Coastal and Estuarine

Hazardous Waste Site Reports

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Hazardous Waste Site Reports

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Acronyms and abbreviations

AST Above-ground Storage Tank

AWQC Ambient water quality criteria for the protection of aquatic life

bgs below ground surface

BHC benzene hexachloride

BNA base, neutral, and acid-extractable organic compounds

BOD biological oxygen demand

BSL brine sludge lagoon

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act of 1980

CERCLIS Comprehensive Environmental Response, Compensation, and Liability Information System

cfs cubic feet per second

cm centimeter

COC contaminant of concern

COD chemical oxygen demand

COE U.S. Army Corps of Engineers

CRC Coastal Resource Coordinator

DDD dichlorodiphenyldichloroethane

DDE dichlorodiphenyldichloroethylene

DDT dichlorodiphenyltrichloroethane

DNAPL dense non-aqueous phase liquid

DNT dinitrotoluene

DOD U.S. Department of Defense

DOI U.S. Department of the Interior

EPA U.S. Environmental Protection Agency

ERL Effects Range - Low

ERM Effects Range - Median

ft foot

ha hectare

HMX cyclotetramethylene tetranitramine

HRS Hazard Ranking System

HUC Hydrologic Unit Code

kg kilogram

km kilometer

L liter

LNAPL light, non-aqueous phase liquid

LOEL lowest observed effects level

m meter

mi mile

m^3/second cubic meter per second

µg/g micrograms per gram (ppm)

µg/kg micrograms per kilogram (ppb)

µg/L micrograms per liter (ppb)

µR/hr microroentgens per hour

mg milligram

mg/kg milligrams per kilogram (ppm)

mg/L milligrams per liter (ppm)

mR/hr milliroentgens per hour

NAPL non-aqueous phase liquid

NFA no further action

NOAA National Oceanic and Atmospheric Administration

NPDES National Pollutant Discharge Elimination System

NPL National Priorities List

OU operable unit

PAH polycyclic (or polynuclear) aromatic hydrocarbon

PA/SI Preliminary Assessment/Site Investigation

PCB polychlorinated biphenyl

PCE perchloroethylene (aka tetrachloro-ethylene)

pCi/g picocuries per gram

PCP pentachlorophenol

PNRS Preliminary Natural Resource Survey

ppb parts per billion

ppm parts per million

ppt parts per thousand or parts per trillion

PRP Potentially Responsible Party

PVC polyvinyl chloride

RCRA Resource Conservation and Recovery Act

RD/RA	Remedial Design/Remedial Action
RDX	cyclonite
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SVOC	semi-volatile organic compound
TCA	1,1,1-trichloroethane
TCE	trichloroethylene
TCL	Target Compound List
TNT	trinitrotoluene
TPH	total petroleum hydrocarbons
TSS	total suspended solids
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
VOC	volatile organic compound
<	less than
>	greater than

Introduction

The National Oceanic and Atmospheric Administration (NOAA) regularly evaluates hazardous waste sites that are proposed for addition to the National Priorities List (NPL), a U.S. Environmental Protection Agency (USEPA) listing of sites that have undergone preliminary assessment and site inspection to determine which locations pose the greatest threat. The NPL is compiled under authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (United States Code, Title 42, Chapter 103). This volume identifies hazardous waste sites that could impact natural resources for which NOAA acts as a federal trustee under the National Oil and Hazardous Substances Pollution Contingency Plan (commonly referred to as the National Contingency Plan or NCP) (Code of Federal Regulations, Title 40, Part 300).

Waste site reports (WSRs) of the type included in this volume often represent NOAA's first examination of a site. Following completion of a WSR, some sites may require a more in-depth assessment called a Preliminary Natural Resource Survey (PNRS). NOAA has published 337 coastal and estuarine hazardous WSRs, 143 PNRS's, and three Air Force Reports (see Tables 1 and 2 in the appendix for a complete list).

Not all hazardous waste sites will affect NOAA trust resources; NOAA is concerned about sites located near trustee resources and their habitats in states along the Atlantic and Pacific oceans, the Gulf of Mexico, and the Great Lakes. NOAA works with the USEPA to identify and assess risks to natural resources and to develop strategies to minimize those risks. Trustee responsibilities also include evaluating cleanup alternatives and restoring habitats.

NOAA uses information from this volume to establish priorities for further site investigations. NOAA's regional Coastal Resource Coordinators (CRCs) will follow up on sites that appear to pose ongoing problems. The CRCs work with other agencies and trustees to communicate any concerns to the USEPA. The CRCs also review sampling and monitoring plans for the sites and help to plan and set objectives for site cleanups. This coordinated approach protects all natural resources, not just those for which NOAA is a steward. The USEPA can also use the WSRs to help identify the types of information that may be needed to complete environmental assessments of the sites. Other federal and state trustees can use the reports to help evaluate the potential impacts to their resources.

Each WSR contains an executive summary and three distinct sections. The first section, Site Background, describes the site, previous site operations and disposal practices, and pathways by which contaminants could migrate to NOAA trust resources. The second section, NOAA Trust Resources, describes the species, habitats, and commercial and recreational fisheries near the site. The final section, Site-Related Contamination, identifies the contaminants of concern to NOAA and describes contaminant distribution at the site.

In addition to the WSRs, this volume contains a list of acronyms and abbreviations (p. vii) and a glossary of terms (p. 59) that commonly appear throughout the reports. Table 1 in the appendix lists the WSRs that NOAA has published to date, and Table 2 lists all of the sites as of April 2003 at which NOAA has been involved because of their potential to affect trust resources. Table 2 also lists the number and variety of hazardous waste reports that the Coastal Protection and Restoration Division has published since 1984, including PNRS's and Air Force Reports.

Chemical-Specific Screening Guidelines

Most WSRs contain a table that focuses on the contaminants in different media that have potential to degrade natural resources. These site-specific tables highlight only a few of the many contami-

nants often found at hazardous waste sites. We compare the chemical concentrations reported in the tables against published screening guidelines for surface water, groundwater, soil, and sediment. Because contaminant releases from hazardous waste sites to the environment can span many years, we are concerned about long-term effects to natural resources. This is why we compare site contaminant levels against screening guidelines for chronic effects rather than for short-term effects.

Ambient water quality criteria (AWQC) (USEPA 1993; USEPA 1999) are used for comparison to contaminant levels detected in surface water and groundwater; mean U.S. soil concentrations (Shacklette and Boerngen 1984; USEPA 1983; Lindsay 1979) are used for comparison to contaminant levels in soil; and effects range-low (ER-L) values (Long and Morgan 1991) and threshold effects level (TEL) values (MacDonald 1993) are used for comparison to contaminant levels in sediment.

There are no national criteria for sediment comparable to the AWQC established for water. In the absence of national criteria, we compare sediment concentrations against several published screening guidelines (Long and Morgan 1991; MacDonald 1993). Studies that associate contaminant concentrations in sediment with biological effects provide guidance for evaluating contaminant concentrations that could harm sediment-dwelling aquatic organisms. These studies include MacDonald et al. 2000a; MacDonald et al. 2000b; Kemble et al. 2000; Long et al. 1998; MacDonald et al. 1996; Smith et al. 1996; Long et al. 1995; and Long and MacDonald 1992. However, screening guidelines are often based on effects from individual chemicals. Their application may be difficult when evaluating biological effects that could be attributed to combined effects from multiple chemicals, unrecognized chemicals, or physical parameters that were not measured.

NOAA's National Status and Trends Program has used chemical and toxicological evidence from a number of modeling, field, and laboratory studies to determine the ranges of chemical concentrations associated with toxic biological effects (Long and Morgan 1991; Kemble et al. 2000):

- No Effects Range — the range of concentrations over which toxic effects are rarely observed;
- Possible Effects Range — the range of concentrations over which toxic effects are occasionally observed; and
- Probable Effects Range — the range of concentrations over which toxic effects are frequently observed.

Two slightly different methods (Long and Morgan 1991; MacDonald 1993) were used to determine these chemical ranges. Long and Morgan (1991; see also Long et al. 1995) compiled chemical data associated with adverse biological effects. The data were ranked to determine where a chemical concentration was associated with an adverse effect (the ER-L)—the lower 10^{th} percentile for the data set in which effects were observed or predicted. Sediment samples were not expected to be toxic when all chemical concentrations were below the ER-L values.

MacDonald (1993) modified the approach used by Long and Morgan to include both the "effects" and "no effects" data, whereas Long and Morgan used only the "effects" data. TELs were derived by taking the geometric mean of the 15^{th} percentile of the "effects" data and the 50^{th} percentile of the "no effects" data.

Although different percentiles were used for these two methods, their results closely agree (Kemble et al. 2000). We do not advocate one method over the other, and we use both screening guidelines to help focus cleanup efforts in areas where natural resources may be at risk from site-related contaminants.

Chemical concentrations in soil that are elevated above background levels (for this purpose, the mean U.S. soil concentrations) can indicate a potential source of contamination. Ideally, screening guidelines for soils would be calculated from a regional data set. In the absence of such data, we compare site soils against the national average values (Shacklette and Boerngen 1984), except for cadmium and silver, which we compare against average concentrations in the Earth's crust (USEPA 1983; Lindsay 1979). The soil values are based on averages calculated from soil data collected throughout the U.S. and are used as a reference only for comparison purposes.

References

Kemble, N.E., D.G. Hardesty, C.G. Ingersoll, B.T. Johnson, F.J. Dwyer, and D.D. MacDonald. 2000. An evaluation of the toxicity of contaminated sediments from Waukegan Harbor, Illinois, following remediation. Archives of Environmental Contamination and Toxicology 39:452-461.

Lindsay, W.L. 1979. Chemical Equilibria in Soils. New York, NY: John Wiley & Sons. 449 pp.

Long, E.R. and L.G. Morgan. 1991. The potential for biological effects of sediment-sorbed contaminants tested in the National Status and Trends Program. NOAA Technical Memorandum NOS OMA 52. Seattle: Office of Oceanography and Marine Assessment, National Oceanic and Atmospheric Administration. 175 pp.

Long, E.R. and D.D. MacDonald. 1992. National Status and Trends Program approach [in] sediment classification methods compendium, EPA 823-R-92-006, September 1992. Washington, DC: Office of Water, U.S. Environmental Protection Agency.

Long, E.R., D.D. MacDonald, S.L. Smith, and F.D. Calder. 1995. Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments. Environmental Management 19 (1):81-97.

Long, E.R., L.J. Field, and D.D. MacDonald. 1998. Predicting toxicity in marine sediments with numerical sediment quality guidelines. Environmental Toxicology and Chemistry 17(4): 714-727.

MacDonald, D.D. 1993. Development of an approach to the assessment of sediment quality in Florida coastal waters, January 1993. Tallahassee: Florida Department of Environmental Regulation. 133 pp.

MacDonald, D.D., R.S. Carr, F.D. Calder, E.R. Long, and C.G. Ingersoll. 1996. Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5(4):253-278.

MacDonald, D.D., L.M. DiPinto, J. Field, C.G. Ingersoll, E.R. Long, and R.C. Swartz. 2000a. Development and evaluation of consensus-based sediment effect concentrations for polychlorinated biphenyls. Environmental Toxicology and Chemistry 19(5):1403-1413.

MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000b. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Archives of Environmental Contamination and Toxicology 39:20-31.

Shacklette, H.T. and J.G. Boerngen. 1984. Element concentrations in soils and other surficial materials of the conterminous United States. USGS Professional Paper 1270. Washington, DC: U.S. Geological Survey.

Smith, S.L., D.D. MacDonald, K.A. Keenleyside, C.G. Ingersoll, and L.J. Field. 1996. A preliminary evaluation of sediment quality assessment values for freshwater ecosystems. Journal of Great Lakes Research 22 (3):624-638.

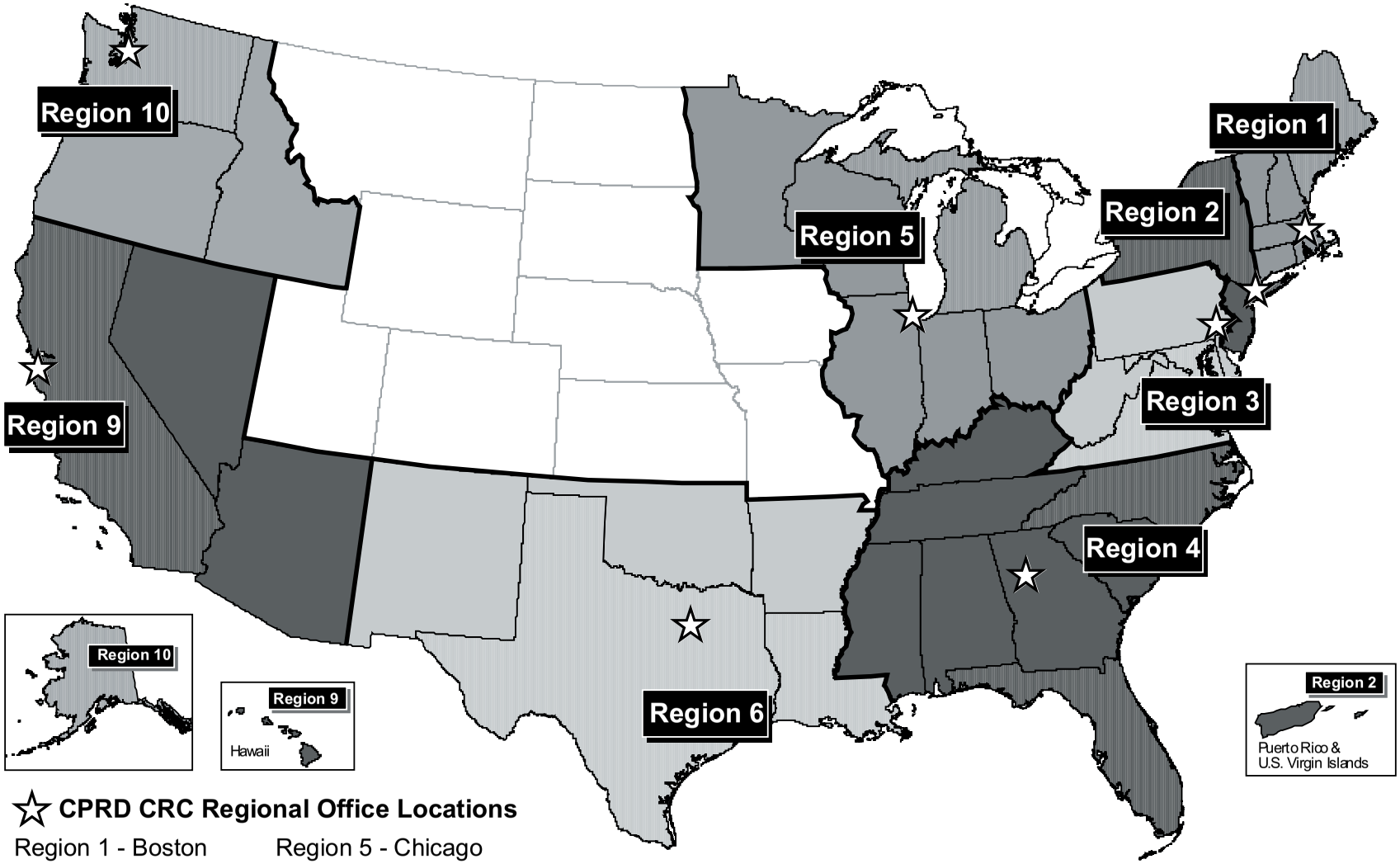
References, *cont*.

U.S. Environmental Protection Agency (USEPA). 1983. Hazardous waste land treatment. EPA SW-874. Cincinnati: Solid and Hazardous Waste Division, Municipal Environmental Research Laboratory, 702 pp.

U.S. Environmental Protection Agency (USEPA). 1993. Water quality criteria. Office of Water, Health and Ecological Criteria Division, Washington, DC.

U.S. Environmental Protection Agency (USEPA). 1999. National recommended water quality criteria — correction. EPA 822-Z-99-001. Washington, DC: U.S. Environmental Protection Agency, Office of Water.

CPRD Coastal Resource Coordinators in EPA Regions



☆ **CPRD CRC Regional Office Locations**

Region 1 - Boston
Region 2 - New York
Region 3 - Philadelphia
Region 4 - Atlanta
Region 5 - Chicago
Region 6 - Dallas
Region 9 - San Francisco
Region 10 - Seattle

Elizabeth Mine

Strafford, Vermont

EPA Facility ID: VTD988366621

Basin: Waits

HUC: 01080103

Executive Summary

The Elizabeth Mine is an abandoned copper mine along the West Branch Ompompanoosuc River in South Strafford, Vermont. Mining, copper smelting, and ore processing have left behind tailings piles, which are suspected to be the primary sources of metals contamination at the site. When water percolates through the tailings piles, sulfuric acid, which is toxic to aquatic resources, is formed. The sulfuric acid dissolves and mobilizes the metals in the tailings piles; the metals are then released into surface water and groundwater that flows into the West Branch Ompompanoosuc River. Metals are also released into stream sediments and soils on and near the site. Contaminants from the Elizabeth Mine site are considered a threat to Atlantic salmon, a NOAA trust resource. The NOAA habitat of concern is the surface waters of the Ompompanoosuc River; the river and its tributaries are part of the Connecticut River Atlantic Salmon Restoration Program.

Site Background

The Elizabeth Mine is an abandoned copper mine in Strafford, Vermont (Figure 1). The mine property is surrounded by woodlands, and there are residential and undeveloped properties along the site's western border. The property encompasses three mine tailings piles and two open-cut mines, as well as several adits (horizontal mine entrances), underground shafts and tunnels, ventilation shafts, and former ore processing buildings (Figure 2; USEPA 2000).

Four primary contaminant source areas have been identified at the Elizabeth Mine site: tailings pile one (TP-1), tailings pile two (TP-2), tailings pile three (TP-3), and a continuous discharge of groundwater from an old air shift connected to the underground work areas of the mine (Figure 2). All four of these source areas eventually discharge contaminants to the West Branch Ompompanoosuc River (WBOR).

The materials that make up TP-1 and TP-2 were generated through the milling of sulfide ores between 1942 and 1958 (Arthur D. Little 2001a). TP-1 and TP-2 are approximately 12 ha (30 acres) and 2.0 ha (5 acres) in area, respectively (Arthur D. Little 2001a). TP-3 was generated from mining and copper smelting operations during the 1800s and early 1900s. TP-3 is approximately 2.4 ha (6 acres) in area and ranges from a few meters to more than 12 m (40 ft) in thickness (Arthur D. Little 2001a).

The Elizabeth Mine site is primarily drained by Copperas Brook (Tetra Tech 2000). Surface water flow in this brook varies within the course of a normal year. During the summer, flow within the Copperas Brook watershed is intermittent. Except during rain events, winter flow is often at near-summer conditions (Arthur D. Little 2001a). When there is sufficient surface water in the Copperas Brook watershed, the brook drains northward from its origin at TP-3, through a divide in TP-2,

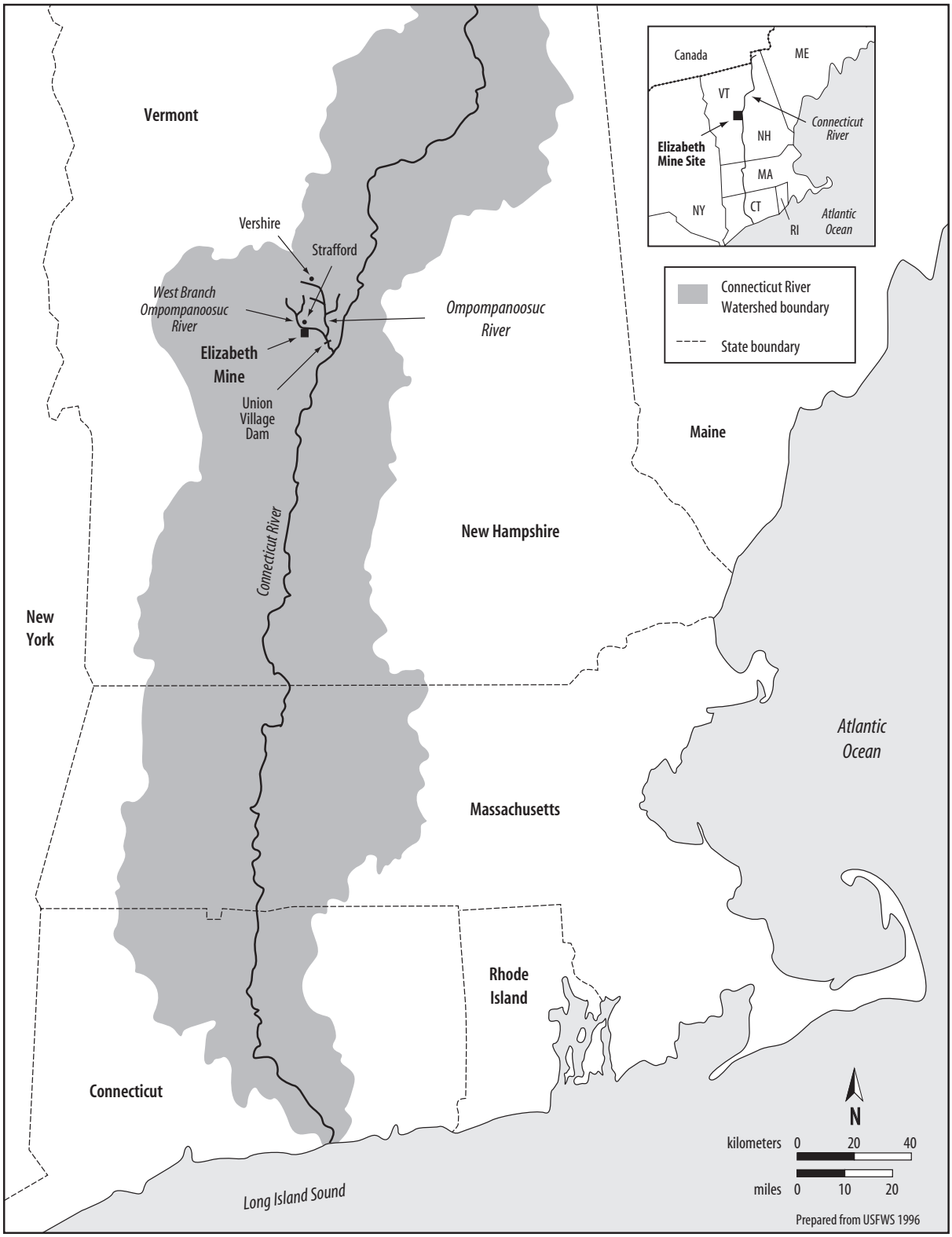


Figure 1. Location of Elizabeth Mine, Strafford, Vermont.

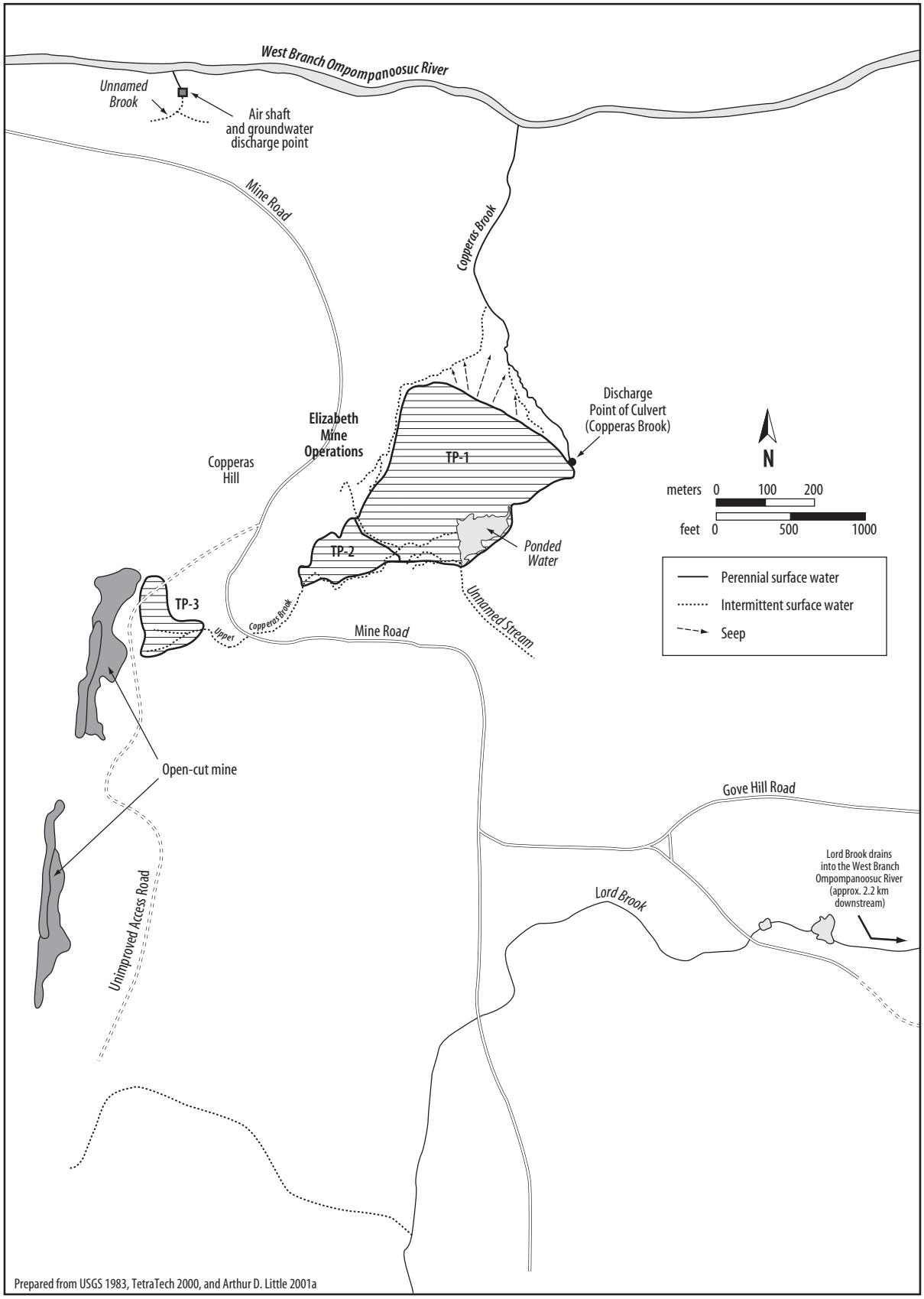


Figure 2. Detail of Elizabeth Mine site.

and toward TP-1, where it forms a small pond (Figure 2). Some water leaves this pond through concrete pipes and discharges at the northeast corner of TP-1, and some percolates through TP-1 (Arthur D. Little 2001a). The water that percolates through TP-1 produces sulfuric acid, which then dissolves and mobilizes the metals within the tailings piles into the surface water, ultimately draining into the WBOR (USEPA 2000).

Since the Elizabeth Mine site was abandoned in 1958, underground work areas have been flooded with groundwater, which mixes with acid mine drainage and discharges from an old air shaft that originally provided ventilation for the mine (Figure 2). Drainage from the old air shaft flows overland and empties into an unnamed brook, which discharges into the WBOR (Tetra Tech 2000).

Although they are not considered a primary source of contamination at the site, two open-cut mines discharge acid mine drainage to surface waters near the site. The northernmost open-cut mine drains into Copperas Brook, while drainage from the southernmost open-cut mine enters Lord Brook. Lord Brook empties into the WBOR downstream of the WBOR's confluence with Copperas Brook (Figure 2; Tetra Tech 2000).

A hazard ranking system package was completed for the Elizabeth Mine site on December 1, 2000. The site was proposed to the National Priorities List (NPL) on the same date, and was placed on the NPL on June 14, 2001 (USEPA 2000).

NOAA Trust Resources

The NOAA trust habitats of concern are the the Ompompanoosuc River and it's tributaries near the mine. The NOAA trust resource potentially at risk is the Atlantic salmon. The Ompompanoosuc River and its tributaries are part of the Connecticut River Atlantic Salmon Restoration Program.

From its confluence with Copperas Brook, the WBOR flows approximately 10 km (6.2 mi) downstream where it joins the Ompompanoosuc River, which eventually empties into the Connecticut River (Figure 1). From the confluence of the WBOR and the Ompompanoosuc River, it is approximately 1.2 km (¾ mi) to the Union Village Dam (Figure 1) (Arthur D. Little 2001a). There are no fish passage facilities at the Union Village Dam, so upstream migration of fish from the Connecticut River is limited to the first 5.6 km (3.5 mi) of the Ompompanoosuc River, below the dam (Kirn 2002).

Although no Atlantic salmon were found among fish samples recently collected from below Union Village Dam, Atlantic salmon fry are stocked above and below the dam (Kirn 2002; Langdon 2002). Salmon fry are stocked above the dam as far north as Vershire, for the purpose of smolt production. In the Ompompanoosuc River, the majority of the habitat suitable for Atlantic salmon smolts is located upstream of the Union Village Dam (Kirn 2002, 2003). The Union Village Dam is used only for flood-control, allowing the dam to be left open year-round. The design of the dam allows juvenile salmon to pass through the dam, moving with the flow of the water, but the dam is an impassable barrier to the upstream migration of returning adult salmon (McMenemy 2002). Restoration plans that would allow upstream fish passage around the Union Village Dam have been deferred until the numbers of adult salmon returning to the river basin increase (Covington 2002; Kirn 2003).

Atlantic salmon fry are not stocked in the WBOR now, but salmon fry could be stocked there in the future if suitable habitat allowed for their survival (Kirn 2002). The riverine wetlands in the WBOR are classified as upper perennial, open-water wetlands which could provide habitat for Atlantic salmon (Arthur D. Little 2001a).

There is no commercial or recreational fishing of Atlantic salmon in the WBOR. A fish consumption advisory, which recommends reduced fish consumption, is currently in effect for all Vermont waters. The advisory is for resident fish species, including chain pickerel, lake trout, largemouth bass, northern pike, smallmouth bass, and walleye (VDH 2000).

Site-Related Contamination

Metals are the primary contaminants of concern to NOAA at the Elizabeth Mine site. Samples of surface water, groundwater, and sediment collected from the site were analyzed for metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and pesticides, and other water quality parameters were measured. Soil samples were analyzed for metals. The maximum concentrations of metals detected in these media are summarized in Table 1.

Table 1. Maximum concentrations of contaminants of concern at the Elizabeth Mine site (Arthur D. Little 2001a; Arthur D. Little 2001b).

	Soil (mg/kg)		Water (µg/L)			Sediment (mg/kg)	
Contaminant	Soil	Mean U.S.[a]	Ground-water	Surface water	AWQC[b]	Sediment	TEL[c]
INORGANIC COMPOUNDS							
Arsenic	8.5	5.2	<0.0096	N/A	150	3	5.9
Cadmium	2.5	0.06	0.016	140	2.2[d]	8	0.596
Chromium[g]	57	37	0.032	120	11	62	37.3
Copper	1400	17	13	100,000	9[d]	4600	35.7
Lead	43	16	0.022	30	2.5[d]	25	35
Mercury	0.1	0.058	0.00045	0.63	0.77[e]	0.33	0.174
Nickel	45	13	0.13	1000	52[d]	32	18
Selenium	40	0.26	<0.0044	9	5.0[e]	13	NA
Silver	6.4	0.05	<0.0036	43	0.12[d,f]	4	NA
Zinc	160	48	2.1	17000	120[d]	350	123.1

a: Shacklette and Boerngen (1984), except for cadmium and silver, which represent average concentrations in the Earth's crust from Lindsay (1979).

b: Ambient water quality criteria for the protection of aquatic organisms (USEPA 1993, 1999). Freshwater chronic criteria presented.

c: Threshold effects level is the geometric mean of the 15th percentile of the effects data and the 50th percentile of the no-effects data. The TEL is intended to represent the concentration below which adverse biological effects rarely occurred (Smith et al. 1996).

d: Criterion expressed as a function of total hardness; concentrations shown correspond to hardness of 100 mg/L.

e: Criterion expressed as total recoverable metal.

f: Chronic criterion not available; acute criterion presented.

g: Screening guidelines represent concentrations for $Cr.^{+6}$

NA: Screening guidelines not available.

N/A: Not analyzed

6 EPA Region 1

The U.S. Environmental Protection Agency collected surface water samples at 46 locations throughout the Elizabeth Mine area (composite sampling resulted in a total of 72 discrete samples). Sediment samples were also collected at the same 46 locations. Groundwater samples were collected from a series of ten residential wells located along Mine Road, west of TP-1 and TP-2. As of 2001, no permanent monitoring wells had been installed at the Elizabeth Mine site. Soil samples were collected in July 2000 from three residences located along Mine Road near the Elizabeth Mine site. Three samples were taken from each of the residential properties (Arthur D. Little 2001a).

