

GENERAL SITE INFORMATION, CHARACTERISTICS, AND STATUS

Project Name	<u>LIPARI LANDFILL</u>	ProjectID: 02-08
Last Updated:	09/23/98	
City:	Mantua Township	
County:	Gloucester	
State:	NJ	
Country:	USA	
Bodies of Water:	Alcyon Lake; Chestnut Branch stream and marsh; Rabbit Run (small tributary of Chestnut Branch)	
US EPA Region:	II	
Status (Active, Complete, or Monitoring Only):	Complete	
Date On NPL:	1983	
ROD/ESD Date:	1988	
Operable Unit:	N / A	
Areas of Concern (length or acres):	Alcyon Lake: 18 acres; Chestnut Branch Marsh: 5 acres; Chestnut Branch Stream: 6 - 9" deep, 8 - 10' wide max., 4 - 5' wide typical.	
Other Characteristics of Water Body:	Chestnut Branch flows in a northerly direction along the eastern side of the landfill. Rabbit Run originates from a small spring adjacent to the site, flows along the full length of the northwestern edge of the landfill, and empties into Chestnut Branch. Chestnut Branch empties into Alcyon Lake, approximately 1,000 feet north of the site. The topography of the site is rolling, with varying depth of depressions in the marsh and stream areas. Signs were posted in 1980 along Chestnut Branch and Alcyon Lake warning the public of potential risks associated with recreational use (due to chemical contaminants). Leachate seepage from under the marsh is an ongoing process. Groundwater is at or near the surface in Chestnut Branch marsh, especially after precipitation.	
Contaminants of Concern:	A total of 63 organic contaminants including benzene, toluene, and xylene, and 13 inorganic contaminants including arsenic, chromium, and lead.	
Source of Contamination:	Inactive municipal and industrial waste landfill.	
Contaminated Area Physical Characteristics:	Soils in the Chestnut Branch marsh; sediments in Chestnut Branch stream, Rabbit Run, and Alcyon Lake.	
Type of Regulatory Action:	Superfund. Final.	
Overall Status Summary:	Wet and dry excavation used to remove 163,000 cy, after stream and lake diversion and marsh draining was accomplished. Excavated volumes included 52,000 cy from marsh and streams (original design volume), 80,000 cy from lake, and an additional 31,000 cy from marsh (according to the PRP, as a result of inaccurate delineation by US EPA). No target cleanup level. Excavation down to natural clay, followed by placement of clean fill. No verification sampling. Thermal desorption of 83,000 cy excavated from marsh. Lake material used as daily cover at Waste Management's GROWS Landfill located in Bucks County, PA. Project completed in late 1996.	
Remedial Action Planned:	<input checked="" type="checkbox"/>	
Risk Assessment:	<input checked="" type="checkbox"/>	
Remedial Action Implemented:	<input checked="" type="checkbox"/>	
Status of Dredging	<input type="checkbox"/>	

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Project Name ***LIPARI LANDFILL***

ProjectID: 02-08

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PRPs: ☒

Contacts: ☒

References: ☒

Modeling: ☐

Fishing Advisory: ☐

Key Conditions: commercial landfill, wetlands, solidification / stabilization, thermal desorption

