flows off-site to the west.

There are three wetland areas located on site and are principally associated with the Maritje Kill and the unnamed stream. The wetlands associated with the unnamed stream are slightly larger (6.6 acres) in extent than the wetlands associated with the Maritje Kill (6.1 acres). The major portion of the wetlands associated with each stream is concentrated in the lower half of the stream course. In addition to the wetlands associated with the streams, there are three small isolated wetland areas located in the northeastern corner of the property.

The wetlands on the Jones site pose no unique characteristics of social significance though they do provide flood flow alteration and wildlife habitat. The only potential impact of the completed closure upon the wetlands is a slight increase in the extent and duration of inundation/saturation due to the increased rate of volume of surface runoff from the cap area into the wetlands.

The physical site conditions are characterized by shallow soil deposits (0 to 15feet) underlain by bedrock consisting of sandstone and shale. Several bedrock ridges with numerous surface outcroppings are present at the site. Overburden groundwater appears to flow from the central disposal area to the wetlands and surface water streams to the north and west.

Land and Resource Use

The site is zoned residential but existing commercial use has been grandfathered. Adjacent land use consists primarily of residential and undeveloped land. Single-family homes are located along Matuk Drive and Thurston Lane to the south and along Cardinal Road to the west. Val-kill trailer park, housing approximately 100 residences, is located to the southwest. This site is currently in use. The cleared area is used for parking and storage of trucks. The wetlands and wooded areas are considered to be in ecological use. The entire property has institutional controls restricting groundwater use.

History of Contamination

Septage operations began at the site in approximately 1956 by Mr. William Jones, Sr., under the name of William Jones Sanitation Services (Jones Sanitation). The wastes that were treated and disposed of at the site during its approximately 30 years of operation include septage wastes, primarily liquid, from residential, commercial, institutional, and industrial facilities. Septage and industrial wastewater were disposed of together in approximately 30 to 40 shallow, randomly oriented trenches located mostly within the central area of the site. Trenches were reportedly three to five feet deep, with lime applied to septage disposed of in trenches to reduce odors. After the trenches were full and liquids had leached out into the ground, the trenches were covered with sand and gravel.

The DeLaval Separator Company (DeLaval), which changed its name to Alfa-Laval in 1980, operated a facility in Poughkeepsie from 1963 to 1990. Untreated industrial wastewater from DeLaval's industrial plant was transported to the site for disposal which contained hazardous substances, including, but not limited to trichloroethylene, methylene chloride, chloroform, 1,1,1-trichloroethane, naphthalene, chromium, copper, lead and zinc.

Basis for Taking Action

Beginning in 1970, the site became the focus of several investigations by the New York State Department of Environmental Conservation (NYSDEC) and the Dutchess County Health Department (DCHD). The investigations included limited sampling of on-site soils, groundwater, surface water, and sediment from the streams on site. Some off-site private and public wells were also sampled. Volatile organic compounds (VOCs), semi volatiles organic compounds (SVOCs), polynuclear aromatic hydrocarbon (PAH) compounds, polychlorinated biphenols (PCBs) and metals were detected at varying concentrations in site media. Based on the results of these investigations, the site was placed on the National Priorities List (NPL) in July 1987. At that time, EPA became the lead agency for the site, with support from the NYSDEC.

The Remedial Investigation (RI) included: a soil investigation consisting of soil gas survey, seismic survey, and soil boring program; a hydrogeologic investigation consisting of aquifer testing, well installation, and groundwater sampling; a surface water and sediment investigation; and, an ambient air monitoring program. Environmental sampling activities at the site included collection and analysis of 179 soil gas samples, 120 subsurface soil samples, 11 surface water samples and 11 sediments samples. Also, groundwater samples were obtained from 13 overburden monitoring wells and 15 bedrock monitoring wells, as well as ten off-site potable wells. The DCHD and New York State Department of Health (NYSDOH) have sampled off-site private and community wells on several occasions and contaminants related to the site were not detected in drinking water supply wells.

The results of the RI indicated that VOC, SVOCs, PAHs and heavy metals in the soil and VOCs and metals in the groundwater presented an unacceptable potential threat to public health at the site.

