SUPERFUND SITE CLOSE-OUT REPORT
FULTON TERMINALS SUPERFUND SITE
CITY OF FULTON, OSWEGO COUNTY, NEW YORK

I. INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has determined that all appropriate response actions for the Fulton Terminals Superfund site have been successfully implemented in accordance with *Close Out Procedures for National Priorities List sites* (OSWER Directive 9320.2-22, May 2011).

Specifically, based upon field observations associated with EPA oversight, it has been determined that the remedy has been implemented in accordance with the 1989 Record of Decision (ROD), as modified by a 1994 Explanation of Significant Differences (ESD).

It has been determined that the site is suitable for unlimited use and unrestricted exposure and no further response is anticipated. Human exposures and contaminated groundwater releases are under control.

II. SUMMARY OF SITE CONDITIONS

Site Background

The Fulton Terminals site originally consisted of an "On-Property" portion, an approximately 1.5-acre parcel of land bounded on the west by First Street, on the south by Shaw Street, on the east by New York State Route 481, and on the north by a warehouse, and an "Off-Property" portion, defined by the area between the On-Property portion's western property boundary to the Oswego River (approximately 50 feet). The site is located in an industrial section of the City of Fulton. The Oswego River is used for recreation. Residences, city and county offices and several businesses are located within a 1,500-foot radius of the site.

From 1936 to 1960, the primary activity on the property was the manufacturing of roofing materials, which involved the storage of asphalt in above-ground tanks and fuel oil storage in underground tanks. From 1972 to 1977, the property was used by Fulton Terminals, Inc. as a staging and storage area for solvents and other materials that were scheduled for incineration at the Pollution Abatement Services facility located in Oswego, New York. Operations at the Fulton Terminals facility resulted in the contamination of the groundwater, soil, and sediments with volatile organic compounds (VOCs).

From 1981 to 1983, Fulton Terminals, Inc. removed several tanks as part of a voluntary cleanup program. These activities ceased in 1983 after the facility operator was fined by the New York State Department of Environmental Conservation (NYSDEC) for the improper disposal of polychlorinated biphenyls. The site was listed on the National Priorities List (NPL) in 1982.

EPA and certain potentially responsible parties (PRPs) conducted removal activities at the site in 1986, consisting of constructing a seven-foot perimeter fence around the site, posting warning

signs, removing two above-ground tanks and two underground tanks, removing approximately 300 cubic yards of visibly-contaminated soil and tar-like wastes, and excavating storm drains that were acting as a conduit for contaminated runoff to enter the Oswego River during storm events. An additional removal action was performed in 1990, which involved the construction of earthen barriers for the prevention of surface runoff from the site.

Remedial Investigation and Feasibility Study Results

From 1985 to 1987, NYSDEC's contractor, URS Company, Inc., performed a remedial investigation/feasibility study (RI/FS) at the site. The RI/FS report that was generated from these efforts was declared invalid by NYSDEC because of problems associated with the laboratory analyses. A revised RI/FS report, based on additional sampling, was prepared by NYSDEC's contractor in 1988. EPA concluded, however, that the revised RI/FS report did not fully characterize the site. Accordingly, EPA performed a supplemental RI/FS. The conclusions set forth in the supplemental RI/FS, completed in 1989 by EPA's contractor, Ebasco Services, Inc., indicated that various VOCs were present in the unsaturated soil (above the water table) and in the groundwater at the site. An Endangerment Assessment for the site, which was also completed in 1989, contained conclusions that minimal human health risks were associated with the existing site conditions. However, the supplemental RI/FS process revealed that the leaching of VOCs from the contaminated on-site soil into the groundwater posed a risk to the environment.

Record of Decision Findings

The remedial action objectives selected for the site included:

- prevent contact with contaminated soil;
- prevent migration of contaminated soil via surface water runoff and erosion;
- ensure protection of groundwater and surface water from the continued release of contaminants from soils; and
- restore groundwater to levels consistent with state and federal water quality standards.

On September 29, 1989, a ROD was signed, in which EPA selected excavation and low temperature thermal desorption (LTTD) to treat approximately 4,000 cubic yards (CY) of contaminated soils located above the water table, and pumping, air stripping, carbon adsorption, and reinjection as the treatment method of the contaminated groundwater. The ROD also included the implementation of institutional controls to prevent the utilization of the groundwater at the site. The remediation goal of the soil remedy was to reduce the concentrations of VOCs in the soils to levels which would not cause the groundwater quality to exceed groundwater standards as a result of percolation of precipitation through the unsaturated soils.

