

**THIRD FIVE-YEAR REVIEW REPORT FOR
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**

August 2016

A handwritten signature in black ink, appearing to read "Walter E. Mugdam", is written over a horizontal dashed line.

**Walter E. Mugdam, Director
Emergency and Remedial Response Division**

A handwritten signature in black ink, appearing to read "September 9, 2016", is written over a horizontal dashed line.

Date

437461



Table of Contents

LIST OF ABBREVIATIONS & ACRONYMS 2

I. INTRODUCTION 3

 FIVE-YEAR REVIEW SUMMARY FORM 4

II. RESPONSE ACTION SUMMARY 4

 Basis for Taking Action 4

 IC Summary Table 8

 Systems Operations/Operation & Maintenance 8

III. PROGRESS SINCE THE LAST REVIEW 9

IV. FIVE-YEAR REVIEW PROCESS 9

 Community Notification, Involvement & Site Interviews 9

 Data Review 9

 Site Inspection 10

V. TECHNICAL ASSESSMENT 11

 QUESTION A: Is the remedy functioning as intended by the decision documents? 11

 QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid? 12

 QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy? 13

VI. ISSUES/RECOMMENDATIONS 14

 OTHER FINDINGS 14

VII. PROTECTIVNESS STATEMENT 14

VIII. NEXT REVIEW 14

REFERENCE LIST 14

LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
BHHRA	Baseline Human Health Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CR	Cancer Risk
COPC	Contaminant of Potential Concern
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
FS	Feasibility Study
HI	Hazard Index
ICs	Institutional Controls
LMS	Lawler Matusky & Skelly Engineers LLP
MCLs	Maximum Contaminant Levels
NPL	National Priorities List
NYSDOH	New York State Department of Health
NYSDEC	New York State Department of Environmental Conservation
O&M	Operation and Maintenance
OIG	Office of Inspector General
OSWER	Office of Solid Waste and Emergency Response
PAH	Polynuclear Aromatic Hydrocarbon
PPB	Parts per Billion
PPM	Parts per Million
PRP	Potentially Responsible Party
RAO	Remedial Action Objectives
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
RSLs	Regional Screening Levels
SVOC	Semi-Volatile Organic Compound
VOC	Volatile Organic Compound
WRS	WRS Infrastructure and Environment, Inc.
WQS	Water Quality Standards

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this five-year review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the third FYR for the Jones Sanitation Superfund site. The triggering action for this statutory review is the signing date of the previous five-year review report, dated June 22, 2011. The FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The site consists of one operable unit which will be addressed in this FYR.

The Jones Sanitation Superfund site Five-Year Review was led by Isabel R. Fredricks the Environmental Protection Agency (EPA) Remedial Project Manager (RPM). Participants included Peter Mannino (Western New York Remediation Section Chief), Julie McPherson (Risk Assessor), Edward Modica (Hydrogeologist) of EPA, and Wayne Mizerak (Project Manager) of New York State Department of Conservation (NYSDEC).

Site Background

The Jones Sanitation site (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. 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 physical site conditions are characterized by shallow soil deposits (0 to 15 feet) 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.

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.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Jones Sanitation Superfund Site		
EPA ID: NYD980534556		
Region: 2	State: NY	City/County: Town of Hyde Park, Dutchess County
SITE STATUS		
NPL Status: Deleted		
Multiple OUs? No	Has the site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: EPA <i>[If "Other Federal Agency", enter Agency name]:</i>		
Author name (Federal or State Project Manager): Isabel R. Fredricks		
Author affiliation: EPA		
Review period: 6/27/2011 - 4/30/2016		
Date of site inspection: 3/15/2016		
Type of review: Statutory		
Review number: 3		
Triggering action date: 6/27/2011		
Due date (five years after triggering action date): 6/27/2016		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

Beginning in 1970, the site became the focus of several investigations by the 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 biphenyls (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. 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 and Feasibility Study (RI/FS). The RI was 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 FS report was completed in 1996.

The 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 VOCs, SVOCs, PAHs and heavy metals in the soil and VOCs and metals, including, but not limited to arsenic and manganese in the groundwater presented an unacceptable potential threat to public health at the site under future use scenarios. The RI and human health risk assessment concluded that for potential future residents, there were carcinogenic risks for ingestion of soil and groundwater at the site.