Initial Response

In March 1991, the owner of the site, Theodore Losee, and Alfa-Laval, Inc., signed an Administrative Order on Consent with EPA in which they agreed to perform a Remedial Investigation/Feasibility Study (RI/FS). The RI was conducted and completed in 1995. In 1994, a FS of potential remedial alternatives was begun by Lawler Matusky & Skelly Engineers LLP (LMS) on behalf of Alfa-Laval. A final report was completed in 1996.

IV. REMEDIAL ACTIONS

Remedy Selection

In March 31, 1997, EPA issued a ROD selecting a remedial action for the site.

The major components of the selected remedy consist of the following:

On-Site Soils

- Construction of a 4.8-acre cap over the central disposal area in conformance with the major elements described in 6 NYCRR Part 360 for solid waste landfill caps.
- Construction of surface water controls consisting of concrete culverts around the perimeter of the cap and the other locations as necessary to ensure that runoff water does not erode the topsoil layer.
- Implementation of long-term maintenance program for the cap to ensure cap integrity.
- Excavation of contaminated soils above the remedial action objectives in outlying trench areas and consolidated into the central disposal area.
- Collection of confirmatory samples from the bottom and sidewalls of the trench unit excavations. Backfill the trenches with clean fill and overlay with a 6-inch layer of clean topsoil and grass cover.

- Implementation of institutional controls such as deed restrictions, to limit access and to prohibit interference with the completed cap.

Groundwater

- Implementation of a long-term groundwater monitoring program.
- Implementation of institutional controls such as deed restrictions, and/or well permitting restrictions to prevent human contact with contaminated groundwater at the site.

Streams and Wetlands

No remedial action was required for the streams and wetlands as there were no adverse impacts observed. During the remedial design, further ecological risk assessment was performed that confirmed that the surroundings streams and wetlands had not been impacted.

Remedy Implementation

A Consent Decree addressing the preparation of the remedial design documents and the performance of selected remedial actions was lodged in November 1997.

Soil Remediation

In July 2000, the final Remedial Design Report was submitted to EPA. This report established the design criteria and schedule for the remediation including the requirements for the long-term groundwater monitoring once the remediation was completed.

WRS Infrastructure and Environment, Inc. (WRS) was selected by Alfa Laval to implement the approved remedial activities at the site. The remedial construction at the site started in June 2001.

The west central portion of the site is now occupied by the capped area that serves to isolate the central disposal area and the waste materials which were removed from the outlying disposal areas northeast, east and south of the central disposal area. A total of 13,864 yards of material were removed from 8 outlying areas and consolidated under the cap. The resulting excavations were backfilled and revegetated. Once the waste materials were consolidated under the cap, a final cover system was installed in conformance with 6NYCRR Part 360 regulations. The analytical results from post excavation soils samples collected from the excavated areas indicated that the remediation of all excavated areas reduced contaminant concentrations in soils to below the cleanup levels required by the ROD. Construction activities for the soils were completed in November 2001.

Groundwater Remediation

Once the excavations and cap were completed, seven monitoring wells were installed at various locations at the site as part of the on-going remedial efforts for the groundwater at the site and to monitor the performance of the remedial action on soils. The installation of the groundwater monitoring wells was completed in December 2001.

Institutional controls were implemented at the site. An environmental easement with restrictive covenants was filed with Dutchess County in August 2003. The environmental easement prohibits any development in the permanent cap area. There will be no groundwater extraction wells installed on any part of the site and there will be no activities that would materially interfere with the maintenance or integrity of the monitoring wells installed at the site.

All elements of the construction phase of the remediation have been completed at the site. On-going activities at the site include the long-term groundwater monitoring and operation and maintenance (O&M) activities.

Site Completion

The site achieved construction completion status with the signing of the Preliminary Close-Out Report for the construction on December 6, 2002. The site was deleted from the NPL on September 23, 2005.

Operation, Maintenance, and Long-Term Monitoring

The long-term groundwater monitoring at the site include groundwater sampling of on-site monitoring wells and off-site sampling of near by residential wells. The groundwater monitoring program includes 15 on-site monitoring wells completed both in the shallow and deeper portions of the on-site aquifer. In addition, ten off-site residential drinking water supply wells in the vicinity of the site were included in the program. The long-term monitoring sampling consists of quarterly sampling of the on-site monitoring wells and annual sampling of the residential wells. The monitoring will be conducted for five years after which the results of the program will be re-evaluated to determine if monitoring should be continued and if so with what frequency and protocols.

