Coastal and Estuarine

Hazardous Waste Site Reports

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Contents

Introduction

The National Oceanic and Atmospheric Administration (NOAA) regularly evaluates hazardous waste sites that are proposed for addition to the National Priorities List[1,2] (NPL). This report 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[3] and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).[4]

These waste site reports are often NOAA's first examination of a site. Following a waste site report, some sites may require a more in-depth assessment called a Preliminary Natural Resource Survey (PNRS). NOAA has published 329 coastal and estuarine hazardous waste site reports (WSRs), 143 PNRS', and three Air Force Reports (Appendix Tables 1 and 2).

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 U.S. Environmental Protection Agency (EPA) 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's regional Coastal Resource Coordinators (CRCs) will follow up on sites that appear to pose ongoing problems. NOAA uses information from this report to establish priorities for further site investigations. The CRC works with other agencies and trustees to communicate any concerns to EPA. CRCs also review sampling and monitoring plans for the site 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 EPA can use the waste site reports to help identify the types of information that may be needed to complete an environmental assessment of the site. Other federal and state trustees can use the reports to help evaluate the potential impacts to their resources.

Each report contains an executive summary and three distinct sections. The first section, Site Background, describes the site, previous site operations and disposal practices, and pathways of contaminant transport to natural 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.

This report contains a list of acronyms and abbreviations (p. 63) and a glossary of terms (p. 65) 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 at which NOAA has been involved that could potentially affect trust resources, as of September 2002. 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' and Air Force Reports.

Chemical-Specific Screening Guidelines

Most waste site reports contain a table that focuses on the contaminants in different media that could potentially degrade natural resources. These site-specific tables highlight only a few of the many contaminants often found at hazardous waste sites. We compare the chemical concentrations reported in the tables against published screening guidelines for surface water, sediment, groundwater, and soil. Ambient Water Quality Criteria (AWQC) values[5] are used for surface water and groundwater, Effects Range Low (ERL) values[6] and Threshold Effects Level (TEL) values[7] are used for sediment, and average soil concentrations[8,9,10] are used for soil.

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 the screening guidelines for chronic effects rather than with the short-term effects.

There are no national criteria for sediment comparable to the AWQC for water. In the absence of national criteria, we compare sediment concentrations against several published screening guidelines.[6,7] Studies that associate contaminant concentrations in sediment with biological effects[11,12,13,14,15,16,17,18] provide guidance for evaluating contaminant concentrations that could harm sediment-dwelling aquatic organisms. 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:[6,13]

- 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
- Probable Effects Range - the range of concentrations over which toxic effects are frequently observed