In soil samples, all the maximum concentrations of detected metals exceeded the soil screening guidelines. The maximum concentrations of arsenic, cadmium, mercury, selenium, silver, and zinc were all detected at the residence closest to TP-3. The maximum concentration of copper, which was more than an order of magnitude greater than the soil screening guideline, and the maximum concentrations of chromium and nickel were all detected at the residence closest to TP-1 and TP-2.

In surface water samples, the maximum concentrations of detected metals all exceeded ambient water quality criteria (AWQC) by at least one order of magnitude (copper by four orders of magnitude), with the exceptions of mercury, which had a maximum concentration somewhat below its AWQC, and selenium, which had a maximum concentration almost twice its AWQC (Table 1). With the exception of mercury, all the maximum concentrations of metals were detected in samples collected from either Copperas Brook or areas near the tailings piles (frequently just above TP-2 or just downstream of TP-1). The maximum concentration of mercury was located 100 m (335 ft) downstream of the confluence of Copperas Brook and the WBOR.

In groundwater samples, copper was the only metal present at a maximum concentration that exceeded the AWQC. Arsenic, selenium, and silver were not detected in groundwater samples; the remaining metals for which the samples were analyzed were detected at concentrations below the AWQC.

Neither surface water nor groundwater samples collected from the Elizabeth Mine site exceeded applicable water quality criteria for VOCs, SVOCs, PCBs, or pesticides, but detection limits for these contaminants were not provided (Arthur D. Little 2001a).

In sediment samples, the maximum concentrations of several metals exceeded the threshold effects level (TEL) screening guidelines. Maximum concentrations of cadmium and copper both exceeded TELs by at least one order of magnitude. Chromium, mercury, nickel, and zinc were also detected at maximum concentrations in excess of TELs. Arsenic was detected at a maximum concentration below its TEL value. Although selenium and silver were both detected, there are no TELs for those two metals. The maximum concentrations of cadmium, lead, mercury, and selenium were all detected in Copperas Brook sediments within a short distance of TP-1 and TP-2. Maximum concentrations of chromium and copper were detected near the southernmost open-cut mine. The greatest concentration of zinc was detected in a sample collected near the air shaft, just upstream of the confluence of Copperas Brook and the WBOR. The maximum concentration of silver was detected in a sample collected from the confluence of Copperas Brook and the WBOR.

References

Arthur D. Little. 2001a. DRAFT: Elizabeth Mine site conditions report. Cambridge, Massachusetts: Prepared for the U.S. Army Corps of Engineers.

Arthur D. Little. 2001b. Preliminary ecological risk evaluation: Elizabeth Copper Mine site, Strafford, Vermont. Cambridge, Massachusetts.

References, *cont.*

Kirn, R. District fisheries biologist for the State Fish and Wildlife Lab. Roxbury, VT. Personal communication February 8, 2002.

Kirn, R. District fisheries biologist for the State Fish and Wildlife Lab. Roxbury, VT. Personal communication March 3, 2003.

Langdon, R. Aquatic biologist for the Vermont Department of Environmental Conservation. Personal communication February 7, 2002.

Lindsay, W.L. 1979. Chemical Equilibria in Soils. New York, NY: John Wiley & Sons. 449 pp.

McMenemy, J. District fisheries biologist for the Vermont Department of Fish and Wildlife. Waterbury, VT. Personal communication February 5, 2002.

Shacklette, H.T. and J.G. Boerngen. 1984. Element concentrations in soils and other surficial materials of the conterminous United States. USGS Professional Paper 1720. Washington, DC: U.S. Geological Survey.

Smith, S.L, D.D. MacDonald, K.A. Keenleyside, C.G. Ingersoll, and L.J. Field. 1996. A preliminary evaluation of sediment quality assessment values for freshwater ecosystems. J. Great Lakes Res. 22(3): 624-638.

Tetra Tech NUS Inc. (Tetra Tech). 2000. Final hazard ranking system package for Elizabeth Mine, Strafford, Vermont. Wilmington, MA: Prepared for USEPA.

U.S. Environmental Protection Agency (USEPA). 1993. Water quality criteria. Washington, DC: Office of Water, Health and Ecological Criteria Division. 294 pp.

U.S. Environmental Protection Agency (USEPA). 1999. National recommended water quality criteria—correction: U.S. Environmental Protection Agency, Office of Water.

U.S. Environmental Protection Agency (USEPA). 2000. NPL site narrative at listing Elizabeth Mine, Strafford, Vermont. Available: http://www.epa.gov/superfund/sites/npl/nar1612.htm.

U.S. Fish and Wildlife Service (USFWS). 1996. Connecticut River watershed map. USFWS. Sunderland, MA.

U.S. Geological Survey (USGS). 1983. South Strafford Quadrangle, Vermont, 7.5 minute series (topographic). 1:24,000. U.S. Geological Survey. Denver, CO.

Vermont Department of Health (VDH). 2000. Health alert: Vermont Department of Health recommends that people limit their consumption of some fish caught in Vermont waters. Available: http://www.healthyvermonters.info/hp/fish/fishalert.shtml.

8 EPA Region 1

Martin Aaron, Inc.

Camden, New Jersey

EPA Facility ID: NJD014623854

Basin: Lower Delaware

HUC: 02040202

Executive Summary

The Martin Aaron site is approximately 1 km (0.6 mi) east of the Delaware River. From 1969 to 1998, a drum reconditioning facility was operated on the property. Drum residues were discharged directly onto the ground or to the storm sewer system. Environmental investigations at the property show that soil, groundwater, and sewer basin sediment are contaminated with metals, PAHs and other SVOCs, pesticides, and PCBs at concentrations that exceed screening guidelines. No investigation-related sampling occurred in the Delaware River or in areas downgradient of the property. The tidal, freshwater reach of the Delaware River in the vicinity of the Martin Aaron property provides spawning, nursery, and adult habitat for numerous NOAA trust resources. The NOAA habitats of concern are the surface waters and sediments of the Delaware River.

Site Background

The Martin Aaron, Inc., site in Camden, New Jersey, is an approximately 1-ha (2.2-acre) site about 1 km (0.6 mi) east of the Delaware River (Figure 1) (USEPA 1993a).

From 1969 to 1998, a drum reconditioning facility was operated on the property (Weston 1999). Volatile organic compounds (VOCs), acids, bases, and fuel oils were used in the drum reconditioning process (Kimball 1999). Figure 2 depicts a schematic layout of the facility. Residues from rinsate runoff and steam blowdown were collected in drainage tanks and floor drains that discharged into four settling basins. Basins 1, 2, and 3 are not connected to the storm sewer system, which means that effluents could have been directly discharged from these basins to the subsurface. Basin 4 discharges to the storm sewer system through a permitted outflow. The remainder of the property consists of paved and unpaved surfaces where drums were stored.

In 1988, the U.S. Environmental Protection Agency (USEPA) conducted a site inspection that revealed buried drums containing hazardous wastes and soils contaminated with hazardous substances (USEPA 1988). A remedial investigation was completed in 1999 (Kimball 1999). Numerous past discharges of contaminants and hazardous substances to the soil and the storm sewer system have been documented. In addition, contamination on the South Jersey Port Corporation's adjacent property has been attributed to past operations at Martin Aaron, Inc. In September 1999, the USEPA proposed that the site be placed on the National Priorities List.

Groundwater discharge and direct discharge through the storm sewer system are the primary pathways for the migration of contaminants from the site to NOAA trust resources. Groundwater beneath the site is part of the Potomac-Raritan-Magothy aquifer system found at a depth of 1.0 to 2.3 m (3.5 to 7.5 ft) below ground surface, and flows east and southeast. Although groundwater flows parallel to and away from the Delaware River, groundwater may be intercepted by Newton

Creek, a tidal tributary approximately 1.6 km (1 mi) south of the Martin Aaron property. In addition, the property is located in the 100-year floodplain of the Delaware River. The facility has a permitted outfall, which allows effluent to enter the storm sewer system. Runoff in the storm sewer system is treated before being discharged into the Delaware River except during periods of heavy flow and high dilution; during those periods, untreated waters are discharged directly to the river (USEPA 1993a).

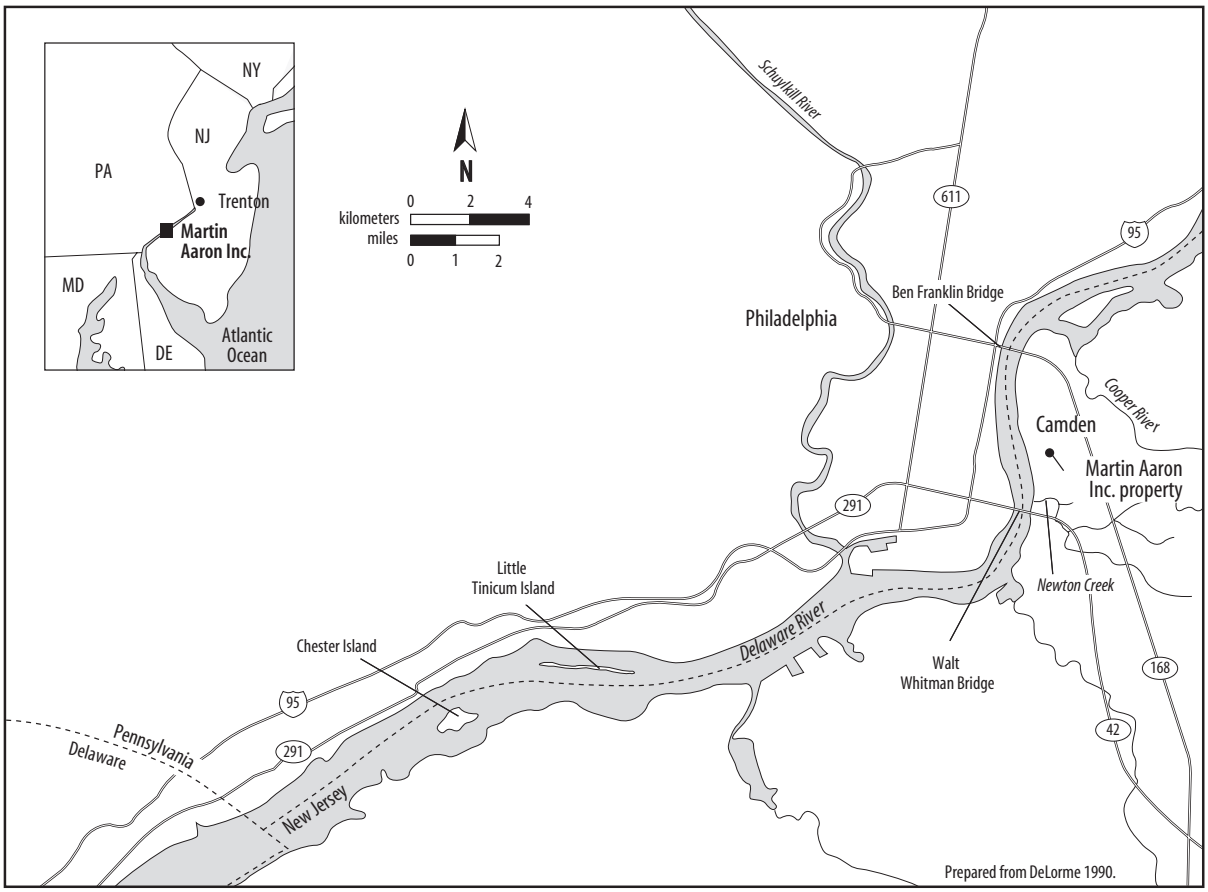


Figure 1. Location of Martin Aaron Inc., Camden, New Jersey.

NOAA Trust Resources

The NOAA habitats of concern in the vicinity of the Martin Aaron property are the surface waters and sediments of the Delaware River. This tidal, freshwater reach of the Delaware River measures approximately 900 m (3,000 ft) in width with depths ranging from 9 to 15 m (30 to 50 ft). Both shores of the river are heavily developed in this area, with piers and seawalls and few tideflats. Periodic dredging maintains a navigation channel (USACE 2002). Bottom substrates (sediments) range from silty sands to rocky debris (EA Engineering 1998). NOAA trust resources that use this reach of the river for spawning, nursery, or adult habitat are anadromous, catadromous, and marine/estuarine fish and invertebrates tolerant of fresh water (Table 1).

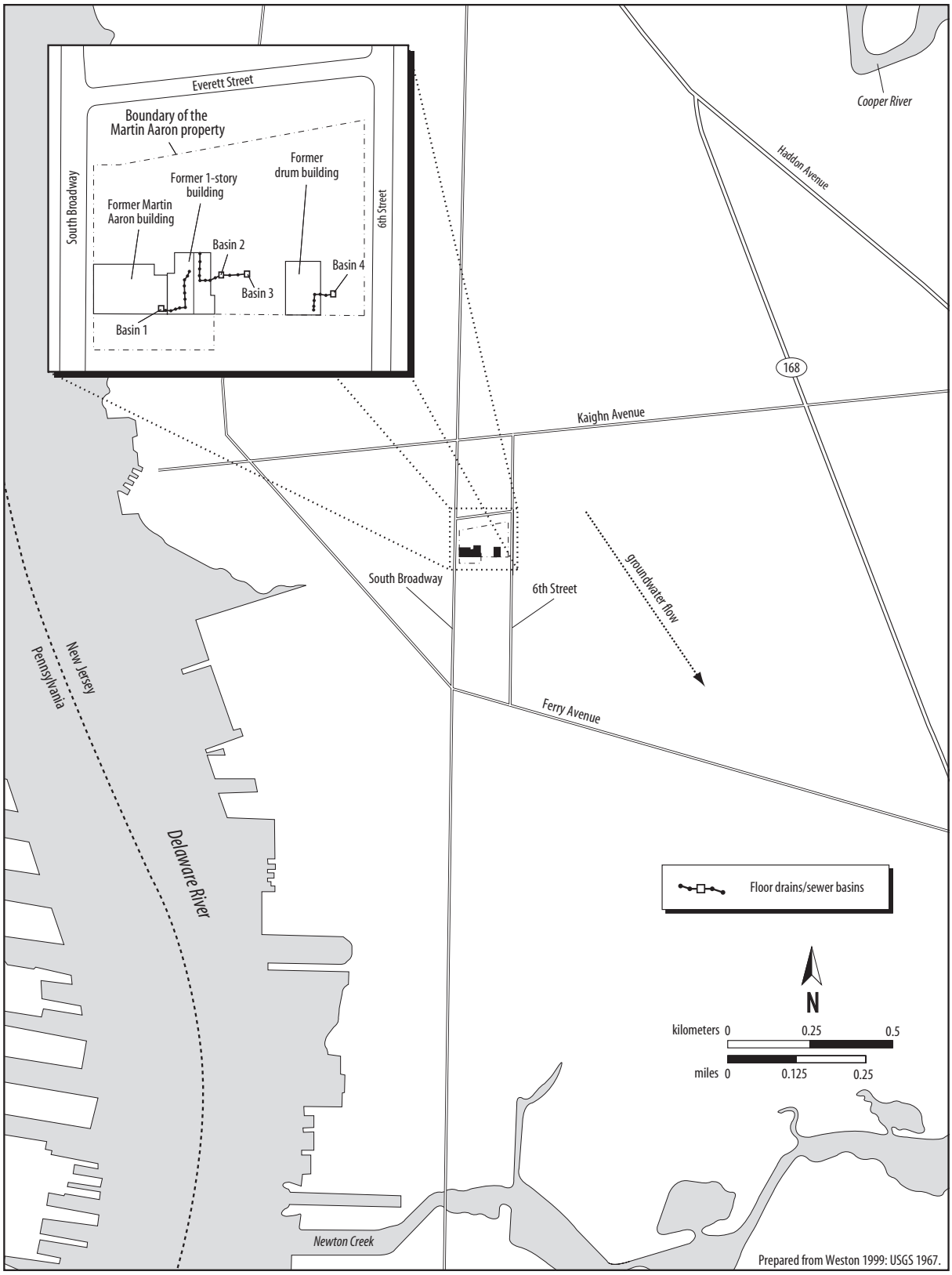


Figure 2. Detail of the Martin Aaron, Inc. property.

Table 1. NOAA trust resources found in tidal freshwater portions of the Delaware River in the vicinity of Martin Aaron, Inc. (Stone et al. 1994; EA Engineering 1998).

Species		Habitat Use			Fisheries	
Common Name	Scientific Name	Spawning Area	Nursery Area	Adult Habitat	Comm.	Rec.
ANADROMOUS FISH						
Alewife	*Alosa pseudoharengus*		◆			
American shad	*Alosa sapidissima*	◆	◆			
Atlantic sturgeon	*Acipenser oxyrinchus*		◆			
Blueback herring	*Alosa aestivalis*		◆			
Gizzard shad	*Dorosoma cepedianum*		◆			
Shortnose sturgeon	*Acipenser brevirostrum*		◆			
Striped bass	*Morone saxatilis*	◆	◆			◆
White perch	*Morone americana*		◆			◆
CATADROMOUS FISH						
American eel	*Anguilla rostrata*		◆			
MARINE/ESTUARINE FISH						
Atlantic croaker	*Micropogonias undulatus*		◆	◆		
Atlantic menhaden	*Brevoortia tyrannus*		◆	◆		
Banded killifish	*Fundulus diaphanus*	◆	◆	◆		
Bay anchovy	*Anchoa mitchilli*		◆	◆		
Hogchoker	*Trinectes maculatus*		◆	◆		
Inland silverside	*Menidia beryllina*	◆	◆	◆		
Mummichog	*Fundulus heteroclitus*		◆	◆		
Naked goby	*Gobiosoma bosci*		◆	◆		
Rough silverside	*Membras martinica*		◆	◆		
INVERTEBRATES						
Blue crab	*Callinectes sapidus*		◆	◆		◆

Finfish surveys indicate that the anadromous white perch is the most abundant species in the area, followed by anadromous blueback herring and American shad and the estuarine bay anchovy and banded killifish. These species composed nearly 70 percent of the fish community sampled. Surveys also found a high proportion of juvenile fish, indicating substantial use of the area as a rearing nursery, particularly for American shad, blueback herring, hogchoker, and white perch. Juvenile American eel were observed as well, but not in large numbers. Catadromous American eel probably use the area more as a migratory corridor to upstream residential areas. Juvenile shortnose sturgeon, a federally endangered species, and Atlantic sturgeon, a candidate for federal protection, have also been observed in the area (EA Engineering 1998).

American shad and possibly striped bass spawn in this reach of the Delaware River. American shad spawn over a large area between Trenton and Camden and, in recent years, downstream of Camden. Spawning striped bass have not been observed in the vicinity of the property, but their

presence can be inferred by the presence of juvenile fish (under one year old) several kilometers downstream near Little Tinicum and Chester Islands (Figure 1) (EA Engineering 1998).

Banded killifish and inland silversides are residents known to live on the freshwater side of the fresh-salt transition zone, while the remaining estuarine species commonly dwell where salinity is low, moving into tidal fresh waters on an occasional or seasonal basis. Blue crab, particularly juveniles and adult males, often migrate into tidal fresh waters on a seasonal basis (Stone et al. 1994).

There is no commercial fishing in the vicinity of the Martin Aaron property; commercial fisheries are limited to Delaware Bay approximately 100 km (60 mi) downstream. There is recreational fishing in the Delaware River, primarily of blue crab, striped bass, and white perch (PADH 1999).

A fish consumption advisory is in effect for the Delaware River in the vicinity of the Martin Aaron property because of elevated concentrations of polychlorinated biphenyls (PCBs) in edible tissues of several fish species. The advisory encompasses the Delaware River from Delaware Bay to the end of the tidal section of the river near Trenton, New Jersey. The advisory limits the consumption of striped bass and white catfish to one meal per month and the consumption of channel catfish to one meal every two months. It also advises against the consumption of American eel in the area (State of New Jersey 2002).

Site-Related Contamination

Data collected during field investigations indicate that former operations and disposal practices have contaminated soils and shallow groundwater on the Martin Aaron property and adjacent properties. The primary contaminants of concern to NOAA are inorganic compounds (metals); semivolatile organic compounds (SVOCs), including polynuclear aromatic hydrocarbons (PAHs); pesticides; and PCBs.

More than 100 soil samples, two storm sewer sediment samples, and groundwater samples from 14 monitoring wells were collected on the Martin Aaron property and adjacent properties for chemical analysis during the 1999 remedial investigation. No sampling occurred in the Delaware River or in areas down-gradient of the property (Kimball 1999; USEPA 1988). Table 2 summarizes the maximum concentrations detected of the primary contaminants of concern to NOAA, and compares them to relevant screening guidelines.

In soil samples, arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc were detected at concentrations that exceeded soil screening guidelines by a range of one to three orders of magnitude. The greatest concentrations were detected in samples collected in the vicinity of the drum processing areas, where floor drains and sewer basins are located. Concentrations of several metals detected in samples from adjacent properties also exceeded the soil screening guidelines, although concentrations were not as elevated as in the drum processing areas. Excepting silver, all maximum concentrations of metals detected in the soil samples also exceeded another set of screening guidelines, the Oak Ridge National Laboratory Preliminary Remediation Goals (ORNL PRGs). The maximum concentration of mercury exceeded the ORNL PRG by four orders of magnitude; arsenic and zinc exceeded ORNL PRGs by three orders of magnitude (Efroymson et al. 1997). No ORNL PRG is available for silver. Elevated concentrations of SVOCs (including PAHs), several pesticides, and PCBs were also detected in soils from the property. Soil screening guidelines are not available for comparison to the maximum concentrations of SVOCs, pesticides, and PCBs. The maximum PCB concentration exceeded the ORNL PRG guideline by two orders of magnitude (Efroymson et al. 1997).

Table 2. Maximum concentrations of primary contaminants of concern found at Martin Aaron, Inc. (Kimball 1999).

	Soil (mg/kg)		Water (µg/L)		Sediment (mg/kg)	
Contaminant	Soil	Mean U.S.[a]	Groundwater	AWQC[b]	Sediment	TEL[c]
INORGANIC COMPOUNDS						
Arsenic	14,000	5.2	9,800	150	39	5.9
Cadmium	230	0.06	33	2.2[d]	29	0.596
Chromium[m]	16,000	37	1,100	11	ND	37.3
Copper	1200	17	220	9[d]	ND	35.7
Lead	9000	16	530	2.5[d]	2,700	35
Mercury	16	0.058	2.7	0.77[k]	ND	0.174
Nickel	300	13	73	52[d]	820	18
Silver	17	0.05	15	0.12	ND	1.0[e]
Zinc	15,000	48	4,200	120[d]	3,100	123.1
SEMIVOLATILE ORGANIC COMPOUNDS						
2-Methylphenol	0.53	NA	2,100	NA	R	NA
4-Methylphenol	1.9	NA	3,100	NA	R	NA
Anthracene	26	NA	1	300[g,h]	R	0.0853[e]
Benz(a)anthracene	97	NA	1	300[g,h]	R	0.0317
Benzo(a)pyrene	75	NA	ND	300[g,h]	R	0.0319
Benzo(b)fluoranthene	82	NA	ND	300[g,h]	R	NA
Benzo(k)fluoranthene	69	NA	ND	300[g,h]	R	NA
Chrysene	100	NA	7	300[g,h]	R	0.0571
Fluoranthene	170	NA	ND	3,980[f,g]	R	0.111
Naphthalene	1,900	NA	12,000	620[g]	R	0.16[e]
Phenanthrene	73	NA	2	6.3[i]	R	0.0419
Pyrene	130	NA	ND	300[g,h]	R	0.053
PESTICIDES/PCBs						
Aldrin	45	NA	ND	3.0[f]	ND	NA
Chlordane	19	NA	ND	0.0043	0.62	0.0045
DDD	1.5	NA	ND	0.6[f,g]	ND	0.00354[o]
DDE	6.9	NA	ND	1050[f,g]	ND	0.00142[n]
DDT	0.21	NA	ND	0.001	ND	0.00698[l]
PCBs (Total)	110	0.371[j]	ND	0.014	ND	0.0341

NA: Screening guideline not available.
ND: Not detected; detection limit not available.
R: Data rejected; did not meet QA standards.
a: Shacklette and Boerngen (1984), except for silver and cadmium, which are average concentrations in the Earth's crust as reported by Lindsay (1979).
b: Ambient water quality criteria for the protection of aquatic organisms (USEPA 1993b, 1999). Freshwater chronic criteria presented.
c: Threshold effects level is the geometric mean of the 15th percentile of the effects data and the 50th percentile of the no-effects data. The TEL is intended to represent the concentration below which adverse biological effects rarely occurred (Smith et al. 1996).
d: Criterion expressed as a function of total hardness; concentrations shown correspond to hardness of 100 mg/L.
e: TEL not available; effects range-low (ER-L) value presented. The ERL represents the 10th percentile for the data set in which effects were observed or predicted in studies compiled by Long et al. 1998.
f: Chronic criterion not available; acute criterion presented.
g: Lowest Observable Effect Level (LOEL).
h: Value for chemical class; marine acute value is presented.
I: Proposed criteria.
j: Oak Ridge National Laboratory Preliminary Remediation Goals (ORNL PRGs) presented (Efroymson et al. 1997).
k: Criterion expressed as total recoverable metal.
l: Expressed as total DDT.
m: Screening guidelines represent concentrations for Cr.+6
n: Expressed as p,p'-DDE.
o: Expressed as p,p'-DDD.

In groundwater samples, arsenic, cadmium, chromium, copper, lead, silver, and zinc were detected at concentrations that exceeded the ambient water quality criteria (AWQC) by one to two orders of magnitude. Maximum concentrations of mercury and nickel exceeded the AWQC by factors of approximately three and 1.4, respectively. The greatest contamination was detected in samples collected in the vicinity of site operations, but concentrations exceeding guidelines were also detected in samples from adjacent properties. Naphthalene, a PAH, was detected in groundwater collected from beneath the property at a concentration exceeding the AWQC by one order of magnitude. Elevated concentrations of 2-methylphenol and 4-methylphenol were also detected in groundwater collected beneath the property; AWQC are not available for these SVOCs. Groundwater contamination was more prevalent in the shallow zone near the water table surface than in deeper zones of the aquifer.

In sediment samples collected from storm sewer deposits beneath Basins 1 and 4, cadmium, lead, nickel, and zinc were detected at concentrations that exceeded threshold effects levels (TELs) by one order of magnitude; the maximum concentration of arsenic exceeded the TEL by a factor of approximately six. Chromium, copper, mercury, and silver were not detected. The pesticide chlordane was the only organic compound detected; its maximum concentration exceeded the TEL by two orders of magnitude. Analytical results for SVOCs did not meet quality assurance standards and so were rejected, which means data are not available for evaluating SVOC concentrations in storm sewer sediment. Samples were not collected farther down-gradient in the storm sewer, so the extent of contamination was not determined.

References

DeLorme. 1990. Pennsylvania Atlas and Gazetteer. DeLorme. Yarmouth, ME.

EA Engineering. 1998. Characterization of aquatic habitats and resources near the Philadelphia Naval Complex: Department of the Navy, Northern Division.

Efroymson, R. A., G. W. Suter II, B. E. Sample, and D. S. Jones. 1997. Preliminary remediation goals for ecological endpoints. Available: http://www.esd.ornl.gov/programs/ecorisk/tm162r2.pdf.

L. Robert Kimball and Associates (Kimball). 1999. Draft final remedial investigation report for Martin Aaron Site, Camden City, Camden County, New Jersey. Trenton, New Jersey: State of New Jersey Department of Environmental Protection, Division of Publicly Funded Site Remediation.

Lindsay, W.L. 1979. Chemical Equilibria in Soils. New York, NY: John Wiley & Sons. 449 pp.

Long, E.R., L.J. Field, and D.D. MacDonald. 1998. Predicting toxicity in marine sediments with numerical sediment quality guidelines. Environmental Toxicology and Chemistry 17(4):714-727.

Pennsylvania Department of Health (PADH). 1999. Commonwealth of Pennsylvania: fish consumption advisories 1999. Available: http://www.health.state.pa.us/nr/1998/fish-list.htm.

Roy F. Weston Inc. (Weston). 1999. Hazard ranking system documentation package, Martin Aaron, Inc., Camden, Camden County, New Jersey. New York, NY: U.S. Environmental Protection Agency, Region III Superfund Technical Assessment and Response Team.

Shacklette, H.T. and J.G. Boerngen. 1984. Element concentrations in soils and other surficial materials of the conterminous United States. USGS Professional Paper 1720. Washington, DC: U.S. Geological Survey.

References, *cont.*

Smith, S.L, D.D. MacDonald, K.A. Keenleyside, C.G. Ingersoll, and L.J. Field. 1996. A preliminary evaluation of sediment quality assessment values for freshwater ecosystems. J. Great Lakes Res. 22(3): 624-638.

State of New Jersey. 2002. Division of Science Research and Technology. A guide to health advisories for eating fish and crabs caught in New Jersey waters: Fish and crab advisories based on PCBs, dioxin or chlordane contamination. Available: http://www.state.nj.us/dep/dsr/fish-crab.htm.

Stone, S.L., T.A. Lowery, J.D. Field, C.D. Williams, D.M. Nelson, S.H. Jury, M.E. Monaco, and L. Andreasen. 1994. Distribution and abundance of fishes and invertebrates in Mid-Atlantic estuaries. Silver Spring, MD: NOAA/NOS Strategic Environmental Assessments Division.

U.S. Army Corps of Engineers (USACE). 2002. Philadelphia District. Dredging and navigation. Available: http://www/nap.usace.army.mil/sb/nav.htm.

U.S. Environmental Protection Agency (USEPA). 1988. Site Inspection Report, Drum Service of Camden, aka Martin Aaron, Inc. New York, NY: U.S. Environmental Protection Agency, Region II. 40.

U.S. Environmental Protection Agency (USEPA). 1993a. Martin Aaron, Inc., site inspection prioritization evaluation. New York, NY: U.S. Environmental Protection Agency, Region II. 5.

U.S. Environmental Protection Agency (USEPA). 1993b. Water quality criteria. Washington, DC: Office of Water, Health and Ecological Criteria Division. 294 pp.

U.S. Environmental Protection Agency (USEPA). 1999. National recommended water quality criteria—correction: U.S. Environmental Protection Agency, Office of Water.

U.S. Geological Survey (USGS). 1967. Topographic map, Philadelphia, PA-NJ, 7.5 minute series, 1: 24,000 scale. U. S. Geological Survey. Denver, CO.

Old Roosevelt Field Contaminated Groundwater Area

Garden City, New York

EPA Facility ID: NYSFN0204234

Basin: Southern Long Island

HUC: 02030202

Executive Summary

The Old Roosevelt Field Contaminated Groundwater Area is a former airfield in Garden City, New York, that was used between 1911 and 1957 for aviation activities. VOCs have been detected in groundwater wells on the property since the 1970s, although Old Roosevelt Field has not been identified as the specific source of the contaminants. Further investigation is required to determine whether other more persistent or toxic contaminants are present at the site. The NOAA habitats of concern are the surface waters of Mill River, Valley Stream, and East Meadow Creek, which provide habitat for the American eel, a NOAA trust resource.

Site Background

The Old Roosevelt Field Contaminated Groundwater Area (Old Roosevelt Field) is located in Garden City, Nassau County, New York, approximately 3.5 km (2 mi) northeast of Mill River and 2.0 km (1.25 mi) west of East Meadow Creek (Figure 1). Old Roosevelt Field is a former airfield that was used for aviation activities from 1911 to 1957.

Volatile organic compounds (VOCs), primarily trichloroethene (TCE) and tetrachloroethene (PCE, also known as perchloroethylene), have been detected in groundwater wells located on the Old Roosevelt Field property since they were first sampled in the 1970s (USEPA 2000). In sampling conducted in 1984, VOC concentrations were measured at increased levels as compared to earlier measurements (USGS 1989). The specific source of the contaminants has not been attributed to Old Roosevelt Field. Other potential sources are nearby industries such as Johnson and Hoffman, Consolidated Lithography, and U.S. Printing (NYSDEC 1999).

The U.S. Environmental Protection Agency (USEPA) placed the Old Roosevelt Field Contaminated Groundwater Area on the National Priorities List of hazardous waste sites in May 2000 (USEPA 2000). Although the USEPA initiated a remedial investigation/feasibility study (RI/FS) in the summer of 2001, information on the current status of the RI/FS is not available (USEPA 2002).