Remedial Activities Performed

A consent decree was signed by the PRPs in 1990, in which they agreed to design and implement the remedy called for in the ROD. The consent decree became effective in 1991.

Soil Remediation

The remedial design (RD) of the soil excavation and treatment was initiated by Blasland, Bouck & Lee, Inc. (BBL), the contractor for the PRPs, in 1991.

Pre-RD sampling revealed the presence of a significant amount of contamination in the deep soil (from the water table down to bedrock). Because the contaminated soil below the water table would continue to leach contaminants to the groundwater, EPA concluded that remediating this soil would be beneficial to the long-term groundwater cleanup.

Remedial alternatives to address the contaminated soils below the water table were evaluated in a focused feasibility study (FFS) completed by BBL in 1994. The FFS determined that specialized methods for stabilizing the deep excavation area would be required for the removal of the contaminated soils because of the excavation depth, the need for control of groundwater infiltration into the excavation area, and the close proximity of the site to the Oswego River.

Based on the results of the pre-RD sampling effort and the findings of the FFS, EPA modified the soil remedy in a 1994 Explanation of Significant Differences (ESD). The ESD called for the excavation of the VOC-contaminated soils in the saturated zone (below the water table), followed by the treatment of the excavated soils by LTTD.

Following the completion of the plans and specifications related to the soil remedy in 1995, BBL initiated construction of the soil remedy. Because of the proximity of the site to the Oswego River, a "freeze wall" was used, which is a construction process whereby the ground is frozen at depth to allow the dry excavation of contaminated soils below the water table. The excavation, treatment, and backfilling were completed in 1996. The total amount of contaminated source material that was remediated was 10,200 cubic yards. Post-excavation soil sampling results indicated that residual levels of VOCs in soils were well below the target cleanup levels. A Remedial Action Report documenting the completion of the soil remedy was approved on September 30, 1996.

Groundwater Remediation

The groundwater remedy called for in the ROD required the reduction of VOC concentrations to Applicable or Relevant and Appropriate Requirements (ARARs)[1] by pumping groundwater from the saturated sand and gravel zone underlying the site, treating the groundwater by air stripping

[1] The ARARs for groundwater cleanup include EPA's Maximum Contaminant Levels (MCLs) and New York State's groundwater quality standards. The action levels established for all VOCs found at the site are 5 micrograms per liter (µg/L) (proposed MCL and New York State's groundwater quality standard at the time of ROD issuance) with the exception of vinyl chloride, which has an action level of 2 µg/L. d

and carbon adsorption, and reinjecting the water into the saturated sand and gravel zone.

The design of the groundwater remediation was performed from 1991 to 1994. Initiation of the groundwater remedial action (RA) was, however, postponed until all of the soil RA activities at the site were completed. At that time, a horizontal extraction well system consisting of a gallery of perforated piping and a collection manhole was installed at the base of the excavation. Given the overall effectiveness of the soil remedy, it was determined that groundwater standards could be achieved within a relatively short time frame if the groundwater extraction could be effected immediately. Utilizing a mobile treatment system, an expedited pumping of the contaminated groundwater commenced on February 11, 1997. The operation of the groundwater extraction and treatment system (including groundwater reinjection/surface water discharge), as well as weekly influent/effluent monitoring conducted during its operation, was performed by Clean Harbors. The system was shut down on May 30, 1997, when the influent data indicated that the objectives of the expedited pumping program had been achieved. During the 12-week operation period, approximately 8.8 million gallons of contaminated groundwater were extracted and treated. Subsequent groundwater sampling showed that MCLs had been achieved in the source area and groundwater modeling indicated that the Off-Property VOCs would naturally attenuate in a "reasonable" time frame. Residual subsurface ice from the freeze wall precluded an accurate evaluation of the groundwater remedy performance (the two downgradient monitoring wells were frozen). Following the forced thaw of the freeze wall via steam injection by the PRPs in 1998, the temperature of the groundwater and the concentrations of contaminants were monitored. Groundwater samples collected in 1999 indicated that the freeze wall was no longer intact (*i.e.*, the two monitoring wells were free of ice) and that the contamination levels in these wells were showing a decreasing trend. Completion of the groundwater operation and transition to long-term groundwater monitoring was documented in the September 30, 1999 Remedial Action Report.