The site contains two intermittent streams (Maritje Kill and an unnamed stream) and several wetlands. The two streams are capable of supporting only limited numbers of transient warmwater fishes. However, wetlands and wildlife (e.g., birds and mammals) indigenous to the site, are abundant and diverse. Samples collected in surface water and sediment present a potential ecological risk to receptors indigenous to the site based on the risk assessment conducted. Concentrations of three metals (cadmium, iron, and manganese) in sediments exceeded the NYSDEC's sediment quality criteria for freshwater aquatic life. The cadmium, iron, and manganese concentrations detected in the sediments are, however, within the range of background concentrations for these metals based on the levels detected in upstream samples. Although no distressed vegetation was detected at the site, and no threatened or endangered species were observed that may be impacted by the metal contaminant levels present, EPA and NYSDEC protocols were not strictly followed and the potential ecological risk may have been underestimated. Therefore, during the remedial design further field investigations were warranted to better assess the environmental impacts to this area.

Response Actions

On March 31, 1997, EPA issued a Record of Decision (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.

The remedial action objectives (RAOs) for soil are the NYSDEC recommended soil cleanup objectives identified in the Technical and Administrative Guidance Memorandum (TAGM HWR-94-4046). Due to the fact that arsenic and manganese pose the greatest potential risk at the site, the most significant RAOs for soil are arsenic at 7.5 parts per million (ppm) and manganese at less than 2,240 ppm.

Due to the fact that arsenic and manganese pose the greatest potential risk at the site, the most significant RAOs for soil are arsenic at 7.5 ppm and manganese at the site background (the manganese levels in New York State are typically in the range of 400-600 ppm).

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.

Groundwater RAOs were based on NYSDEC, Class GA groundwater standards and/or the EPA primary drinking water standards (MCLs), whichever were more stringent. The primary RAOs for groundwater are arsenic at 25 parts per billion (ppb) and manganese at 300 ppb.

Streams and Wetlands

Substantial contaminant concentrations were not detected in surface water or sediments at the site. Therefore, remedial action objectives were not developed for site surface waters or sediments and no remedial action was selected. However, the ROD required that, during the remedial design, further ecological risk assessment was to be performed to confirm that the surroundings streams and wetlands had not been impacted.

Status of Implementation

The potentially responsible parties (PRPs), Alpha Laval, Inc. and Theodore C. Losee, Sr. entered into a Consent Decree (CD) with EPA for the preparation of the remedial design documents and the performance of selected remedial actions; the CD was lodged on November 21, 1997 and entered on February 4, 1998.

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 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 was removed from eight 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 ongoing remedial efforts for the groundwater 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; installation of groundwater extraction wells on any part of the site, and any 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.

Supplemental Ecological Risk Assessment

Although an ecological risk assessment was performed during the RI, the ROD for the site required further field investigations during the remedial design to better assess the environmental impacts to this area. This additional ecological investigations were completed in February 2000; it was concluded that there were no unacceptable ecological risks. Furthermore, it was concluded that in light of the near-absence of fish resources on the site, lack of critical habitats for endangered or threatened species, or evidence of off-site transport of site-generated chemicals in excess of applicable criteria precluded the need for further assessment.

Site Completion

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

IC Summary Table

Table 1: Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater and soils	Yes	Yes	Cap/surrounding site property	Prohibits any development in the permanent cap area. No groundwater extraction wells on any part of the site. No interference with monitoring wells.	Environmental Easement with Restrictive Covenants, August 2003

Systems Operations/Operation & Maintenance

The long-term groundwater monitoring at the site originally included groundwater sampling of on-site monitoring wells and off-site sampling of nearby residential wells. The groundwater monitoring program included 15 on-site monitoring wells constructed both in the shallow and deeper portions of the on-site aquifer located outside the landfill area. A series of monitoring wells were installed on-site around the periphery of the cap to evaluate groundwater quality beneath and adjacent to the site. Monitoring wells were installed in pairs, one screened in the overburden, the second in the shallow bedrock. In addition, ten off-site residential drinking water supply wells in the vicinity of the site were originally included in the program. The long-term monitoring program originally consisted of quarterly sampling of the on-site monitoring wells and annual sampling of the residential wells. Pursuant to the ROD for the site, monitoring of the residential wells would be conducted for a period of five years, after which the results of the program would be re-evaluated to determine if monitoring should be continued, and if so, with what frequency and protocols. This monitoring program was initiated upon the completion of the remedial action for the site in 2001. After collecting data for a period of five years, the results were evaluated, and a determination was made in 2006 that no additional monitoring of the residential wells would be necessary. The remaining 5 well pairs are being monitored once every five years to support the FYR.