Groundwater is the primary pathway for the migration of contaminants to NOAA trust resources. Groundwater is encountered at 8 to 15 m (25 to 50 ft) below the surface in the Upper Glacial aquifer. Groundwater flows southwest toward the Atlantic Ocean (USGS 1989).

NOAA Trust Resources

The NOAA trust habitats of concern are Mill River, Valley Stream, and East Meadow Creek, all relatively small streams with several impoundments that block the passage of anadromous fish. American eel, a NOAA trust resource, can traverse these impoundments and is present in the middle to upper reaches of these three streams (Kozlowski 2002).

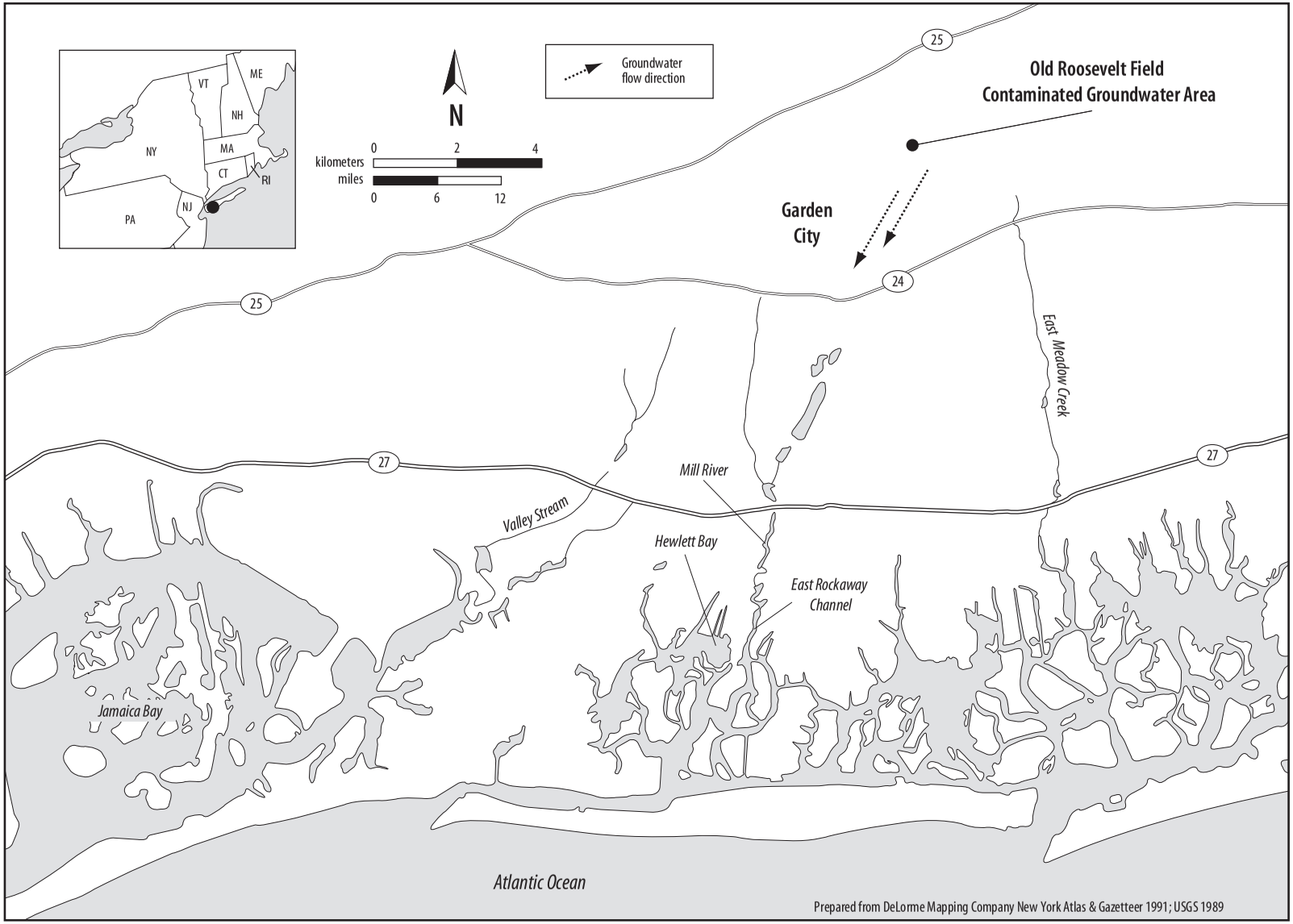


Figure 1. Location of the Old Roosevelt Field Contaminated Groundwater Area, Garden City, New York.

Site-Related Contamination

VOCs, the primary contaminants of concern at the Old Roosevelt Field site, have a relatively low persistence and toxicity to aquatic organisms. A total of 224 water samples were collected in August and September 1983 and in April through June 1984 from 52 monitoring wells, 28 public-supply wells, and 25 cooling-water wells. Three VOCs of primary concern were detected: 1,2-dichloroethylene (DCE), PCE, and TCE (Table 1). Maximum concentrations of DCE and PCE were below the ambient water quality criteria (AWQC) (USGS 1989). The maximum concentration of TCE exceeded the AWQC by less than one order of magnitude. Further investigation is required to determine whether other more persistent or toxic contaminants are present at the site.

Table 1. Maximum concentrations of contaminants of concern (VOCs) detected in groundwater at the Old Roosevelt Field Contaminated Groundwater Area (USGS 1989).

	Water (µg/l)	
Contaminant	Groundwater	AWQC[a]
1, 2-Dichloroethylene (DCE)	2800	11600
Tetrachloroethene (PCE)	550	840
Trichloroethene (TCE)	38000	21900[b]

a: Ambient water quality criteria for the protection of aquatic organisms (USEPA 1993). Freshwater chronic criteria presented.

b: Chronic criterion not available; acute criterion presented.

References

Kozlowski, G. Fisheries biologist for the New York State Department of Environmental Conservation. Stony Brook, NY. Personal communication June 7, 2002.

New York State Department of Environmental Conservation (NYSDEC). 1999. Memorandum: Recommendation for an EPA funded expanded groundwater investigation for the Old Roosevelt Air Field Hangar Site; Site No. 130051. Stony Brook, NY: New York State Department of Environmental Conservation.

U.S. Environmental Protection Agency (USEPA). 1993. Water quality criteria. Washington, DC: Office of Water, Health and Ecological Criteria Division. 294 pp.

U.S. Environmental Protection Agency (USEPA). 2000. NPL site narrative at listing, Old Roosevelt Field Contaminated Ground Water Area, Garden City, New York

U.S. Environmental Protection Agency (USEPA). 2002. Region 2 Superfund: Old Roosevelt Field Contaminated Ground Water Area. Available: http://www.epa.gov/region02/superfund/npl/0204234c.htm.

U.S. Geological Survey (USGS). 1989. Chlorinated organic compounds in ground water at Roosevelt Field, Nassau County, Long Island, New York. Syosset, NY: U.S. Department of the Interior.

Smithtown Groundwater Contamination

Smithtown, New York

EPA Facility ID: NY0002318889

Basin: Long Island Sound

HUC: 02030201

Executive Summary

The Smithtown Groundwater Contamination area is approximately 3 km (2 mi) south of Smithtown Bay and Long Island Sound in Smithtown, New York. Field investigations have identified an area of VOC-contaminated groundwater of approximately 1,036 hectares (2,560 acres). The primary VOC of concern is tetrachloroethylene. The presence of VOCs at the site may increase the potential for other, more persistent contaminants to migrate through the groundwater to NOAA trust resources. Further analysis for other contaminants has not been conducted, and no other analytes have been measured in the groundwater. Several commercial and industrial facilities in the area have been investigated to identify the source of the contamination, but sources of contamination have not been identified. The Nissequogue River and Stony Brook Harbor estuaries within Long Island Sound, which are the NOAA habitats of concern, contain NOAA trust resources, including marine and anadromous fish species, that use the waters for spawning, rearing, and adult residence.

Site Background

The Smithtown Groundwater Contamination area is approximately 3 km (2 mi) south of Smithtown Bay and Long Island Sound in Smithtown, Suffolk County, New York. The groundwater contamination area is approximately 1,036 ha (2,560 acres), bounded to the north by Stony Brook Harbor and to the west by the Nissequogue River (Figure 1) (CDM 1999b).

Volatile organic compounds (VOCs), primarily tetrachloroethylene (also known as perchloroethylene, or PCE), were first detected in groundwater at the site in 1997 (Weston 1998). The Suffolk County Department of Health Services has investigated 11 potential sources of the contaminated groundwater plume, including current and former commercial and industrial facilities located east of the contamination. The sources of contamination have not been fully identified (CDM 1999b).

The U.S. Environmental Protection Agency (USEPA) signed an Action Memorandum in July 1998 authorizing removal action activities to be conducted in the groundwater contamination area. The USEPA proposed that the Smithtown Groundwater Contamination area be placed on the National Priorities List in January 1999 (CDM 1999b).

The shallow, unconfined water table aquifer over most of Long Island is within the Upper Glacial aquifer system (CDM 1999a). Regional groundwater flows north toward Smithtown Bay and Long Island Sound, although the Nissequogue River and Stony Brook Harbor induce flow to the west and east, respectively (CDM 1999b). The minimum depth to the water table is approximately 9 m (30 ft) below ground surface (CDM 1999a).

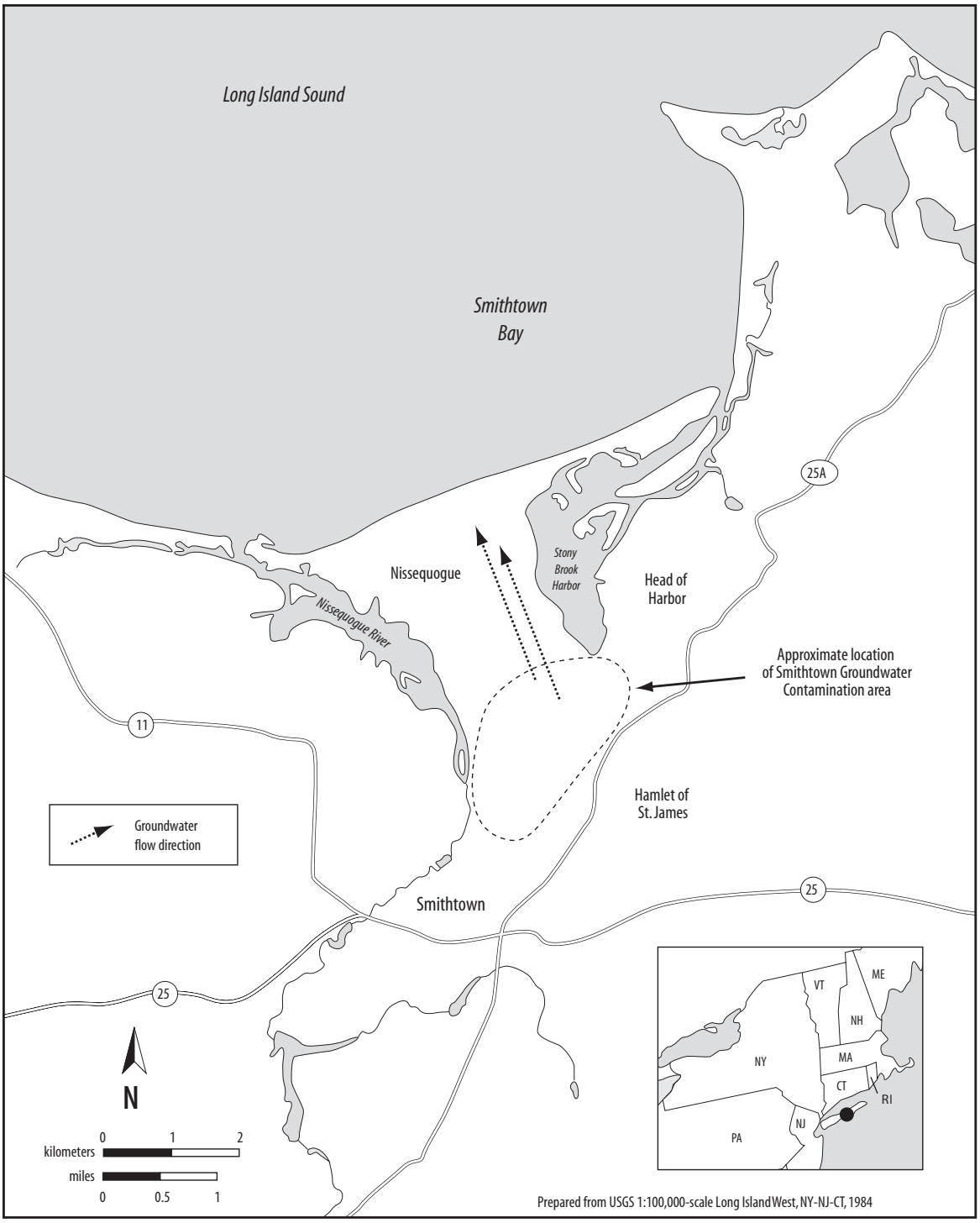


Figure 1. Approximate location of Smithtown Groundwater Contamination area in Smithtown, New York.

NOAA Trust Resources

The NOAA habitats of concern are the Nissequogue River and Stony Brook Harbor, which are estuaries within Long Island Sound. Many fish and invertebrates, including NOAA trust resources, use these estuaries for spawning, rearing, and adult habitat (Table 1).

Table 1. Fish and invertebrate species commonly found in Long Island Sound estuaries (Stone et al. 1994).

Species		Habitat Use			Fisheries	
Common Name	Scientific Name	Spawning Ground	Nursery Area	Adult Forage	Comm.	Recr.
ANADROMOUS/CATADROMOUS FISH						
Alewife	*Alosa pseudoharengus*		◆	◆		
American shad	*Alosa sapidissima*		◆	◆		
Blueback herring	*Alosa aestivalis*		◆	◆		
Rainbow smelt	*Osmerus mordax*		◆	◆		
Striped bass	*Morone saxatilis*		◆	◆		◆
White perch	*Morone americana*		◆	◆		◆
MARINE/ESTUARINE FISH						
American sand lance	*Ammodytes americanus*		◆	◆		
Atlantic herring	*Clupea harengus*		◆	◆		
Atlantic mackerel	*Scomber scombrus*		◆	◆		
Atlantic menhaden	*Brevoortia tyrannus*		◆	◆		
Atlantic tomcod	*Microgadus tomcod*		◆	◆		◆
Bay anchovy	*Anchoa mitchilli*		◆	◆		
Black sea bass	*Centropristis striata*		◆	◆		◆
Bluefish	*Pomatomus saltatrix*		◆	◆		◆
Butterfish	*Peprilus triacanthus*		◆	◆		
Cunner	*Tautogolabrus adspersus*		◆	◆		
Gobies	*Gobiosoma spp.*	◆	◆	◆		
Hogchoker	*Trinectes maculatus*	◆	◆	◆		
Killifish	*Fundulus spp.*	◆	◆	◆		
Northern pipefish	*Syngnathus fuscus*	◆	◆	◆		
Northern searobin	*Prionotus carolinus*	◆	◆	◆		
Oyster toadfish	*Opsanus tau*	◆	◆	◆		
Pollock	*Pollachius virens*		◆	◆		
Red hake	*Urophycis chuss*		◆	◆		
Scup	*Stenotomus chrysops*		◆	◆		
Sheepshead minnow	*Cyprinodon variegatus*	◆	◆	◆		
Silversides	*Menidia spp.*	◆	◆	◆		
Skates	*Raja spp.*	◆	◆	◆		
Tautog	*Tautoga onitis*		◆	◆	◆	◆
Weakfish	*Cynoscion regalis*		◆	◆		
Windowpane flounder	*Scophthalmus aquosus*	◆	◆	◆		
Winter flounder	*Pleuronectes americanus*	◆	◆	◆		◆
INVERTEBRATES						
American lobster	*Homarus americanus*	◆	◆	◆	◆	◆
Blue crab	*Callinectes sapidus*		◆	◆		◆
Blue mussel	*Mytilus edulis*	◆	◆	◆		
Eastern oyster	*Crassostrea virginica*	◆	◆	◆		
Grass shrimp	*Palaemonetes pugio*	◆	◆	◆		
Northern quahog	*Mercenaria spp.*	◆	◆	◆	◆	◆
Sevenspine bay shrimp	*Crangon septemspinosa*	◆	◆	◆		
Softshell clam	*Mya arenaria*	◆	◆	◆		

Site-Related Contamination

The sources of the contaminated groundwater plume have not been fully identified (CDM 1999b). The presence of VOCs at the site may increase the potential for other, more persistent contaminants to migrate through the groundwater to NOAA trust resources. NOAA is concerned about contaminants more persistent than VOCs, but the groundwater has yet to be analyzed for contaminants other than VOCs. Therefore, data on the presence of other, more persistent contaminants were not available at the time of this report.

References

CDM Federal Programs Corporation (CDM). 1999a. Final quality assurance project plan, Phase I, Smithtown groundwater contamination site, Smithtown, New York. New York, NY: U.S. Environmental Protection Agency.

CDM Federal Programs Corporation (CDM). 1999b. Final work plan, Volume I, Smithtown groundwater contamination site, Phase I remedial investigation, Smithtown, New York. New York, NY: U.S. Environmental Protection Agency.

Roy F. Weston Inc. (Weston). 1998. Hazard ranking system documentation package, Smithtown ground water contamination, Smithtown, Suffolk County, New York. New York, NY: U.S. Environmental Protection Agency, Region II Superfund Technical Assessment and Response Team.

Stone, S.L., T.A. Lowery, J.D. Field, C.D. Williams, D.M. Nelson, S.H. Jury, M.E. Monaco, and L. Andreasen. 1994. Distribution and abundance of fishes and invertebrates in Mid-Atlantic estuaries. Silver Spring, MD: NOAA/NOS Strategic Environmental Assessments Division.

Andrews Air Force Base

Camp Springs, Maryland

EPA Facility ID: MD0570024000

Basin: Middle Potomac-Anacostia-Occoquan

HUC: 02070010

Executive Summary

Numerous sources of contamination have been identified at the Andrews Air Force Base (AAFB) in Camp Springs, Maryland. The primary sources of concern to NOAA are three former landfills that drain into Piscataway Creek, which is the NOAA habitat of concern. Samples of environmental media collected from Piscataway Creek near the landfills show concentrations of trace elements (metals), PAHs, PCBs, and pesticides that exceed screening guidelines. Alewife, blueback herring, white perch, and yellow perch are NOAA trust species that spawn in Piscataway Creek; however, these species are not found within 15 km (9 mi) of AAFB. American eel is the NOAA trust resource likely to use habitat in the vicinity of the site.

Site Background

Andrews Air Force Base (AAFB) is an active facility in Camp Springs, Maryland. The installation was established in 1942 as the Camp Springs Army Airfield and has since served as the headquarters of the Continental Air Command, the Strategic Air Command, the Military Air Transport Service, and the Air Force Systems Command. The facility currently supports worldwide airlift operations for the President of the United States and other high-ranking officials, as well as the flight operation of more than 100 aircraft. AAFB occupies approximately 1,740 ha (4,300 acres) and is situated on a drainage divide that separates the watersheds of the Potomac and Patuxent Rivers (Figure 1).

Under the U.S. Air Force's Installation Restoration Program (IRP), more than 20 potential sources of contamination have been identified on the main base of AAFB, as shown on Figure 2 (I.T. Corporation 1998). Table 1 lists the types of waste present at the sources of concern.

In determining the site's hazard ranking score, the U.S. Environmental Protection Agency (USEPA) evaluated four of the potential sources of contamination identified under the IRP (LF05, LF07, FT02, and FT03), as well as an additional potential source, the Sludge Disposal Area (also shown on Figure 2) (USEPA 1998). For this waste site report, data were available only for the evaluation of those five potential sources, as well as for potential source LF06. Although other potential sources are listed in Table 1, data were not available for their evaluation.

On the basis of the types of activities conducted, the proximity to NOAA trust resources, and the availability of data, the primary sources of concern to NOAA are the three former landfills: LF05, LF06, and LF07. The landfills were used from the late 1950s to the late 1980s for the disposal of spent solvents, chemical reagents, process wastes, waste oils, sewage sludge, general refuse, construction rubble, and medical wastes.

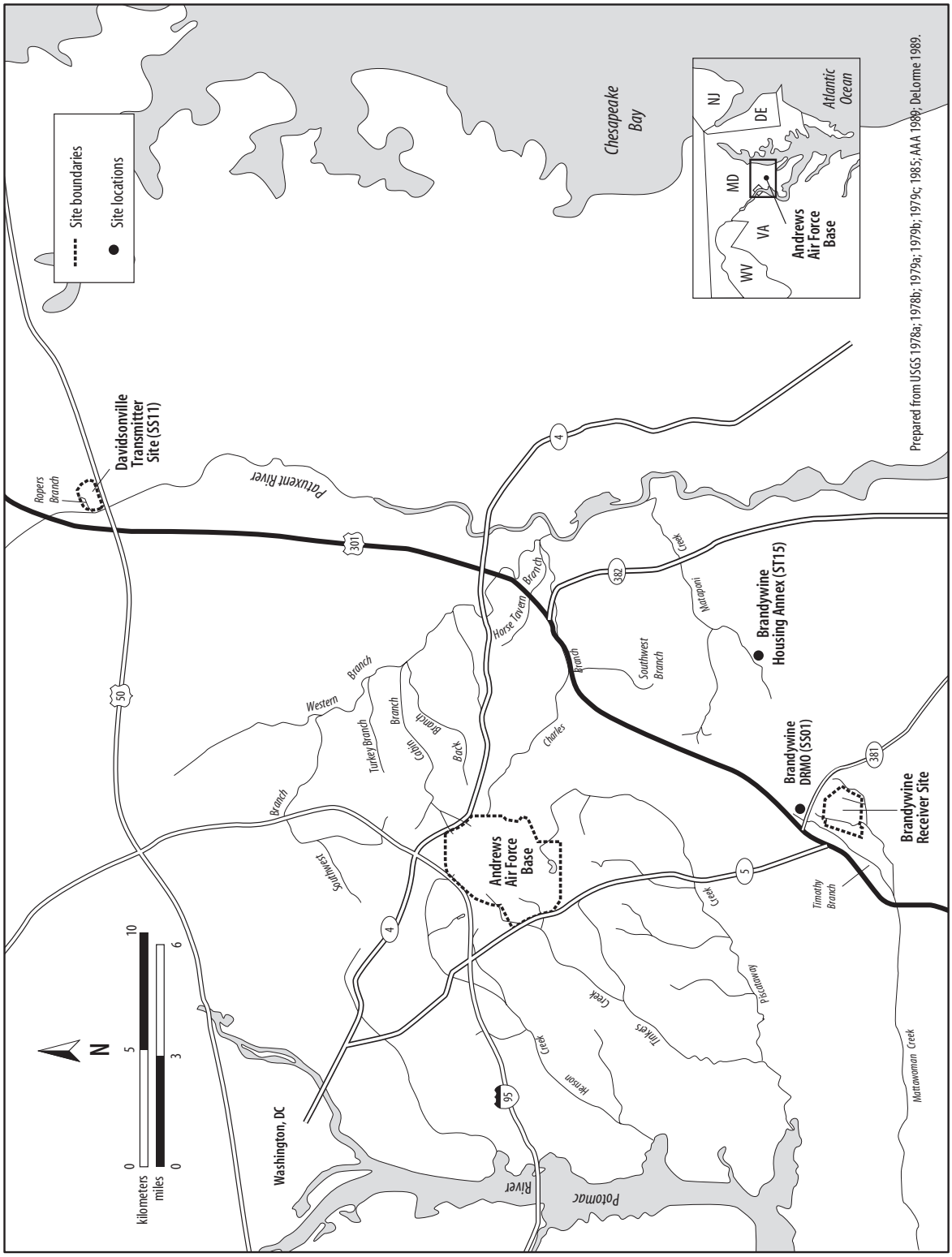


Figure 1. Andrews Air Force Base, Camp Springs, Maryland and associated base facilities.

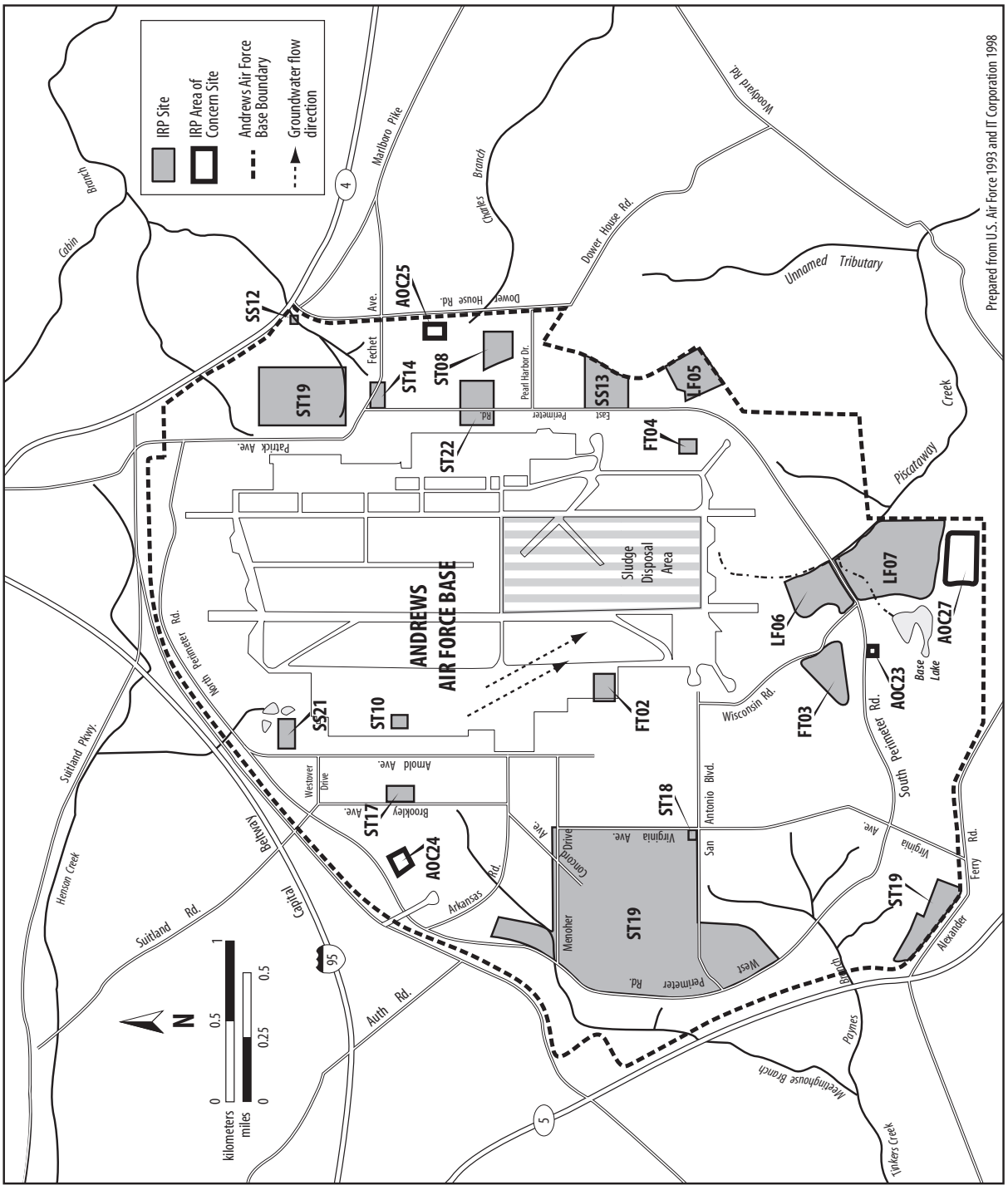


Figure 2. Detail of the Andrews Air Force Base site (only the main base sites are shown).

Table 1. Description of potential sources of contamination at Andrews AFB (Radian Corporation 1992; USEPA 1998).

Site ID	Site Name	Description
LF05	D1 Landfill/Leroy's Landfill	Solvents, oils, dilute process wastes, fly ash, and sewage sludge were disposed; approximately 7,500 liters of shop wastes were dumped each week.
LF06	D3 Landfill	Construction debris, equipment, and unknown quantities of shop wastes were disposed.
LF07	D4 Landfill	Construction debris, hospital waste, chemical reagents, and general refuse were disposed.
FT02	Fire Training Area No. 1	Fuels and waste oils were burned during training exercises.
FT03	Fire Training Area No. 2	Waste oil, jet fuel, paint thinner and other liquid waste were poured on the ground and ignited.
FT04	Fire Training Area No. 4	Jet fuel and motor oil were burned weekly; spent oil and remains flowed into an oil interceptor and then into a gravel-bottomed pond.
SS13	POL Yard	Petroleum, oils, and lubricants (POL) leaked from underground storage tanks (USTs) and aboveground storage tanks (ASTs).
SS12	JP-4 Spill	Approximately 3,800 liters of JP-4 (jet fuel) spilled from a puncture in a pressurized delivery line.
SS21	NA	NA
ST08	MOGAS UST Leak	Gasoline and solvents leaked from USTs at a military gas station.
ST10	PD 680 Spill	An estimated 19,000 liters of PD 680 solvent leaked from UST.
ST14	East Side Service Station	Petroleum products leaked from USTs. Trichloroethylene (TCE) from unknown sources was found in groundwater.
ST17	AAFES Gas Station	Petroleum products leaked from USTs.TCE from unknown sources was found in groundwater.
ST18	2132 Richmond Drive	Fuel oil leaked from a UST.
ST19	Base-Wide Heating Oil USTs	Fuel oil leaked from USTs.
ST22	NA	NA
AOC23	NA	NA
AOC24	NA	NA
AOC25	NA	NA
AOC27	NA	NA
NA	Sludge Disposal Area	Sludge from the Blue Plains Waste Treatment Plant and AAFB waste treatment plant was spread between the runways

NA: Information was not available in the documents reviewed.

The primary pathways for the migration of contaminants to NOAA trust resources are surface water runoff and groundwater transport. Potential sources LF06 and LF07 are adjacent to Piscataway Creek, which originates several hundred meters upstream of the landfills (Figure 2). Potential source LF05 is located approximately 500 m (0.3 mi) from an unnamed tributary that enters Piscataway Creek just downstream of the landfill (Figure 2).

Shallow groundwater beneath AAFB occurs within the Brandywine Formation and the underlying Calvert Formation, which forms a significant regional aquitard separating the shallow aquifer from deeper aquifers. Together these formations range from 20 to 45 m (65 to 150 ft) in thickness. The depth at which groundwater is encountered at the site ranges from approximately 1 to 9 m (3 to 28 ft) below ground surface. Groundwater in the surficial aquifer flows horizontally at a velocity of approximately 1 to 14 m/yr (3 to 46 ft/yr) (Dames and Moore 1992a). In general, the direction of groundwater flow at AAFB is toward Piscataway Creek.

NOAA Trust Resources

The NOAA trust habitat of concern is Piscataway Creek. Piscataway Creek originates on AAFB and flows for about 25 km (16 mi) before entering the Potomac River. The lower 10 km of the creek is considered low salinity estuarine habitat, with salinities generally ranging from 0.5 to 5 parts per thousand (USFWS 1980). NOAA trust resources found in Piscataway Creek include alewife, American eel, blueback herring, white perch, and yellow perch (Table 2) (Kazyak 2001; King 2001). American eel is the species likely to use habitat in the vicinity of AAFB; the other species have only been observed 15 km (9 mi) downstream from AAFB.

Table 2. NOAA trust resources inhabiting Piscataway Creek (Kazyak 2001; King 2001).

Species		Habitat Use			Fisheries	
Common Name	Scientific Name	Spawning Area	Nursery Area	Adult Forage	Comm. Fishery	Rec. Fishery
ANADROMOUS/CATADOMOUS FISH						
Alewife	*Alosa pseudoharengus*	◆	◆	◆		
American eel	*Anguilla rostrata*		◆	◆		
Blueback herring	*Alosa aestivalis*	◆	◆	◆		◆
White perch	*Morone americana*	◆	◆	◆		◆
Yellow perch	*Perca flavescens*	◆	◆	◆		

Blueback herring and alewife are small anadromous fish that spend their adult lives at sea and return to fresh water to spawn. They have been documented spawning in Piscataway Creek several kilometers upstream of its confluence with Tinkers Creek (Kazyak 2001). White perch are semi-anadromous fish that migrate to tidal fresh water and slightly brackish water each spring to spawn. The confluence with Tinkers Creek is the upstream limit of documented spawning for white perch in Piscataway Creek (Kazyak 2001). Yellow perch are generally freshwater fish, although they have adapted to estuarine waters in Maryland. Yellow perch have been observed spawning at the mouth of Piscataway Creek (Kazyak 2001). American eel are catadromous fish that spawn at sea and use freshwater habitats as adults.