Institutional Controls

The ROD included the implementation of institutional controls to prevent the utilization of the groundwater at the site. A deed restriction prohibiting the installation of wells at the site was filed with the Oswego County Clerk’s office on July 31, 2009. Groundwater has been remediated to drinking water standards and this institutional control is no longer a necessary component of the Comprehensive Environmental Response, Compensation, and Liability Act response action.

Preliminary Close-Out Report

A Preliminary Close-Out Report was approved on September 27, 1999.

Partial Site Deletion

On April 6, 2015, the On-Property portion of the site was deleted from the NPL. This deletion addressed all media for this portion of the site, namely surface soils, subsurface soils, and groundwater. Because residual groundwater contamination remained in the Off-Property portion of the site, groundwater monitoring and five-year reviews were still required for the Off-Property

portion of the site. Information supporting the partial deletion can be found in the *Federal Register* (80 FR 5957).

III. MONITORING RESULTS

Soil remediation activities were completed in 1996 and post-excavation soil sampling results indicated that residual levels of VOCs in soils were well below the target cleanup levels. This determination was documented in the September 30, 1996 Remedial Action Report and are summarized in the table below:

Chemical	Cleanup Goal from ROD milligrams per kilogram (mg/kg)	Soil Cleanup Level Achieved (mg/kg)
1,2-Dichloroethene (1,2-DCE)	1	<0.03
Trichloroethene (TCE)	2	<0.004
Benzene	1.4	<0.02
Vinyl Chloride (VC)	0.4	<0.01
Xylenes	8	<0.01
Chlorobenzene	5.5	<0.03
Methyl Isobutyl Ketone	2.5	<0.02

IV. ATTAINMENT OF GROUNDWATER RESTORATION CLEANUP LEVELS

For groundwater restoration remedies, OSWER 9355.0-129, *Guidance for Evaluating Completion of Groundwater Restoration Remedial Actions*, recommends evaluating contaminant of concern (COC) concentrations on a monitoring well-by-monitoring well basis to assess whether aquifer restoration is complete (*i.e.*, that the groundwater has met and will continue to meet cleanup levels for all COCs in the future). The guidance recommends that sufficient data be collected and evaluated using appropriate visual or statistical methods to make this determination.

The ARARs for the groundwater include MCLs and New York State's groundwater quality standards. The action levels established for the COCs are:

Groundwater COC	Action Level (µg/L)
1,2-DCE	5
TCE	5
VC	2

After completion of the groundwater remedial action in 1999, a sampling and analysis plan to assess the effectiveness of the groundwater remedy was completed. The groundwater monitoring well network included three source area (On-Property) monitoring wells (RX-1, RX-2, and RX-3)

and five Off-Property monitoring wells (RX-4, RX-5, RX-6, RX-7, and FBW-3). The initial plan required three years of post-remedy groundwater monitoring (March 2000 through September 2002) to verify the successful performance of the groundwater remedy. In October 2003, the groundwater long-term monitoring was extended for an additional three years.

Groundwater samples collected from 2000-2004 showed "non-detect" concentrations for all of the groundwater COCs in six of the eight monitoring wells (RX-1, RX-2, RX-3, RX-6, RX-7, and FBW-3). As a result, sampling at these wells was discontinued and they were abandoned in 2004.

As of 2004, the two remaining monitoring wells, RX-4 and RX-5, demonstrated attainment of TCE; however, cis-1,2-DCE and VC concentrations remained above their respective cleanup levels and concentration trends were decreasing. As a result, biannual sampling continued at these two monitoring wells.

In 2006, it was determined that monitoring well RX-5 continued to show a decreasing trend for all COCs and that groundwater had reached cleanup levels for multiple sampling events. As such, sampling at this well was discontinued in 2006.