An operation and maintenance (O&M) program is part of the remedy for the site and has been developed and implemented. The O&M program includes routine inspections of the capped area; a semi-annual gas venting monitoring program; and maintenance of the established vegetation cover within the capped area.

Institutional Controls Implementation

The ROD included recommendations for limiting future use of the Site and the groundwater through deed restrictions, to insure that the remedial measures which have been taken on the site will not be disturbed and that the site will not be used for purposes incompatible with the completed remedial action. Institutional controls were implemented at the site. An environmental easement with restrictive covenants was filed with Dutchess County in August 2003. There is limited reuse of the site. The environmental easement prohibits any development in the permanent cap area. The easement also applies to the overburden and bedrock aquifer, even though the overburden aquifer on-site is not a viable source of potable water. There will be no groundwater extraction wells installed on any part of the site and there will be no activities that would materially interfere with the maintenance or integrity of the monitoring wells installed at the site.

V. FIVE-YEAR REVIEW PROCESS

Administrative Components

The five-year review team consisted of Isabel Rodrigues (Remedial Project Manager), Kevin Lynch (Western New York Remediation Section Chief), Julie McPherson (Risk Assessor), Edward Modica (Hydrogeologist), and Michael Clemetson (Ecological Risk Assessor) of EPA and Wayne Mizerak (Project Manager) of NYSDEC.

Community Involvement

The EPA Community Involvement Coordinator (CIC) for the Jones Sanitation site published a notice in the *Daily Freeman*, a local newspaper notifying the community of the initiation of the Five-Year Review process. The notice indicated that EPA would be conducting a Five-Year Review to ensure that the remedies implemented at the Site remain protective of public health and are functioning as designed. It also indicated that once the five-year review is completed it will be made available in the local site repository.

In addition, the notice included the RPM's mailing addresses and telephone number in the event the public had any comments or questions. A similar notice will be published when the review is completed.

Document Review

This five-year review consisted of a review of relevant documents including O&M records and monitoring data. See Table 2.

Data Review

Annual Residential Well Sampling Program

The objective of the annual residential sampling potable well monitoring program is to ensure that no site related contaminants are impacting the local drinking water sources. The ten residential wells that are in the long term monitoring program were selected for inclusion in the sampling program based on the anticipated groundwater flow directions, proximity to the site, and which aquifer the well was drawing water from. The wells selected include three overburden wells less than 100 feet deep and seven bedrock wells which range from 109 to 220 feet deep.

In 2002, no site-related contaminants were detected. The only VOCs detected during the residential well sampling were found in the sample collected from Valkill Park. Bromodichloromethane and dibromochloromethane were detected in concentration of 0.5 µg/l and 0.56 µg/l. An MCL is available for only dibromochloromethane and the concentration detected during this sampling event did not exceed its respective MCL. The concentration of VOCs was compared to the health based criteria and was found to be within the risk range. These compounds are chlorination residuals which are most likely a result of the well disinfection systems and are not related to the Jones site.

The samples collected from the residential wells were also analyzed for total metals. In 2002, sodium was detected at concentrations ranging from 4,870 to 257,000 µg/l. Only two of the samples exceeded the 20,000 µg/l standard and it is unknown if the results reflect naturally occurring sodium or the result of use of in-home water softeners. Potassium and calcium were both detected in all of the samples analyzed; there is no standard available for either of these metals. No other metals were detected above standards.

In 2003, no VOCs were detected in any of the groundwater samples collected from the residential wells. The low levels of chlorination by-products which were detected during the 2002 sampling event in one of the wells (Valkill Park) were not found during the 2003 sampling event.

In 2003, sodium levels exceeded the standards of 20,000 µg/l in groundwater in eight of the ten residential wells sampled. The concentration of sodium in the groundwater collected from these wells ranged from 6,030 to 163,000 µg/l. Cadmium was not found at detectable concentrations at these locations.

No site-related VOCs were detected in any of the residential wells that were tested during 2004. During the 2004 sampling event, only one compound, methyltertiarybutylether (MTBF) was detected in groundwater collected from two residential wells along Cardinal Road. Both detections (0.8 µg/l and 2.0 µg/l), were at concentrations below the 1997 EPA Drinking Water Advisory Guidance Value of 20 µg/l. MTBF is a common gasoline additive and its presence in the groundwater in this area is likely from the use of petroleum products and not indicative of previous activities at the Jones site.

