

US EPA ARCHIVE DOCUMENT

**STATEMENT OF BASIS/FINAL DECISION AND
RESPONSE TO COMMENTS SUMMARY**

Region III
ID# 1223

ROHM AND HAAS DELAWARE VALLEY INC. BRISTOL LANDFILL

Bristol, Pennsylvania
(signed December 31, 1991)

Facility/Unit Type: Industrial landfill for active plastics and emulsions manufacturing plant
Contaminants: VOC, heavy metals
Media: Ground water, surface water, soil
Remedy: RCRA cap and cut-off wall, diversion trench

FACILITY DESCRIPTION

In February 1989, EPA and Rohm and Haas Delaware Valley Inc. (Rohm and Haas) entered into a Consent Order pursuant to Section 3008(h) of RCRA. Under the terms of the Consent Order, Rohm and Haas was required to complete a corrective measures study (CMS) and propose several corrective measures alternatives (CMAs) to EPA.

The 800-acre facility is an active manufacturing plant that has been in operation since 1917, producing a variety of compounds. The corrective action addresses a 60-acre industrial landfill which was used from approximately 1952 to 1975. There are three landfill areas. Landfill Area A covers approximately 38 acres and was in use from 1952 to 1975. Portions of Area A are on property owned by the Bristol Township Authority (BTA) and Chemical Properties, Inc. Landfill Areas B and C, approximately 11 and 8 acres, respectively, were in use from 1965 to 1975.

From 1984 to 1991, the depth to ground water ranged from 7.26 feet to 12.79 feet. Ground water flows radially from a potentiometric high on the BTA property adjoining the Rohm and Haas property. Ground water flows east and southeast toward the landfill and north toward Hog Run Creek.

The Delaware River and Hog Run Creek are the two closest bodies of surface water. Hog Run Creek runs directly through the landfill. The Delaware River borders the facility on the east. The Delaware River is used for recreational boating and swimming, fishing, drinking water, and transportation.

No previous corrective actions have been taken at the site.

EXPOSURE PATHWAYS

Exposure pathways of concern are direct contact, ingestion, and inhalation (while swimming) of water and direct contact with surface soil. Potential human receptors include dirt bike riders, landfill workers, residents using the Delaware River as a drinking water supply, local fishermen and their families, and recreational swimmers. The risk assessment results indicated no chronic or acute non-cancer health effects for the exposed population, with the exception of unprotected workers at the BTA facility. These workers could be exposed to unsafe levels of contamination during manual excavation around tanks and pipes.

The cancer risk for a 70-year-old lifetime resident subjected to all exposure pathways was calculated to be 3×10^{-6} (3 in 1 million).

Concentrations of bis(2-ethylhexyl) phthalate, manganese and compounds, inorganic mercury, cyclohexadiene, and tetraethyl diphosphoric acid exceed acceptable levels for freshwater aquatic life at a depth of 6 feet in the river. These chemicals pose a potential chronic health effect to aquatic life. Acute health effects, such as death of aquatic life, are not expected to result from releases from the landfill.