An 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 (which was suspended in 2009); and maintenance of the established vegetation cover within the capped area.

Potential site impacts from climate change have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the site.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the **last** five-year review as well as the recommendations from the **last** five-year review and the current status of those recommendations.

Table 2: Protectiveness Determinations/Statements from the 2011 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1	Protective	Protective
Sitewide	Protective	Protective

Table 3: Status of Recommendations from the 2011 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1	Well JSMS-6B appeared to be corroding and has been a source of nickel and chromium contamination	Demonstrate that Well JSMS-6B is no longer needed or replace the well with PVC well	Completed	Well was abandoned	2012

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

On November 19, 2015, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at 32 Superfund sites and four federal facilities in New York and New Jersey, including the Jones Sanitation site. The announcement can be found at the following web address: http://www2.epa.gov/sites/production/files/2015-11/documents/fy_16_fyr_public_website_summary.pdf. In addition to this notification, a public notice was made available and posted on the website for the Town of Hyde Park notifying the community of the initiation of the five-year review process, on May 2, 2016 and inviting the public to submit any comments to the U.S. EPA. The results of the review and the report will be made available at the site information repository located Hyde Park Free Public Library, 2 Main Street, Hyde Park, NY 12538.

Data Review

On-Site Monitoring Groundwater Well Sampling Program

Long-term groundwater monitoring of on-site groundwater at the Jones Sanitation site has been conducted since 2003. The objectives of the monitoring program are to provide additional data on the chemical composition, specifically VOCs and metals of on-site groundwater; evaluate potential changes in groundwater flow patterns and chemistry resulting from landfill closure activities; and monitor natural attenuation of contaminants in the groundwater. The on-site wells are located within the shallow zone at approximately 20 feet below ground surface and in the deeper zone at approximately 35 feet below ground

surface. Currently, the well network consists of the well pairs JSMW-1 (A&B), located at the northeast corner of the property, JSMW-3 (A&B), located east of the capped area, JSMW-4 (A&B), located south of the capped area, and JSMW-8 (A&B), located just north of the capped area. Well JSMW-6A is also monitored and is located about 250 feet west of the cap border (refer to Figure 1).

Data from 2015:

A round of groundwater sampling was conducted on select on-site monitoring wells in October 2015 in support of this five-year review. The previous sampling event was conducted in 2011, when 12 wells were sampled. The 2015 sampling event replicates the 2011 event except for the exclusion of well JSMW-6B in the group of sampled wells, which, as previously noted, was decommissioned. VOC detections from the wells sampled during 2015 were very similar to the results from the sampling event conducted in 2011 and remain consistent with historical sampling conducted at the site since 2002. Trace levels of VOCs were detected in four of the wells that were sampled and three of the sampled wells (JSMW-3B, JSMW-4A, and JSMW-8A) exhibited VOCs exceeding applicable NYSDEC standards.

In well JSMW-3B *cis*-1,2-dichloroethylene (*cis*-1,2-DCE) was detected at 1.2 ppb, the same concentration as was detected in this well during the next most recent sampling event in 2011. Other compounds detected in JSMW-3B included chlorobenzene at a concentration of 15 ppb, slightly down from 16 ppb in 2011, and 1,2-dichlorobenzene, detected at 1.6 ppb, also slightly down from 1.8 ppb in 2011. Other VOCs detected in trace amounts in JSMW-3B from the 2011 sampling, such as benzene, were not detected during the 2015 sampling event. JSMW-4A had an exceedance of *cis*-1,2-DCE, with a concentration of 5.4 ppb, a slight increase compared to the 4.6 ppb detected during 2011. Trichloroethylene (TCE) and tetrachloroethylene (PCE) both increased from 0.8 ppb and 2.8 ppb in 2011, respectively, to 1.3 ppb and 3.6 ppb in 2015. Groundwater from JSMW-4B had a detection of *cis*-1,2-DCE of 1 ppb compared to 1.5 ppb in 2011. JSMW-8A had a detection of 5.1 ppb chlorobenzene in the 2015 sampling event compared to the 4.6 ppb detected in 2011. Other trace amounts of VOCs that were detected in in the 2011 sampling event from well pair JSMW-8 (A&B) were not detected during this sampling event.