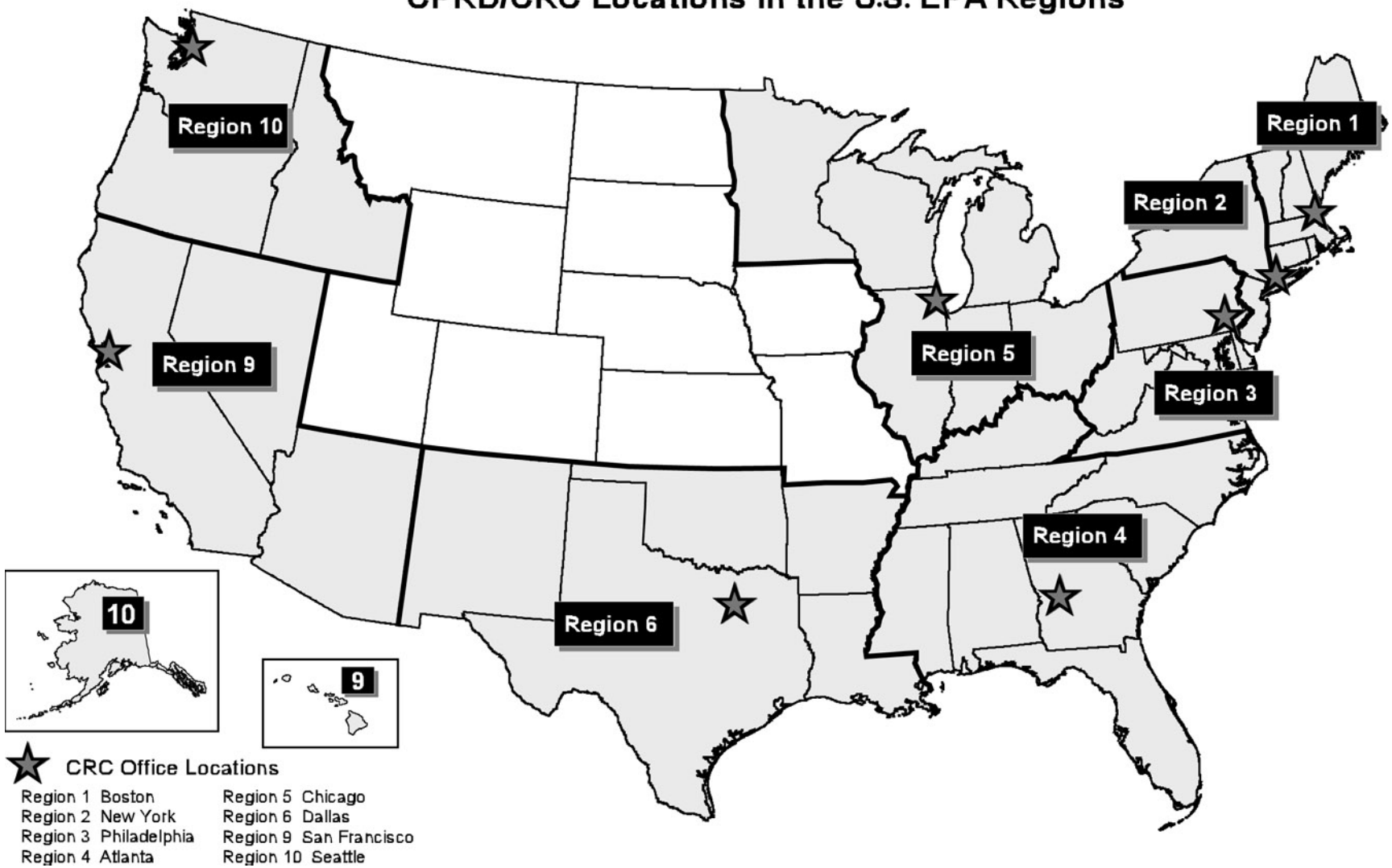
Two slightly different methods[6,7] were used to determine these chemical ranges. Long and Morgan[6] compiled chemical data associated with adverse biological effects. The data were ranked to determine where the chemical concentration was associated with an adverse effect (Effects Range-Low or ERL)—the lower 10th percentile. Sediment samples were not expected to be toxic when all chemical concentrations were below the ERL values.

MacDonald[7] 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. Threshold Effects Levels (TELs) were derived by taking the geometric mean of the 15th percentile of the "effects" data and the 50th percentile of the "no effects" data.

Although different percentiles were used for these two methods, their results closely agree.[13] We advocate neither method over the other and 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 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,[8] except for cadmium and silver, which we compare against average concentrations in the earth's crust.[9,10] The soil values are based on averages calculated from soil data collected throughout the U.S. and are used as a reference for comparison purposes only.

CPRD/CRC Locations in the U.S. EPA Regions



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Computer Circuits

Hauppauge, New York

EPA Facility ID: NYD125499673

Basin: Northern Long Island

HUC: 02030201

Executive Summary

The Computer Circuits property in Hauppauge, New York was the site of a circuit board manufacturing company from 1969 to 1977. The property is approximately 2.5 km (1.5 mi) southwest of the Nissequogue River, which flows into Smithtown Bay. Wastewater dumped into underground leaching pools; soil, groundwater, and surface water on the property have concentrations of trace elements above screening guidelines. Although trust resources use the Nissequogue River, no sampling has been conducted down-gradient of the site to determine whether contaminants are migrating toward NOAA trust habitats.