In 2004, two metals, sodium and iron were detected at concentrations exceeding NYSDEC Class GA standards. Sodium was detected at concentrations above the NYSDEC standard of 20,000 µg/l in groundwater collected from eight of the ten residential wells sampled. Sodium concentrations exceeding the NYSDEC standard ranged from 23,900 to 114,000 µg/l. The iron concentration in groundwater collected from one residential well was 962 µg/l. This was the only residential well from the 2004 sampling event found to have groundwater with iron levels that exceeded the NYSDEC standard of 300 µg/l.

In 2005, no site-related VOCs were noted in any of the residential wells sampled. The presence of very low levels of acetone in three residential wells is believed to be the results of cross contamination at the laboratory and does not reflect groundwater quality. An MCL is currently not available for bromodichloroethane or acetone. Therefore, the concentration of VOCs detected during the sampling event were compared to their respective health based criteria (PRG) and were found to be within the risk range. Sodium concentrations exceeded standards in 6 of the 10 residential wells and were consistent with the previous findings.

The groundwater quality data for the nearby residential wells indicate that the Jones site does not impact the quality of the off-site groundwater in either the shallow or overburden or deeper bedrock aquifer in the vicinity of the site. No site-related contaminants were detected in any of the wells that were tested.

On-Site Monitoring Well Sampling Program

The objectives of the quarterly long-term monitoring of the fifteen selected on-site monitoring wells are to provide additional data on the chemical composition, especially VOCs and metals, of groundwater on-site; evaluate whether the landfill closure has substantially changed groundwater flow patterns and chemistry; and, to observe the natural attenuation of contaminants in the groundwater. The on-site wells are located within a shallow zone at approximately 20 feet below the ground surface and a deeper zone at approximately 35 feet below the ground surface.

In 2002, six individual VOCs were detected above the NYSDEC groundwater standards during the four rounds of sampling and only two of the wells (JSMW-4B and JSMW-3B) consistently exhibited VOCs (cis-1,2 dichloroethane, 1,2-dichloroethene, trichlorethene, tetrachloroethene, chlorobenzene and benzene) above standards.

A total of ten individual metals were found above the standards. Of these, antimony, arsenic, copper, thallium, chromium, nickel and lead are site related contaminants.

In 2003, only three VOCs (benzene, chlorobenzene, and 1,2dichloroethane) were detected above the standards during the annual sampling. The noted excursions were found in three wells (JSMW-03B, JSMW-04 and JSMW-4B). VOCs were not detected in the remaining ten on-site monitoring wells in the program.

A total of six individual metals were found above the groundwater standards. Of these, only three are believed to be site related contaminants, namely, antimony, chromium, and nickel.

In comparing the 2004 data to the groundwater standards, only one VOC (1,2 dichloroethane) was detected above the standard. This occurred in well JSMW-4A with a 1,2-dichloroethane concentration of 2.0 $\mu\text{g/l}$. This well also exhibits several other VOCs such that the total VOC concentration exceeds the 10 $\mu\text{g/l}$ total VOC standard. VOCs were not detected in the remaining nine on-site monitoring wells.

A total of six individual metals were found above applicable standards. Of these, four are believed to be site-related contaminants: arsenic, chromium, nickel, and thallium. The noted excursions for iron, manganese, and sodium do not appear to be related to the site and are naturally elevated in this particular bedrock aquifer.

In 2005, two VOCs (benzene and chlorobenzene) were detected above their respective standards. The noted excursions were found in wells JSMW-3B and JSMW-8A with benzene concentration of 2.2 and 1.8 $\mu\text{g/l}$, respectively. Chlorobenzene concentrations in these wells were 14 and 13 $\mu\text{g/l}$, respectively. In both of these wells the total VOC concentration exceeded the 10 $\mu\text{g/l}$ total VOC standard. VOCs were not detected in the nine of the fifteen on-site monitoring wells in the program. Only three of the on-site wells (JSMW-3B,-4A,-4B) have consistently shown VOCs above standards. The VOC concentrations have been decreasing over the seven rounds of groundwater monitoring that have been conducted from 2002 to 2005.