Through 2009, biannual sampling continued. At this time, groundwater in monitoring well RX-4 continued to show cis-1,2- DCE and VC above their respective cleanup levels. It was determined that groundwater sampling should continue. Samples were collected from 2009 to 2017 and were used to demonstrate attainment in monitoring well RX-4:

Monitoring Well RX-4 VC Attainment Analysis

Six data points from 2009 through 2017 were analyzed using both a visual and statistical analysis. Specific to the groundwater meeting the VC cleanup level of 2 µg/L, a statistical analysis was conducted for the six data points and concluded that the mean concentration was 1.2 µg/L; however, due to statistical variation, the 95 percent upper confidence limit on the mean was 2.8 µg/L, slightly above the cleanup level of 2 µg/L. Although the upper confidence limit was slightly above 2 µg/L, the last three data points collected in 2016 and 2017 are all below the cleanup level, with two of the three being "non-detect."[2] As such, it was determined that the data provided assurance that the cleanup level for VC had been met in this monitoring well.

The data was also evaluated using a time-dependent trend. The trend for the six data points had a statistically significant decreasing slope providing assurance that the groundwater will continue to meet the cleanup level.

Monitoring Well RX-4 cis-1,2-DCE Attainment Analysis

[2] VC concentrations were "non-detect," 0.75 µg/L, and "non-detect" in July 2016, June 2017, and September 2017, respectively.

Five data points[3] from 2013 to 2017 were analyzed using both a visual and statistical analysis. Specific to the groundwater meeting the cis-1,2-DCE cleanup level of 5 µg/L, a statistical analysis was conducted and concluded that the mean concentration was 3.1 µg/L; however, much like the VC data, due to statistical variation, the 95 percent upper confidence limit on the mean was 14.1 µg/L. Although the upper confidence limit was three times the cleanup level, the last three data points collected in 2016 and 2017 were all below the cleanup level, with two of the three being "non-detect."[4] As such, it was determined that the data provided assurance that the cleanup level for cis-1,2-DCE had been met in this monitoring well.

The data was also evaluated using a time dependent trend. The trend for the five data points had a statistically significant decreasing sloping providing assurance that the groundwater will continue to meet the cleanup level.

Conclusion

Based on this analysis of all groundwater monitoring wells and associated contaminant-specific data, it has been concluded that the groundwater remedy has achieved the ROD cleanup levels and data analysis indicates that the groundwater will continue to stay below these standards. Therefore, the response action is determined to be completed and further groundwater monitoring at the site is no longer necessary.

V. SUMMARY OF OPERATION AND MAINTENANCE REQUIRED

No operation and maintenance is required at this site.

VI. DEMONSTRATION OF QA/QC FROM CLEANUP ACTIVITIES

RA activities at the site were undertaken in a manner consistent with the ROD (as modified by the ESD) and the design specifications. All applicable EPA and State quality assurance and quality control (QA/QC) procedures and protocols were incorporated into the design specifications. EPA analytical methods were used for all validation and monitoring samples during all RA activities. All procedures and protocols followed for groundwater and soil sample collection and analyses during the RA are documented in the plans, specifications, and design reports and the sample analyses were performed at state-certified laboratories.

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[3] The number of data points for VC and 4 cis-1,2-DCE are different because when evaluating attainment, one only includes data once attainment has been "initially met." This determination was made at different times for the two COCs.

[4] cis-1,2-DCE concentrations were "non-detect," 0.72 µg/L, and "non-detect" in July 2016, June 2017, and September 2017, respectively.

The QA/QC program used throughout the groundwater and source control RAs was rigorous and in conformance with EPA and State standards; therefore, EPA and the State determined that all analytical results are accurate to the degree needed to assure satisfactory execution of the RAs, consistent with the ROD, as modified by the ESD, and the design plans and specifications.

VIII. FIVE-YEAR REVIEW

Policy five-year reviews of the site were performed in September 2004, June 2009, and May 2014. The last five-year review concluded that the implemented remedy is protective of human health and the environment.

Based on the determination that the groundwater has achieved the ROD cleanup levels, no further five-year reviews are warranted because the site has achieved unlimited use/unrestricted exposure. This determination is documented in a December 2017 memorandum.

IX. SITE COMPLETION CRITERIA

The site meets all the completion requirements as specified in OSWER Directive 9320.2-22, *Close-Out Procedures for National Priorities List sites*. Specifically, all areas of concern have been adequately addressed, the implemented remedy achieves the degree of cleanup specified in the ROD, as modified by the ESD, for all pathways of exposure, and no further Superfund response is needed to protect human health and the environment.

Approved:

Walter E. Mugdan, Director
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Date