Iron and manganese were detected in well pairs JSMW-3 (A&B) and JSMW-8 (A&B) at concentrations above standards, with concentrations ranging from 384 ppb to 37,300 ppb and 425 ppb to 1,340 ppb, respectively. Exceedances of iron reported were also detected in wells JSMW-5A and JSMW-6A and an exceedance of manganese was detected in well JSMW-4A. The 2015 concentrations are similar to those detected during 2011 for iron and manganese and continue to reflect high background concentrations of these metals due to the bedrock and surficial geology of the area. Sodium was also reported in well pair JSMW-8 (A&B) and in well JSMW-6A at a concentration as high as 65,000 ppb. The high levels are attributed to the brackish groundwater character of the region.

Site Inspection

The inspection of the site was conducted on 3/15/2016. In attendance were Isabel R. Fredricks, the Environmental Protection Agency (EPA) Remedial Project Manager (RPM), Julie McPherson (Risk Assessor), Edward Modica (Hydrogeologist) of EPA, and Wayne Mizerak (Project Manager) of NYSDEC. The purpose of the inspection was to assess the protectiveness of the remedy. 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. The containment cell cap appeared fully vegetated with no bare spots and no evidence of erosion. Site fencing was observed to be in good condition and all wells were clearly marked.

V. TECHNICAL ASSESSMENT

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

Question A Summary:

All components of the remedy for the Jones Sanitation site are functioning as intended by the decision documents. As described in the 1997 ROD, the remedy for the site addresses contaminated soils and groundwater. The objectives of the remedy are to control source contamination at the site and reduce the migration of contaminants into the adjacent soils and into the groundwater. The soil remedy calls for capping, consolidation of contaminated soils from outlying areas beneath the cap, and surface water controls. The groundwater remedy involves a minimal action and includes long-term monitoring and implementation of institutional controls.

Remedial Action Performance

Cap installation and soil excavation activities were successfully completed on the site by 2001. The cap covers a 4.8-acre area over the central disposal area of the site and was constructed in conformance with 6 NYCRR, Part 360. The cap includes a low permeability layer to reduce infiltration and a porous layer to enhance drainage. Soils in outlying areas that were contaminated above action levels were excavated and placed beneath the cap. Confirmatory sampling was conducted in excavated areas to ensure that no contaminated soil remained. The excavations were backfilled with clean fill.

An ongoing maintenance program ensures the integrity of the cap. Based on the latest inspection, there are no major breaches or subsidence noted on the cap, nor is there any major erosion of topsoil or vegetative cover. Recently, a program has been initiated to measure the inclination (out-of-plumb) of the nine gas vents set on the cap because of the concern that excessive tilting of vents may induce stress and tearing at the vent's interface with the cap liner membrane. Based on a comparison of vent-out-of-plumb measurements made in April 2014 compared to baseline measurements made in November 2010, there appears to be little or negligible change in the position of vents.

Drainage-control structures of the remedy are functioning as designed and are in good working order. Surface water control consists of concrete culverts installed around the perimeter of the cap to ensure that runoff water does not erode the topsoil layer. The perimeter toe drainage and outfall system are functional and are well maintained.

The perimeter fence is inspected semi-annually and is noted to be in good repair. Also, there were no problems noted with the gate, signs, and access roads surrounding the landfill.

System Operations/O&M

As mentioned previously, monitoring wells were installed on-site near the periphery of the cap to evaluate groundwater quality (and water level) beneath and adjacent to the landfill. The wells were installed in pairs, in both the overburden and in the shallow-bedrock aquifers. Since 2003, site groundwater has been monitored for VOCs, metals, and indicator parameters. Initially groundwater-quality monitoring was conducted at a quarterly frequency. However, recently, the monitoring frequency has been adjusted so that sampling occurs once every five years, this owing to the consistently low levels of VOCs and of most metals that are observed in on-site wells historically.

The most recent water-quality data was collected in October 2015. Chlorobenzene, 1,2-DCB, PCE, TCE, and *cis*-1,2-DCE were detected in wells JSMW-3B, JSMW-4A, and JSMW-8A. Chlorobenzene was detected in well JSMW-3A at a concentration of 15 ppb (the highest VOC concentration of this round),

and at a concentration of 5.1 ppb in JSMW-8A; *cis*-1,2-DCE was detected in well JSMW-4A at a concentration of 5.4 ppb. These are the only VOC concentrations to exceed the NYSDEC GA standard for this sampling event. Concentrations of other VOCs ranged from 1 ppb to 3.6 ppb. Although benzene has been detected at low levels historically (in wells JSMW-3B and JSMW-8A), it was not detected in any well in this most recent sampling event. The results are similar to those from a previous sampling event conducted in 2011 and remain consistent with historical sampling conducted at the site since 2002.