Site Background

The Computer Circuits property occupies 0.7 hectares (1.7 acres) approximately 2.5 km (1.5 mi) southwest of the Nissequogue River in Hauppauge, New York (Figure 1). The Nissequogue River is approximately 11 km (6.8 mi) upstream from Smithtown Bay.

The Computer Circuits Corporation manufactured printed circuit boards at this location from 1969 to 1977. Some of the chemicals used in this manufacturing process included copper sulfate, nickel, sulfuric acid, hydrochloric acid, lead fluoroborate, fluorides, copper, trichloroethylene, photography chemicals, gold cyanate, ammonia, lead, nitric acid, and tin (USEPA 1997). Wastewater produced during the manufacturing process was dumped into underground leaching pools. One of these pools was connected to a storm drain east of the property (Roux Associates Inc. 1989). The storm drain and all other runoff near the site empty into a stormwater management system that discharges to infiltration basins (USEPA 1997).

The U. S. Environmental Protection Agency (EPA) completed a Hazard Ranking System Package for the site in November 1997, and the site was placed on the National Priorities List in May 1999 (USEPA 2000).

The primary pathway for transport of contaminants from the Computer Circuits site to NOAA trust resources is via groundwater. Groundwater, which flows northeast towards the Nissequogue River, is encountered approximately 30 m (100 ft) bgs in the underlying glacial aquifer (Foster Wheeler 1999). Aside from the storm drain sampling, the surface water pathway has not been evaluated.

NOAA Trust Resources

The habitats of concern to NOAA are the upper and lower reaches of the Nissequogue River. The river extends north from central Long Island for approximately 10 km (6 mi) to Long Island Sound.