There are no commercial fisheries in Piscataway Creek. There is recreational fishing of blueback herring and white perch in Piscataway Creek (Borras 2001). The most popular fishing areas are near Piscataway Creek's confluence with Tinkers Creek or downstream (Borras 2001). There are no fish consumption advisories currently in effect for Piscataway Creek.

Site-Related Contamination

A variety of investigations have been conducted at the three landfills of concern. For a groundwater contamination survey conducted in 1991, nine to 11 groundwater samples were collected from monitoring wells at each of the three landfills (Dames and Moore 1992a). For remedial investigations in 1992 and 1993, four to six soil samples and two to three surface water and sediment samples were collected at each of the three landfills (Dames and Moore 1992b; Dames and Moore 1992c; Dames and Moore 1993). For an additional remedial investigation in 1995 at LF05, six surface soil samples, 43 subsurface soil samples, and four sediment samples were collected, as well as five groundwater samples from monitoring wells (EA Engineering 1996). In 1993, four paired sets of surface water and sediment samples were collected from Piscataway Creek to assess potential impacts on the creek from the landfills (USAF 1993).

Table 3 summarizes maximum concentrations of contaminants detected in soil and groundwater from the landfills and in sediment and surface water from landfill locations or from Piscataway Creek in the vicinity of the landfills.

The soil data indicate a source of trace element (metals) contamination when maximum detected concentrations are compared to soil screening guidelines. Arsenic, chromium, and copper exceeded the soil screening guidelines by less than an order of magnitude. Lead, mercury, nickel, and zinc exceeded by one order of magnitude. No soil screening guidelines are available for comparison to the maximum concentrations of cadmium and silver in soil. The presence of polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and pesticides also indicate a source of contamination. There are no soil screening guidelines available for comparison to the maximum concentrations of those contaminants.

Groundwater samples contained trace elements and several pesticides. Trace elements detected in groundwater at maximum concentrations that exceeded the applicable ambient water quality criteria (AWQC) by one order of magnitude were cadmium and silver. Lead, nickel, and zinc exceeded by less than an order of magnitude. Maximum concentrations of arsenic, chromium, copper, and mercury did not exceed their AWQCs. Four pesticides were detected in groundwater. Chlordane exceeded its AWQC by two orders of magnitude; endrin aldehyde by one order of magnitude; dieldrin by less than an order of magnitude; and the maximum concentration of DDD did not exceed the AWQC. PAHs and PCBs were not detected.

In surface water from Piscataway Creek, concentrations of cadmium, copper, lead, and zinc exceeded their respective freshwater AWQCs by less than an order of magnitude. Maximum concentrations of arsenic, chromium, and nickel did not exceed their AWQCs. Mercury and silver were not detected. The only organic compound detected in surface water from Piscataway Creek was dieldrin, but its concentration did not exceed the AWQC.

In sediment, arsenic, cadmium, lead, mercury, nickel, silver, and zinc were detected at maximum concentrations that exceeded their respective threshold effect levels (TELs) by less than an order of magnitude. Chromium and copper were also detected, but at concentrations less than their TELs. In addition, concentrations of PCBs, total PAHs, and three pesticides exceeded TELs by less than an order of magnitude. The highest concentration of PAHs in sediment was detected in a sample collected from Piscataway Creek between LF06 and LF07.

Table 3. Maximum concentrations of contaminants of concern detected in media collected from potential sources of contamination (LF05, LF06, and LF07) and Piscataway Creek during site investigations (Dames and Moore 1992a; 1992b; 1992c; 1993; USAF 1993; EA Engineering 1996).

	Soil (mg/kg)		Water (µg/L)			Sediment (mg/kg)	
Contaminant	Soil	Mean U.S.[a]	Ground-water	Surface water	AWQC[b]	Sediment	TEL[c]
TRACE ELEMENTS							
Arsenic	23	5.2	19	3.7	150	6.2	5.9
Cadmium	12	NA	140	2.7	2.2	1.8	0.596
Chromium	120	37	29	7.3	74	10	37.3
Copper	160	17	7.8	11	9	29	35.7
Lead	780	16	17	20	2.5	69	35
Mercury	1.5	0.058	0.4	ND	0.77	0.19	0.174
Nickel	190	13	61	27	52	21	18
Silver	280	NA	3.1	ND	0.12	1.8	0.73[f]
Zinc	800	48	500	195	120	210	123.1
SEMI-VOLATILE ORGANIC COMPOUNDS							
PCBs	3.7	NA	ND	ND	0.014	0.18	0.0341
Total PAHs	130	NA	ND	ND	NA	13.4	1.684[f]
PESTICIDES							
DDD	0.0088	NA	0.11	ND	0.6[d]	0.0037	0.00354
Dieldrin	0.066	NA	0.17	0.015	0.056	0.0052	0.00285
Endrin Aldehyde	ND	NA	0.54	ND	0.036[e]	0.0033	0.00267[e]
Chlordane	0.006	NA	0.78	ND	0.00215	ND	0.0045

a: Shacklette and Boerngen (1984) except cadmium and silver, which represent average concentrations in the Earth's crust from Lindsay (1979).

b: Ambient water quality criteria for the protection of aquatic organisms (USEPA 1993; USEPA 1999). Freshwater chronic criteria presented. Criterion expressed as a function of total hardness with the exception of arsenic and silver; concentrations shown correspond to hardness of 100 mg/L.

c: Threshold effects level (TEL) is the geometric mean of the 15th percentile of the effects data and the 50th percentile of the no-effects data. The TEL is intended to represent the concentration below which adverse biological effects rarely occurred (Smith et al. 1996).

d: Freshwater acute lowest observable effect level.

e: Endrin value used.

f: Freshwater TEL not available, marine TEL used.

ND: Not detected.

NA: Value not available.

References

American Automobile Association (AAA). 1989. Road Atlas: United States, Canada, Mexico. AAA. Falls Church, VA.

Borras, R. Natural resource technician, Maryland Department of Natural Resources, Cedarville Visitors Center. Cedarville, MD. Personal communication January 23, 2001.

Dames and Moore. 1992a. Groundwater contamination survey, Andrews Air Force Base, Maryland. Oak Ridge, TN: Prepared for the Hazardous Waste Remedial Action Program. 223 pp.

Dames and Moore. 1992b. Technical memorandum for the LF06 site, Andrews Air Force Base, Maryland. Oak Ridge, TN: Prepared for the Hazardous Waste Remedial Action Program. 82 pp.

Dames and Moore. 1992c. Technical memorandum for the LF07 site, Andrews Air Force Base, Maryland. Oak Ridge, TN: Prepared for the Hazardous Waste Remedial Action Program. 72 pp.

Dames and Moore. 1993. Draft remedial investigation, LF05, Andrews Air Force Base, Maryland. Oak Ridge, TN: Prepared for the Hazardous Waste Remedial Action Program. 82 pp.

DeLorme Mapping Company (DeLorme). 1989. Virginia atlas and gazetteer. 1:150,000. DeLorme. Freeport, ME.

E.A. Engineering Science and Technology (EA Engineering). 1996. Draft remedial investigation report, Leroy's Lane Landfill, Andrews Air Force Base, Maryland. Sparks, MD: Prepared for the U.S. Army Corps of Engineers.

I.T. Corporation. 1998. Installation-wide plans, Andrews Air Force Base, Maryland. Knoxville, TN: Prepared for the Air Force Center for Environmental Excellence, Brooks Air Force Base, TX.

Kazyak, P. Maryland Stream Biological Survey head. Annapolis, Maryland. Personal communication January 2, 2001.

King, H. Fisheries manager for the Fisheries, Policy, and Management Department of the Maryland Department of Natural Resources. Annapolis, Maryland. Personal communication January 2, 2001.

Lindsay, W.L. 1979. Chemical Equilibria in Soils. New York, NY: John Wiley & Sons. 449 pp.

Radian Corporation. 1992. Management action plan, Andrews Air Force Base. Camp Springs, MD: Prepared for the United States Air Force, Scott Air Force Base, IL.

Shacklette, H.T. and J.G. Boerngen. 1984. Element concentrations in soils and other surficial materials of the conterminous United States. USGS Professional Paper 1720. Washington, DC: U.S. Geological Survey.

Smith, S.L, D.D. MacDonald, K.A. Keenleyside, C.G. Ingersoll, and L.J. Field. 1996. A preliminary evaluation of sediment quality assessment values for freshwater ecosystems. J. Great Lakes Res 22(3): 624-638.

U.S. Air Force (USAF). 1993. Assessment of impacts of landfills LF06 and LF07 on Piscataway Creek and surrounding area. Andrews Air Force Base, MD: Prepared by the U.S. Air Force Installation Restoration Program.

U.S. Environmental Protection Agency (USEPA). 1993. Water quality criteria. Washington, DC: Office of Water, Health and Ecological Criteria Division. 294 pp.

References, *cont*.

U.S. Environmental Protection Agency (USEPA). 1998. Hazard ranking score documentation record, Andrews Air Force Base. Philadelphia, PA: USEPA Region 3. 110 pp.

U.S. Environmental Protection Agency (USEPA). 1999. National recommended water quality criteria—correction: U.S. Environmental Protection Agency, Office of Water.

U.S. Fish and Wildlife Service (USFWS). 1980. Atlantic Coast ecological inventory map, Washing D.C.-MD-VA. 1:250,000. U.S. Geological Survey. Washington D.C.

U.S. Geological Survey (USGS). 1978a. Topographic map, Bowie quadrangle, MD, 7.5 minutes series. 1:24,000. USGS. Denver, CO.

U.S. Geological Survey (USGS). 1978b. Topographic map, Upper Marlboro quadrangle, MD, 7.5 minute series. 1:24,000. USGS. Denver, CO.

U.S. Geological Survey (USGS). 1979a. Topographic map, Anacostia quadrangle, D.C.-MD, 7.5 minutes series. 1:24,000. USGS. Denver, CO.

U.S. Geological Survey (USGS). 1979b. Topographic map, Brandywine quadrangle, MD, 7.5 minutes series. 1:24,000. USGS. Denver, CO.

U.S. Geological Survey (USGS). 1979c. Topographic map, Lanham quadrangle, MD, 7.5 minute series. 1:24,000. USGS. Denver, CO.

U.S. Geological Survey (USGS). 1985. Topographic map, Piscataway quadrangle, MD, 7.5 minutes series. 1:24,000. USGS. Denver, CO.

Malone Service Company, Inc.

(Also Known as the Swan Lake Facility)

Texas City, Galveston County, Texas

EPA Facility ID: TXD980854789

Basin: West Galveston Bay

HUC: 12040204

Executive Summary

The Malone Service Company, Inc. (MSC) site is located in Texas City, Galveston County, Texas, in an industrial and petrochemical area built in marsh/wetlands on the shores of Swan Lake and Galveston Bay. Contaminants of concern at the MSC site include metals, SVOCs (primarily PAHs), pesticides, and PCBs. The NOAA habitats of concern are the surface waters of Swan Lake and Galveston Bay, as well as the surrounding wetlands. Several NOAA trust resources use these waters and wetlands, including invertebrates, fish, and sea turtles.

Site Background

The Malone Service Company, Inc. (MSC) site, also known as the Swan Lake Facility, is located in Texas City, Galveston County, Texas, in an industrial and petrochemical area built in marsh/wetlands on the shores of Swan Lake and Galveston Bay (Figure 1). The MSC site is bordered to the northeast by Galveston Bay and to the east by Swan Lake (shown on Figure 2), which is an embayment of Galveston Bay; marsh/wetlands border the southern portions of the site. The MSC site encompasses approximately 61 ha (150 acres) (TNRCC 1998; USEPA 2001).

The MSC site began operating in 1964 as a reclamation plant for waste oils and chemicals. Later, hazardous waste underground injection/disposal wells were added. Wastes generated from reclamation processes were injected into these wells. Operations ceased in January 1996, and the site has remained inactive since then. Waste materials, two American Petroleum Institute (API) separators, two underground injection wells, roll-off bins, a freshwater pond, and metal drums inside small buildings were left on the site after the plant was closed. The entire site is located within a flood control levee that ranges from 3 m (9 ft) above mean sea level (MSL) in undeveloped areas to 5.5 m (18 ft) above MSL around the waste management areas (TNRCC 1998; USEPA 2001).

The MSC site received a variety of waste products from surrounding industries, including acids and caustics; contaminated residues and solvents; gasoline and crude oil tank bottoms; contaminated earth and water from chemical spill cleanups; general industrial plant wastes; phenolic tars; and waste oils (USEPA 2001). Incoming wastes were placed into two earthen, unlined pits, which were formed by excavating into the sand of a paleostream that crosses from the southeast beneath the site (Figure 2). Wastes with high solids or high water content were placed in the larger pit, which was referred to as the settling pond. The oil fraction that rose to the top of the larger pit was skimmed off the surface and deposited into the smaller pit, known as the oil pit. This oil was then pumped to one of several tanks for treatment, after which it was resold as waste oil for energy recovery (USEPA 2001).

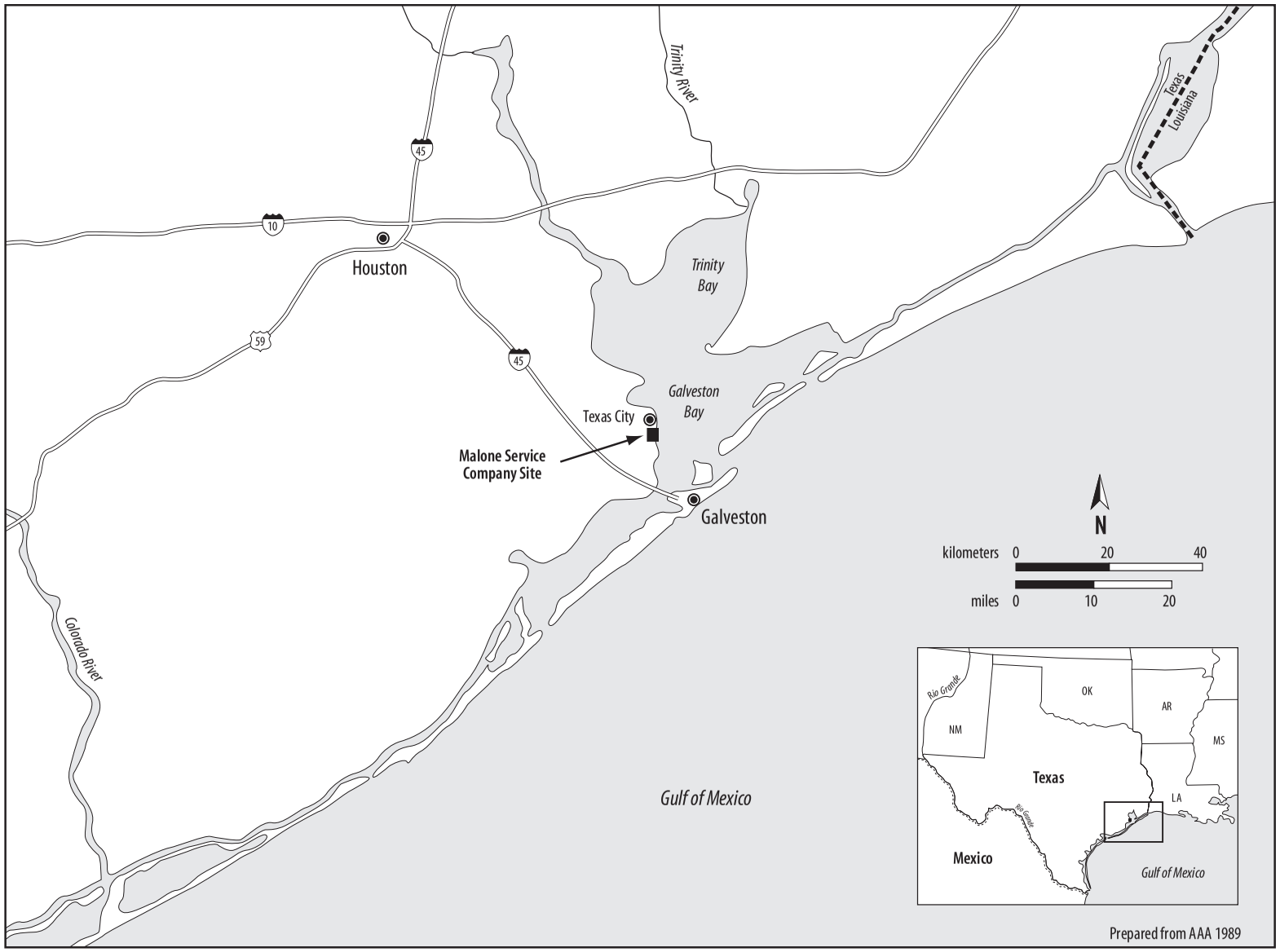


Figure 1. Location of Malone Service Company site, Texas City, Texas.

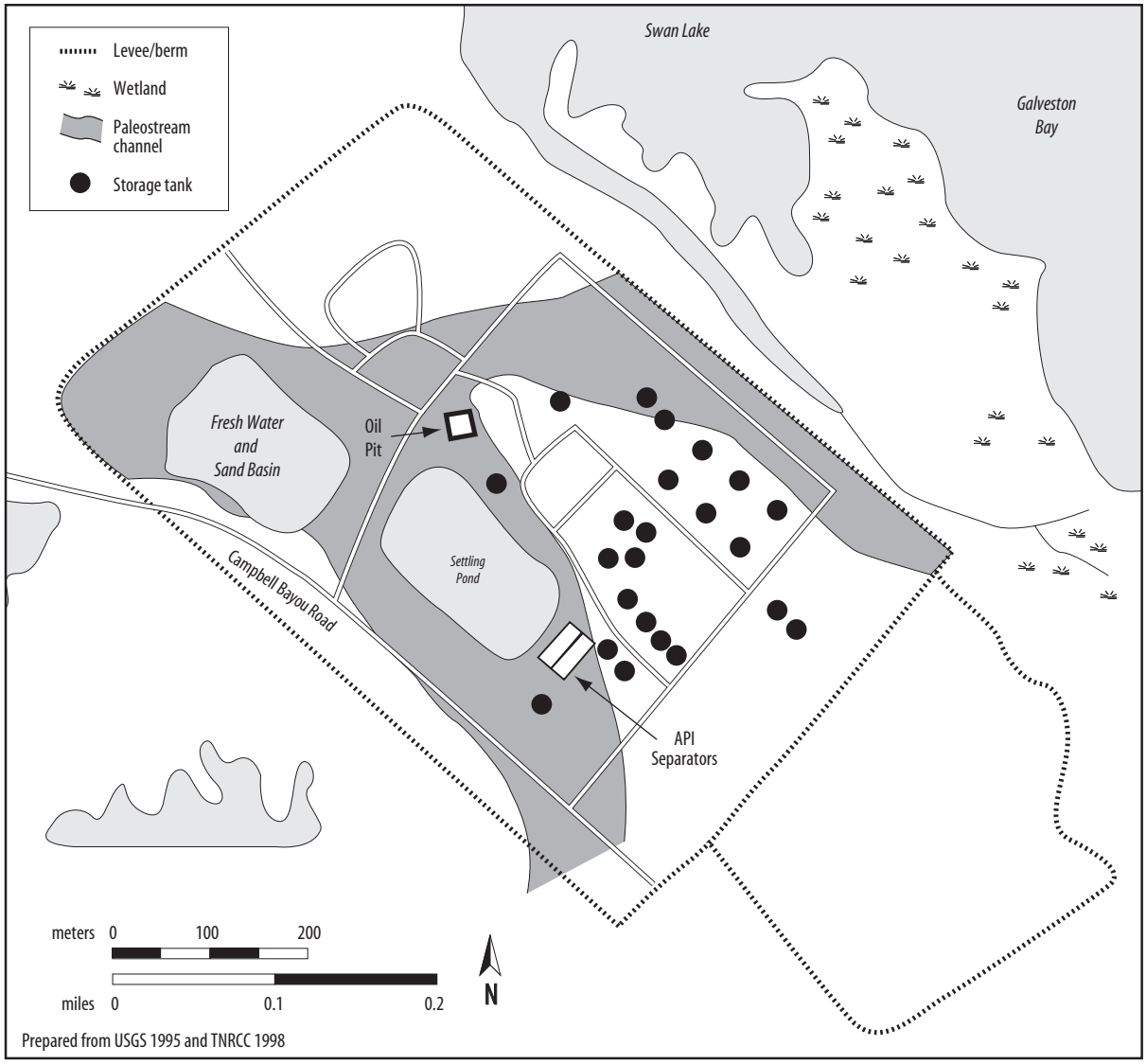


Figure 2. Detail of the Malone Service Company site.

In 1979 and 1987, API separators were installed to replace the settling pond and oil pit. The separators were unlined, but were built on top of a tight clay layer at a depth of 6 m (20 ft) below the ground surface. The settling pond and oil pit were never cleaned out, leaving behind hazardous liquid wastes and solids. A cap was placed on the oil pit in 1983, but the cap has undergone serious damage as a result of pooling storm water (TNRCC 1998; USEPA 2001). The MSC site was proposed to the National Priorities List (NPL) on August 24, 2000, and was placed on the NPL on June 14, 2001. The primary pathways for the migration of contaminants to NOAA trust resources are surface water runoff and groundwater transport.

NOAA Trust Resources

The NOAA habitats of concern are the surface waters of Swan Lake and Galveston Bay, as well as the surrounding wetlands. Swan Lake is a contiguous embayment of Galveston Bay. Together, these two water bodies compose the seventh largest estuary in the United States and have been designated a National Estuary as part of the National Estuary Program. The wetlands between the MSC site, Swan Lake, and Galveston Bay are considered an intertidal, estuarine environment (TNRCC 1998)

Numerous NOAA trust resources (Table 1), including both invertebrate and marine/estuarine fish species, use the surface waters of Swan Lake and Galveston Bay for a variety of habitat functions, including spawning and nursery areas as well as for adult habitat and as a migratory route. Many of the NOAA trust resources support both commercial and/or recreational fisheries, as indicated on Table 1 (Nelson 1992; Robinson 2002). In addition, a number of endangered species exist in the vicinity of the MCS site. Federal- and state-listed endangered leatherback sea turtles, Atlantic hawksbill sea turtles, and Kemp's ridley sea turtles, as well as state-listed endangered loggerhead sea turtles, have all been identified in the area (TNRCC 1998). There are currently no consumption advisories in effect for lower Galveston Bay in the vicinity of the site.

Site-Related Contamination

In 1997, an inspection of the MSC site by the Texas Natural Resource Conservation Commission (TNRCC) determined that hazardous substances originally found in the impoundment and the API separators had been released to the underlying aquifer and were present in the groundwater (TNRCC 1998).

Nine groundwater samples, 14 sediment samples, and three soil samples were collected from the MSC site and analyzed for metals, semivolatile organic compounds (SVOCs), including polynuclear aromatic hydrocarbons (PAHs), and pesticides. The sediment samples were also analyzed for polychlorinated biphenyls (PCBs). No surface water samples were collected. Table 2 summarizes maximum concentrations of the contaminants of concern detected in these media.

In soil samples, the maximum concentrations of arsenic, chromium, copper, lead, nickel and zinc did not exceed mean U.S. soil guidelines. The samples were not analyzed for cadmium, mercury, selenium, and silver. Pyrene was the only PAH detected, and DDT was the only pesticide detected. No mean U.S. soil guidelines are available for comparison to the maximum concentrations of these compounds.

Groundwater contained maximum concentrations of arsenic and mercury that exceeded the ambient water quality criteria (AWQC) by more than two orders of magnitude. The maximum concentration of nickel exceeded the AWQC by more than one order of magnitude, and the maximum concentration of chromium exceeded the AWQC by just under one order of magnitude. Copper slightly exceeded the AWQC, while cadmium, lead, selenium, and zinc were detected at maximum concentrations below the AWQC. Silver was not analyzed for. All of the six PAHs for which groundwater samples were analyzed were also detected; however, only fluoranthene was detected at a maximum concentration that exceeded the AWQC. Maximum concentrations of PAHs ranged from 18 µg/L (fluoranthene and phenanthrene) to 130 µg/L (naphthalene). Several pesticides were also detected in the groundwater samples; all maximum concentrations exceeded the AWQC, with the exceptions of aldrin and DDE; there is no AWQC available for DDE. Maximum concentrations of DDT, dieldrin, endosulfan, endrin, and heptachlor epoxide exceeded the AWQC by at least two orders of magnitude.

Table 1. NOAA trust resources found in Swan Lake and Galveston Bay waters (Nelson 1992; Robinson 2002).

Species		Habitat Use				Fisheries	
Common Name	Scientific Name	Migratory Route	Spawning Area	Nursery Area	Adult Habitat	Comm. Fishery	Rec. Fishery
MARINE/ESTUARINE FISH							
Atlantic croaker	*Micropogonias undulaus*		◆	◆	◆	◆	◆
Atlantic menhaden	*Brevoortia tyrannus*	◆	◆	◆			
Bay anchovy	*Anchoa mitchilli*	◆	◆	◆	◆		
Bay squid	*Lolliguncula brevis*		◆	◆	◆	◆	
Black drum	*Pogonias cromis*	◆		◆	◆	◆	◆
Gizzard shad	*Dorosoma cepedianum*				◆		
Gulf killifish	*Fundulus grandis*		◆	◆	◆	◆	
Gulf kingfish	*Menticirrhus littoralis*				◆	◆	◆
Hardhead catfish	*Arius felis*		◆	◆	◆		
Pigfish	*Orthopristis chrysoptera*	◆		◆			◆
Pinfish	*Lagodon rhomboides*	◆		◆			◆
Red drum	*Sciaenops ocellatus*	◆	◆	◆	◆		◆
Sand seatrout	*Cynoscion arenarius*		◆	◆	◆		◆
Sea catfish	*Arius felis*		◆	◆	◆	◆	◆
Sheepshead	*Archosargus probatocephalus*		◆	◆	◆	◆	◆
Sheepshead minnow	*Cyprinodon variegatus*		◆	◆	◆		
Silver perch	*Bairdiella chrysoura*		◆	◆	◆	◆	◆
Silversides	*Menidia species*			◆	◆		
Southern flounder	*Paralichthys lethostigma*	◆		◆	◆	◆	◆
Spot	*Leiostomus xanthurus*			◆	◆	◆	
Spotted seatrout	*Cynoscion nebulosus*		◆	◆	◆		◆
Striped mullet	*Mugil cephalus*			◆	◆	◆	◆
INVERTEBRATES							
Blue crab	*Callinectes sapidus*	◆		◆	◆	◆	◆
Brown shrimp	*Farfante penaeus aztecus*	◆		◆	◆	◆	◆
Eastern oyster	*Crassostrea virginica*		◆	◆	◆	◆	◆
Grass shrimp	*Palaemonetes pugio*		◆	◆	◆		
Gulf stone crab	*Menippe adina*		◆	◆	◆	◆	◆
Hard clam	*Mercenaria species*		◆	◆	◆		
White shrimp	*Litopenaeus setiferus*	◆		◆	◆	◆	◆

Table 2. Maximum concentrations of contaminants of concern at the Malone Service Company, Inc. site (USEPA 1997a; USEPA 1997b).

	Soil (mg/kg)		Water (µg/L)		Sediment (mg/kg)	
Contaminant	Soil	Mean U.S.[a]	Groundwater	AWQC[b]	Sediment	ER-L[c]
METALS						
Arsenic	3.4	5.2	6000	36	29	8.2
Cadmium	N/A	0.06	4.7	9.3	2.3	1.2
Chromium[j]	6.2	37	470	50	79	81
Copper	4.2	17	3.9	3.1	110	34
Lead	13	16	4.8	8.1	230	46.7
Mercury	N/A	0.058	9.6	0.094[d]	0.25	0.15
Nickel	4	13	620	8.2	16	20.9
Selenium	N/A	NA	12	71	N/A	1.0[g]
Silver	N/A	0.05	N/A	0.95[e]	3.5	1
Zinc	21	48	30	81	320	150
PAHs						
Acenaphthene	N/A	NA	24	710[f]	0.18	0.016
Acenaphthylene	N/A	NA	N/A	300[f,e,i]	0.19	0.044
Anthracene	N/A	NA	N/A	300[f,e,i]	0.57	0.0853
Benz(a)anthracene	N/A	NA	N/A	300[f,e,i]	1.1	0.261
Chrysene	N/A	NA	N/A	300[f,e,i]	1.1	0.384
Dibenz(a,h)anthracene	N/A	NA	25	300[f,e,i]	0.26	0.0634
Fluoranthene	N/A	NA	18	16[f]	1.4	0.6
Fluorene	N/A	NA	N/A	NA	0.21	0.019
2-Methylnaphthalene	N/A	NA	N/A	300[f,e,i]	0.25	0.07
Naphthalene	N/A	NA	130	2350[f,e]	0.16	0.16
Phenanthrene	N/A	NA	18	NA	1.6	0.24
Pyrene	0.02	NA	43	300[f,e,i]	3.5	0.665
PESTICIDES/PCBs						
Aldrin	N/A	NA	0.6	1.3[e]	0.004	NA
DDE	N/A	NA	0.31	NA	0.05	0.0022[k]
DDT	0.001	NA	0.6	0.001	0.02	0.00158[h]
Dieldrin	N/A	NA	0.53	0.0019	0.02	0.00002
Endosulfan (alpha + beta)	N/A	NA	1.3	0.0087	0.011	NA
Endrin	N/A	NA	0.35	0.0023	0.03	NA
Gamma-BHC (Lindane)	N/A	NA	0.54	0.16[e]	0.003	NA
Heptachlor	N/A	NA	0.2	0.0036	0.001	NA
Heptachlor Epoxide	N/A	NA	0.77	0.0036	31	NA
PCBs (as Aroclors)	N/A	NA	N/A	0.03	0.33	0.0227

ND: Not detected; detection limit not available.
NA: Screening guidelines not available.
N/A: Contaminant not analyzed for.

a: Shacklette and Boerngen (1984), except for cadmium and silver, which represent average concentrations in the Earth's crust from Lindsay (1979).
b: Ambient water quality criteria for the protection of aquatic organisms (USEPA 1993, 1999). Marine chronic criteria presented.
c: Effects range-low represents the 10th percentile for the dataset in which effects were observed or predicted in studies compiled by Long et al. (1998).
d: Derived from inorganics but applied to total.
e: Chronic criterion not available; acute criterion presented.
f: Lowest Observable Effect Level (LOEL).
g: Marine apparent effects threshold (AET) for amphipod bioassay. The AET represents the concentration above which adverse biological impacts would be expected.
h: Expressed as Total DDT.
i: Value for chemical class.
j: Screening guidelines represent concentrations for Cr^{+6}.
k: Expressed as p,p-DDE.

Sediment samples contained maximum concentrations of arsenic, cadmium, copper, lead, mercury, silver, and zinc that exceeded the effects range-low (ER-L) guidelines by less than one order of magnitude. Lead showed the greatest exceedance at approximately five times the ER-L. Chromium and nickel were detected, but not at concentrations in excess of the ER-Ls. Selenium was not analyzed for. All of the PAHs for which the sediment samples were analyzed were detected at maximum concentrations that either exceeded or were equal to the ER-Ls. Exceedances ranged from just over twice the ER-L (fluoranthene) to more than an order of magnitude (acenaphthene and fluorene). Three pesticides were detected at maximum concentrations that exceeded the ER-Ls by one order of magnitude (DDE and DDT) to three orders of magnitude (dieldrin). ER-Ls are not available for comparison to the maximum concentrations of other pesticides detected in sediment samples. PCBs were detected at a maximum concentration that exceeded the ER-L by one order of magnitude.

References

American Automobile Association (AAA). 1989. Road Atlas: United States, Canada, Mexico. AAA. Falls Church, VA.

Lindsay, W.L. 1979. Chemical Equilibria in Soils. New York, NY: John Wiley & Sons. 449 pp.

Long, E.R., L.J. Field, and D.D. MacDonald. 1998. Predicting toxicity in marine sediments with numerical sediment quality guidelines. Environmental Toxicology and Chemistry 17(4):714-727.

Nelson, David M. (editor). 1992. Distribution and abundance of fishes and invertebrates in Gulf of Mexico estuaries, Volume I: data summaries. ELMR Rep. No. 10. Rockville, MD: NOAA/NOS Strategic Environmental Assessments Division. 273 pgs.