REMEDIAL ACTION PLANNED

Project Name	<u>LIPARI LANDFILL</u>	ProjectID: 02-08
Last Updated:	08/11/98	
Target Sediment Cleanup Standards (TSCS):	None established; during remediation target was non-detect for bis(2-chloroethyl)ether, defined by achievement of a depth horizon considered uncontaminated (the Kirkwood clay layer).	
How TSCS Established:	<p>A lifetime excess cancer risk greater than 1×10^{-6} (one in a million) was calculated for the following exposure pathways:</p> <ul style="list-style-type: none">• Direct contact with soils in the leachate seep areas;• Consumption of fish from Alcyon Lake; and• Inhalation of ambient air in the Howard Avenue residential area. <p>The risk assessment concluded that long-term exposure to volatile organic emissions originating in the Chestnut Branch marsh would result in a potential human health threat. Increased lifetime cancer incidences associated with exposure to bis (2-chloroethyl) ether, benzene, and 1, 2-dichloroethane were quantified. Although these compounds were detected during residential air monitoring with the TAGA unit, the Agency for Toxic Substances and Disease Registry evaluation of the TAGA data concluded that the levels detected did not pose a current health threat. The principal threats associated with these contaminants in the off-site areas included potential human health threats from long-term exposure to contaminants, and contaminants that are present in quantities that exceed environmental standards and guidelines.</p> <p>Remedial actions to remove persistent contaminants from Chestnut Branch marsh, Rabbit Run, Chestnut Branch stream, and Alcyon Lake would eliminate these threats. The installation of a collection system in the marsh outside of the slurry wall would ensure that no existing contaminants or potential future contaminant migration during on-site flushing impacts the off-site areas.</p> <p>No connection is explicitly made in the ROD between these risk-based levels of concern and the extent of remediation in the target areas.</p>	
Target Bank and Floodplain Cleanup Levels (if applicable):	N/A	
Other Target:	N/A	
Environmental Sample Data References:	<ul style="list-style-type: none">• Sediment: Reference A-236• Water: Reference A-236• Fish:	
Estimated Target Volume:	For marsh, original estimate of 51,500 cy; for lake, 140,000 cy of dredged material reduced to 56,000 cy after dewatering; for streams, undefined.	
Planned Disposal Method:	For marsh, lake, and stream "soils," dewatering, thermal treatment in a rotary kiln dryer, and disposal as non-hazardous material	
Estimated Calendar Time to Implement Remedy:		
Estimated Time to Implement Remedy:	3 years	

REMEDIAL ACTION PLANNED

Project Name	<u>LIPARI LANDFILL</u>	ProjectID: 02-08
Last Updated:	08/11/98	
Estimated Cost to Implement Remedy:	\$21 million present worth (ROD, July 11, 1988)	
Stated Remedial Action Objectives (and Source):	<p>(Source: ROD, July 11, 1988) The selected remedy includes Alternatives 2b (drain and cap Chestnut Branch marsh), 9b (excavate Chestnut Branch marsh and treat), 12b, 14b, and 18b (dredge Alcyon Lake, Rabbit Run, and Chestnut Branch, dewater and treat), 16 (pump/treat Kirkwood aquifer), and 19 (interim measure at Chestnut Branch).</p> <p>The community prefers that all of the contaminated soils and sediments in the off-site areas be excavated/dredged and treated to permanently remove contaminants. The selected remedy would be protective of human health and the environment by: 1) utilizing treatment to reduce toxicity and mobility of the waste; 2) being the most effective and permanent solution in the long-term; 3) being relatively easy to implement; and 4) assuring short-term effectiveness. Furthermore, alternatives 2b and 16 would meet the intent of the September 30, 1985 ROD relative to leachate collection.</p> <p>In summary, EPA has selected Alternatives 2b, 9b, 12b, 14b, 16, 18b, and 19 because they are protective of human health and the environment, will attain all applicable or relevant and appropriate requirements, are cost-effective, and utilize permanent solutions and treatment technologies or resource recovery options to the maximum extent practicable. Additionally, since these alternatives employ thermal treatment to eliminate the principal threat at the site, this option would also satisfy SARA's preference for remedies which employ treatment as their principal element to permanently and significantly reduce toxicity, mobility or volume of the contaminants.</p>	
Measures of Success to be Used:	Not defined.	
Planned Monitoring and Restoration:	Closure and site restoration will return the site as near as practical to its natural condition which existed prior to remediation activities. Final grading, planting, and restocking the lake will be performed as required by the wetland mitigation plan.	
Agency Position on Sediment Removal (and Source):	(ROD, July 11, 1988) The marsh soils, the leachate seep areas, and the sediments of Alcyon Lake, Rabbit Run and Chestnut Branch all contain contaminants that are also present in the surface waters at levels in violation of federal and state water quality standards and/or guide lines. The removal and treatment of the soils and sediments, coupled with the hydraulic isolation of the landfill via an off-site collection system will eliminate the soil/sediment/surface water interface as a contaminant pathway. The capture of seepage in the marsh, coupled with the interception of contaminated ground water in the Kirkwood aquifer will ensure that contaminants present in these areas will not migrate to the surface waters of Chestnut Branch and to downstream receiving waters.	