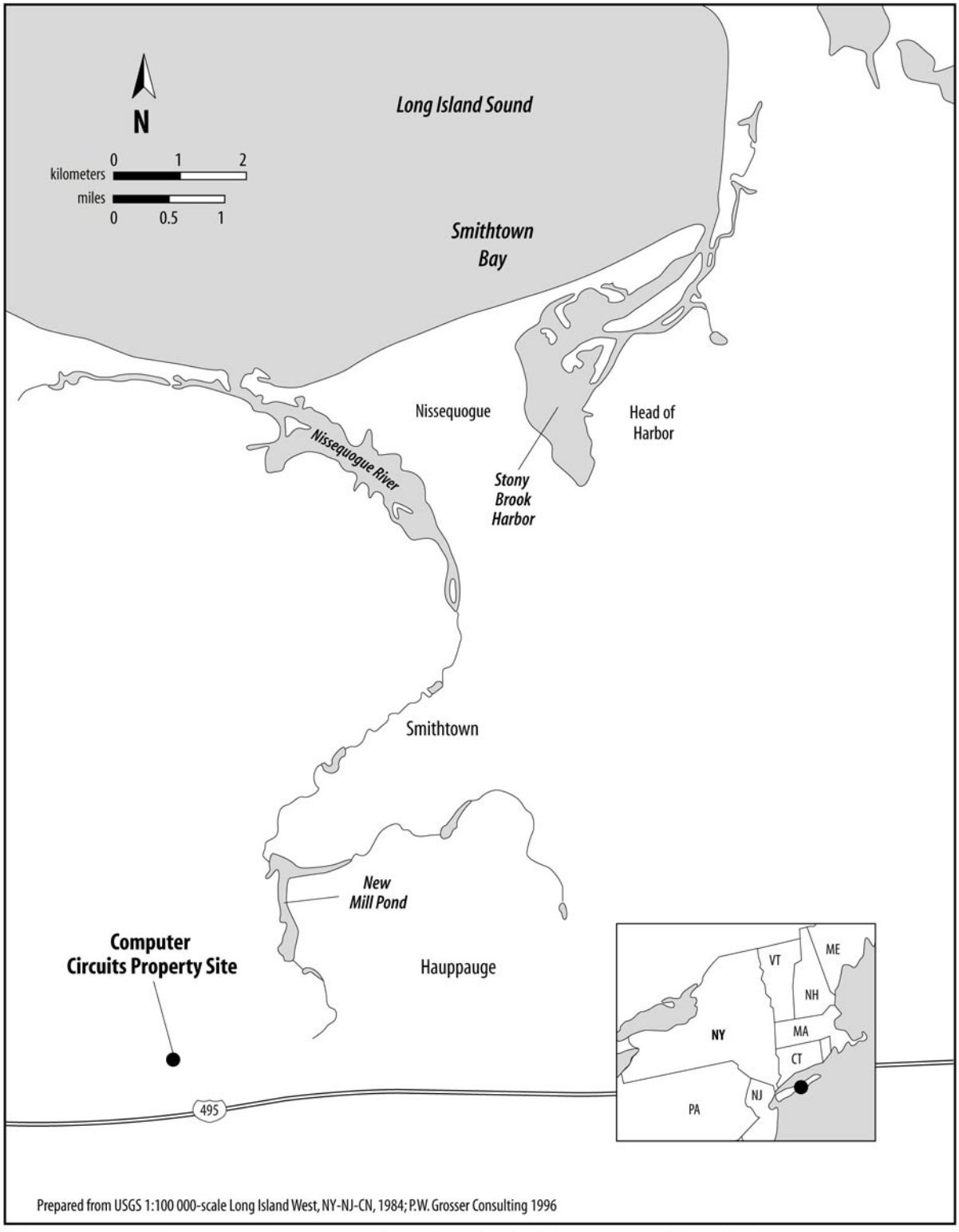

Figure 1. Location of the Computer Circuits Site in Hauppauge, New York.

The upper reaches of the stream, nearest the facility, are dammed to form New Mill Pond. Below New Mill Pond, the stream is low-gradient, meandering for approximately 5 km (3.1 mi) to the lower Nissequogue River. The lower river widens into a shallow, estuarine embayment of Long Island Sound that is predominantly composed of estuarine tidal flats and salt marsh islands (USGS 1967a, 1967b).

NOAA trust resources commonly found in Long Island Sound are presented in Table 1. The upper Nissequogue River contains anadromous runs of alewife and blueback herring that spawn in the stream below the New Mill Pond dam. Both species are spring spawners, migrating upstream between April and June. Juveniles use the stream as a nursery for several months before emigrating to Long Island Sound (Young 2000). The catadromous American eel is present upstream of the dam in New Mill Pond (Guthrie 1984).

The lower Nissequogue River and Long Island Sound contain numerous marine fish and invertebrate species. Small forage species such as silversides, killifish, goby, sheepshead minnow, bay anchovy, oyster toadfish, and pipefish are common, spending their entire lives within estuaries. Atlantic menhaden and Atlantic herring are also common forage species that usually spawn in coastal waters, but larvae are transported to estuaries where they reside through adulthood (Stone et al. 1994).

Larger demersal species such as winter flounder, windowpane flounder, and skates are common, spending all or most of their lives in the estuary. These animals spawn in estuaries and the coastal Sound (Stone et al. 1994).

Several cod species, including tomcod, red hake, and pollock, are present in Long Island Sound. Tomcod may spawn in salt water but apparently prefer to move into estuaries and up rivers to the head of the tide (Scott and Scott 1984). Pollock and hake spawn in coastal waters; their larvae are then transported to estuaries where they reside as juveniles and adults (Stone et al. 1994).

Most of the remaining species spawn in coastal areas; their larvae are then transported into estuaries where they will reside as juveniles. Adults use the estuaries seasonally, usually moving offshore during the winter (Stone et al. 1994).

Shellfish spend their entire lives within the estuary. The northern quahog is the most common species in Long Island Sound, followed by the eastern oyster. Grass shrimp, bay shrimp, and American lobster are common, spending most or all of their lives within the estuary. Blue crab are common; juveniles and adults use the estuary while brooding females generally move offshore (Stone et al. 1994).