Robinson, L. Fisheries biologist for the Texas Parks and Wildlife Department, Seabrook Marine Laboratory. Seabrook, TX. Personal communication February 8, 2002.

Shacklette, H.T. and J.G. Boerngen. 1984. Element concentrations in soils and other surficial materials of the conterminous United States. USGS Professional Paper 1720. Washington, DC: U.S. Geological Survey.

Texas Natural Resource Conservation Commission (TNRCC). 1998. Screening Site Inspection Report Volume I of III for Malone Service Company, Inc., Texas City, Galveston County, Texas. TXD 980864789. Houston, TX: Prepared for the U.S. Environmental Protection Agency (USEPA).

U.S. Environmental Protection Agency (USEPA). 1993. Water quality criteria. Washington, DC: Office of Water, Health and Ecological Criteria Division. 294 pp.

U.S. Environmental Protection Agency (USEPA). 1997a. Sample Designation Group MFGQ-27, Contract Laboratory Program data review, analyses data package, chain of custodies, and sample quantitation limit calculations. Case Number 25289. Houston, TX: USEPA Region 6 Houston Branch. 47 pgs.

U.S. Environmental Protection Agency (USEPA). 1997b. Sample Designation Group MFGQ-42, Contract Laboratory Program data review, analyses data package, chain of custodies, and sample quantitation limit calculations. Case Number 25289. Houston, TX: USEPA Region 6 Houston Branch. 36 pgs.

References, *cont.*

U.S. Environmental Protection Agency (USEPA). 1999. National recommended water quality criteria—correction: U.S. Environmental Protection Agency, Office of Water.

U.S. Environmental Protection Agency (USEPA). 2001. Malone Services Company, Texas City, Texas, EPA ID# TXD980864789. Available: http://www.epa.gov/region06/6sf/pdffiles/malonesr.pdf.

U.S. Geological Survey (USGS). 1995. Topographic map, Virginia Point, TX, 7.5 minutes series. 1: 24,000. USGS. Denver, CO.

Portland Harbor

Portland, Oregon

EPA Facility ID: ORSFN1002155

Basin: Lower Willamette

HUC: 17090012

Executive Summary

The Portland Harbor site is a heavily industrialized stretch of the lower Willamette River in Portland, Oregon. The site is composed of numerous individual sites. From the center of the site, the Willamette River flows approximately 10 km (6.2 mi) north to its confluence with the Columbia River. Spills and direct discharges into this section of the river have contaminated river sediment with PAHs, PCBs, metals, and pesticides. The NOAA habitats of concern are the lower Willamette River and the Columbia River downstream of the site. The Willamette River contains NOAA trust resources, including spawning populations of American shad, chinook and coho salmon, Pacific lamprey, sockeye salmon, steelhead, and white sturgeon. The lower Willamette River is a migratory corridor for juvenile and adult anadromous fish and is rearing habitat for several juvenile anadromous fish species. Downstream of the site, the Columbia River supports recreational fishing of spring chinook and several commercial fisheries.

Site Background

The Portland Harbor site includes approximately 10 km (6.2 mi) of the lower Willamette River in an industrial section of Portland, Oregon. The site boundary has not yet been determined. From the center of the Portland Harbor site, the Willamette River flows approximately 10 km (6.2 mi) north before discharging into the Columbia River (Figure 1). The Portland Harbor site has been divided into five reaches (Reaches A through E) to facilitate environmental investigations (Figure 2).

Numerous industrial sites have been identified as possible sources of sediment contamination at the Portland Harbor site (NOAA 1999b). Spills and direct discharges into this section of the river have led to the contamination of the sediment with polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), metals, and pesticides. Current and historical activities at these industrial sites include hazardous waste storage, marine construction, storage and handling of bulk petroleum products, oil firefighting training, oil gasification plant operations, wood treating, agricultural chemical production, battery processing, liquid natural gas plant operations, chlorine production, ship maintenance and repair, and railcar manufacturing.

In May 1997, contractors for the U.S. Environmental Protection Agency (USEPA) completed a site inspection (SI) for the Portland Harbor site (Weston 2000). The Portland Harbor site was placed on the National Priorities List in December 2000 (USEPA 2000).

Because industrial activity is within 300 m (328 yd) of the lower Willamette River, direct surface discharges, spills, and groundwater transport are the most likely pathways for the migration of contaminants to NOAA trust resources (Weston 1998). Leaking underground storage tanks have been documented at several of the industrial sites (NOAA 1999b). Detailed information on groundwater characteristics at the Portland Harbor site was unavailable at the time of this report.

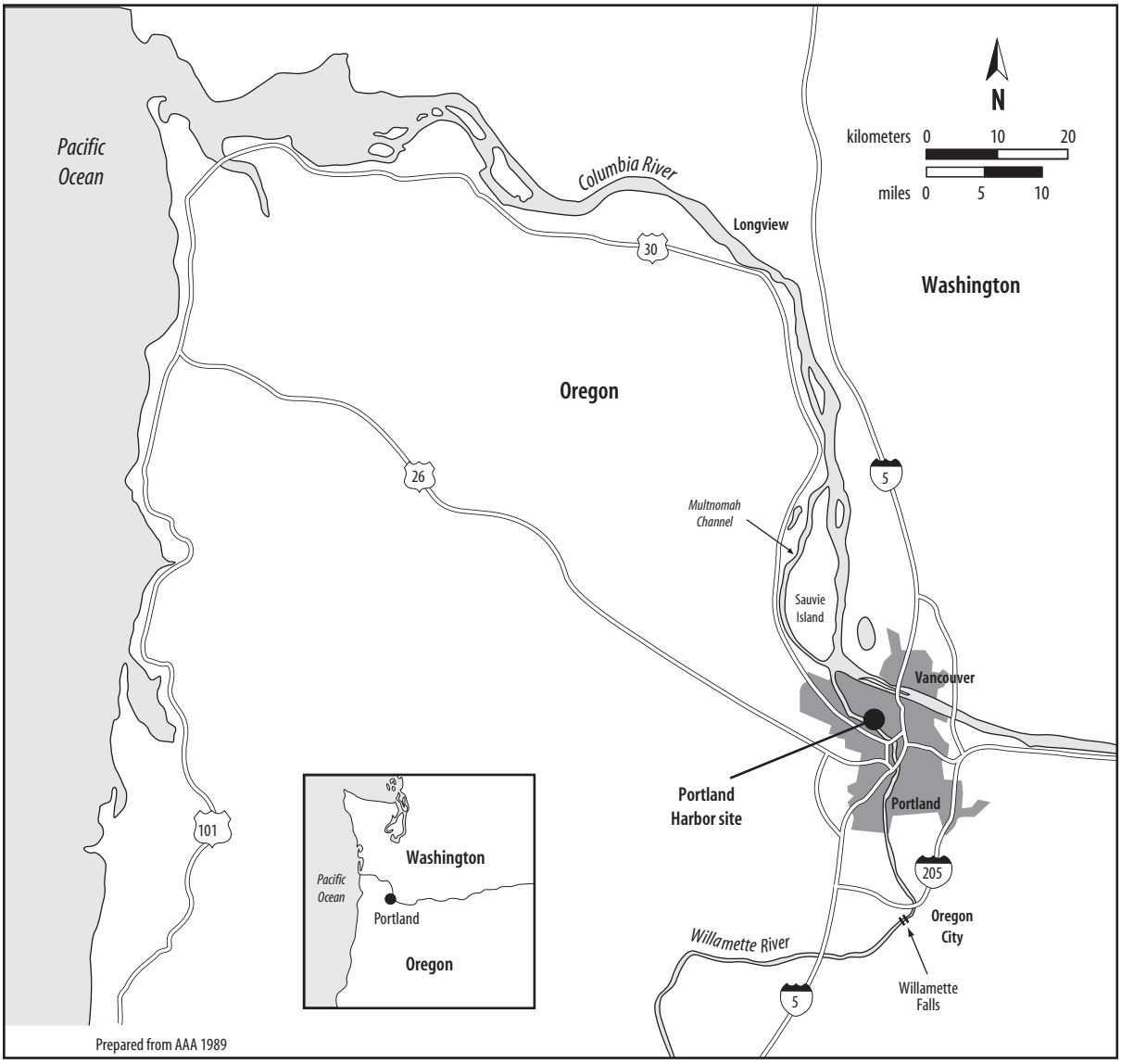


Figure 1. Location of Portland Harbor site, Portland, Oregon.

NOAA Trust Resources

The NOAA trust habitats of concern are the lower Willamette River and the Columbia River downstream of the site. NOAA trust resources potentially at risk include anadromous fish species such as American shad, chinook salmon, coho salmon, Pacific lamprey, sockeye salmon, steelhead, and white sturgeon (Table 1) (NOAA 1999b). Anadromous fish spawn throughout the upper river basin, upstream of the Portland Harbor site. The lower Willamette River is a migratory corridor for juvenile and adult anadromous fish and provides rearing habitat for several juvenile anadromous fish species (NOAA 1999b).

Recreational fishing is common throughout the Willamette River basin. The most desired species are the coho and spring chinook salmon, steelhead, and white sturgeon (NOAA 1999b). Spring chinook salmon support the largest recreational fishery in the lower Willamette River, between Oregon City and the confluence of the Willamette and Columbia rivers and throughout the

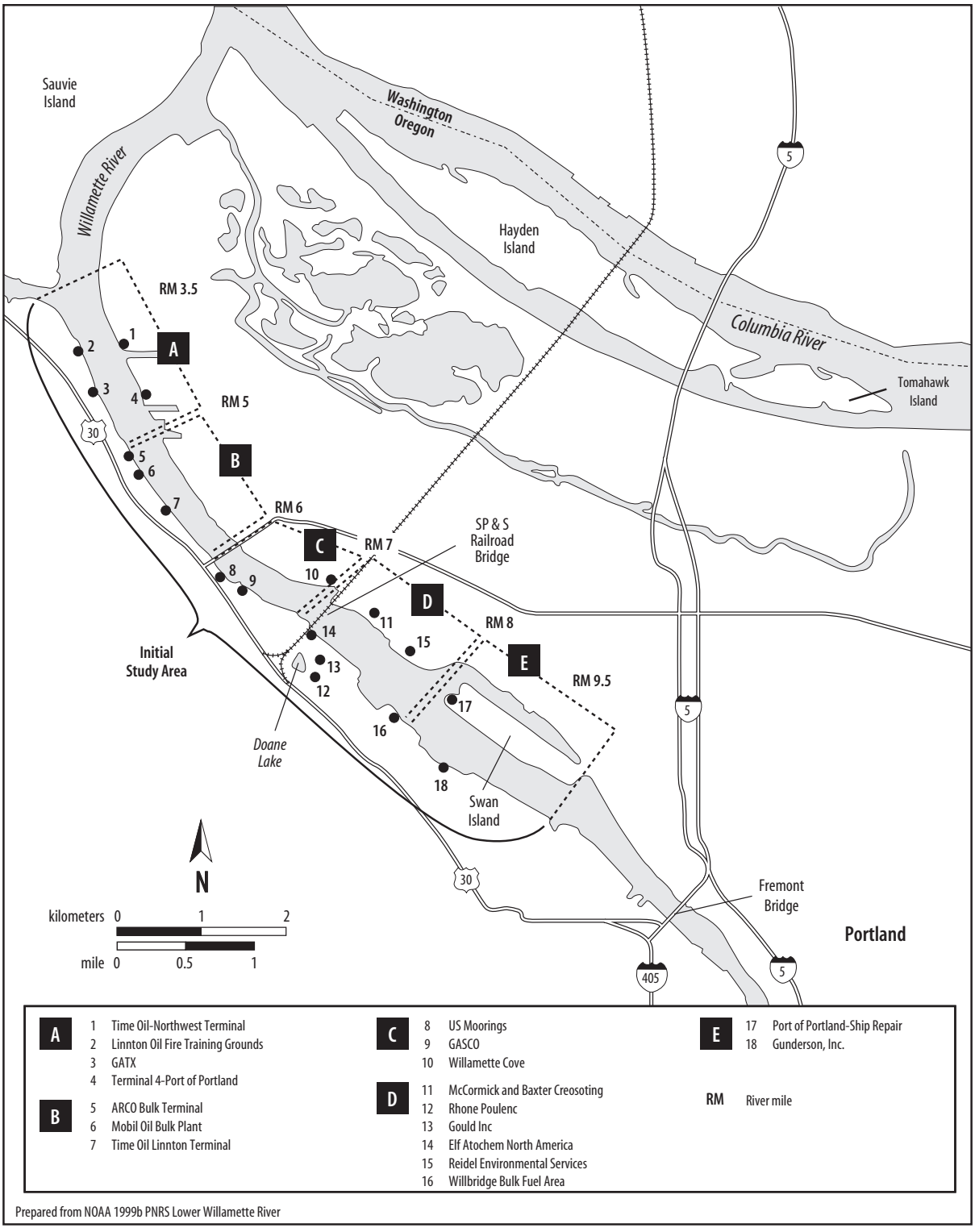


Figure 2. The Initial Study Area investigated by the USEPA in 1998, with the river reach sections (lettered) and individual sites (numbered) within each section.

Multnomah Channel. The Portland Harbor site is located within this 75 km (47 mi) reach, and recreational angling is permitted there (NOAA 1999b). There are no commercial fisheries for anadromous fish species on the Willamette River. However, the Columbia River supports many commercial fisheries that are closely regulated due to declining stocks and conflicting uses of the river. Spring chinook contribute substantially to the mainstream Columbia River sport fishery.

Table 1. NOAA trust resources present in the lower Willamette River (NOAA 1999b).

Species		Habitat Use		Fisheries	
Common Name	Scientific Name	Nursery Area	Migratory Route	Comm. Fishery	Recr. Fishery
ANADROMOUS FISH					
American shad	*Alosa sapidissima*	◆	◆		◆
Chinook salmon	*Oncorhynchus tshawytscha*	◆	◆		◆
Coho salmon	*Oncorhynchus kisutch*	◆	◆		◆
Pacific lamprey	*Lampetra tridentata*	◆	◆		◆
Sockeye salmon	*Oncorhynchus nerka*	◆	◆		
Steelhead[a]	*Oncorhynchus mykiss*	◆	◆		◆
White sturgeon	*Acipenser transmontanus*	◆	◆		◆

a: The term steelhead is applied to a sea-run rainbow trout and some populations from lakes.

Spring chinook and steelhead are listed as federally threatened under the Endangered Species Act. Coho salmon in the lower Columbia River and southwest Washington are candidates for listing because of concerns about the health of their runs (NOAA 1999a). The Pacific lamprey is a culturally important resource to Native American tribes in the Pacific Northwest. Historically, Pacific lamprey have been harvested for subsistence, ceremonial, and medicinal purposes (BPA 1995).

Two fish advisories are in effect for the Willamette River. One advisory bans the commercial harvest and sale of shellfish within a 305 m (1,000 ft) radius of the McCormick and Baxter site (Figure 2) because of arsenic, creosote, and pentachlorophenol (PCP) contamination (NOAA 1999b; USEPA 2002). The other advisory recommends moderate consumption of resident fish species from the mainstem of the Willamette River because of elevated concentrations of mercury and several organic compounds. This advisory does not apply to anadromous fish species (ODHS 2002).

Site-Related Contamination

PAHs and metals have been detected in all reaches of the Portland Harbor site. Chlorinated pesticides and PCBs, although not as widespread, have also been detected at elevated concentrations. During the SI, 150 surface sediment samples, 37 subsurface sediment cores, and 28 sediment porewater samples were collected (NOAA 1999b). All samples were analyzed for metals and semivolatile organic compounds, which include the PAHs. In addition, 61 surface sediment samples were analyzed for PCBs and pesticides. Table 2 summarizes maximum concentrations of contaminants of concern in sediment samples, along with appropriate screening guidelines, in this case the threshold effect levels (TELs), for comparison.

Table 2. Maximum concentrations of contaminants of concern in Portland Harbor sediment (Weston 1998; NOAA 1999b).

	Sediment (mg/kg)	
Contaminant	Site Sediment	TEL[a]
TRACE ELEMENTS		
Arsenic	16	5.9
Cadmium	2.2	0.6
Chromium	68	37.3
Copper	540	35.7
Lead	260	35
Mercury	0.86	0.17
Nickel	39	18
Silver	1.9	NA
Zinc	540	123.1
PAHs		
Acenaphthylene	3.6	NA
Acenaphthene	51	NA
Anthracene	26	NA
Benz(a)anthracene	72	0.032
Chrysene	100	0.057
Dibenz(a,h)anthracene	25	NA
Fluoranthene	110	0.11
Fluorene	22	NA
2-Methylnaphthalene	44	NA
Naphthalene	130	NA
Phenanthrene	170	0.042
Pyrene	140	0.053
PESTICIDES and PCBs		
DDT	3.1	0.0070[b]
DDE	0.22	0.0014
PCBs (as Aroclors)	0.58	0.034

a: Threshold Effects Level is the geometric mean of the 15th percentile of the effects data and the 50th percentile of the no-effects data. The TEL is intended to represent the concentration below which adverse biological effects rarely occurred (Smith et al. 1996).

b: Expressed as total DDT.

NA: Screening guidelines not available.

PAHs were the most widely detected contaminants in sediment at the Portland Harbor site. Eleven of the 12 PAHs of concern were detected at maximum concentrations in Reach C (Figure 2). Three bulk petroleum facilities, located on the western bank of the river in this reach, have been identified as potential sources. Only five of the detected PAHs (benz(a)anthracene, chrysene, fluoranthene, phenanthrene, and pyrene) have established freshwater TELs. Maximum concentrations of these PAHs exceeded their TELs by three orders of magnitude.

The maximum concentrations of arsenic, chromium, copper, mercury, nickel, silver, and zinc in sediment were detected in Reach E near the Port of Portland Ship Repair facility. The maximum concentrations of cadmium and lead were detected in Reach A. Maximum concentrations of all detected metals exceeded their respective freshwater TELs by less than one order of magnitude, except copper, which exceeded the TEL by one order of magnitude, and silver, for which there is no TEL.

The pesticides DDT and DDE were detected at maximum concentrations in sediment from Reach D near the Rhone Poulenc facility, which produced and distributed agricultural chemicals. The maximum concentrations of DDT and DDE exceeded their respective TELs by two orders of magnitude.

The greatest number of surface sediment samples with detected concentrations of PCBs in excess of the TEL were collected in Reach E. Concentrations of PCBs exceeded the TEL at 17 different sampling stations near Swan Island. PCBs were also detected in sediment samples from Reaches C and D at concentrations exceeding the TEL. The maximum PCB concentration was detected in Reach E and exceeded the TEL by one order of magnitude.

References

American Automobile Association (AAA). 1989. Road Atlas: United States, Canada, Mexico. AAA. Falls Church, VA.

Bonneville Power Administration: U.S. Department of Energy (BPA). 1995. Status Report of the Pacific Lamprey (Lampetra trzdentata) in the Columbia River Basin. Available: http://www.efw.bpa.gov/Environment/EW/EWP/DOCS/REPORTS/GENERAL/I39067-1.pdf.

National Oceanic and Atmospheric Administration (NOAA). 1999a. National Marine Fisheries: Northwest Regional Office: Fact sheet for West Coast coho salmon. Available: http://www.nwr.noaa.gov/1salmon/salmesa/pubs/99cohofs.htm.

National Oceanic and Atmospheric Administration (NOAA). 1999b. Preliminary natural resource survey: Lower Willamette River, Portland, Oregon. Seattle, WA.

Oregon Department of Human Services (ODHS). 2002. Oregon Public Health Services. Available: http://www.ohd.hr.state.or.us/news/2001/1120esc.htm.

Roy F. Weston Inc. (Weston). 1998. Portland Harbor sediment investigation report Multnomah-County, Oregon. EPA910/R-98-006. Seattle, WA: Prepared for U.S. Environmental Protection Agency.

Roy F. Weston Inc. (Weston). 2000. HRS documentation record - Portland Harbor. NPL-U33-2-7-R10. Seattle, WA: Prepared for U.S. Environmental Protection Agency.

Smith, S.L, D.D. MacDonald, K.A. Keenleyside, C.G. Ingersoll, and L.J. Field. 1996. A preliminary evaluation of sediment quality assessment values for freshwater ecosystems. J. Great Lakes Res 22(3): 624-638.

References, *cont.*

U.S. Environmental Protection Agency (USEPA). 2000. NPL site narrative at listing Portland Harbor: Portland, Oregon. Available: http://www.epa.gov/superfund/sites/npl/nar1606.htm.

U.S. Environmental Protection Agency (USEPA). 2002. Listing of fish and wildlife advisories: State advisories. Available: http://map1.epa.gov/scripts/.esrimap?name=Listing&Cmd=Map.

Stibnite/Yellow Pine Mining Area

Yellow Pine, Idaho

EPA Facility ID: ID9122307607

Basin: Upper Middle Fork Salmon

HUC:17060208

Executive Summary

The Stibnite/Yellow Pine Mining Area site is in northern-central Valley County, Idaho, along the East Fork South Fork Salmon River (East Fork). Gold-antimony ore and tungsten were mined at the Stibnite site from the early 1900s through 1997. The East Fork is a tributary of the South Fork Salmon River. The NOAA trust habitats of concern are the surface waters and sediments of the East Fork, which is designated as habitat for salmonid spawning. NOAA trust resources using the East Fork are Snake River spring/summer chinook salmon, Pacific lamprey, and steelhead trout. Chemicals of concern at the Stibnite site are metals and cyanide.

Site Background

The Stibnite/Yellow Pine Mining Area (Stibnite) site is in northern-central Valley County, Idaho, along the East Fork South Fork Salmon River (East Fork), approximately 23 km (14 mi) southeast of Yellow Pine, Idaho (Figure 1). The site boundary begins approximately 1.6 km (1 mi) upstream of the Meadow Creek Diversion Channel and extends north to approximately 0.4 km (0.25 mi) downstream of the confluence of Sugar Creek and the East Fork (Figure 2). The site and nearby terrain consist of narrow valleys surrounded by steep mountains. The Payette and Boise National Forests both border the Stibnite site (URS 2000).

Mining and mineral processing, primarily of gold, antimony, and tungsten, have taken place at the Stibnite site since the early 1900s. Major operations within the Stibnite site included the Meadow Creek Mine and ore processing facilities in Meadow Creek Valley (1919-1938); the Yellow Pine Mine (1937-1952); the West End mining area (1982-1990); and the Homestake ore body (1988-1992). Mining activities ceased in 1997 (URS 2000).

Originally, tailings from the Meadow Creek Mine and the Yellow Pine Mine were disposed of at impoundments called the Bradley Tailings and were also directly discharged into Meadow Creek (Figure 2). Near the end of World War II, a larger tailings impoundment (known as the Historical Bradley Tailings) was constructed in the upper Meadow Creek Valley, upstream of Blowout Creek. Meadow Creek was diverted to provide room for these tailings deposits. Over time, ponding of upper Meadow Creek occurred behind the impoundment. On one or more occasions between 1952 and 1978, a period when the Stibnite site was mostly idle, the Meadow Creek diversion failed, allowing the creek to erode the tailings. The U.S. Department of Agriculture Forest Service (USDA Forest Service) has estimated that approximately 9,072 metric tons (10,000 tons) of tailings washed into Meadow Creek as a result (URS 2000).

The Yellow Pine Mine began as underground workings in 1937. In May 1943, it was converted to an open-pit mine, and the East Fork was diverted around the pit. In 1952, the Yellow Pine Mine

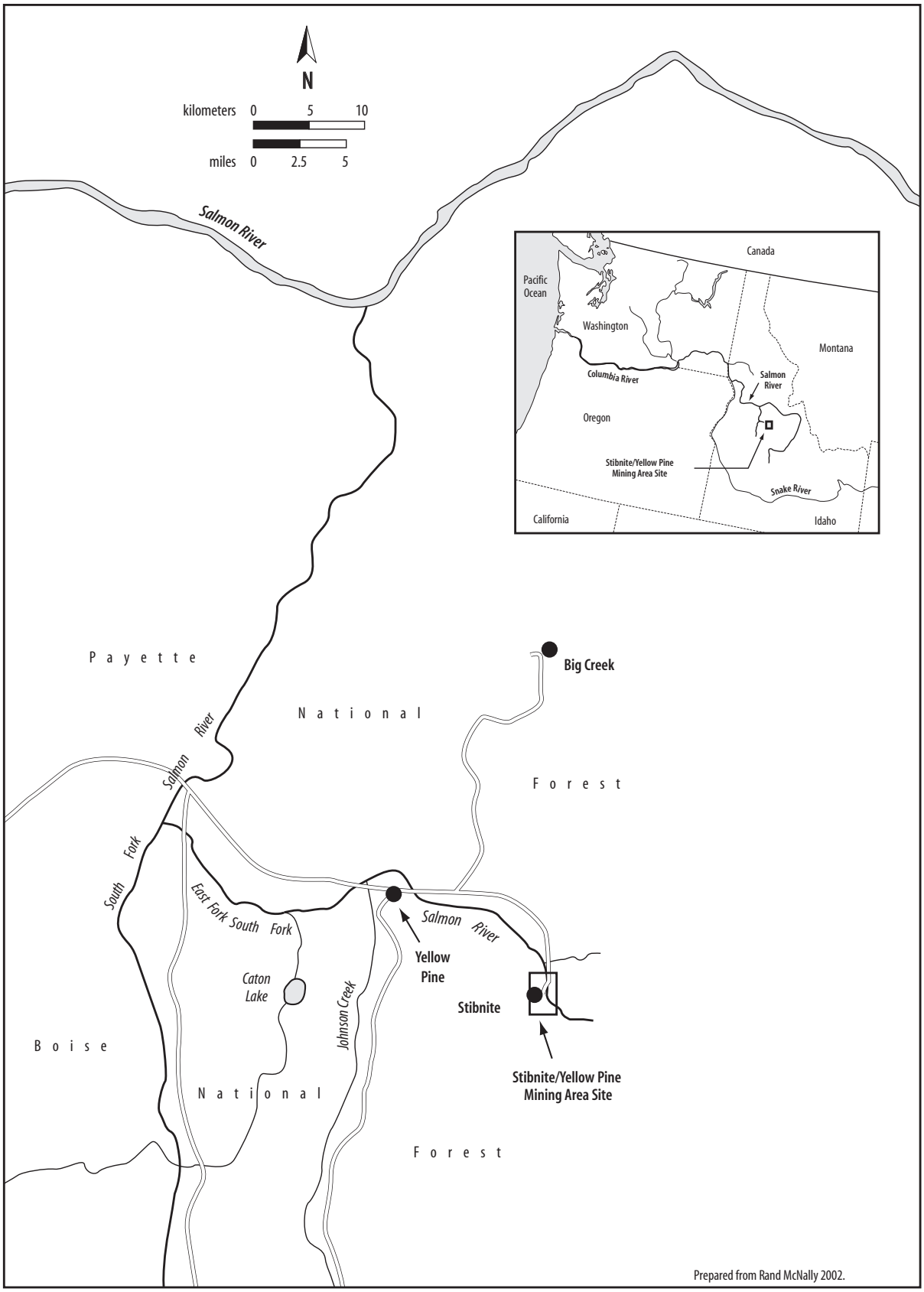


Figure 1. Location of Stibnite/Yellow Pine Mining Area site, Yellow Pine, Idaho.

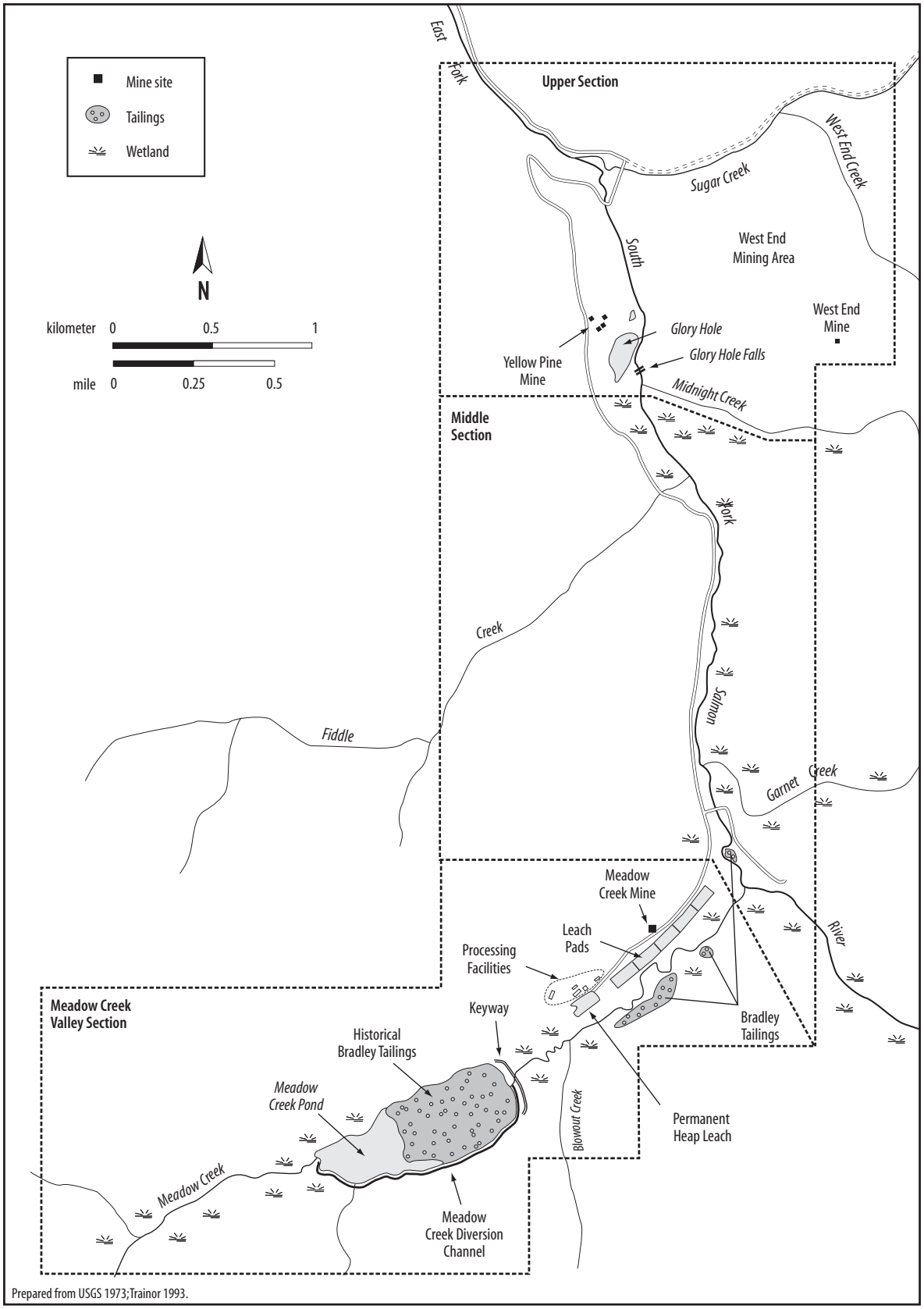


Figure 2. Detail of Stibnite/Yellow Pine Mining Area site.

closed, and the East Fork was diverted back to its original stream channel, running through and filling the pit, now termed the Glory Hole. This action also created a waterfall upstream of the Glory Hole (pit lake), known as Glory Hole Falls (NMFS 1995).

In 1982, the mining of low-grade oxide gold ore began in the West End mining area. On/off leach pads and cyanidation processing facilities associated with the West End mining area were constructed near the site of the former Meadow Creek Mine and processing facilities (URS 2000). In spring 1990, a cyanide release occurred as the result of one mining company's practices related to the disposal of spent ore from the West End mining area. The cyanide release caused the U.S. Environmental Protection Agency (USEPA) to consider the site for possible placement on the National Priorities List (NPL) (USDA Forest Service 1994).

Between 1988 and 1992, oxide gold ore was mined from the Homestake ore body. The exact location of the Homestake ore body could not be determined from available information for this report, but it is generally east of the Yellow Pine Mine. A permanent heap leach associated with mining at the Homestake ore body was constructed along Meadow Creek near the old processing facilities in Meadow Creek Valley (URS 2000).

A number of investigations and data collection programs have been undertaken at the Stibnite site, including surface water quality monitoring and flow measurement studies, groundwater monitoring, and the sampling of soil, tailings, and sediment (URS 2000). In addition, several reclamation activities have been undertaken within the Stibnite site. The Historical Bradley Tailings impoundment has been encapsulated with neutralized ore from the leach pads. To reduce the sediment load to Meadow Creek from tailings deposits, Meadow Creek has been diverted/realigned around the tailings impoundment, a keyway (earthen dam) has been constructed at the base of the tailings impoundment, and other tailings impoundments have been covered with waste rock and other materials. Revegetation along the banks of Meadow Creek and stream restoration have also been undertaken (URS 2000).