A total of six individual metals were found above the standards. Of these, only four are believed to be site-related contaminants including: arsenic, chromium, nickel, and thallium. Over the seven rounds of groundwater monitoring conducted from 2002 to 2005, only well JSMW-6B continues to exhibit chromium and nickel over the standards. The excursions of iron, manganese and sodium do not appear to be related to the site and are naturally elevated in this particular bedrock aquifer.

Long-term groundwater monitoring at the Jones Sanitation Site has been conducted since 2002. The first-year quarterly sampling of the on-site monitoring wells was followed by annual sampling in 2003, 2004 and 2005 (seven total sampling events). The residential well sampling component of the monitoring program included annual sampling events in 2002, 2003, 2004 and 2005. Sampling results from the on-site monitoring wells and residential wells demonstrate that the impacts to the groundwater are limited to only a few isolated on-site wells and off-site groundwater has not been impacted.

Landfill Gas Monitoring Program

During each quarterly inspection, LMS conducted gas monitoring to evaluate the composition and concentrations of gas vented from the landfill. The capped materials are generating minor amounts of gas that is passively venting from the nine gas vents in the cap. Measurable levels of gas are only noted in the vents themselves and perimeter monitoring did not indicate any gas levels above background. The generated gas does not cause an odor or nuisance on-site or for the surrounding properties. The capped area is functioning as intended and only routine maintenance such as mowing and vector control are necessary.

Fencing

Monthly inspections of the Site fence indicate no deficiencies in, or need for repair of the fencing.

Site Inspection

A site visit related to this five-year review was conducted on March 3, 2006. EPA representatives were accompanied by Michael Lehtinen, project manager for LMS on behalf of the PRPs. During the site visit, it was observed that several monitoring wells were not locked. It was suggested that all monitoring wells be locked after each sampling event to prevent vandalism. There were no other comments or deviations from the on-going operation and maintenance activities that were observed during the site visit.

VI. TECHNICAL ASSESSMENT

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

Yes. The remedy is functioning as intended by the ROD. The remedy selected and implemented at the Jones Sanitation Superfund site includes the following components: excavation of the outlying soils that exceed the cleanup goals and placing the materials in the existing landfill; construction of a cap (complying with NYS 360 Solid Waste Regulations) over the central disposal area; implementation of a groundwater monitoring program; and institutional controls. The landfill cap

was installed as part of the remedy and eliminates the exposure to site-related contaminants via the soil exposure pathway. The cap is currently being maintained by the PRPs contractor. As part of the NYS 360 closure requirements, the PRPs contractor inspects and assesses the integrity of the cap as well as the fence quarterly. A perimeter toe drainage and outfall system is maintained and continues to function as intended. An air quality monitoring program at nine passive gas vents on the landfill cap is also in effect. Results indicate that minor amounts of gas are generated and do not migrate from the site. In addition, monitoring wells on site and residential wells downgradient of the site are monitored annually and have not detected the migration of any site-related contaminants.

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

The majority of the exposure pathways and the receptor populations identified in the 1995 Baseline Human Health Risk Assessment (BHHR) are still valid. Although some exposure assumptions have changed and several exposure pathways were not evaluated, it is not expected to affect the remedy.

The toxicity values for several COPCs have changed since the RI. In order to account for changes in toxicity values since the RI, the maximum detected concentrations of COPCs detected in the on-site monitoring wells and residential wells during the sampling period 2001-2004 were compared to their respective residential groundwater PRGs and MCLs (National Primary Drinking Water Standards) and New York Department of Conservation Water Quality Regulations (NYSDEC WQR). 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. The PRGs are a human health risk based value that is equivalent to a cancer risk (CR) of 1×10^{-6} or a hazard index (HI) of 1.

As shown in Table 3, several constituents detected in the on-site wells have exceeded their respective criteria since the initiation of the groundwater monitoring program. Aluminum, antimony, iron, manganese and nickel exceeded either the cancer risk range (1×10^{-6}) or the hazard index of 1. The maximum detected concentrations of aluminum, antimony and nickel have decreased since 2002 and have not exceeded their respective human health risk based criteria (PRG) in the 2003 and 2004 sampling events. Although the concentrations of iron and manganese have decreased since 2002, the maximum detected concentrations have consistently exceeded their respective PRG. Lead has also exceeded its respective action level in 2002, however, it was observed that the concentration of lead in groundwater has decreased since the initial sampling and has not exceeded its respective action level in the two recent sampling events.