RISK ASSESSMENT

Project Name **LIPARI LANDFILL**

ProjectID: 02-08

Last Updated: 08/11/98

RA Type: Human Health

RA Status: Complete

RA Objectives:

***Company
Performing RA:***

RA Reference Report: Public Health Evaluation

***RA Summary and
Conclusions:*** (Source ROD, July 11, 1988): Risks:

Thirteen indicator chemicals were selected in accordance with the Superfund Public Health Evaluation Manual on the basis of toxicity, persistence, mobility and concentration. The list of indicator chemicals included: benzene, bis (2-chloroethyl) ether, 1,2-dichloroethane, ethyl-benzene, 4-methyl-2-pentanone, toluene, xylenes (total), arsenic, chromium, lead, mercury, nickel, and zinc.

For risk assessment purposes, individual contaminants were separated into two categories of chemical toxicity depending on whether they cause carcinogenic or non-carcinogenic effects.

The Public Health Evaluation (PHE) characterized the risk associated with exposure to off-site Lipari Landfill indicator chemicals. A lifetime excess cancer risk greater than 1×10^{-6} (one in a million) was characterized for the following exposure pathways:

- Direct contact with soils in the leachate seep areas
- Consumption of fish from Alcyon Lake
- Inhalation of ambient air in the Howard Avenue residential area

The PHE concluded that long-term exposure to volatile organic emissions originating in the Chestnut Branch marsh would result in a potential human health threat. Increased lifetime cancer incidences associated with exposure to BCEE, benzene, and 1,2-dichloroethane were quantified. Although these compounds were detected during residential air monitoring, the Agency for Toxic Substances and Disease Registry (ATSDR) evaluation of the data concluded that the levels detected do not pose a current health threat.

Contaminant migration persists in the leachate seeps that in turn migrate into the Chestnut Branch marsh, as well as into the air above the marsh and nearby residential areas, to Chestnut Branch stream, and to downstream receiving waters including Alcyon Lake. Studies have shown that bis(2-chloroethyl)ether and mercury are present in the tissue of fish from the lake. The landfill and the marsh areas are fenced to restrict access. Alcyon Lake is closed to fishing, swimming, boating and other recreational activities. The lake and streams are not used as sources of potable water.

The Pitman municipal wells, as well as 11 non-potable residential wells, have been sampled for priority pollutants, and most recently for Target Compound List contaminants. The water samples have demonstrated that contaminants from the Lipari Landfill have not migrated into any local wells.

REMEDIAL ACTION IMPLEMENTED

Project Name:	<u>LIPARI LANDFILL</u>	ProjectID: 02-08
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Physical Target:	Marsh soils; stream bed and lake sediments.	
Goals:		
Primary Contractor:	Sevenson Environmental Services	
Other Contractors:	US Army Corps of Engineers (Kansas City District), and its Contractors, Dames and Moore (Los Angeles) and Environmental Science and Engineering (Peoria, IL); URS Consultants Inc. (Buffalo, NY, office) as value engineering consultant.	
Generic Remediation Method:	Dry excavation (marsh and lake); wet excavation (stream)	
Equipment:	Excavators; thermal desorption unit for marsh sediments.	
Material Handling:	<p>The government's design called for a 2,000-foot-long, reinforced concrete stream-diversion channel that would support a 100-year storm flow estimated at 1,100 cubic feet per second. The channel was necessary to contain the stream and prevent it from inundating the adjacent marsh excavation activities. Two temporary steel-deck bridges also were required to provide site access across the channel. Using computer models of site hydrology and hydraulics a revised design was created by Sevenson that replaced the concrete channel with three custom-fabricated, 9-foot-diameter culvert pipes. The pipe and backfill were less expensive than concrete, easier to install and remove, eliminated the need for bridges, and provided an additional access road downstream of the marsh.</p> <p>The 18-acre Alcyon Lake was slated for temporary dewatering to allow excavation of 80,000 cubic yards of sediments. The original design to dewater the lake called for a force-main and pump system that would have operated continually during excavation (along with a provision that the contractor could propose other methods). This was replaced with a lower-cost, relatively silent gravity-flow channel and sedimentation pond system along the lakes west bank.</p> <p>The northwest corner of the lake was isolated using a sheet-pile cofferdam to provide a settling basin for the channel, controlling discharges of downstream sediment. Once the lake was dewatered, conventional sump pumps were used for further dewatering of lake sediments, which then were removed with excavators and dump trucks.</p> <p>Excavated material from the marsh was transported 3000 feet away to an on site thermal desorption unit for treatment.</p>	
Volume Removed:	Total volume: 163,500 cy; further breakdown: <ul style="list-style-type: none">• stream - 500 cy• lake - 80,000 cy• marsh - 83,000 cy	
Calendar Time:	Completed Fall 1996	
Time To Implement:	2 years	
Total Cost:	Approximately \$50 million; \$306 per cy.	
Dredging Cost:	N/A	
Disposal of Sediment:	Thermal desorption of excavated marsh sediments and placement onsite. Solidification of excavated lake materials and placement over treated marsh sediments. Some thermally desorbed material was deposited on an 11-acre location and used as base material. All of the lake bottom	