Surface water provides the primary pathway for the migration of contaminants from and within the Stibnite site to NOAA trust resources. Surface water bodies at the site include the East Fork and its tributaries, the Glory Hole (pit lake), wetlands in Meadow Creek Valley, and various springs throughout the area. The East Fork is the main drainage running through the site, and all of the site's minor drainages flow into the East Fork (URS 2000).

The Stibnite site was proposed to the NPL on September 13, 2001 (USEPA 2001). No information is currently available regarding possible further actions to be taken at the site.

NOAA Trust Resources

The NOAA trust habitats of concern are the surface waters and sediments of the East Fork South Fork Salmon River and the South Fork Salmon River. The NOAA trust resources found within the East Fork are Snake River spring/summer chinook salmon, Pacific lamprey, and steelhead trout (Table 1).

The East Fork's watershed covers approximately 101,000 ha (250,000 acres). The East Fork flows into the main stem of the South Fork Salmon River approximately 48 km (about 30 mi) downstream of the site. The South Fork Salmon River joins the Salmon River approximately 54 km (about 33 mi) farther downstream. The Salmon River then forms a confluence with the Snake River, which flows into the Columbia River and ultimately to the Pacific Ocean (URS 2000).

Table 1. NOAA trust fish species found within the East Fork South Fork Salmon River and the South Fork Salmon River (Apperson 2002).

Species		Habitat Use			Fisheries	
Common Name	Scientific Name	Spawning Ground	Nursery Ground	Adult Forage	Comm. Fishery	Rec. Fishery
ANADROMOUS FISH						
Pacific lamprey	*Lampetra tridentata*	◆	◆			
Snake River spring/summer chinook salmon[a]	*Oncorhynchus tshawytscha*	◆	◆			
Steelhead trout	*Oncorhynchus mykiss*	◆	◆			◆[b]

a: Federally listed as a threatened species
b: Catch-and-release basis only

The Salmon River, a major river system in Idaho, supports anadromous fish (USDA Forest Service 1994). The South Fork Salmon River drainage, including the East Fork, has historically contained one of Idaho's largest salmon runs. The East Fork has been designated by the State of Idaho as habitat for salmonid spawning (URS 2000). Specifically, the Salmon River and its tributaries (including the East Fork) are proposed for designation as "critical habitat" for the Snake River spring/summer chinook salmon, which were listed as a threatened species under the Endangered Species Act on April 17, 1992 (Greystone 1993; USDA Forest Service 1994). Approximately 6.4 km (4 mi) of chinook salmon habitat exist upstream of the Glory Hole (pit lake) in the East Fork (NMFS 1995).

There are eight dams between the Pacific Ocean and the Stibnite site: four along the lower section of the Columbia River and four along the Snake River. All eight dams are equipped with adult and juvenile fish passage facilities (NDPSCO 2002).

Although there are no dams on the Salmon River, the South Fork Salmon River, or the East Fork, Glory Hole Falls creates a complete migration barrier to returning adult chinook salmon and returning adult steelhead. Chinook salmon have been planted above Glory Hole Falls by the Idaho Department of Fish and Game and are known to have spawned successfully (Apperson 2002). The Idaho Department of Environmental Quality has submitted a grant proposal to the Bonneville Power Administration (BPA) for a project to restore fish passage and habitat on the upper East Fork, including restoration work to Glory Hole Falls. The BPA is in the process of reviewing the proposal (Schuld 2002).

Both A-run and B-run steelhead migrate up the Columbia River Basin. The A-run fish pass over Bonneville Dam by August 25, have mostly spent one year rearing in the ocean, and average 63 to 70 cm (about 25 to 27 in) in length and about 3 kg (about 6.5 lb) in weight. The B-run fish pass over Bonneville Dam after August 25, have mostly spent two years rearing in the ocean, and average 80 to 88 cm (about 31 to 34 in) in length and 5 to 6 kg (about 11 to 13 lb) in weight (NOAA 1994). Steelhead found in the East Fork are predominantly B-run fish, although both A-run and B-run fish do get up into the stream (Apperson 2002).

Pacific lamprey, although historically documented in the South Fork Salmon River, have not been observed since the mid-1980s. The South Fork Salmon River still provides suitable habitat for this species to spawn (Apperson 2002).

There is no commercial fishing in the Salmon River and its tributaries. Chinook salmon is closed to fishing to protect the wild chinook runs. There is recreational fishing of steelhead in the East Fork

and in the South Fork Salmon River, but only on a catch-and-release basis. No fish consumption advisories are currently in effect for the Stibnite area (Apperson 2002).

Site-Related Contamination

Contaminants of concern at the Stibnite site include metals and cyanide (Greystone 1993) (Table 2). Groundwater, surface water, soil, and sediment samples collected from the site have all been analyzed for metals. Groundwater and surface water samples have also been analyzed for cyanide (URS 2000).

Table 2. Maximum concentrations of contaminants of concern detected in environmental media collected from the Stibnite site (Trainor 1993; URS 2000).

	Soil (mg/kg)		Water (µg/L)			Sediment (mg/kg)	
Contaminant	Soil	Mean U.S.[a]	Groundwater	Surface Water	AWQC[b]	Sediment	TEL[c]
INORGANIC COMPOUNDS							
Arsenic	9,500	5.2	14,000	610	150	2,200	5.9
Cadmium	5.3	0.06	38	1.7	2.2[d]	6.6	0.596
Chromium[h]	33	37	14	5.4	11	18	37.3
Copper	290	17	180	110	9[d]	290	35.7
Cyanide, free	N/A	NA	0.26[g]	700[g]	5.2	N/A	NA
Lead	750	16	15	44	2.5[d]	720	35
Mercury	470	0.058	0.99	7.7	0.77[e]	11	0.174
Nickel	36	13	87	14	52[d]	22	18
Selenium	67	0.26	4.6	<5	5.0[e]	4.5	NA
Silver	20	0.05	<10	5.8	0.12[df]	7.5	NA
Zinc	290	48	440	2,200	120[d]	110	123.1

NA: Screening guidelines not available.

N/A: Analyte not analyzed for.

a: Shacklette and Boerngen (1984), except for cadmium and silver, which represent average concentrations in the Earth's crust from Lindsay (1979).

b: Ambient water quality criteria for the protection of aquatic organisms (USEPA 1993, 1999). Freshwater chronic criteria presented.

c: Threshold effects level is the geometric mean of the 15th percentile of the effects data and the 50th percentile of the no-effects data. The TEL is intended to represent the concentration below which adverse biological effects rarely occurred (Smith et al. 1996).

d: Criterion expressed as a function of total hardness; concentrations shown correspond to hardness of 100 mg/L.

e: Criterion expressed as total recoverable metal.

f: Chronic criterion not available; acute criterion presented.

g: Site concentrations based on weak acid disassociated figures, which were assumed to be equivalent to free cyanide concentrations.

h: Screening guidelines represent concentrations for $Cr.^{+6}$

In soil samples, maximum concentrations of several metals exceeded mean U.S. soil guidelines. The maximum concentrations of arsenic and mercury exceeded the U.S. soil guidelines by three orders of magnitude. The maximum concentrations of selenium and silver exceeded guidelines by two orders of magnitude, while maximum concentrations of cadmium, copper, and lead exceeded guidelines by one order of magnitude. The maximum concentrations of nickel and zinc exceeded the U.S. soil guidelines by factors of approximately three and six, respectively. The maximum concentration of chromium did not exceed U.S. soil guidelines. Maximum concentrations of arsenic, mercury, and selenium occurred in samples from the site's middle section; maximum concentrations of cadmium, copper, lead, nickel, silver, and zinc occurred in the Meadow Creek Valley area; and the maximum concentration of chromium occurred in the site's upper section.

Several metals were detected in groundwater samples collected from the site; all but two of the maximum concentrations exceeded ambient water quality criteria (AWQC). Maximum concentrations of arsenic, cadmium, and copper exceeded the AWQC by one order of magnitude. Maximum concentrations of chromium, lead, nickel, and zinc exceeded the AWQC by factors ranging from 1.3 to six times the AWQC. The maximum concentration of mercury slightly exceeded the AWQC. Selenium and cyanide were detected at maximum concentrations below the AWQC. Silver was not detected, but the detection limit was above the AWQC. The maximum concentrations of arsenic, cadmium, chromium, copper, lead, nickel, and zinc all occurred in samples from the Meadow Creek Valley area. The maximum concentration of mercury occurred in the site's middle section.

In surface water samples, the maximum concentration of cyanide exceeded the AWQC by two orders of magnitude, while maximum concentrations of copper, lead, mercury, silver, and zinc all exceeded the AWQC by one order of magnitude. The maximum concentration of arsenic exceeded the AWQC by a factor of four. Maximum concentrations of cadmium, chromium, nickel, and selenium did not exceed the AWQC. The distribution of maximum concentrations in surface water was similar to that in groundwater. Most of the maximum concentrations occurred in the Meadow Creek Valley, with some also occurring in the middle to upper sections of the site. The maximum concentration of cyanide occurred in a surface water sample from Meadow Creek Pond.

Sediment samples from the site also contained elevated metals concentrations. The maximum concentration of arsenic exceeded the threshold effects level (TEL) by two orders of magnitude. The maximum concentrations of cadmium, lead, and mercury all exceeded TELs by one order of magnitude. The maximum concentrations of copper and nickel exceeded TELs by factors of approximately eight and 1.2, respectively. Maximum concentrations of chromium and zinc did not exceed TELs. There are no TELs for comparison with the maximum concentrations of selenium and silver. Most maximum concentrations occurred in samples from the Meadow Creek Valley, including arsenic, cadmium, copper, lead, mercury, nickel, selenium, and silver. The maximum concentrations of chromium and zinc occurred in samples collected from Midnight Creek.

References

Apperson, Kim. Fisheries biologist for the Idaho Department of Fish and Game. Personal communication April 23, 2002.

Greystone. 1993. Stibnite Valley site inspection, Valley County, Idaho. Englewood, CO: Prepared for U.S. Department of Agriculture Forest Service.

Lindsay, W.L. 1979. Chemical Equilibria in Soils. New York, NY: John Wiley & Sons. 449 pp.

References, *cont.*

National Marine Fisheries Service (NMFS). 1995. Biological opinion: U.S. Forest Service and U.S. Army Corps of Engineers authorizations for Stibnite Mining Inc. Commercial Road Use Permits and Garnet Pit Mining: National Marine Fisheries Service, Northwest Region, Habitat Conservation Division.

National Oceanic and Atmospheric Administration (NOAA). 1994. Preliminary natural resource survey: Blackbird Mine, Lemhi County, Idaho. CERCLIS # IDD980725832. Seattle, WA: National Oceanic and Atmospheric Administration (NOAA). 64 pp.

Northwestern Division Pacific Salmon Coordination Office (NDPSCO). 2002. Columbia River Basin - dams and salmon. Available: http://www.nwd.usace.army.mil/ps/colrvbsn.htm.

Rand McNally. 2002. The road atlas, United States, Canada & Mexico. Rand McNally. Skokie, IL.

Schuld, Bruce. Biologist for the Idaho Department of Environmental Quality - Idaho Office of Species Conservation. Personal communication April 23, 2002.

Shacklette, H.T. and J.G. Boerngen. 1984. Element concentrations in soils and other surficial materials of the conterminous United States. USGS Professional Paper 1720. Washington, DC: U.S. Geological Survey.

Smith, S.L, D.D. MacDonald, K.A. Keenleyside, C.G. Ingersoll, and L.J. Field. 1996. A preliminary evaluation of sediment quality assessment values for freshwater ecosystems. J. Great Lakes Res 22(3): 624-638.

Trainor, Pat. 1993. Preliminary assessment/site investigation; Stibnite Mining Area. CERLIS ID. NO. ID9122307607: Payette National Forest: U.S. Department of Agriculture Forest Service.

U.S. Department of Agriculture Forest Service (USDA Forest Service). 1994. Preliminary draft environmental impact statement: Stibnite Mine Expansion Project. Valley County, ID: Payette National Forest.

U.S. Environmental Protection Agency (USEPA). 1993. Water quality criteria. Washington, DC: Office of Water, Health and Ecological Criteria Division. 294 pp.

U.S. Environmental Protection Agency (USEPA). 1999. National recommended water quality criteria—correction: U.S. Environmental Protection Agency, Office of Water.

U.S. Environmental Protection Agency (USEPA). 2001. NPL site narrative at listing Stibnite/Yellow Pine Mining Area. Available: http://www.epa.gov/superfund/sites/npl/nar1659.htm.

U.S. Geological Survey (USGS). 1973. Topographic map, Stibnite quadrangle, ID, 7.5 minute series. USGS. Denver, CO.

URS Corporation (URS). 2000. Stibnite Area site characterization report: Volume I. T01050. Denver, CO: Prepared for The Stibnite Area Site Characterization Voluntary Consent Order Respondents.

Glossary of terms

Adit Horizontal entrance to a mine

Adult habitat The environment where an aquatic resource lives after reaching physical and sexual maturity.

Ambient water quality criteria (AWQC) The U.S. Environmental Protection Agency's (USEPA) compilation of nationally recommended water quality criteria, based on data and scientific judgments on pollutant concentrations and how they affect the environment or human health.[1]

Anadromous Migrating from marine waters to breed in freshwater. Examples of anadromous fish include salmon, river herring (alewife), and striped bass.

Aquifer An underground geological formation, or group of formations, containing water. Are sources of groundwater for wells and springs.

Aroclor A trade name for a group of polychlorinated biphenyls (PCBs).

Bioavailable The fraction of the total chemical in the surrounding environment that is available for uptake by organisms. The environment may include water, sediment, suspended particles, and food items.

Biotransformation Chemical alteration of a substance within the body.

Body burden The amount of a chemical stored in the body at a given time, especially a potential toxin in the body as the result of exposure.

Borehole A hole made with drilling equipment.

Brood To hatch eggs.

Capacitor An electric circuit element used to store charge temporarily.

Catadromous Living in fresh water but migrating to marine waters to breed. An example is the American eel.

Chemical affinity An attraction or force between particles that causes them to combine.

Confluence The point where two or more streams meet or flow together.

Contaminants of concern Chemicals at a hazardous waste site that are likely to have an adverse effect on NOAA trust resources.

Contaminant partitioning In general, it is the tendency of a contaminant to be in the air, water, soil, or sediment based on the relative chemical affinities of that contaminant.

Decant To pour off without disturbing the sediment.

Demersal Dwelling at or near, sinking to, or deposited near the bottom of a body of water.

Depurate Elimination of a chemical from an organism by desorption, diffusion, excretion, egestion, biotransformation, or another route.

Desorption To remove an absorbed substance from.

Effects range–low (ER-L or ERL) NOAA sediment quality guidelines derived from the examination of a large number of individual contamination studies, all in salt water. The ERLs are indicative of contaminant concentrations below which adverse effects rarely occur.[2]

Egestion To discharge or excrete from the body.

Emergent wetland, emergent area A wetland in which vegetation is present for most of the growing season in most years and is dominated by plants that grow year round.[3]

Emergent wetland, subclass: non-persistent No obvious signs of emergent vegetation at certain seasons.

Emergent wetland, subclass: persistent Erect, rooted, herbaceous aquatic plants. Species that normally remain standing until the beginning of the next growing season.

Endangered species Animals, birds, fish, plants, or other living organisms threatened with extinction by anthropogenic (human-caused) or other natural changes in their environment.[4]

Endangered Species Act A 1973 act of Congress mandating that endangered and threatened species of fish, wildlife, and plants be protected and restored.

Environmental medium/media External conditions affecting the life, development, and survival of an organism, including air, water, and soil, which are the subject of regulatory concern and activities.

Estuary, estuarine Region of interaction between rivers and nearshore marine waters, where tidal action and river flow mix fresh and salt water. Such areas include bays, mouths of rivers, salt marshes, and lagoons. These brackish water ecosystems shelter and feed marine life, birds, and wildlife. See wetlands.

Fish passage Features of a dam that enable fish to move around, through, or over without harm. Generally an upstream fish ladder or a downstream bypass system.

Forage To search for food.

Groundwater The supply of fresh water found beneath the earth's surface, which supplies wells and springs.[4]

Groundwater monitoring well See monitoring well.

Groundwater plume A visible or measurable discharge of a contaminant from a given point of origin into groundwater.[4]

Habitat The place where a plant or animal species naturally lives and grows or characteristics of the soil, water, and biologic community (other plants and animals) that make this possible.

Habitat of concern The habitat that will be or is being affected by contaminants of concern from a hazardous waste site.

Hazard ranking system/hazard ranking system package The principal screening tool used by the USEPA to evaluate risks to public health and the environment associated with abandoned or uncontrolled hazardous waste sites.[4]

Heavy metals Metallic elements with high atomic weights (e.g., mercury, chromium, cadmium, arsenic, and lead).

Hectare 2.471 acres or 10,000 square meters (m^2).

Hydrologic Unit Code (HUC) The United States is divided into hydrologic units for water resource planning and data management. Hydrologic units represent natural and human-imposed areas. Each HUC is a unique eight-digit number. The first two digits indicate the major geographic area or region, the second two digits indicate the sub-region, the third two digits indicate the accounting units, and the fourth two digits indicate the cataloging units. Cataloging units are also called "watersheds".

Ingot A mass of metal that is cast in a standard shape for convenient storage or transportation.

Inorganic compounds Chemical substances of mineral origin, not of basically carbon structure.

Intertidal That area of the shore between the high and low water marks; the intertidal zone of oceans and estuaries is regularly covered and exposed by the tides.

Invertebrate An animal without a spinal column or backbone.

Isomers Different substances that have the same formula.

Juvenile habitat The environment in which an organism lives from one year of age until sexual maturity.

Lowhead dam Dams that range from a six-inch drop off to a 25- foot drop off.

Mainstem The principal channel of a drainage system into which other smaller streams or rivers flow.

Marine Of or relating to the sea.

Marsh A type of wetland that does not accumulate appreciable peat deposits (partially decomposed plants and other organic materials that can build up in poorly drained wetland habitats) and is dominated by plants with little or no woody tissue. See wetland.

Materiel The equipment, apparatus, and supplies of a military force.

Mean U.S. soil screening guidelines Average concentrations of inorganic compounds found in natural soils of the United States.

Metals Chemical elements with particular properties that include being good conductors of electricity and heat; in these reports, generally synonymous with inorganic compounds.

Migratory corridor, migratory route A body of water that adult fish travel through but do not remain in for any significant time.

Monitoring well (1) A well used to obtain water quality samples or measure groundwater levels. (2) A well drilled to collect groundwater samples for the purpose of physical, chemical, or biological analysis to determine the amounts, types, and distribution of contaminants beneath a site.

National Priorities List A list of hazardous waste sites, compiled by the USEPA, where hazardous wastes have been found and the initial evaluation shows a significant risk to human health or the environment. NPL sites are often called "Superfund sites" because Superfund money can be used by the USEPA to investigate and clean up these sites.

Neutralization Decreasing the acidity or alkalinity of a substance by adding alkaline or acidic materials, respectively.

NOAA trust resources Natural resources in coastal and marine areas, including the anadromous and catadromous fish that migrate between freshwater and coastal and marine areas.

Nursery habitat The habitat where larvae or juveniles settle, seek shelter, feed, and mature.

Order of magnitude A change in the value of a quantity or unit by a factor of 10.

Ordnance Military materiel, such as weapons, ammunition, artillery, combat vehicles, and equipment.

Organic compounds/chemicals/substances/materials Naturally occurring (animal- or plant-produced) or synthetic substances containing mainly carbon, hydrogen, nitrogen, and oxygen.[4]

Pathway (for migration of contaminants) The physical course a chemical or pollutant takes from its source to the exposed organism.[5]

Pelagic Living or occurring in the open sea.

Pentachlorophenol A manufactured chemical that is not found naturally in the environment. It was used as a biocide and wood preservative, and was one of the most heavily used pesticides in the United States. Now, only certified applicators can purchase and use this chemical. It is still used in industry as a wood preservative for power line poles, railroad ties, cross arms, and fence posts.

Pesticides Substances or mixtures thereof intended for preventing, destroying, repelling, or mitigating any pest.[4]

Polychlorinated biphenyls (PCBs) A group of synthetic organic compounds that can cause a number of different harmful effects. There are no known natural sources of PCBs in the environment. PCBs are either oily liquids or solids and are colorless to light yellow.[5]

Polynuclear aromatic hydrocarbons (PAHs) A group of chemicals that are formed during the incomplete burning of coal, oil, gas, wood, garbage, or other organic substances, such as tobacco and charbroiled meat. Also referred to as polycyclic aromatic hydrocarbons (PAHs).[5]

Rearing habitat See nursery habitat.

Rinsate The solution remaining after something is rinsed.

Runoff That part of precipitation, snowmelt, or irrigation water that runs off the land into streams or other surface-water. It can carry pollutants from the air and land into receiving waters.

Salinity A measurement of the amount (usually in parts per thousand) of salt in water.

Salmonid Fish of the family Salmonidae, which includes salmon and steelhead.

Sediment The organic material that is transported and deposited by wind and water.

Semivolatile organic compounds (SVOCs) Organic compounds that volatilize slowly at standard temperature (20 degrees C and 1 atm pressure).

Spawning habitat The habitat where fish reproduce.

Steam (or boiler) blowdown To control solids in the boiler water

Storm sewer A system of pipes (separate from sanitary sewers) that carries water runoff from buildings and land surfaces.

Substrate The composition of a streambed, including either mineral or organic materials.[6]

Sump A low-lying place such as a pit, that receives drainage.

Superfund Money collected from a special tax on chemicals and raw petroleum that is appropriated by Congress. These funds are used to investigate, evaluate, and clean up the worst hazardous waste sites in the U.S. These sites are listed on the NPL.

Surface water All water naturally open to the atmosphere (rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, etc.).

Surface water runoff Precipitation, snow melt, or irrigation water in excess of what can infiltrate the soil surface and be stored in small surface depressions.[4]

Tailings Residue of raw material or waste separated out during the processing of crops or mineral ores.[4]

Threatened species Plants and animals whose numbers are very low or decreasing rapidly. Threatened species are not endangered species yet, but are likely to become endangered in the future.[7]

Threshold effect level (TEL) The concentration of a contaminant below which negative biological effects are expected to occur only rarely.

Trace elements In these reports, generally synonymous with inorganic compounds.

Trust resources See NOAA trust resources.

Trustee (for natural resources) The party responsible for maintaining the original characteristics of our land, water, and the plants and animals that live there. NOAA is a federal trustee for natural resources that spend any portion of their life cycle in a marine or estuarine environment; and their habitats.

Uptake The transfer of a chemical into or onto an aquatic organism.

Volatile organic compounds (VOCs) Organic compounds that evaporate readily.[4]

Wastewater The spent or used water from a home, community, farm, or industry, which contains dissolved or suspended matter.

Water Quality Criteria Levels of water quality expected to render a body of water suitable for its designated use. Criteria are based on specific levels of pollutants that would make the water harmful if used for drinking, swimming, farming, fish production, or industrial processes.

Water table The level of groundwater.

Watershed The region draining into a river, river system, or other body of water.

Wetland An area that is saturated by surface or groundwater with vegetation adapted for life under those soil conditions including marshes, estuaries, swamps, bogs, and fens.

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[1] http://www.epa.gov/waterscience/criteria/

[2] http://response.restoration.noaa.gov/cpr/sediment/SPQ.pdf

[3] USFWS. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31.

[4] http://www.epa.gov/OCEPAterms/

[5] http://www.atsdr.cdc.gov/toxprofiles/

[6] http://www.streamnet.org/pub-ed/ff/Glossary/

[7] http://www.epa.gov/espp/coloring/especies.htm

Appendix

66 Appendix

Appendix

Table 1. List of the 337 hazardous Waste Site Reports published by NOAA to date. Sites in bold italics are included in this volume.

Region 1

Connecticut	Date	EPA Facility ID
Barkhamsted-New Hartford Landfill	1989	CTD980732333
Beacon Heights Landfill	1984	CTD072122062
Gallup's Quarry	1989	CTD108960972
Kellogg-Deering Well Field	1987	CTD980670814
New London Submarine Base	1990	CTD980906515
O'Sullivans Island	1984	CTD980667992
Raymark Industries, Inc.	1996	CTD001186618
Yaworski Waste Lagoon	1985	CTD009774969
Massachusetts		
Atlas Tack Corp.	1989	MAD001026319
Blackburn and Union Privileges	1993	MAD982191363
Charles-George Reclamation Landfill	1987	MAD003809266
GE - Housatonic River	1999	MAD002084093
Groveland Wells	1987	MAD980732317
Hanscom Field/Hanscom Air Force Base	1995	MA8570024424
Haverhill Municipal Landfill	1985	MAD980523336
Industri-Plex	1987	MAD076580950
Materials Technology Laboratory (USArmy)	1995	MA0213820939
Natick Laboratory Army Research, D&E Center	1995	MA1210020631
New Bedford Site (Acushnet Estuary)	1984	MAD980731335
Nyanza Chemical Waste Dump	1987	MAD990685422
Plymouth Harbor/Cannon Engineering Corp.	1984	MAD980525232
South Weymouth Naval Air Station	1995	MA2170022022
Sullivan's Ledge	1987	MAD980731343

Region 1 *cont.*

Maine	Date	EPA Facility ID
Brunswick Naval Air Station	1987	ME8170022018
Eastland Woolen Mill	2002	MED980915474
McKin Company	1984	MED980524078
O'Connor Company	1984	MED980731475
Portsmouth Naval Shipyard	1995	ME7170022019
Saco Municipal Landfill	1989	MED980504393
New Hampshire		
Beede Waste Oil	1997	NHD018958140
Coakley Landfill	1985	NHD064424153
Dover Municipal Landfill	1987	NHD980520191
Fletcher's Paint Works & Storage	1989	NHD001079649
Grugnale Waste Disposal Site	1985	NHD069911030
New Hampshire Plating Co.	1992	NHD001091453
Pease Air Force Base	1990	NH7570024847
Savage Municipal Water Supply	1985	NHD980671002
Sylvester	1985	NHD099363541
Rhode Island		
Davis Liquid Waste	1987	RID980523070
Davisville Naval Construction Battalion Center	1990	RI6170022036
Newport Naval Education & Training Center	1990	RI6170085470
Peterson/Puritan, Inc.	1987	RID055176283
Picillo Farm	1987	RID980579056
Rose Hill Regional Landfill	1989	RID980521025
Stamina Mills, Inc.	1987	RID980731442
West Kingston Town Dump/URI Disposal	1992	RID981063993
Western Sand & Gravel	1987	RID009764929
Vermont		
BFI Sanitary Landfill (Rockingham)	1989	VTD980520092
Elizabeth Mine	***2003***	***VTD988366621***
Old Springfield Landfill	1987	VTD000860239

Region 2

New Jersey	Date	EPA Facility ID
Albert Steel Drum	1984	NJD000525154
American Cyanamid Co.	1985	NJD002173276
Atlantic Development 11	1984	NJD980528731
Bog Creek Farm	1984	NJD063157150
Brick Township Landfill	1984	NJD980505176
Brook Industrial Park	1989	NJD078251675
Chemical Control	1984	NJD000607481
Chemical Insecticide Corp.	1990	NJD980484653
Chipman Chemical Co.	1985	NJD980528897
Ciba-Geigy Corp.	1984	NJD001502517
Cornell Dubilier Electronics, Inc.	1999	NJD981557879
Cosden Chemical Coatings Corp.	1987	NJD000565531
Curcio Scrap Metal, Inc.	1987	NJD011717584
De Rewal Chemical Co.	1985	NJD980761373
Denzer & Schafer X-Ray Co.	1984	NJD046644407
Diamond Alkali Co.	1984	NJD980528996
Emmell's Septic Landfill	2002	NJD980772727
Federal Aviation Admin. Tech. Center	1990	NJ9690510020
Garden State Cleaners Co.	1989	NJD053280160
Global Sanitary Landfill	1989	NJD063160667
Hercules, Inc. (Gibbstown Plant)	1984	NJD002349058
Higgins Disposal	1989	NJD053102232
Higgins Farm	1989	NJD981490261
Horseshoe Road	1984,1995	NJD980663678
Ideal Cooperage Inc.	1984	NJD980532907
Industrial Latex Corp.	1989	NJD981178411
Jackson Township Landfill	1984	NJD980505283
Kauffman & Minteer, Inc.	1989	NJD002493054
Kin-Buc Landfill	1984	NJD049860836
Koppers Co Inc/Seaboard Plant	1984	NJD002445112
Krysowaty Farm	1985	NJD980529838
LCP Chemicals, Inc.	1999	NJD079303020
Martin Aaron, Inc.	***2003***	***NJD014623854***

Region 2 *cont.*

New Jersey *cont.*	Date	EPA Facility ID
Middlesex Sampling Plant (DOE)	2002	NJ0890090012
Mobil Chemical Co.	1984	NJD000606756
NL Industries	1984	NJD061843249
Perth Amboy PCB's	1984	NJD980653901
PJP Landfill	1984	NJD980505648
Price Landfill	1984	NJD070281175
Puchack Well Field	1999	NJD981084767
PVSC Sanitary Landfill	1984	NJD980529671
Roebling Steel Co.	1984	NJD073732257
Roosevelt Drive-In	1984	NJD030250484
Route 561 Dump	2002	NJ0000453514
Sayreville Landfill	1984	NJD980505754
Scientific Chemical Processing	1984	NJD070565403
South Jersey Clothing Co.	1989	NJD980766828
Syncon Resins	1984	NJD064263817
United States Avenue Burn	2002	NJ0001120799
Universal Oil Products (Chemical Division)	1984	NJD002005106
Ventron/Velsicol	1984	NJD980529879
White Chemical Corp.	1984	NJD001239185
Williams Property	1984	NJD980529945
Zschiegner Refining Company	1999	NJD986643153
New York		
Action Anodizing, Plating, & Polishing Corp.	1989	NYD072366453
Applied Environmental Services	1985	NYD980535652
Brookhaven National Laboratory (USDOE)	1990	NY7890008975
C & J Disposal Leasing Co. Dump	1989	NYD981561954
Carroll & Dubies Sewage Disposal	1989	NYD010968014
Computer Circuits	2002	NYD125499673
Jones Sanitation	1987	NYD980534556
Li Tungsten Corp.	1992	NYD986882660
Liberty Industrial Finishing	1985	NYD000337295
Marathon Battery Corp.	1984	NYD010959757

Region 2 *cont.*

New York *cont.*	**Date**	**EPA Facility ID**
Mattiace Petrochemical Co., Inc.	1989	NYD000512459
North Sea Municipal Landfill	1985	NYD980762520
Old Roosevelt Field Contaminated Groundwater Area	***2003***	***NYSFN0204234***
Peter Cooper	1999	NYD980530265
Port Washington Landfill	1984	NYD980654206
Rowe Industries Groundwater Contamination	1987	NYD981486954
Sidney Landfill	1989	NYD980507677
Smithtown Groundwater Contamination	***2003***	***NY0002318889***
Stanton Cleaners Area Groundwater Contamination	2002	NYD047650197
Puerto Rico		
Clear Ambient Services Co.	1984	PRD090416132
Frontera Creek	1984	PRD980640965
Naval Security Group Activity	1989	PR4170027383
V&M/Albaladejo Farms	1997	PRD987366101
Vega Baja Solid Waste Disposal	2002	PRD980512669
Virgin Islands		
Island Chemical Corp./V.I. Chemical Corp.	1996	VID980651095
Tutu Wellfield	1993	VID982272569

Region 3

Washington, D.C.	**Date**	**EPA Facility ID**
Washington Navy Yard	1999	DC9170024310
Delaware		
Army Creek Landfill	1984	DED980494496
Coker's Sanitation Service Landfills	1986	DED980704860
Delaware City PVC Plant	1984	DE0001912757
Delaware Sand & Gravel	1984	DED000605972
Dover Air Force Base	1987	DE8570024010
Dover Gas Light Co.	1987	DED980693550
E.I. Du Pont Newport Landfill	1987	DED980555122