CONTAMINATION DETECTED AND CLEANUP GOALS

Media	Estimated Volume	Contaminant	Maximum Concentration	Action Level	Cleanup Goal	Point of Compliance	
Ground water (enhanced remediation)	Not provided	bis(2-c/h)ether	890 ug/l		150 ug/l	Wells LF-4-21, LF-102-15 Southeast area of Landfill A	
		bis(2-e/h)phthalate	1,980 ug/l		50 ug/l		
		chlorobenzene	170 ug/l		15 ug/l		
		1,2 dichlorobenzene	28 ug/l		20 ug/l		
		1,4 dichlorobenzene	61 ug/l		20 ug/l		
		2,4-dimethylphenol	182 ug/l		35 ug/l		
		ethylbenzene	453 ug/l		200 ug/l		
		toluene	940 ug/l		600 ug/l		
		total xylenes	3,000 ug/l		1,200 ug/l		
		total organics	11,194 ug/l		1		
	11,700 cu yds	BCEE			3,500 ug/		
Soil					Micrograms/liter		
					surface water*	ground water**	
Water	Not provided	1, 2-Dichloroethane	Not provided		20,000	0.20	Surface water: points nearest landfill on Delaware River and Hog Run Creek
		1, 1-Dichloroethane		-	0.20		
		Benzene		-	0.62		
		Vinyl Chloride		-	0.014		
		1, 4-Dichloroethane		763	0.75		
		2, 4, 6-Trichlorophenol		970	3.18		
		bis(2-c/e)ether		-	0.03		
		bis(2-c/h)phthalate		3.0	2.50		
		Dibenz(a,h)anthracene		-	0.010		
		Lindane		0.08	0.03	Ground water: northwest edge of landfill and	
		Isophorone		-	8.54		
		1, 1-Dichloroethane		-	0.02		
		Chloroform		1,240	0.42		
		Methylene Chloride		-	3.86		
		Tetrachloroethene		840	0.65		
		Trichloroethene		21,900	1.29		
		2, 4-Dichloroethane		365	105		
		2-Chlorophenol		2000	175		
		Boron		-	3,150		
		Chlorobenzene		-	146		
		Ethylbenzene		-	1,795		
		Manganese		-	3,500		
		Naphthalene		620	140		
		Antimony		1,600	14		
		Cadium		1.1	5		
		Cyanide		5.2	200		
		Lead		3.2	5		
Mercury	0.012	2					
Nickel	160	100					
Pentachlorophenol	13	0.71					
Zinc	110						

* Goals are based on Ambient Water Quality Criteria (AWQC).

** Goals are based on Human Health Criteria.

SELECTED REMEDY

EPA has determined that the subsurface contaminated soil in the Bristol Township Authority portion of Landfill Area A will be moved and consolidated into the Rohm and Haas section of Landfill Area A. This area will be contained with a cap and a slurry wall. A diversion trench also will be constructed to restrict the migration of contaminated ground water. Enhanced remediation will be performed for the southeast area of Area A to reduce the high concentrations of organics in the ground water there. The same remedy of a cap, containment structure, and ground water management will be implemented in Landfill Area B. Landfill Area C, where ground water contamination is not a concern, will be covered with a soil cap. A flood wall will be placed to protect the cap if it remains below the 100-year floodplain after construction.

EPA believes that the selected remedies will attain soil and ground water cleanup standards, will permanently reduce or eliminate further releases of hazardous waste, and will provide for the proper management of the wastes generated during the implementation of the corrective measures.

In response to public comment, EPA indicated the cost of the remedy will be from \$15 to \$35 million.

Additional studies will be completed to identify the need for biological media protection standards. A benchmark biological, chemical, and physical characterization of the existing impacts of contamination will be established to determine the need for mitigation of such impacts. During construction of the selected remedies, the river and creek will be monitored to identify any degradation caused by construction activity.

INNOVATIVE TECHNOLOGIES CONSIDERED

None.

PUBLIC PARTICIPATION

A public meeting was held on September 19, 1991 to discuss the proposed Corrective Measures Alternatives. During the public comment period from August 25, 1991 through September 24, 1991, EPA received 117 comments.

The public comments covered many issues, ranging from general questions about the site to detailed technical inquiries. Major issues raised include:

- The accuracy and completeness of the characterization of site hydrogeology, including a bedrock trough
- The feasibility of grouting the slurry wall in bedrock and the selection of materials for the slurry wall
- The health and safety of residents and workers during construction of the remedy
- Potential air quality impacts of the remedy
- Arrangements for long-term maintenance, monitoring, and oversight of the corrective measures and financial responsibility for these activities.

Some commentors expressed a preference for excavation and removal of contaminated media. Commentors also wanted an opportunity to comment on the remedy design.

NEXT STEPS

There are four additional study areas that are under investigation as part of the order. These include the trailer staging area, the ammonium sulfate area, the manufacturing area, and the wastewater treatment plant.

Implementation of the selected remedies requires perpetual maintenance. Rohm and Haas has indicated commitment to perform the required perpetual maintenance if the property is ever sold.

KEY WORDS

ground water, soil, surface water; dermal contact, ingestion; VOCs, xylenes, toluene; heavy metals, mercury; cap, hydraulic containment, slurry wall.

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