Arsenic, cadmium and iron are the only constituents that exceeded their respective criteria in the residential wells during the last 4 years (Table 2). The maximum detected concentration of arsenic exceeded its respective PRG, but did not exceed its MCL or NYSDEC WQS. Although the maximum detected concentration of arsenic exceeded its respective PRG, it is within EPA's acceptable cancer risk range. The maximum detected concentrations of cadmium and iron exceeded the MCL and NYSDEC WQS but did not exceed their respective PRGs. It should be noted that the MCL for iron is a secondary standard. Secondary standards are not based on human health but rather are based on cosmetic or aesthetic effects, which are not enforceable guidelines. The maximum

detected concentration of cadmium was detected in 2003 (12 µg/l) and decreased in the following sampling event to below its respective MCL and NYSDEC WQR. VOCs have not been detected in any of the residential samples since 2002. Based on the most recent sampling event (2004), the concentrations of contaminants detected in the residential wells are within or below EPA's acceptable risk range or hazard index threshold and are considered protective of human health.

Soil vapor intrusion was not previously evaluated as a potential future exposure pathway based on the conservative (health protective) assumption that buildings are not located above the contaminants of concern in the groundwater. The health based screening criteria provided in the Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (USEPA, 2002) was used to initially evaluate this exposure pathway. This guidance provides calculations of concentrations in groundwater associated with indoor air concentrations at acceptable levels of cancer risk and non cancer hazard. This review compared the maximum detected concentrations of the chemicals of potential concern with the vapor intrusion screening criteria (Table 5). The maximum detected concentrations of TCE, benzene and mercury have exceeded their respective risk based criteria (1×10^{-6}) but did not exceed the upper bound of the risk range (1×10^{-4}). This does not indicate that a vapor intrusion problem would occur if a building were to be erected at the site. This merely indicates that further investigation would be necessary, which includes site specific considerations such as the type of building, the location of the building to the maximum detected concentration, and the subsurface characteristics of the site. Currently, there are no buildings on the site; therefore, the exposure pathway is incomplete at this time.

The soil remedy was reviewed to address the protectiveness of the remedy presented in the 1997 ROD. As stated earlier, the outlying trenches were excavated and placed in the landfill. RAOs for this area are listed in Table 6. Since the land use is designated residential, the cleanup criteria were compared to the Region 9 Preliminary Remediation Goals - Residential Soil. The RAOs established are either within or below EPA's risk range or hazard index and are considered protective of human health.

The RAOs established in the ROD are valid at this time.

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

Yes, as indicated in Question B, vapor intrusion into indoor air was previously not evaluated. However, since there are no buildings on the site, this pathway is incomplete.

Technical Assessment Summary

Based upon the results of the five-year review, it has been concluded that the selected remedy has been fully implemented. Institutional controls to protect the landfill remedy and to prevent the installation of potable water wells in the vicinity of the landfill were implemented. The existing groundwater quality data indicate that the site does not impact the off-site groundwater quality and only minimal impact was noted on-site in several of the monitoring wells.

VII. ISSUES, RECOMMENDATIONS AND FOLLOW-UP ACTIONS

The selected remedy has been fully implemented. Institutional controls to protect the landfill remedy and to prevent the installation of potable water wells in the vicinity of the landfill were implemented. This site has ongoing operation, maintenance and monitoring activities as part of the selected remedy. As anticipated by the decision documents, these activities are subject to routine modification and adjustments. The existing groundwater quality data indicate that the site does not impact the off-site groundwater quality and only minimal impact was noted on-site in several of the monitoring wells.

VIII. PROTECTIVENESS STATEMENT

The remedy for the Jones Sanitation site protects human health and the environment. There are no exposure pathways that could result in unacceptable risks and none expected as long as the engineered and institutional controls currently in place continue to be properly operated, monitored and maintained.

IX. NEXT REVIEW

Since hazardous substances, pollutants or contaminants remain at the Jones Sanitation Superfund site, the next five-year review for the Jones Sanitation Superfund Site should be completed before April 2011, five years from the date of this review.