Region 3 *cont.*

Delaware *cont.*	**Date**	**EPA Facility ID**
Halby Chemical	1986	DED980830954
Kent County Landfill	1989	DED980705727
Koppers Co. Facilities Site	1990	DED980552244
NCR Corp., Millsboro	1986	DED043958388
New Castle Spill Site	1984	DED058980442
New Castle Steel	1984	DED980705255
Old Brine Sludge Landfill	1984	DED980704894
Pigeon Point Landfill	1987	DED980494603
Sealand Limited	1989	DED981035520
Standard Chlorine Co.	1986	DED041212473
Sussex Co. Landfill #5	1989	DED980494637
Tybouts Corner Landfill	1984	DED000606079
Wildcat Landfill	1984	DED980704951

Maryland		
68th Street Dump/Industrial Enterprises	2002	MDD980918387
Andrews Air Force Base	***2003***	***MD0570024000***
Anne Arundel County Landfill	1989	MDD980705057
Bush Valley Landfill	1989	MDD980504195
Central Chemical Corporation	1999	MDD003061447
Indian Head Naval Surface Warfare Center	1984	MD7170024684
Joy Reclamation Co.	1984	MDD030321178
Ordnance Products, Inc.	1995	MDD982364341
Sand, Gravel & Stone Site	1984	MDD980705164
Southern Maryland Wood Treating	1987	MDD980704852
U.S. Agricultural Center Beltsville (2 Tenants)	1995	MD0120508940
USA Aberdeen - Edgewood	1986	MD2210020036
USA Aberdeen - Michaelsville	1986	MD3210021355
USA Fort George Meade	1997	MD9210020567
USN Patuxent Naval Air Station	1996	MD7170024536
Woodlawn Co. Landfill	1987	MDD980504344

Region 3 *cont.*

Pennsylvania	Date	EPA Facility ID
Austin Avenue Radiation Site	1993	PAD987341716
Boarhead Farms	1989	PAD047726161
Bridesburg Dump	1984	PAD980508402
Butler Mine Tunnel	1987	PAD980508451
Crater Resources, Inc./Keystone Coke Co./Alan Wood	1993	PAD980419097
Croydon TCE Spill	1986	PAD981035009
Douglassville Disposal	1987	PAD002384865
Elizabethtown Landfill	1989	PAD980539712
Enterprise Avenue	1984	PAD980552913
FMC Marcus Hook	1996	PAD987323458
Foote Mineral Co.	1993	PAD077087989
Hellertown Manufacturing Co.	1987	PAD002390748
Jack's Creek/Sitkin Smelting & Refining, Inc.	1989	PAD980829493
Keyser Ave. Borehole	1989	PAD981036049
Metal Bank of America	1984	PAD046557096
Occidental Chemical Corp./Firestone Tire and Rubber Co.	1989	PAD980229298
Paoli Rail Yard	1987	PAD980692594
Publicker/Cuyahoga Wrecking Plant	1990	PAD981939200
Raymark	1996	PAD039017694
Recticon/Allied Steel	1989	PAD002353969
Revere Chemical Co.	1986	PAD051395499
Rohm and Haas Landfill	1986	PAD091637975
Salford Quarry	1997	PAD980693204
Tinicum National Environmental Center	1986	PA6143515447
Tysons Dump #1	1985	PAD980692024
UGI Corp. Gas Manufacturing Plant	1995	PAD980539126
USN Ships Parts Control Center	1996	PA3170022104
Wade (ABM)	1984	PAD980539407
Virginia		
Abex Corp.	1989	VAD980551683
Arrowhead Associates Inc./Scovill Corp.	1989	VAD042916361
Atlantic Wood Industries, Inc.	1987	VAD990710410

Region 3 *cont.*

Virginia *cont.*	**Date**	**EPA Facility ID**
C & R Battery Co., Inc.	1987	VAD049957913
Chisman Creek	1984	VAD980712913
Former Nansemond Ordnance Depot	2002	VAD123933426
Kim-Stan Landfill	2002	VAD077923449
Marine Corps Combat and Development Command	1995	VA1170024722
Langley Air Force Base/NASA-Langley Research Center	1995	VA2800005033
Naval Amphibious Base Little Creek	2002	VA5170022482
Naval Surface Warfare Center - Dahlgren	1993	VA7170024684
Naval Weapons Station - Yorktown	1993	VA8170024170
Saunders Supply Co.	1987	VAD003117389
USA Fort Eustis	1996	VA6210020321
USN Naval Shipyard Norfolk	1999	VA1170024813
USN Norfolk Naval Base	1997	VA6170061463

Region 4

Alabama	**Date**	**EPA Facility ID**
American Brass, Inc.	2002	ALD981868466
Ciba-Geigy Corp. (McIntosh Plant)	1990	ALD001221902
Olin Corp. (McIntosh Plant)	1990	ALD008188708
Redwing Carriers, Inc. (Saraland)	1989	ALD980844385
Florida		
Agrico Chemical Co.	1989	FLD980221857
American Creosote Works (Pensacola Plant)	1984	FLD008161994
Broward County-21st Manor Dump	1992	FLD981930506
Chemform, Inc.	1990	FLD080174402
Harris Corp. (Palm Bay Plant)	1986	FLD000602334
Helena Chemical Co. (Tampa Plant)	1993	FLD053502696
MRI Corporation	1997	FLD088787585
Munisport Landfill	1984	FLD084535442
Pensacola Naval Air Station	1990	FL9170024567
Pickettville Road Landfill	1984	FLD980556351

Region 4 *cont.*

Florida *cont.*	**Date**	**EPA Facility ID**
Sixty-Second Street Dump	1984	FLD980728877
Solitron Microwave	2002	FLD045459526
Standard Auto Bumper Corp.	1989	FLD004126520
Stauffer Chemical Co. (Tampa Plant)	1993	FLD004092532
Stauffer Chemical Co. (Tarpon Springs)	1993	FLD010596013
USAF Tyndall Air Force Base	1997	FL1570024124
USN Air Station Cecil Field	1990	FL5170022474
USN NAS Jacksonville	1990	FL6170024412
USN Naval Air Station Whiting Field Site 5	1996	FL2170023244
Woodbury Chemical Co. (Princeton Plant)	1989	FLD004146346
Georgia		
Brunswick Wood Preserving	1997	GAD981024466
Camilla Wood Preserving Company	1999	GAD008212409
Terry Creek Dredge Spoil Areas/Hercules Outfall	1997	GAD982112658
Mississippi		
Chemfax, Inc.	1995	MSD008154486
Gautier Oil Co., Inc.	1989	MSD098596489
North Carolina		
ABC One Hour Cleaners	1989	NCD024644494
Camp Lejeune Military Res. (USNavy)	1989	NC6170022580
FCX, Inc. (Washington Plant)	1989	NCD981475932
New Hanover County Airport Burn Pit	1989	NCD981021157
Potter's Septic Tank Service Pits	1989	NCD981023260
South Carolina		
Geiger (C&M Oil)	1984	SCD980711279
Helena Chemical Co. Landfill	1989	SCD058753971
Koppers Co., Inc. (Charleston Plant)	1993	SCD980310239
Savannah River Site (USDOE)	1990	SC1890008989
Wamchem, Inc.	1984	SCD037405362

Region 6

Louisiana	Date	EPA Facility ID
Bayou Sorrel Site	1984	LAD980745541
Delatte Metals	2002	LAD052510344
Madisonville Creosote Works	1997	LAD981522998
Texas		
ALCOA (Point Comfort)/Lavaca Bay	1995	TXD008123168
Bailey Waste Disposal	1985	TXD980864649
Brio Refining, Inc.	1989	TXD980625453
Crystal Chemical Co.	1989	TXD990707010
Dixie Oil Processors, Inc.	1989	TXD089793046
French, Ltd.	1989	TXD980514814
Highlands Acid Pit	1989	TXD980514996
Malone Service Company, Inc.	***2003***	***TXD980864789***
Motco, Inc.	1984	TXD980629851
Sikes Disposal Pits	1989	TXD980513956
State Marine	1999	TXD099801102
Tex-Tin Corp.	1989	TXD062113329

Region 9

American Somoa		
Taputimu Farm	1984	ASD980637656
California		
Alameda Naval Air Station	1989	CA2170023236
Camp Pendleton Marine Corps Base	1990	CA2170023533
Coast Wood Preserving	1984	CAD063015887
Concord Naval Weapons Station	1989,1993	CA7170024528
Cooper Drum Co.	1993	CAD055753370
CTS Printex, Inc.	1989	CAD009212838
Del Amo Facility	1992	CAD029544731
Del Norte Pesticide Storage	1984	CAD000626176
El Toro Marine Corps Air Station	1989	CA6170023208
Fort Ord	1990	CA7210020676

Region 9 *cont.*

California *cont.*	**Date**	**EPA Facility ID**
GBF, Inc., Dump	1989,1993	CAD980498562
Hewlett-Packard (620-640 Page Mill Road)	1989	CAD980884209
Intersil Inc./Siemens Components	1989	CAD041472341
Iron Mountain Mine	1989	CAD980498612
Jasco Chemical Corp.	1989	CAD009103318
Liquid Gold Oil Corp.	1984	CAT000646208
McCormick & Baxter Creosoting Co.	1993	CAD009106527
MGM Brakes	1984	CAD000074120
Moffett Naval Air Station	1986	CA2170090078
Montrose Chemical Corp.	1985	CAD008242711
Pacific Coast Pipe Lines	1989	CAD980636781
Rhone-Poulenc, Inc./Zoecon Corp.	1985	CAT000611350
Riverbank Army Ammunition Plant	1989	CA7210020759
Sola Optical USA, Inc.	1989	CAD981171523
South Bay Asbestos Area	1985	CAD980894885
Travis Air Force Base	1990	CA5570024575
Treasure Island Naval Station - Hunters Pt. Annex	1989	CA1170090087
Guam		
Andersen Air Force Base	1993	GU6571999519
Hawaii		
Del Monte Corporation (Oahu Plantation)	1995	HID980637631
Pearl City Landfill	1984	HID980585178
Pearl Harbor Naval Station	1992	HI2170024341

Region 10

Alaska		
Adak Naval Air Station	1993	AK4170024323
Elmendorf Air Force Base	1990	AK8570028649
Fort Richardson (US Army)	1995	AK6214522157
Klag Bay Site	2002	AK0002364768

Region 10 *cont.*

Alaska *cont.*	**Date**	**EPA Facility ID**
Standard Steel & Metals Salvage Yard (USDOT)	1990	AKD980978787
Idaho		
Blackbird Mine	1995	IDD980725832
Stibnite/Yellow Pine Mining Area	***2003***	***IDD980665459***
Oregon		
Allied Plating, Inc.	1987	ORD009051442
Gould, Inc.	1984	ORD095003687
Martin-Marietta Aluminum Co.	1987	ORD052221025
McCormick & Baxter Creosoting Co. (Portland Plant)	1995	ORD009020603
Northwest Pipe & Casing Co.	1993	ORD980988307
Portland Harbor (Lower Willamette River)	***2003***	***ORSFN1002155***
Reynolds Metals Co.	1996	ORD009412677
Rhone Poulenc Inc.	1984	ORD990659492
Teledyne Wah Chang	1985	ORD050955848
Union Pacific Railroad Co. Tie-Treating Plant	1990	ORD009049412
Washington		
ALCOA (Vancouver Smelter)	1989	WAD009045279
American Crossarm & Conduit Co.	1989	WAD057311094
Bangor Naval Submarine Base	1990	WA5170027291
Bonneville Power Administration Ross Complex (USDOE)	1990	WA1891406349
Centralia Municipal Landfill	1989	WAD980836662
Commencement Bay, Near Shore/Tide Flats	1984	WAD980726368
Commencement Bay, South Tacoma Channel	1984	WAD980726301
Hamilton Island Landfill (USA/COE)	1992	WA5210890096
Hanford 100-Area (USDOE)	1989	WA3890090076
Harbor Island (Lead)	1984	WAD980722839
Jackson Park Housing Complex (USNavy)	1995	WA3170090044
Naval Air Station, Whidbey Island (Ault Field)	1986	WA5170090059
Naval Air Station, Whidbey Island (Seaplane Base)	1986	WA6170090058
Northwest Transformer (South Harkness Street)	1989	WAD027315621
Oeser Company	1997	WAD008957243

Region 10 *cont.*

Washington *cont.*	**Date**	**EPA Facility ID**
Old Navy Dump/Manchester Lab (USEPA/NOAA)	1996	WA8680030931
Pacific Sound Resources (Wyckoff West Seattle)	1995	WAD009248287
Puget Sound Naval Shipyard Complex	1995	WA2170023418
Quendall Terminals	1985	WAD980639215
Seattle Municipal Landfill (Kent Highlands)	1989	WAD980639462
Tulalip Landfill	1992	WAD980639256
Western Processing Co., Inc.	1984	WAD009487513
Wyckoff Co./Eagle Harbor (2 areas)	1986	WAD009248295

80 Appendix

Table 2. List of sites (934) and published reports, including Hazardous Waste Site Reports (WSR), Preliminary Natural Resource Surveys (PNRS'), U.S. Air Force reports (USAF), and hazardous waste sites that have been evaluated at the time of publication. Sites in bold italic are included in this volume.

Region 1

Connecticut	WSR	PNRS	USAF	EPA FACILITY ID
29 Pomperaug Road				CTD983884412
Army Engine Plant/Stratford				CT3213822924
Barkhamsted-New Hartford Landfill	1989			CTD980732333
Beacon Heights Landfill	1984			CTD072122062
Black Rock Shipyard				CT0001407865
Broad Brook Mill				CT0002055887
Dexter Corp.				CTD001155761
Gallup's Quarry	1989			CTD108960972
Hamilton Standard				CTD001145341
Kellogg-Deering Well Field	1987			CTD980670814
Laurel Park, Inc.		1988		CTD980521165
Linemaster Switch Corp.				CTD001153923
New London Submarine Base	1990			CTD980906515
Nutmeg Valley Road				CTD980669261
Old Southington Landfill				CTD980670806
O'Sullivans Island	1984			CTD980667992
Pharmacia & Upjohn Company				CTD001168533
Precision Plating Corp.				CTD051316313
Raymark Industries, Inc.	1996			CTD001186618
Remington Arms Company Incorporated				CTD001453216
Revere Textile Prints Corp.				CTD004532610
Sikorsky Aircraft Division UTC				CTD001449784
Solvents Recovery Service of New England				CTD009717604
Yaworski Waste Lagoon	1985	1989		CTD009774969
Massachusetts				
Atlas Tack Corp.	1989			MAD001026319
Baird & McGuire				MAD001041987
Blackburn and Union Privileges	1993			MAD982191363

Region 1 *cont.*

Massachusetts *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Boston Gas Co. Lng. Plt.				MAD087137329
Cannon Engineering Corp. (CEC)		1988		MAD079510780
Charles-George Reclamation Landfill	1987	1988		MAD003809266
Eastern Gas & Fuel				MAD981063142
Fort Devens				MA7210025154
Fort Devens-Sudbury Training Annex				MAD980520670
GE - Housatonic River	1999			MAD002084093
Groveland Wells	1987	1988		MAD980732317
Hanscom Field/Hanscom Air Force Base	1995			MA8570024424
Haverhill Municipal Landfill	1985			MAD980523336
Hocomonco Pond				MAD980732341
Holyoke Gas Works (Former)				MAD985298108
Industri-Plex	1987	1988		MAD076580950
Iron Horse Park				MAD051787323
Materials Technology Laboratory (USArmy)	1995			MA0213820939
Natick Laboratory Army Research, D&E Center	1995			MA1210020631
Naval Weapons Industrial Reserve Plant				MA6170023570
New Bedford Harbor				MA2690390024
New Bedford Site (Acushnet Estuary)	1984			MAD980731335
Norwood PCB's				MAD980670566
Nuclear Metals				MAD062166335
Nyanza Chemical Waste Dump	1987	1993		MAD990685422
Otis Air National Guard Base/Camp Edwards				MA2570024487
Plymouth Harbor/Cannon Engineering Corp.	1984	1990		MAD980525232
PSC Resources				MAD980731483
Re-Solve, Inc.				MAD980520621
Rose Disposal Pit				MAD980524169
Salem Acres		1991		MAD980525240
Shpack Landfill				MAD980503973
Silresim Chemical Corp.				MAD000192393
South Weymouth Naval Air Station	1995			MA2170022022
Sullivan's Ledge	1987	1989		MAD980731343
Sutton Brook Disposal Area				MAD980520696

Region 1 *cont.*

Massachusetts *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
W. R. Grace and Co., Inc. (Acton Plant)				MAD001002252
Wells G&H		1990		MAD980732168
Zeneca Specialties				MAD051505477
Maine				
Brunswick Naval Air Station	1987	1991		ME8170022018
Eastern Surplus Co.				MED981073711
Eastland Woolen Mill	2002			MED980915474
Holtrachem				MED000242701
Loring Air Force Base				ME9570024522
Maine Yankee Atomic Power Company				MED071749329
McKin Company	1984			MED980524078
O'Connor Company	1984			MED980731475
O'Connor Company Main Office				MED018980227
Pinette's Salvage Yard				MED980732291
Portsmouth Naval Shipyard	1995			ME7170022019
Saco Municipal Landfill	1989			MED980504393
Saco Tannery Waste Pits				MED980520241
Union Chemical Co., Inc.				MED042143883
Winthrop Landfill				MED980504435
New Hampshire				
Auburn Road Landfill		1989		NHD980524086
Beede Waste Oil	1997			NHD018958140
Coakley Landfill	1985	1989		NHD064424153
Dover Municipal Landfill	1987	1990		NHD980520191
Fletcher's Paint Works & Storage	1989			NHD001079649
Gilson Road Tar Pit				NHD980503304
Grugnale Waste Disposal Site	1985			NHD069911030
Kearsarge Metallurgical Corp				NHD062002001
Keefe Environmental Services				NHD092059112
Mohawk Tannery				NHD981889629
Mottolo Pig Farm				NHD980503361

Region 1 *cont.*

New Hampshire *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
New Hampshire Plating Co.	1992			NHD001091453
Ottati & Goss/Kingston Steel Drum				NHD990717647
Pease Air Force Base	1990	1991		NH7570024847
Savage Municipal Water Supply	1985			NHD980671002
Somersworth Sanitary Landfill				NHD980520225
South Municipal Water Supply Well				NHD980671069
Sylvester	1985			NHD099363541
Tibbetts Road				NHD989090469
Tinkham Garage				NHD062004569
Town Garage/Radio Beacon				NHD981063860
Rhode Island				
Central Landfill				RID980520183
Centredale Manor Restoration Project				RID981203755
Davis (GSR) Landfill				RID980731459
Davis Liquid Waste	1987			RID980523070
Davisville Naval Construction Battalion Center	1990	1994		RI6170022036
Landfill & Resource Recovery, Inc. (L&RR)				RID093212439
Newport Naval Education & Training Center	1990	1994		RI6170085470
Peterson/Puritan, Inc.	1987	1990		RID055176283
Picillo Farm	1987	1988		RID980579056
Rose Hill Regional Landfill	1989	1994		RID980521025
Stamina Mills, Inc.	1987	1990		RID980731442
West Kingston Town Dump/URI Disposal	1992			RID981063993
Western Sand & Gravel	1987			RID009764929
Vermont				
Bennington Municipal Sanitary Landfill				VTD981064223
BFI Sanitary Landfill (Rockingham)	1989			VTD980520092
Burgess Brothers Landfill				VTD003965415
Darling Hill Dump				VTD980520118
Elizabeth Mine	***2003***			***VTD988366621***
Ely Copper Mine				VTD988366571

Region 1 *cont.*

Vermont *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Old Springfield Landfill	1987	1988		VTD000860239
Parker Sanitary Landfill				VTD981062441
Pine Street Canal				VTD980523062
Tansitor Electronics, Inc.				VTD000509174

Region 2

New Jersey				
A.O. Polymer				NJD030253355
Albert Steel Drum	1984			NJD000525154
Allied Corp.				NJD980530604
American Cyanamid Co.	1985			NJD002173276
Asbestos Dump				NJD980654149
Atlantic Aviation Corp.				NJD011308988
Atlantic Development 11	1984			NJD980528731
Bog Creek Farm	1984	1992		NJD063157150
Brick Township Landfill	1984			NJD980505176
Bridgeport Rental & Oil Services		1990		NJD053292652
Brook Industrial Park	1989			NJD078251675
Burnt Fly Bog		1992		NJD980504997
Chemical Control	1984			NJD000607481
Chemical Insecticide Corp.	1990	1992		NJD980484653
Chemical Leaman Tank Lines, Inc.		1989		NJD047321443
Chemsol, Inc.				NJD980528889
Chipman Chemical Co.	1985			NJD980528897
Ciba-Geigy Corp.	1984	1989		NJD001502517
Cinnaminson Ground Water Contamination				NJD980785638
Combe Landfill South				NJD094966611
Cornell Dubilier Electronics, Inc.	1999			NJD981557879
Cosden Chemical Coatings Corp.	1987			NJD000565531
CPS/Madison Industries		1990		NJD002141190
Curcio Scrap Metal, Inc.	1987			NJD011717584
De Rewal Chemical Co.	1985			NJD980761373

Region 2 *cont.*

New Jersey *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Delilah Road				NJD980529002
Denzer & Schafer X-Ray Co.	1984	1992		NJD046644407
Diamond Alkali Co.	1984			NJD980528996
Diamond Head Oil Refinery Div.				NJD092226000
Diamond Shamrock Corp.				NJD002442408
D'Imperio Property				NJD980529416
E.I. Du Pont de Nemours				NJD002385730
Ellis Property				NJD980529085
Emmell's Septic Landfill	2002			NJD980772727
Evor Phillips Leasing		1992		NJD980654222
Ewan Property				NJD980761365
Federal Aviation Admin. Tech. Center	1990			NJ9690510020
Federal Creosote				NJ0001900281
Fort Dix (Landfill Site)				NJ2210020275
Franklin Burn Site				NJD986570992
Fried Industries				NJD041828906
GAF Corp.				NJD980771638
GAF Corp. - Gloucester City				NJD043292606
Garden State Cleaners Co.	1989			NJD053280160
Global Sanitary Landfill	1989	1991		NJD063160667
Goose Farm				NJD980530109
Grand Street Mercury				NJ0001327733
Helen Kramer Landfill		1990		NJD980505366
Hercules, Inc. (Gibbstown Plant)	1984	1993		NJD002349058
Higgins Disposal	1989			NJD053102232
Higgins Farm	1989			NJD981490261
Hopkins Farm				NJD980532840
Horseshoe Road	1984,1995			NJD980663678
Iceland Coin Laundry and Dry Cleaning				NJ0001360882
Ideal Cooperage Inc.	1984			NJD980532907
Imperial Oil Co., Inc./Champion Chemical				NJD980654099
Industrial Latex Corp.	1989			NJD981178411
ISP Environmental Services, Inc.				NJD002185973

Region 2 *cont.*

New Jersey *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Jackson Township Landfill	1984			NJD980505283
JIS Landfill				NJD097400998
Kauffman & Minteer, Inc.	1989			NJD002493054
Kin-Buc Landfill	1984	1990		NJD049860836
King of Prussia				NJD980505341
Koppers Co. Inc./Seaboard Plant	1984			NJD002445112
Krysowaty Farm	1985			NJD980529838
LCP Chemicals, Inc.	1999			NJD079303020
Lightman Drum Company				NJD014743678
Lipari Landfill				NJD980505416
Lone Pine Landfill		1992		NJD980505424
Lustrelon Inc.				NJD008388951
M&T Delisa Landfill				NJD085632164
Mannheim Avenue Dump				NJD980654180
Martin Aaron, Inc.	***2003***			***NJD014623854***
Matteo Brothers				NJD011770013
Maywood Chemical Co.				NJD980529762
McGuire Air Force Base				NJ0570024018
Metaltec/Aerosystems				NJD002517472
Middlesex Sampling Plant (DOE)	2002			NJ0890090012
Military Ocean Terminal (Landfill)				NJ0210022752
Mobil Chemical Co.	1984			NJD000606756
Monroe Township Landfill				NJD980505671
Myers Property				NJD980654198
Nascolite Corp.				NJD002362705
Naval Air Engineering Center				NJ7170023744
Naval Weapons Station Earle (Site A)				NJ0170022172
NL Industries	1984	1992		NJD061843249
Pepe Field				NJD980529598
Perth Amboy PCB's	1984			NJD980653901
PJP Landfill	1984	1990		NJD980505648
Pohatcong Valley Groundwater Contamination				NJD981179047

Region 2 *cont.*

New Jersey *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Pomona Oaks Residential Wells				NJD980769350
Price Landfill	1984	1993		NJD070281175
Puchack Well Field	1999			NJD981084767
Pulverizing Services				NJD980582142
PVSC Sanitary Landfill	1984			NJD980529671
Quanta Resources				NJD000606442
Raritan Arsenal				NJD986589190
Reich Farms				NJD980529713
Renora, Inc.				NJD070415005
Rhone-Poulenc Chemical Co.				NJD099293326
Ringwood Mines/Landfill				NJD980529739
Roebling Steel Co.	1984	1990		NJD073732257
Roosevelt Drive-In	1984			NJD030250484
Route 561 Dump	2002			NJ0000453514
Safety-Kleen (Rollins Environmental)				NJD053288239
Sayreville Landfill	1984	1990		NJD980505754
Scientific Chemical Processing	1984	1989		NJD070565403
Sharkey Landfill		1990		NJD980505762
Shield Alloy Corp.				NJD002365930
South Jersey Clothing Co.	1989			NJD980766828
Swope Oil & Chemical Co.				NJD041743220
Syncon Resins	1984	1992		NJD064263817
Tabernacle Drum Dump				NJD980761357
Troy Chemical				NJD002144517
United States Avenue Burn	2002			NJ0001120799
Universal Oil Products (Chemical Division)	1984			NJD002005106
Upper Deerfield Township Sanitary Landfill				NJD980761399
Ventron/Velsicol	1984			NJD980529879
Vineland Chemical Co., Inc.		1990		NJD002385664
W.R. Grace/Wayne Interim Storage (USDOE)				NJ1891837980
Waldick Aerospace Devices, Inc.		1990		NJD054981337
Welsbach & General Gas Mantle (Camden Radiation)				NJD986620995

Region 2 *cont.*

New Jersey *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
White Chemical Corp.	1984			NJD001239185
White Chemical Corp.				NJD980755623
Williams Property	1984	1992		NJD980529945
Wilson Farm				NJD980532824
Witco Chemical Corp. (Oakland Plant)				NJD045653854
Woodland Route 532 Dump				NJD980505887
Woodland Route 72 Dump				NJD980505879
Zschiegner Refining Company	1999			NJD986643153
New York				
93rd Street School				NYD980780829
Action Anodizing, Plating, & Polishing Corp.	1989			NYD072366453
ALCOA Aggregation Site				NYD980506232
American Thermostat Co. Superfund Site				NYD002066330
Anchor Chemicals				NYD001485226
Applied Environmental Services	1985	1991		NYD980535652
BEC Trucking		1990		NYD980768675
Bioclinical Laboratories, Inc.				NYD980768683
Brewster Well Field				NYD980652275
Brookhaven National Laboratory (USDOE)	1990			NY7890008975
Byron Barrel & Drum				NYD980780670
C & J Disposal Leasing Co. Dump	1989			NYD981561954
Carroll & Dubies Sewage Disposal	1989			NYD010968014
Circuitron Corp.				NYD981184229
Claremont Polychemical				NYD002044584
Clothier Disposal				NYD000511576
Colesville Municipal Landfill				NYD980768691
Computer Circuits	2002			NYD125499673
Consolidated Iron and Metal				NY0002455756
Cornwall Lf.				NYD982276933
Croton Point Sanitary Landfill				NYD980508048
Dupont/Necco Park				NYD980532162
Endicott Village Well Field				NYD980780746

Region 2 *cont.*

New York *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
FMC Corp.				NYD000511857
Forest Glen Mobile Home Subdivision				NYD981560923
Fort Totten				NY2213720897
Fulton Terminals				NYD980593099
G.E. Moreau				NYD980528335
General Motors (Central Foundry Division)		1989		NYD091972554
Genzale Plating Co.				NYD002050110
Goldisc Recordings, Inc.				NYD980768717
Griffiss Air Force Base (Former)-AFBCA/OL-X				NY4571924451
Harbor at Hastings Associates				NY0001817097
Haviland Complex				NYD980785661
Hertel Landfill				NYD980780779
Hooker (102nd Street)				NYD980506810
Hooker Chemical/Ruco Polymer Corp.				NYD002920312
Hooker Hyde Park				NYD000831644
Hooker S Area				NYD980651087
Hudson Coal Tar				NYD987039104
Hudson River PCB's		1989		NYD980763841
Jackson Steel				NYD001344456
Johnstown City Landfill				NYD980506927
Jones Chemicals, Inc.				NYD000813428
Jones Sanitation	1987			NYD980534556
Lawrence Aviation Industries Inc				NYD002041531
Li Tungsten Corp.	1992	1993		NYD986882660
Liberty Heat Treating Co. Inc.				NYD053169694
Liberty Industrial Finishing	1985	1993		NYD000337295
Love Canal				NYD000606947
Ludlow Sand & Gravel				NYD013468939
Malta Rocket Fuel Area				NYD980535124
Marathon Battery Corp.	1984	1989		NYD010959757
Mattiace Petrochemical Co., Inc.	1989	1990		NYD000512459
Mercury Refining Inc.				NYD048148175
Nepera Chemical Co., Inc.				NYD002014595

Region 2 *cont.*

New York *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Newstead Site				NYD986883387
Niagara County Refuse				NYD000514257
Niagara Mohawk Power Co. (Saratoga Springs)				NYD980664361
North Sea Municipal Landfill	1985	1989		NYD980762520
Old Roosevelt Field Contaminated Groundwater Area	***2003***			***NYSFN0204234***
Pasley Solvents & Chemicals, Inc.				NYD991292004
Pennsylvania Ave. Municipal Landfill				NY6141790018
Peter Cooper	1999			NYD980530265
Pfohl Brothers Landfill				NYD986875979
Pollution Abatement Services				NYD000511659
Port Washington Landfill	1984	1989		NYD980654206
Preferred Plating Corp.				NYD980768774
Reynolds Metals Co.		1996		NYD002245967
Richardson Hill Road Landfill/Pond				NYD980507735
Rowe Industries Groundwater Contamination	1987	1991		NYD981486954
Sidney Landfill	1989			NYD980507677
Sinclair Refinery				NYD980535215
Smithtown Groundwater Contamination	***2003***			***NY0002318889***
Solvent Savers				NYD980421176
Stanton Cleaners Area Groundwater Contamination	2002			NYD047650197
Suffern Village Well Field				NYD980780878
Syosset Landfill				NYD000511360
Tri-Cities Barrel Co., Inc.				NYD980509285
Tronic Plating Co., Inc.				NYD002059517
Volney Municipal Landfill				NYD980509376
Wallkill Landfill				NYD980535496
Warwick Landfill				NYD980506679
Wide Beach Development				NYD980652259
York Oil Co.				NYD000511733

Region 2 *cont.*

Puerto Rico	WSR	PNRS	USAF	EPA FACILITY ID
Clear Ambient Services Co.	1984			PRD090416132
Frontera Creek	1984	1991		PRD980640965
GE Wiring Devices				PRD090282757
Juncos Landfill				PRD980512362
Naval Security Group Activity	1989	1991		PR4170027383
Upjohn Facility				PRD980301154
V&M/Albaladejo Farms	1997			PRD987366101
Vega Alta Public Supply Wells				PRD980763775
Vega Baja Solid Waste Disposal	2002			PRD980512669
Virgin Islands				
Island Chemical Corp./V.I. Chemical Corp.	1996			VID980651095
Tutu Wellfield	1993			VID982272569

Region 3

Washington, D.C.				
Poplar Point Nursery				DCN000305662
Washington Gas Light Co.				DCD077797793
Washington Navy Yard	1999			DC9170024310
Delaware				
12th Street Landfill				DESFN0305510
Army Creek Landfill	1984			DED980494496
Chem-Solv, Inc.				DED980714141
Coker's Sanitation Service Landfills	1986	1990		DED980704860
Delaware City PVC Plant	1984			DE0001912757
Delaware Sand & Gravel	1984			DED000605972
Dover Air Force Base	1987	1989		DE8570024010
Dover Gas Light Co.	1987			DED980693550
E.I. Du Pont Newport Landfill	1987	1991,1992		DED980555122
Halby Chemical	1986	1990		DED980830954
Harvey & Knott Drum, Inc.				DED980713093