Similarly, metals have been detected in most of the wells at the site at low levels; the exceptions being iron, manganese, and sodium, which were detected in several wells at concentrations that exceed the NYSDEC GA standard (maximum concentrations of 37,300 ppb, 1,340 ppb, and 65,000 ppb, respectively for the 2015 sampling event). The high levels of iron and manganese reflect the high background levels of these metals due to the bedrock and surficial geology of the area, whereas the high levels of sodium reflect the brackish character of the groundwater in the area.

Implementation of institutional Controls and other Measures

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. The easement also prohibits the installation of groundwater extraction wells 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.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

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

The toxicity values for several contaminants of potential concern (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 during the 2011 and 2015 sampling periods were compared to their respective residential groundwater Regional Screening Levels (RSLs). National Primary Drinking Water Standards and New York Department of Environmental Conservation Water Quality Standards (NYSDEC WQS). The maximum contaminant level (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 RSLs 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.

The water-quality data for the last several years indicate that there were some minor exceedences (NYSDEC WQS) of chlorobenzene in well JSMW-3B and JSMW-4A and JSMW-8A. The concentrations of chlorobenzene did not exceed their respective MCL or RSL. TCE was detected in JSMW-3B and JSMW-4A. The concentrations exceeded its respective RSL, but did not exceed its respective NYSDEC

WQS or MCL. TCE concentrations decreased in this monitoring well from 2011 to 2015. The well is located just off the southeastern edge of the cap (upgradient from the capped area but downgradient from the excavated contaminated areas). Groundwater in this area flows to the southwest. JSMW-4A is downgradient of JSMW-3B. TCE, PCE and chlorobenzene have been detected in this well. The concentrations show a slight increase, but are relatively the same. The concentrations are also below their respective MCL; however, TCE was detected above its respective RSL. The concentrations of TCE detected in the monitoring wells during the 2011 and 2015 sampling events are within the acceptable risk range (1×10^{-6} to 1×10^{-4}).

The following metals have exceeded their respective NYSDEC WQS, RSL or MCL in either the total or filtered samples collected from several monitoring wells within the past five years: iron; manganese; selenium; arsenic; and thallium. In general, the concentrations of metals in the monitoring wells have decreased from 2011 to 2015.

Soil vapor intrusion was not evaluated during the RI as a potential future exposure pathway. However, the pathway was initially identified and evaluated in the five-year review conducted in 2006 using a conservative (health protective) assumption that buildings are located above the maximum detected concentration of 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 COPCs with the vapor intrusion screening criteria. The maximum detected concentrations of several VOCs 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 over the plume. 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. This is consistent with conclusions made during the five-year review conducted in 2006. The vapor intrusion analysis conducted in 2006 and the data reviewed for this FYR still supports the conclusion that vapor intrusion could be an issue if buildings were constructed over the plume.

The land use is designated residential, the cleanup criteria were compared to the Regional Screening Levels - Residential Soil. The RAOs established are either within or below EPA's cancer risk range or below the non-cancer hazard index threshold of 1. Therefore, the RAOs are considered protective of human health.

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

No.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU1

OTHER FINDINGS

None.

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)
<i>Protectiveness Statement:</i> The remedy at the Jones Sanitation site is protective of human health and the environment.

Sitewide Protectiveness Statement
<i>Protectiveness Statement:</i> The remedy at the Jones Sanitation site is protective of human health and the environment.

VIII. NEXT REVIEW

The next five-year review report for the Jones Sanitation Superfund site is required five years from the completion date of this review.

REFERENCE LIST



Documents, Data and Information Reviewed in Completing this Five-Year Review

Record of Decision, 1997
Remedial Action Report, 2001
Close-out Report, 2001
Annual Long-term and Operation, Maintenance Reports and Monitoring Reports (2011- 2015)
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