Approved by:

**Table 1
Chronology of Site Events**

Event	Date
Final Listing on National Priorities List	1987
Administrative Order on Consent	1991
Remedial Investigation completed	1995
Feasibility Study	1996
Record of Decision (ROD)	1997
Consent Order	1997
Remedial Design approved	2000
Remedial Action performed	2001
Preliminary Closeout Report	2002
Site Deletion from NPL	2005

**Table 2
Documents, Data, and Information Reviewed in Completing the Five-Year Review**

Record of Decision, 1997
Remedial Action Report
Close-Out Report
Annual Long-Term and Operation, Maintenance Reports and Monitoring Reports
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

Table 3

Comparison of the maximum detected concentrations of COPCs detected in the on-site monitoring wells to their respective human health risk based screening criteria (Preliminary Remediation Goal), Primary Drinking Water Standard (Maximum Contaminant Level) and New York Department of Environmental Conservation Water Quality Regulations (NYSDEC WQR)

COPC	Maximum Detected Concentration (ug/l)	Region 9 Preliminary Remediation Goal (ug/l)	Primary Drinking Water Standard - MCL (ug/l)	NYSDEC WQR (ug/l)	Date
1,2-DCE	6.7	61 (nc)	100	5	2002
1,2-DCA	4	0.12 (c)	5	0.6	2002
1,1,1-TCA	1.1	3200 (nc)	200	5	2004
TCE	1.8	0.028 (c)	5	5	2002
PCE	5.5	0.1 (c)	5	5	2002
Chlorobenzene	24	110 (nc)	100	5	2003
Benzene	5.2	0.35 (c)	5	1	2002
cis-1,2-DCE	1.4	61 (nc)	100	5	2002
1,1-DCA	1.6	810 (nc)		5	2002
1,2-Dichlorobenzene	0.63	370 (nc)	600	3	2002
Aluminum	36300	36000 (nc)			2002
Antimony	75.1	15 (nc)	6	3	2002
Arsenic	43.7	0.045 (c)	10	25	2002
Barium	386	2600 (nc)	2000	1000	2002
Beryllium	2	73 (nc)	4		2002
Cadmium	4.7	18 (nc)	5	5	2004
Chromium	4740	110 (c)	100	50	2002
Cobalt	138	730 (nc)			2002
Copper	294	1500 (nc)	1300	200	2002
Iron	126000	11000 (nc)	300*	500	2002
Lead	69.1	15 (nc)	15	25	2002

Manganese	6350	880 (nc)	50*	300	2002
Mercury	0.22	11 (nc)	2	0.7	2002
Nickel	2590	730 (nc)		100	2002
Selenium	3.7	180 (nc)	50	10	2003
Silver	35.5	180 (nc)		50	2002
Thallium	6	2.4 (nc)	2		2004
Vanadium	40.1	36 (nc)			2002
Zinc	2300	11000 (nc)	5000		2002

Footnotes:

(c): Value is based on a Cancer endpoint

(nc): Value is based on a Non-cancer endpoint

*: Values are National Secondary Drinking water regulations, which are non-enforceable guidelines regulating contaminants that may cause cosmetic or aesthetic effects in drinking water.

Source:

Region 9 Preliminary Remediation Goals (PRGs) are human health risk based screening criteria. This values are equivalent to a cancer risk of 1×10^{-6} or a hazard index of 1. Refer to: <http://www.epa.gov/Region9/waste/sfund/prg/index.htm>

National Drinking Water Standards (MCLs) are legally enforceable standards that apply to public water systems. Refer to: <http://www.epa.gov/cgi-bin/epaprintonly.cgi>

New York State Department of Environmental Conservation Water Quality Regulations (NYSDEC WQR) are the ARARs established in the ROD. Refer to: <http://www.dec.state.ny.us/website/regs/part703.html>

Table 4

Comparison of the maximum detected concentrations of COPCs detected in the residential wells to their respective human health risk based screening criteria (Preliminary Remediation Goal), Primary Drinking Water Standard (Maximum Contaminant Level) and New York Department of Environmental Conservation Water Quality Regulations (NYSDEC WQR)