Region 3 *cont.*

Delaware *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Kent County Landfill	1989			DED980705727
Koppers Co. Facilities Site	1990			DED980552244
NCR Corp., Millsboro	1986			DED043958388
New Castle Spill Site	1984	1989		DED058980442
New Castle Steel	1984			DED980705255
NVF (Yorklyn)				DE0002014975
Old Brine Sludge Landfill	1984			DED980704894
Pigeon Point Landfill	1987			DED980494603
Sealand Limited	1989			DED981035520
Standard Chlorine Co.	1986			DED041212473
Sussex Co. Landfill #5	1989			DED980494637
Tybouts Corner Landfill	1984			DED000606079
Tyler Refrigeration Pit				DED980705545
Wildcat Landfill	1984			DED980704951
Maryland				
68th Street Dump/Industrial Enterprises	2002			MDD980918387
Allied Chemical				MDD069396711
Andrews Air Force Base	***2003***		***1994***	***MD0570024000***
Anne Arundel County Landfill	1989			MDD980705057
Bethlehem Steel Sparrows Point Plant				MDD053945432
Brandywine DRMO				MD9570024803
Bush Valley Landfill	1989	1993		MDD980504195
Central Chemical Corporation	1999			MDD003061447
Chemical Metals Industries, Inc.				MDD980555478
Hawkins Pt / MD. Port Admin.				MDD000731356
Indian Head Naval Surface Warfare Center	1984	1997		MD7170024684
Joy Reclamation Co.	1984			MDD030321178
Kane & Lombard Street Drums				MDD980923783
Maryland Port Admin.				MDD030324073
Mid-Atlantic Wood Preservers, Inc.				MDD064882889
Naval Surface Warfare Center - White Oak				MD0170023444
Naval Training Center Bainbridge				MDD985397256

Region 3 *cont.*

Maryland *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Ordnance Products, Inc.	1995			MDD982364341
Sand, Gravel & Stone Site	1984	1990		MDD980705164
Southern Maryland Wood Treating	1987			MDD980704852
Spectron, Inc.		1997		MDD000218008
U.S. Agricultural Center Beltsville (2 Tenants)	1995			MD0120508940
USA Aberdeen - Edgewood	1986			MD2210020036
USA Aberdeen - Edgewood: Bush River Watershed		1994		MD2210020036
USA Aberdeen - Edgewood: Gun Powder River Watershed		1994		MD2210020036
USA Aberdeen - Michaelsville	1986			MD3210021355
USA Aberdeen - Michaelsville: Romney Creek Watershed		1994		MD3210021355
USA Fort George Meade	1997			MD9210020567
USN Patuxent Naval Air Station	1996			MD7170024536
Woodlawn Co. Landfill	1987			MDD980504344
Pennsylvania				
A.I.W. Frank/Mid-County Mustang				PAD004351003
Allied Signal Aerospace Co. Guidance and Control Systems				PAD003047974
Ambler Asbestos Piles				PAD000436436
American Electronic Lab, Inc.				PAD009224981
AMP Inc., Global Envir Services				PAD980693048
Austin Avenue Radiation Site	1993			PAD987341716
Bally Engineered Structure Incorporated				PAD061105128
Bell Landfill				PAD980705107
Berkley Products				PAD980538649
Berks Landfill Corp.				PAD000651810
Berks Sand Pit				PAD980691794
Boarhead Farms	1989			PAD047726161
Bridesburg Dump	1984			PAD980508402
Brodhead Creek				PAD980691760
Brown's Battery Breaking		1991		PAD980831812
Butler Mine Tunnel	1987			PAD980508451

Region 3 *cont.*

Pennsylvania *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Butz Landfill				PAD981034705
Crater Resources, Inc./Keystone Coke Co./ Alan Wood	1993			PAD980419097
Croydon TCE Spill	1986			PAD981035009
Delta Quarries & Disposal Inc./Stotler Landfill				PAD981038052
Douglassville Disposal	1987			PAD002384865
Drake Chemical				PAD003058047
Dublin TCE Site				PAD981740004
Eastern Diversified Metals				PAD980830533
Elizabethtown Landfill	1989			PAD980539712
Enterprise Avenue	1984			PAD980552913
FMC Marcus Hook	1996			PAD987323458
Foote Mineral Co.	1993			PAD077087989
GMT Microelectronics				PAD093730174
Hamburg Lead Site				PAD987332541
Havertown PCP Site				PAD002338010
Hebelka Auto Salvage Yard				PAD980829329
Hellertown Manufacturing Co.	1987			PAD002390748
Henderson Road		1989		PAD009862939
Industrial Lane				PAD980508493
Jack's Creek/Sitkin Smelting & Refining, Inc.	1989			PAD980829493
Keyser Ave. Borehole	1989			PAD981036049
Kimberton				PAD980691703
Lackawanna Refuse				PAD980508667
Lansdowne Radiation Site				PAD980830921
Letterkenny Army Depot (PDO Area)				PA2210090054
Letterkenny Army Depot (SE Area)				PA6213820503
Lord-Shope Landfill				PAD980508931
Lower Darby Creek Area				PASFN0305521
Malvern TCE				PAD014353445
Marjol Operation				PAD003041910
Metal Bank of America	1984	1990		PAD046557096
Metropolitan Mirror and Glass				PAD982366957

Region 3 *cont.*

Pennsylvania *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Middletown Air Field				PAD980538763
Mill Creek Dump				PAD980231690
Modern Sanitation Landfill				PAD980539068
Moyers Landfill				PAD980508766
MW Manufacturing				PAD980691372
National Vulcanized Fiber				PAD107214116
Naval Air Development Center (8 Areas)				PA6170024545
North Penn - Area 1				PAD096834494
North Penn - Area 12				PAD057152365
North Penn - Area 2				PAD002342475
North Penn - Area 5				PAD980692693
North Penn - Area 6				PAD980926976
North Penn - Area 7				PAD002498632
Novak Sanitary Landfill				PAD079160842
Occidental Chemical Corp./Firestone Tire and Rubber Co.	1989			PAD980229298
Old Wilmington Road GW Contamination				PAD981938939
Palmerton Zinc Pile				PAD002395887
Paoli Rail Yard	1987	1991		PAD980692594
Publicker/Cuyahoga Wrecking Plant	1990			PAD981939200
Raymark	1996			PAD039017694
Recticon/Allied Steel	1989			PAD002353969
Reeser's Landfill				PAD980829261
Revere Chemical Co.	1986			PAD051395499
Rohm and Haas Landfill	1986			PAD091637975
Sable Diamonds/US Metal & Coins				PAD982364234
Saegertown Industrial Area				PAD980692487
Salford Quarry	1997			PAD980693204
Shriver's Corner				PAD980830889
Stanley Kessler				PAD014269971
Strasburg Landfill				PAD000441337
Textron Lycoming				PAD003053709
Tinicum National Environmental Center	1986			PA6143515447

Region 3 *cont.*

Pennsylvania *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Tonolli Corp.				PAD073613663
Tysons Dump #1	1985			PAD980692024
UGI Corp. Gas Manufacturing Plant	1995			PAD980539126
USN Philadelphia Naval Shipyard				PA4170022418
USN Ships Parts Control Center	1996			PA3170022104
Wade (ABM)	1984			PAD980539407
Walsh Landfill				PAD980829527
Whitmoyer Laboratories				PAD003005014
Willow Grove Naval Air and Air Reserve Station				PAD987277837
Virginia				
Abex Corp.	1989			VAD980551683
Arrowhead Associates Inc./Scovill Corp.	1989			VAD042916361
Atlantic Wood Industries, Inc.	1987	1990		VAD990710410
C & R Battery Co., Inc.	1987			VAD049957913
Chisman Creek	1984			VAD980712913
Clarke L.A. & Son				VAD007972482
Former Nansemond Ordnance Depot	2002			VAD123933426
H & H Inc., Burn Pit				VAD980539878
Hampton Roads Welders Site				VAD988197133
Kim-Stan Landfill	2002			VAD077923449
Marine Corps Combat and Development Command	1995			VA1170024722
NASA Wallops Island				VA8800010763
Langley Air Force Base/ NASA Langley Research Center	1995	1997		VA2800005033
Naval Amphibious Base Little Creek	2002			VA5170022482
Naval Surface Warfare Center - Dahlgren	1993			VA7170024684
Naval Weapons Station - Yorktown	1993	1997		VA8170024170
NWS Yorktown - Cheatham Annex				VA3170024605
Rentokil, Inc. (Virginia Wood Preserving Division)				VAD071040752
Richmond, Fredericksburg & Potomac Railroad		1994		VAD020312013
Saunders Supply Co.	1987			VAD003117389

Region 3 *cont.*

Virginia *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
St Juliens Creek Annex (U.S. Navy)				VA5170000181
Suffolk City Landfill				VAD980917983
U.S. Defense General Supply Center				VA3971520751
USA Fort Eustis	1996			VA6210020321
USA Woodbridge Research Facility				VA7210020981
USN Naval Shipyard Norfolk	1999			VA1170024813
USN Norfolk Naval Base	1997			VA6170061463
USN Radio Transmitting Facility				VA9170022488

Region 4

Alabama				
Alabama Wood Treating Corp Inc				ALD058221326
American Brass, Inc.	2002			ALD981868466
Ciba-Geigy Corp. (McIntosh Plant)	1990			ALD001221902
Gulf Oil Co.				ALD000604249
Interstate Lead Co. (ILCO)				ALD041906173
Olin Corp. (McIntosh Plant)	1990			ALD008188708
Redwing Carriers, Inc. (Saraland)	1989			ALD980844385
Stauffer Chemical Co. (Cold Creek Plant)		1990		ALD095688875
Stauffer Chemical Co. (Lemoyne Plant)				ALD008161176
T.H. Agriculture & Nutrition (Montgomery)				ALD007454085
US Naval Outlying Barin Field				AL2170024630
USAF Maxwell Air Force Base				AL0570024182

Florida				
Agrico Chemical Co.	1989			FLD980221857
Airco Plating Co.				FLD004145140
Alaric Area GW Plume				FLD012978862
American Creosote Works (Pensacola Plant)	1984	1989		FLD008161994
Anaconda Aluminum Co./Milgo Electronics				FLD020536538
Anodyne, Inc.				FLD981014368

Region 4 *cont.*

Florida *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
B&B Chemical Co., Inc.				FLD004574190
Bay Drum				FLD088783865
Beulah Landfill				FLD980494660
BMI-Textron				FLD052172954
Broward County-21st Manor Dump	1992			FLD981930506
Cabot/Koppers				FLD980709356
Cascade Park Gasification Plant				FLD981931959
Chemform, Inc.	1990			FLD080174402
Chevron Chemical Co. (Ortho Division)				FLD004064242
Coleman-Evans Wood Preserving Co.				FLD991279894
Cypress Garden Skis				FLD029505161
Davie Landfill				FLD980602288
Dubose Oil Products Co.				FLD000833368
Florida Petroleum Processors				FLD984184127
Florida Steel Corp.				FLD050432251
Gardinier Inc./ Ft Meade Mine				FLD000827428
Harris Corp. (Palm Bay Plant)	1986	1990		FLD000602334
Helena Chemical Co. (Tampa Plant)	1993			FLD053502696
Hipps Road Landfill				FLD980709802
Hollingsworth Solderless Terminal				FLD004119681
Kassauf-Kimerling Battery Disposal		1989		FLD980727820
Madison County Sanitary Landfill				FLD981019235
MRI Corporation	1997			FLD088787585
Munisport Landfill	1984			FLD084535442
Normandy Park Apartments				FLD984229773
Peak Oil Co./Bay Drum Co.				FLD004091807
Peele-Dixie Wellfield Site				FLD984259374
Pensacola Naval Air Station	1990			FL9170024567
Pepper Steel & Alloys, Inc.				FLD032544587
Pickettville Road Landfill	1984	1990		FLD980556351
Piper Aircraft/Vero Beach Water & Sewer				FLD004054284
Pleasant Grove Landfill				FLD984169763
Reeves SE Corp Southeastern Wire Div.				FLD000824888

Region 4 *cont.*

Florida *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Reeves Southeastern Galvanizing Corp.				FLD000824896
Sapp Battery Salvage		1989		FLD980602882
Schuylkill Metals Corp.				FLD062794003
Sherwood Medical Industries				FLD043861392
Sixty-Second Street Dump	1984	1989		FLD980728877
Solitron Devices, Inc.				FLD032845778
Solitron Microwave	2002			FLD045459526
Southern Solvents, Inc				FL0001209840
St. Augustine Gas Company				FLD101835528
Standard Auto Bumper Corp.	1989			FLD004126520
Stauffer Chemical Co. (Tampa Plant)	1993			FLD004092532
Stauffer Chemical Co. (Tarpon Springs)	1993			FLD010596013
Sydney Mine Sludge Ponds		1989		FLD000648055
Taylor Road Landfill				FLD980494959
Trans Circuits, Inc.				FLD091471904
US NASA Kennedy Space Center				FL6800014585
USAF Cape Canaveral AFB				FL2800016121
USAF Eglin AFB Armament Division				FL8570024366
USAF Homestead AFB				FL7570024037
USAF MacDill AFB				FL2971590003
USAF NAS Key West (Boca Chica)				FL6170022952
USAF Patrick AFB				FL2570024404
USAF Tyndall Air Force Base	1997			FL1570024124
USCG Station Key West				FL1690331300
USN Air Station Cecil Field	1990			FL5170022474
USN NAS Jacksonville	1990			FL6170024412
USN Naval Air Station Mayport				FL9170024260
USN Naval Air Station Whiting Field Site 5	1996			FL2170023244
USN Naval Coastal Systems Ctr.				FL8170023792
Whitehouse Oil Pits				FLD980602767
Wilson Concepts of Florida, Inc.				FLD041184383
Wingate Road Municipal Incinerator Dump				FLD981021470

Region 4 *cont.*

Florida *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Woodbury Chemical Co. (Princeton Plant)	1989			FLD004146346
Zellwood Ground Water Contamination				FLD049985302
Georgia				
Brunswick Wood Preserving	1997			GAD981024466
Cedartown Industries, Inc.				GAD095840674
Cedartown Municipal Landfill				GAD980495402
Diamond Shamrock Corp. Landfill				GAD990741092
Camilla Wood Preserving Company	1999			GAD008212409
Firestone Tire & Rubber Co. (Albany Plant)				GAD990855074
Hercules 009 Landfill				GAD980556906
Hercules Inc.				GAD004065520
International Paper Co.				GAD000827444
LCP Chemicals Georgia Inc		1995		GAD099303182
Marine Corps Logistics Base				GA7170023694
Mathis Brothers Landfill				GAD980838619
Monsanto Corp. (Augusta Plant)				GAD001700699
New Sterling Landfill				GAD980495451
Robins Air Force Base				GA1570024330
T.H. Agriculture & Nutrition (Albany)				GAD042101261
Terry Creek Dredge Spoil Areas/ Hercules Outfall	1997			GAD982112658
Woolfolk Chemical Works, Inc.				GAD003269578
Mississippi				
Chemfax, Inc.	1995			MSD008154486
Davis Timber Company				MSD046497012
Gautier Oil Co., Inc.	1989			MSD098596489
Naval Construction Battalion Center				MS2170022626
Southeast Mississippi Industrial Council				MSD980403240
Tennessee Gas Pipeline/CS 530				MSD991277542
USAF Keesler AFB				MS2570024164

Region 4 *cont.*

North Carolina	WSR	PNRS	USAF	EPA FACILITY ID
ABC One Hour Cleaners	1989			NCD024644494
Camp Lejeune Military Res. (U.S. Navy)	1989			NC6170022580
Charles Macon Lagoon & Drum Storage				NCD980840409
Cherry Point Marine Corps Air Station				NC1170027261
Dockery Property				NCD980840342
FCX, Inc. (Washington Plant)	1989			NCD981475932
Geigy Chemical Corp. (Aberdeen Plant)				NCD981927502
General Electric Co./Shepherd Farm				NCD079044426
Georgia-Pacific Corporation Hardwood Sawmill				NCD000813592
Koppers Co. Inc. (Morrisville Plant)				NCD003200383
National Starch & Chemical Corp.				NCD991278953
New Hanover County Airport Burn Pit	1989			NCD981021157
Old ATC Refinery				NCD986186518
Potter's Septic Tank Service Pits	1989			NCD981023260
Reasor Chemical Company				NCD986187094
Triangle Pacific Corp. IXL Division				NCD087336335
Weyerhaeuser Co. Plymouth Wood Treating Plant				NCD980601587

South Carolina				
Allied Terminals				SC0000861054
Beaufort County Landfill				SCD980844260
Calhoun Park Area		1993		SCD987581337
Carolawn, Inc.				SCD980558316
Charleston Landfill				SCD980846034
Columbia Nitrogen				SC0001040393
Geiger (C&M Oil)	1984			SCD980711279
Helena Chemical Co. Landfill	1989			SCD058753971
International Paper Co.				SCD055915086
Kalama Specialty Chemicals				SCD094995503
Koppers Co., Inc. (Charleston Plant)	1993			SCD980310239
Leonard Chemical Co., Inc				SCD991279324
Lexington County Landfill Area				SCD980558043

Region 4 *cont.*

South Carolina *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Macalloy Corporation				SCD003360476
Naval Shipyard - Charleston				SC0170022560
Naval Weapons Station - Charleston				SC8170022620
Palmetto Recycling, Inc.				SCD037398120
Para-Chem Southern, Inc.				SCD002601656
Parris Island Marine Corps Recruit Depot		1995		SC6170022762
Savannah River Site (USDOE)	1990			SC1890008989
USDOI Charleston Harbor Site		1993		SCD987572674
Wamchem, Inc.	1984			SCD037405362

Region 5

Illinois	
Fort Sheridan	IL8214020838
Great Lakes Naval Training Center	NA
Outboard Marine Corp.	ILD000802827
Yeoman Creek Landfill	ILD980500102

Indiana	
Grand Calumet/IHC Area of Concern	IND980500573

Michigan	
Allied Paper/Portage Creek/Kalamazoo River	MID006007306
Cannelton Industries	MID980678627
Deer Lake	MID980679799
Ford Motor Co.	MID005057005
Hooker Montague Plant	MID006014906
Manistique River/Harbor, Area of Concern	MID981192628
Muskegon Chem Co.	MID072569510
Packaging Corp. of America	MID980794747
Shiawassee River	MID980794473
Thunder Bay	MID985640630
Torch Lake	MID980901946

Region 5 *cont.*

Minnesota	WSR	PNRS	USAF	EPA FACILITY ID
St Louis River/Interlake				MND039045430
Ohio				
Ashtabula River				NA
Fields Brook				OHD980614572
Wisconsin				
Ashland/NSP Lakefront Site				WISFN0507952
Boerke Site				WID981189632
Fort Howard Paper Co. Lagoons				WID006136659
Fort Howard Steel Incorporated				WID006141402
Fox River NRDA/PCB Releases				WI0001954841
Kohler Co. Landfill				WID006073225
Moss-American (Kerr-McGee Oil Co.)				WID039052626
Sheboygan Harbor & River				WID980996367

Region 6

Louisiana				
American Creosote Works, Inc. (Winnfield Plant)				LAD000239814
Bayou Bonfouca				LAD980745632
Bayou d'Inde				LAD981916570
Bayou Sorrel Site	1984			LAD980745541
Bayou Trepagnier (Shell Oil Co./NORCO Mfg. Complex)				LAD008186579
Bayou Verdine, Occidental Chemical				LAD985195346
Calcasieu Estuary				LA0002368173
Calcasieu Parish Landfill				LAD980501423
Delatte Metals	2002			LAD052510344
Devil's Swamp Lake				LAD985202464
Gulf State Utilities-North Ryan Street				LAD985169317
Madisonville Creosote Works	1997			LAD981522998
Mallard Bay Landing Bulk Plant				LA0000187518

Region 6 *cont.*

Louisiana *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
New Orleans Naval Air Station				LA6170022788
Petro-Processors of Louisiana, Inc.				LAD057482713
Ponchatoula Battery Company				LAD062644232
PPG Industries Inc.				LAD008086506
Southern Shipbuilding Corp.				LAD008149015
Texas				
ALCOA (Point Comfort)/Lavaca Bay	1995			TXD008123168
Bailey Waste Disposal	1985	1989		TXD980864649
Brio Refining, Inc.	1989	1989		TXD980625453
Chevron Products Co.				TXD008090409
Corpus Christi Naval Air Station				TX7170022787
Crystal Chemical Co.	1989	1989		TXD990707010
Dixie Oil Processors, Inc.	1989	1989		TXD089793046
French, Ltd.	1989	1989		TXD980514814
Geneva Industries/Fuhrmann Energy				TXD980748453
Harris (Farley Street)				TXD980745582
Highlands Acid Pit	1989			TXD980514996
International Creosoting				TXD980625636
Malone Service Company, Inc.	***2003***			***TXD980864789***
Motco, Inc.	1984			TXD980629851
North Cavalcade Street				TXD980873343
Palmer Barge Line				TXD068104561
Patrick Bayou				TX0000605329
Petro-Chemical Systems (Turtle Bayou)				TXD980873350
Sheridan Disposal Services				TXD062132147
Sikes Disposal Pits	1989			TXD980513956
South Cavalcade Street				TXD980810386
Sprague Road Groundwater				TX0001407444
Star Lake Canal Site - Port Neches				TX0001414341
State Marine	1999			TXD099801102
Tex-Tin Corp.	1989			TXD062113329
Triangle Chemical Co.				TXD055143705

Region 9

American Somoa	WSR	PNRS	USAF	EPA FACILITY ID
Taputimu Farm	1984			ASD980637656
California				
Aerojet General Corp.				CAD980358832
Alameda Naval Air Station	1989			CA2170023236
Bolsa Chica Lowlands				NA
Brown & Bryant, Inc. (Arvin Plant)				CAD052384021
Camp Pendleton Marine Corps Base	1990	1992		CA2170023533
Caretaker Site Office Treasure Island				CA7170023330
Casmalia Resources				CAD020748125
Chevron USA Richmond Ref.				CAD009114919
Coast Wood Preserving	1984			CAD063015887
Concord Naval Weapons Station	1989,1993	1990		CA7170024528
Cooper Drum Co.	1993			CAD055753370
Crazy Horse Sanitary Landfill				CAD980498455
CTS Printex, Inc.	1989			CAD009212838
Del Amo Facility	1992			CAD029544731
Del Norte Pesticide Storage	1984			CAD000626176
El Toro Marine Corps Air Station	1989			CA6170023208
Fairchild Semiconductor Corp. (Mt View)				CAD095989778
Farallon Islands		1990		CAD981159585
Fleet Industrial Supply Center Oakland				CA4170090027
Fort Ord	1990	1992		CA7210020676
Fresno Municipal Sanitary Landfill				CAD980636914
GBF, Inc., Dump	1989,1993			CAD980498562
Gray Eagle Mine				CAD000629923
Halaco Engineering Co.				CAD009688052
Hamilton Army Airfield				CA3570024288
Hewlett-Packard (620-640 Page Mill Road)	1989			CAD980884209
Hexcel Corporation				CAD058783952
Hunters Point Naval Shipyard	1989	1989		CA1170090087
Intersil Inc./Siemens Components	1989			CAD041472341
Iron Mountain Mine	1989	1989		CAD980498612

Region 9 *cont.*

California *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
J.H. Baxter & Co.				CAD000625731
Jasco Chemical Corp.	1989			CAD009103318
Jet Propulsion Laboratory (NASA)				CA9800013030
Kaiser Steel Corp. (Fontana Plant)				CAD008274938
Kearney-KPF				CAD981429715
Liquid Gold Oil Corp.	1984			CAT000646208
Long Beach Naval Station				CA2170023194
Louisiana-Pacific Corp.				CAD065021594
Mare Island Naval Shipyard				CA7170024775
McClellan Air Force Base (Western Parcels)				NA
McCormick & Baxter Creosoting Co.	1993			CAD009106527
McNamara & Peepe Sawmill				CA0001097088
M-E-W Study Area				CAD982463812
MGM Brakes	1984			CAD000074120
Modesto Ground Water Contamination				CAD981997752
Moffett Naval Air Station	1986			CA2170090078
Montrose Chemical Corp.	1985			CAD008242711
NASSCO/SW Marine Shipyard				NA
Naval Air Station Lemore				CA3170024381
Naval Shipyard Long Beach				CA1170090483
Naval Station San Diego				NA
Naval Supply Center Pt Molate Site				CA0170090021
Naval Training Center (Boat Channel)				NA
Newmark Ground Water Contamination				CAD981434517
North Island Naval Air Station				CA7170090016
Oakland Army Base				CA4210020661
Oakland Naval Supply Ctr./Alameda Fac				CA1170090012
Pacific Coast Pipe Lines	1989			CAD980636781
Pacific Missile Test Center				CA9170027271
Palos Verdes Shelf				NA
Playa Vista Development Project				CAD982418139
Point Loma Naval Complex				CA1170090236
Port Hueneme Naval Constr. Battalion Ctr.				CA6170023323

Region 9 *cont.*

California *cont.*	**WSR**	**PNRS**	**USAF**	**EPA FACILITY ID**
Presidio of San Francisco				CA7210020791
Ralph Gray Trucking Co.				CAD981995947
Redwood Shore Landfill				CAD982462343
Rhone-Poulenc, Inc./Zoecon Corp.	1985			CAT000611350
Riverbank Army Ammunition Plant	1989			CA7210020759
Romic Chem Corp.				CAD009452657
Sacramento Army Depot				CA0210020780
San Diego Naval Training Center				CA7170090057
Seal Beach Naval Weapons Station				CA0170024491
Shell Oil Co. Martinez				CAD009164021
Simpson-Shasta Ranch				CAD980637482
Sola Optical USA, Inc.	1989			CAD981171523
Solar Turbines, Inc.				CAD008314908
Solvent Service, Inc.				CAD059494310
South Bay Asbestos Area	1985			CAD980894885
Spectra-Physics, Inc.				CAD009138488
Sulphur Bank Mercury Mine				CAD980893275
Synertek, Inc. (Building 1)				CAD990832735
Tosco Corp Avon Ref.				CAD000072751
Travis Air Force Base	1990			CA5570024575
TRW Microwave, Inc (Building 825)				CAD009159088
United Heckathorn Co.				CAD981436363
Vandenberg AFB				CA9570025149
Guam				
Andersen Air Force Base	1993		1994	GU6571999519
Apra Harbor Naval Complex				GU7170090008
Naval Air Station Agana				GU0170027320
Naval Sta. Guam				GU7170027323
Hawaii				
ABC Chem Corp.				HID033233305
Barbers Point Naval Station				HI1170024326

Region 9 *cont*

Hawaii *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Bellows Air Force Station				HI3570028719
Chemwood Treatment Co., Inc.				HID981424138
Del Monte Corporation (Oahu Plantation)	1995			HID980637631
Hawaiian Western Steel Limited				HID981581788
Hickam Air Force Base				HI8570028722
Honolulu Skeet Club				HI0000768382
Kahoolawe Island				HI6170090074
Kailua-Kona Landfill				HID980497184
Kapaa Ldfl				HID980497176
Kewalo Incin Ash Dump				HID980497226
Kure Atoll, U.S. Coast Guard				HID984470039
Marine Corps Base Hawaii				HI6170022762
Naval Submarine Base				HI3170024340
Pearl City Landfill	1984			HID980585178
Pearl Harbor Naval Complex				HI4170090076
Pearl Harbor Naval Station	1992	1993		HI2170024341
Tern Island				NA
USCG Base Honolulu				HID984469890
Waiakea Pond/Hawaiian Cane Prdts Plant		1990		HID982400475
Trust Territories				
PCB Wastes				TTD980637987
U.S. Minor Outlying Islands				
Johnston Atoll				UM4210090003
Midway Island Naval Air Station				UM6170027332
Wake Island				
Wake Island Air Field				WQ0570090001

Region 10

Alaska	WSR	PNRS	USAF	EPA FACILITY ID
Adak Naval Air Station	1993			AK4170024323
Alaska Pulp Corp.		1995		AKD009252487
Dutch Harbor Sediment Site				AKSFN1002080
Elmendorf Air Force Base	1990	1990		AK8570028649
Fort Richardson (US Army)	1995		1994	AK6214522157
Fort Wainwright				AK6210022426
Kennicott Copper Mining Co.				AKD983073123
Ketchikan Pulp Co.				AKD009252230
Klag Bay Site	2002			AK0002364768
Metlakatla Indian Community (Brownfield Site)				NA
Standard Steel & Metals Salvage Yard (USDOT)	1990	1990		AKD980978787
USAF Eareckson AFS				AK9570028705
USAF King Salmon Airport				AK3570028669
USDOC NOAA Nat Marine Fisheries Svc				AK0131490021
USNAVY Barrow Naval Arctic Research Lab				AK2170027245
Idaho				
Blackbird Mine	1995	1994		IDD980725832
Grouse Creek Mine				IDD000643254
St Maries Creosote				IDSFN1002095
Stibnite/Yellow Pine Mining Area	***2003***			***IDD980665459***
Oregon				
Allied Plating, Inc.	1987	1988		ORD009051442
Port of Coos Bay - Charleston Boatyard				OR0001389972
East Multnomah County Ground Water Contamination				ORD987185030
Gould, Inc.	1984	1988		ORD095003687
Hoy's Marine LLC				ORD987190840
Joseph Forest Products				ORD068782820
Martin-Marietta Aluminum Co.	1987	1988		ORD052221025
McCormick & Baxter Creosoting Co. (Portland Plant)	1995	1995		ORD009020603
Northwest Pipe & Casing Co.	1993			ORD980988307

Region 10 *cont.*

Oregon *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Portland Harbor (Lower Willamette River)	***2003***	***1999***		***ORSFN1002155***
Reynolds Metals Co.	1996			ORD009412677
Rhone Poulenc Inc.	1984			ORD990659492
Taylor Lumber and Treating, Inc.		1991		ORD009042532
Teledyne Wah Chang	1985	1988		ORD050955848
Union Pacific Railroad Co. Tie-Treating Plant	1990	1990		ORD009049412
Washington				
ALCOA (Vancouver Smelter)	1989	1989		WAD009045279
American Crossarm & Conduit Co.	1989	1988		WAD057311094
Asarco Inc.				WAD010187896
Bangor Naval Submarine Base	1990	1991		WA5170027291
Bangor Ordnance Disposal (USNavy)		1991		WA7170027265
Boeing Company Plant 2				WAD009256819
Bonneville Power Administration Ross Complex (USDOE)	1990	1990		WA1891406349
Boomsnub/Airco				WAD009624453
Centralia Municipal Landfill	1989	1989		WAD980836662
Commencement Bay, Near Shore/Tide Flats	1984	1988		WAD980726368
Commencement Bay, South Tacoma Channel	1984			WAD980726301
Hamilton /Labree Roads GW Contamination				WASFN1002174
Hamilton Island Landfill (USA/COE)	1992	1991		WA5210890096
Hanford 100-Area (USDOE)	1989	1988		WA3890090076
Hansville Landfill				WAD000711804
Harbor Island (Lead)	1984	1989		WAD980722839
Jackson Park Housing Complex (USNavy)	1995			WA3170090044
Lower Duwamish Waterway				WA0002329285
Naval Air Station, Whidbey Island (Ault Field)	1986	1989		WA5170090059
Naval Air Station, Whidbey Island (Seaplane Base)	1986	1989		WA6170090058
Naval Undersea Warfare Engineering Station (4 Waste Areas)		1989		WA1170023419
Northwest Transformer (South Harkness Street)	1989	1988		WAD027315621
Oeser Company	1997			WAD008957243

Region 10 *cont.*

Washington *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Old Navy Dump/Manchester Lab (USEPA/NOAA)	1996	1995		WA8680030931
Olympic View Sanitary Landfill				WAD042804971
Pacific Sound Resources (Wyckoff West Seattle)	1995	1992		WAD009248287
Pacific Wood Treating				WAD009422411
Palermo Well Field Groundwater Contamination				WA0000026534
Puget Sound Naval Shipyard Complex	1995			WA2170023418
Quendall Terminals	1985			WAD980639215
Rayonier Inc Port Angeles Mill				WAD000490169
Seattle Municipal Landfill (Kent Highlands)	1989	1988		WAD980639462
South Tacoma Field				WAD980724173
Strandley/Manning Site		1992		WAD980976328
Tulalip Landfill	1992	1991		WAD980639256
United Marine Shipyards				WAD009264284
US Navy Puget Sound FISC Dept.				WA2170023426
Vancouver Water Station #1 Contamination				WAD988519708
Washington Natural Gas - Seattle Plant		1996		WAD980639280
Western Processing Co., Inc.	1984			WAD009487513
Weyerhaeuser Co. Landfill				WAD009041450
WPNSTA Seal Beach Det. Port Hadlock		1989,1995		WA4170090001
Wyckoff Co./Eagle Harbor (2 areas)	1986	1988		WAD009248295

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