There are recreational fisheries in the lower Nissequogue River and extensive commercial fisheries in Long Island Sound (Young 2000).

The New York State Department of Health has issued a health advisory warning against eating crab and lobster hepatopancreas due to contamination from cadmium and PCBs in the marine waters of Long Island Sound. The advisory also limits the consumption of striped bass to no more than one meal per month, and bluefish and American eel to no more than one meal per week (NYSDOH 2001).

Table 1. Fish and invertebrates commonly found in Long Island Sound estuaries (Guthrie 1984, Stone 1994, Young 2000).

Species		Habitat Use			Fisheries	
Common Name	**Scientific Name**	Spawning Area	Nursery Area	Adult Forage	Comm. Fishery	Recr. Fishery
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*		◆	◆		
Goby	*Gobiosama spp.*	◆	◆	◆		
Hogchoker	*Trinectes maculatus*	◆	◆	◆		
Killifish	*Fundulus spp.*	◆	◆	◆		
Northern pipefish	*Syngnathus fuscus*	◆	◆	◆		
Northern searobin	*Prionotus carolinus*	◆	◆	◆		
Pollock	*Pollachius virens*		◆	◆		
Red hake	*Urophycis chuss*		◆	◆		
Oyster toadfish	*Opsanus tau*	◆	◆	◆		
Scup	*Stenotomus chrysops*		◆	◆		
Sheepshead minnow	*Cyprinodon variegatus*	◆	◆	◆		
Silversides	*Menidia spp.*	◆	◆	◆		
Skate	*Raja spp.*	◆	◆	◆		
Tautog	*Tautoga onitis*		◆	◆	◆	◆
Weakfish	*Cynoscion regalis*		◆	◆		
Windowpane flounder	*Scophthalmus aquosus*	◆	◆	◆		
Winter flounder	*Pleuronectes americanus*	◆	◆	◆		◆
INVERTEBRATES						
American lobster	*Homarus americanus*	◆	◆	◆	◆	◆
Bay shrimp	*Crangon septemspinosa*	◆	◆	◆		
Blue crab	*Callinectes sapidus*		◆	◆		◆
Blue mussel	*Mytilus edulis*	◆	◆	◆		
Eastern oyster	*Crassostrea virginica*	◆	◆	◆		
Grass shrimp	*Palaemonetes pugio*	◆	◆	◆		
Northern quahog	*Mercenaria spp.*	◆	◆	◆	◆	◆
Softshell clam	*Mya arenaria*	◆	◆	◆		

Site-Related Contamination

Investigations at the Computer Circuits Property have found contaminants at concentrations substantially greater than screening guidelines in soil, groundwater, and surface water. In 1976

and 1977, the Suffolk County Department of Environmental Control collected surface water samples from leaching pools on the Computer Circuits property (Foster Wheeler 1999). In May 1989 the New York State Department of Environmental Conservation (NYSDEC) requested that 10 soil samples and three groundwater samples be collected from the site (Roux Associates Inc. 1989). In November 1995 NYSDEC arranged for five soil borings to be drilled by a consultant for the property owner (P.W. Grosser Consulting 1996). The EPA collected 14 soil samples and sampled five monitoring wells as part of the Hazard Ranking System Report completed in November 1997 (USEPA 1997).

Trace elements are the primary contaminants of concern to NOAA at the Computer Circuits site. High concentrations of volatile organic compounds were also found on the property but due to their relatively low persistence and toxicity, they are of less concern to NOAA. Table 2 summarizes maximum concentrations of contaminants, along with appropriate screening guidelines.

Table 2. Maximum concentrations of contaminants of concern at the Computer Circuits site (Analytical Resources Inc. 1996a, 1996b, 1996c; Foster Wheeler 1999; Roux Associates Inc. 1989).