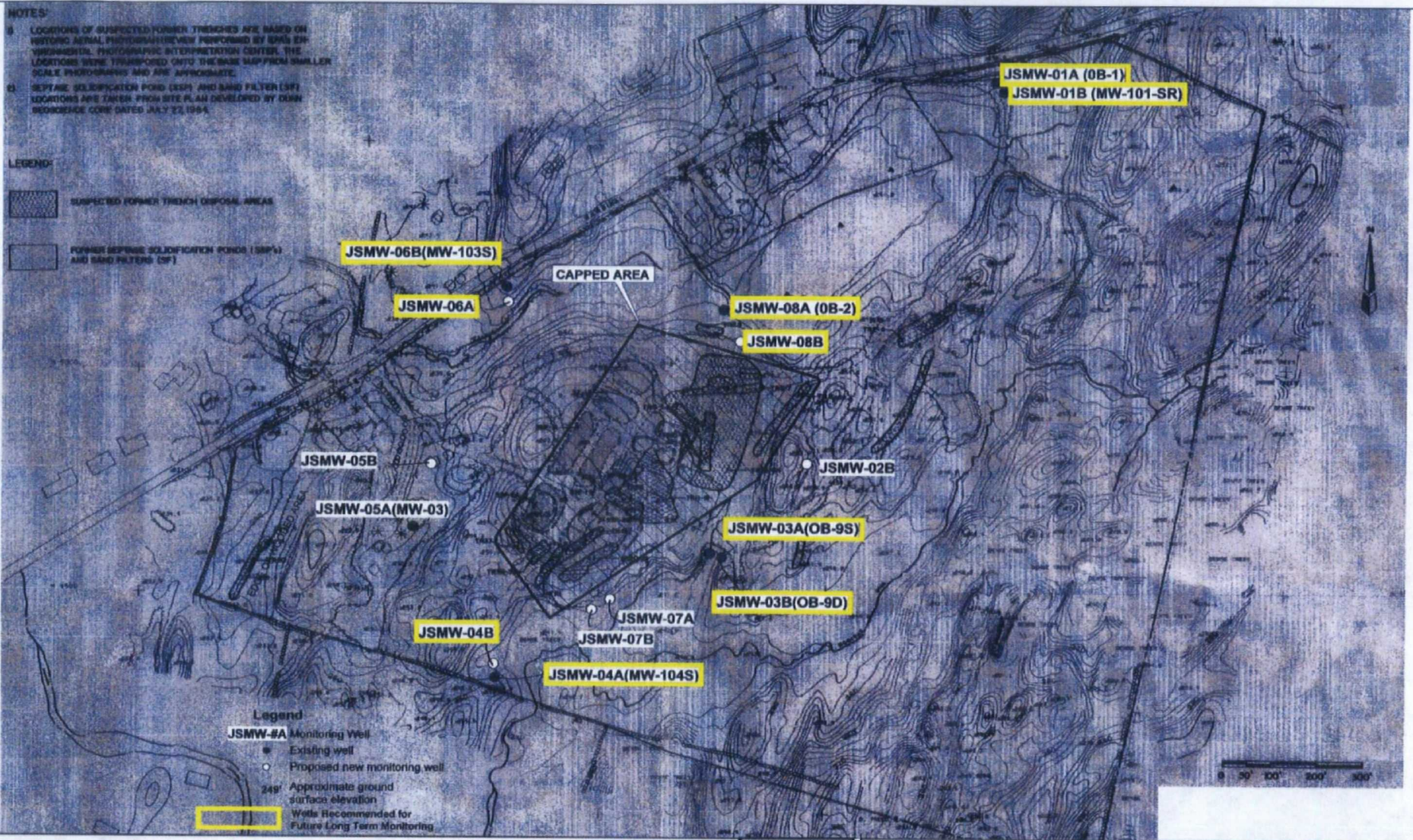
NOTES:

- 1) LOCATIONS OF SUSPECTED FORMER TRENCHES ARE BASED ON HISTORIC AERIAL PHOTOGRAPHS REVIEW PERFORMED BY DWA. ENVIRONMENTAL PHOTOGRAPHIC INTERPRETATION CENTER. THE LOCATIONS WERE TRANSFERRED ONTO THE BASE MAP FROM SMALLER SCALE PHOTOGRAPHS AND ARE APPROXIMATE.
- 2) SEPTIC SOLIDIFICATION POND (SSP) AND SAND FILTER (SF) LOCATIONS ARE TAKEN FROM SITE PLAN DEVELOPED BY DWA. GEOTECHNICAL CORP. DATED JULY 22, 1994.

LEGEND:

-  SUSPECTED FORMER TRENCH DISPOSAL AREAS
-  FORMER SEPTIC SOLIDIFICATION POND (SSP) AND SAND FILTERS (SF)

- Legend**
-  JSMW-#A Monitoring Well
 -  Existing well
 -  Proposed new monitoring well
 -  Approximate ground surface elevation
 -  Wells Recommended for Future Long Term Monitoring



Recommended Monitoring Wells for Reduced Schedule of Future Long Term Monitoring
JONES SANITATION LANDFILL
 TOWN OF HYDE PARK, DUTCHESS COUNTY, NEW YORK

DATE	02-07-06
FIGURE	1