COPC	Maximum Detected Concentration (ug/l)	Region 9 Preliminary Remediation Goal (ug/l)	Primary Drinking Water Standard - MCL (ug/l)	NYSDEC WQR (ug/l)	Date
Aluminum	21.1	36000 (nc)			2004
Arsenic	6.4	0.045 (c)	10	25	2002
Barium	643	2600 (nc)	2000	1000	2004
Cadmium	12	18 (nc)	5	5	2003
Chromium	7.1	110 (c)	100	50	2003
Copper	69.7	1500 (nc)	1300	200	2003
Iron	962	11000 (nc)	300*	500	2004
Lead	6.7	15 (nc)	15	25	2003
Manganese	160	880 (nc)	50*	300	2002
Nickel	22	730 (nc)		100	2002
Selenium	1.7	180 (nc)	50	10	2004
Silver	3.8	180 (nc)		50	2002
Zinc	38.9	36 (nc)			2003
Bromodichloromethane	0.52	0.18 (c)			2002
Dibromochloromethane	0.56	0.13 (c)		5	2002

Footnotes:

(c): Value is based on a Cancer endpoint

(nc): Value is based on a Non-cancer endpoint

*: Values are National Secondary Drinking water regulations, which are non-enforceable guidelines regulating contaminants that may cause cosmetic or aesthetic effects in drinking water.

Source:

Region 9 Preliminary Remediation Goals (PRGs) are human health risk based screening criteria. This values are equivalent to a cancer risk of 1×10^{-6} or a hazard index of 1. Refer to: <http://www.epa.gov/Region9/waste/sfund/prg/index.htm>

National Drinking Water Standards (MCLs) are legally enforceable standards that apply to public water systems. Refer to: <http://www.epa.gov/cgi-bin/epaprintonly.cgi>

New York State Department of Environmental Conservation Water Quality Regulations (NYSDEC WQR) are the ARARs established in

the ROD. Refer to: <http://www.dec.state.ny.us/website/regs/part703.html>

Table 5

Comparison of the maximum detected concentrations of COPCs detected in the monitoring wells to their respective vapor intrusion screening criteria

COPC	Maximum Detected Concentration (ug/l)	Vapor Intrusion Screening Value (ug/l)	Vapor Intrusion Screening Value (ug/l)
		Cancer Risk = $1 * 10^{-6}$ Non-cancer hazard = 0.1	Cancer Risk = $1 * 10^{-4}$ Non-cancer hazard = 1
1,2-DCE	6.7	58 (c)	5800 (c)
1,2-DCA	4	150 (nc)	1500 (nc)
1,1,1-TCA	1.1	310 (nc)	3100 (nc)
TCE	1.8	0.053 (c)	5.3 (c)
PCE	5.5	1.1 (c)	110 (c)
Chlorobenzene	24	39 (nc)	390 (nc)
Benzene	5.2	1.4 (c)	140 (c)
cis-1,2-DCE	1.4	21 (nc)	210 (nc)
1,1-DCA	1.6	220 (nc)	2200 (nc)
1,2-Dichlorobenzene	0.63	260 (nc)	2600 (nc)
Bromodichloromethane	0.52	2.1 (c)	210 (c)
Dibromochloromethane	0.56	3.2 (c)	320 (c)
Mercury	0.22	0.068 (nc)	0.68 (nc)

Footnotes:

(c): Value is based on a Cancer endpoint

(nc): Value is based on a Non-cancer endpoint

Source:

Vapor Intrusion Screening Values are used for screening purposes. Refer to: <http://www.epa.gov/correctiveaction/eis/vapor.htm>

Table 6
Site RAOs (ppb) established for soil in the outlying trenches

<u>COPC</u>	<u>RAO</u>
Organics	
PCE	<1400 ppb
4-methylphenol	<900 ppb
Fluoranthene	<50000 ppb
Pyrene	<50000 ppb
Benzo(a)anthracene	<220 ppb
Benzo(b)fluoranthene	<1100 ppb
Benzo(a)pyrene	<61 ppb
Indeno(1,2,3-cd)pyrene	<3200 ppb
Dibenzo(a,h)anthracene	<14 ppb
PCBs	<10 ppb
Inorganics	
Antimony	<9.6 ppm
Arsenic	<7.5 ppm
Barium	<300 ppm
Beryllium	<1.3 ppm
Cadmium	<1 ppm
Chromium	<25.9 ppm
Copper	<35.1 ppm
Manganese	<2240 ppm
Mercury	<0.1 ppm
Nickel	<41.1 ppm
Silver	<1.9 ppm
Vanadium	<150 ppm
Zinc	<141 ppm
Cyanide	<0.06 ppm