REMEDIAL ACTION IMPLEMENTED

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	materials were used for daily cover at a nearby commercial landfill.	
Volume of Water:	Not available (some wet excavation and sediment dewatering)	
Method of Water Treatment:	Water pumped from excavation areas was directed to catch basins.	
Water Discharge Limit:	Not available	
Air Monitoring During Remediation:	Not available	
Water Monitoring During Remediation:	Not available	
Outcome:	Depth target only; no verification sampling performed. Original remedial design (Chestnut Branch marsh) was removal down to Kirkwood Clay, then 6" into clay. In areas where Kirkwood Clay was not present (unexpected), went 18" below an extrapolated level of clay from contiguous areas. For excavation of lake sediments, built road across lake. Started on up-gradient side of lake and dismantled road as work progressed to down-gradient side. Removed total of 163,500 cy.	
Restoration and Post-Monitoring:	Excavation down to natural clay followed by placement of clean fill. The marsh restoration plan called for creating a forested floodplain ecosystem consistent with preexisting conditions. Lake restoration plans included a fish habitat with rock reefs and spawning beds, and the release of forage species and game fish.	
Site-Specific Difficulties:	<p>Field conditions were encountered during the project that were not reflected in the bid documents. Two of these were especially important, requiring quick action and creative solutions for the project to remain on schedule. These were the discovery of sulfur in the marsh soils and contamination beyond the contract's excavation limits. US EPA did not define limits of excavation properly according to the PRP. This made excavation and other remedial activities more difficult and costly because of the need to make in-field adjustments.</p> <p>The appearance of relatively high levels of naturally occurring pyritic sulfur in marsh soils contributed to a five-month shutdown of the thermal treatment unit for retrofitting. Because lake remediation could not be started before the marsh was excavated and the pace of the excavation was controlled by the treatment rate, shutdown of the treatment unit threatened closure of the entire project. To sustain project activities, a design was developed to provide onsite, double-lined storage for the marsh soils. This made marsh excavation independent of the unit's feed rate, taking the thermal unit off critical path.</p> <p>When additional contamination was discovered in the marsh, the PRP hired a contractor to conduct an investigation and develop an excavation plan. An additional 31,000 cubic yards of contaminated soil beyond the original government design were excavated.</p> <p>The safety of Lake Alcyon's large turtle population concerned area residents. They were worried that the turtles would be endangered when the lake was drained and excavated. To allay these fears, US EPA and the PRP funded a salvage operation that rescued more than 170 turtles, which were moved into a "turtle house" made from two tractor trailers and attended by a full-time biologist. The structure was equipped with tanks, aquariums, basking lights, and special food to simulate summer conditions in January, allowing the turtles to adapt to their new environment for a 10-month stay before being returned to the lake.</p>	

REMEDIAL ACTION IMPLEMENTED

Project Name: **LIPARI LANDFILL**

ProjectID: 02-08

Last Updated: 08/11/98

Monitoring Data

References:

- **Sediment**
- **Water:**
- **Fish:**

POTENTIALLY RESPONSIBLE PARTIES

Project Name **LIPARI LANDFILL**

ProjectID: 02-08

PRP Name: PRP INFORMATION NOT RELEASED

PRPID:

Street Address:

City:

State:

KEY CONTACTS

Project Name **LIPARI LANDFILL**

ProjectID: 02-08

Last Name: KEY CONTACT INFORMATION NOT RELEASED

Contact ID:

First Name:

Title:

Company:

Address:

City:

State:

Postal Code:

Work Phone # :

Other Phone #:

Fax # :

Email Address:

REFERENCES

Project Name LIPARI LANDFILL

ProjectID: 02-08

Reference Type: A

ReferenceID: 16

Title: *Investigation of the Lipari Landfill using Geophysical Techniques*

Location: AEM

Category: Contaminated Sediments: Overview of Issues

Prepared by/Author: Joseph R. Kolmeer

Preparer/Author Address: Woodward-Clyde Consultants
Plymouth Meeting, PA 19462

Prepared For: US EPA, Municipal Environmental Research Laboratory

Date Published: 1980s early

Key Words and Phrases: landfill, geophysical, techniques

Reference Type: A

ReferenceID: 235

Title: *Superfund Record of Decision: Lipari Landfill, NJ (Second Remedial Action, 09/30/85)*

Location: AEM

Category: ROD/Proposed Plan/Action Memo/Decision Document

Prepared by/Author: US EPA HQ (Rod / RO2-85/023)

Preparer/Author Address: 401 M Street, SW
Washington, DC 20460

Prepared For: General Public

Date Published: September 1985

Key Words and Phrases:

Reference Type: A

ReferenceID: 236

Title: *Superfund Record of Decision: Lipari Landfill, Mantua Township, Gloucester County New Jersey, July 11, 1988. (EPA Region 2) Third Remedial Action*

Location: AEM

Category: ROD/Proposed Plan/Action Memo/Decision Document

Prepared by/Author: US EPA HQ (PB89-219224)

Preparer/Author Address: 401 M Street, SW
Washington, DC 20460

Prepared For: General Public

Date Published: July 11, 1988

Key Words and Phrases:

REFERENCES

Project Name LIPARI LANDFILL

ProjectID: 02-08

Reference Type: A

ReferenceID: 243

Title: *Superfund Record of Decision: Lipari Landfill, NJ
(Groundwater)*

Location: AEM

Category: ROD/Proposed Plan/Action Memo/Decision Document

Prepared by/Author: US EPA HQ (ROD/RO2-82/006)

**Preparer/Author
Address:** 401 M Street, SW
Washington, DC 20460

Prepared For: General Public

Date Published: August 1982

**Key Words and
Phrases:**

Reference Type: A

ReferenceID: 247

Title: *Remedial Design Summary of Work*

Location: AEM

Category: Site Update

Prepared by/Author: US EPA Region II

**Preparer/Author
Address:** 290 Broadway
New York, NY 10007-1866

Prepared For:

Date Published:

**Key Words and
Phrases:**

Reference Type: B

ReferenceID: 244

Title: *Record of Decision Summary from Internet -- Lipari Landfill,
NJ*

Location: AEM

Category: Site Update

Prepared by/Author: US EPA HQ

**Preparer/Author
Address:** 401 M Street, SW
Washington, DC 20460

Prepared For: General Public

Date Published: December 14, 1991

**Key Words and
Phrases:**

REFERENCES

Project Name LIPARI LANDFILL

ProjectID: 02-08

Reference Type: C

ReferenceID: 150

Title: *Value Engineering, community relations speed Superfund site cleanup*

Location: AEM

Category: Site Update

Prepared by/Author: (1) Robert E. Murphy, (2) Paul Thomson and (3) Matt Yunaska

Preparer/Author Address: (1) URS Consultants,
(2) Severson Environmental Services, Inc., and
(3) Rohm and Haas

Prepared For: Environmental Solutions

Date Published: November 1996

Key Words and Phrases:

Reference Type: C

ReferenceID: 204

Title: *Lipari job agreement lodged*

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author Address:

Prepared For: Superfund Week

Date Published: March 18, 1994

Key Words and Phrases:

Reference Type: C

ReferenceID: 205

Title: *Lipari Landfill thermal contractor needed*

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author Address:

Prepared For: Superfund Week

Date Published: October 22, 1993

Key Words and Phrases:

REFERENCES

Project Name LIPARI LANDFILL

ProjectID: 02-08

Reference Type: C

ReferenceID: 206

Title: *PRPs sign Lipari payment pact*

Location: AEM

Category: Site Update

Prepared by/Author:

Preparer/Author

Address:

Prepared For: Superfund Week

Date Published: January 29, 1992

**Key Words and
Phrases:**

Reference Type: R

ReferenceID: 13

Title: *Letter to PRP re: Case Histories: Contaminated Sediment Sites
(with response from Rohm & Haas)*

Location: AEM

Category: Site Update

Prepared by/Author: AEM, Inc. with response from Rohm & Haas

**Preparer/Author
Address:** Malvern, PA 19355

Prepared For: Rohm & Haas, submitted to

Date Published: August 14, 1998

**Key Words and
Phrases:**