	Soil (mg/kg)		Water (µg/L)		
Contaminant	Soil	Mean U.S.[a]	Groundwater	Surface water	AWQC[b]
TRACE ELEMENTS					
Cadmium	2.3	0.06	2.2	ND	2.2[c]
Chromium	9.3	37	340	ND	11
Copper	2,600	17	710	540,000	9[c]
Lead	370	16	110	82,000	2.5[c]
Mercury	0.14	0.058	0.11	ND	0.77
Nickel	180	13	270	57,000	52[c]
Silver	630	0.05	ND	620	0.12
Zinc	13	48	700	ND	120[c]

ND: Not detected; detection limit not available.

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 1999). Freshwater chronic criteria presented.

c: Criterion expressed as a function of total hardness; concentrations shown correspond to hardness of $CaCO_3$ 100 mg/L.

Concentrations of copper, silver, lead, nickel, cadmium, and mercury exceeded screening guidelines in soil (Table 2) (Foster Wheeler 1999).

Sediment samples collected from the leaching pool area exceeded screening guidelines for copper and silver by two and four orders of magnitude, respectively (Table 2) (Malcolm Pirnie Inc. 1996a).

Groundwater samples collected at the site contained concentrations of copper, chromium, and lead that exceeded the AWQC by at least one order of magnitude (Table 2) (Foster Wheeler 1999). The maximum concentrations of trace elements were found in samples collected from a monitoring well, down-gradient from the on-site leaching pools (Malcolm Pirnie Inc. 1996b).

In surface water, samples collected from the on-site leaching pools had concentrations of copper, lead, nickel, and silver that substantially exceeded the AWQC (Table 2) (Foster Wheeler 1999).

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8 EPA Region 2

Emmell's Septic Landfill

Galloway Township, NJ

EPA Facility ID: NJD980772727

Basin: Mullica-Toms

HUC: 02040301

Executive Summary

Emmell's Septic Landfill was a land disposal facility permitted for septic and sewage sludge waste, although other types of industrial and miscellaneous wastes were apparently disposed of there. The property is located near Morses Mill Stream within the Mullica River watershed, about 600 m (2,000 ft) from NOAA trust resource habitats.

Groundwater is the primary pathway for migration of contaminants from the landfill. Trace elements have been detected at elevated concentrations in soil and groundwater. Substantial concentrations of PCBs have been measured in soils. Insufficient analyses were conducted in groundwater to verify PCB concentrations there. The presence of volatile organic compounds (VOCs) at the site does not pose a risk to NOAA trust resources, but may increase the potential for PCBs to migrate through groundwater. No surface water or sediment sampling has been conducted down-gradient from the site.

Site Background

Emmell's Septic Landfill is located in Galloway Township, New Jersey. The landfill is located on 15 hectares (38 acres) approximately 0.6 km (2,000 ft) north of Morses Mill Stream, which discharges to Mill Pond and then Nacote Creek approximately 4 km (2.5 mi) downstream. Nacote Creek flows for 7.1 km (4.4 mi) before discharging into the Mullica River. The Mullica River empties into Great Bay an additional 7.4 km (4.6 mi) downstream (Figures 1 and 2).

Emmell's Septic Landfill was an active land disposal facility for septic and sewage sludge waste from 1967 to 1979. A permit was issued for land application of septic and sewage sludge on the property, but other types of wastes, including household garbage, tire piles, drums, paint sludges, gas cylinders, and construction and industrial wastes have been observed on the property. During this period, the New Jersey Department of Environmental Protection (NJDEP) noted repeated violations, including pooled wastes in trenches and lagoons, failure to submit engineering designs and Annual Operations Statements, and failure to maintain a dike on the premises to prevent septic flow into wooded areas adjacent to the site. An inspection report in July 1979 noted crushed drums with paint-like material in a pit. The property has been abandoned since 1979 (NJDEP 1997; USEPA 1999a). During a site investigation by NJDEP in 1984, contaminants including several volatile organic compounds (VOCs) and metals, were identified in soil and groundwater samples. In 1984 the Atlantic County Health Department closed residential wells northeast of the site after VOCs were detected in five residential wells (Weston 1993).

The primary pathway for migration of contaminants from the site to NOAA trust resources is through groundwater. Soils in the area are described as loamy sand and gravel with relatively high

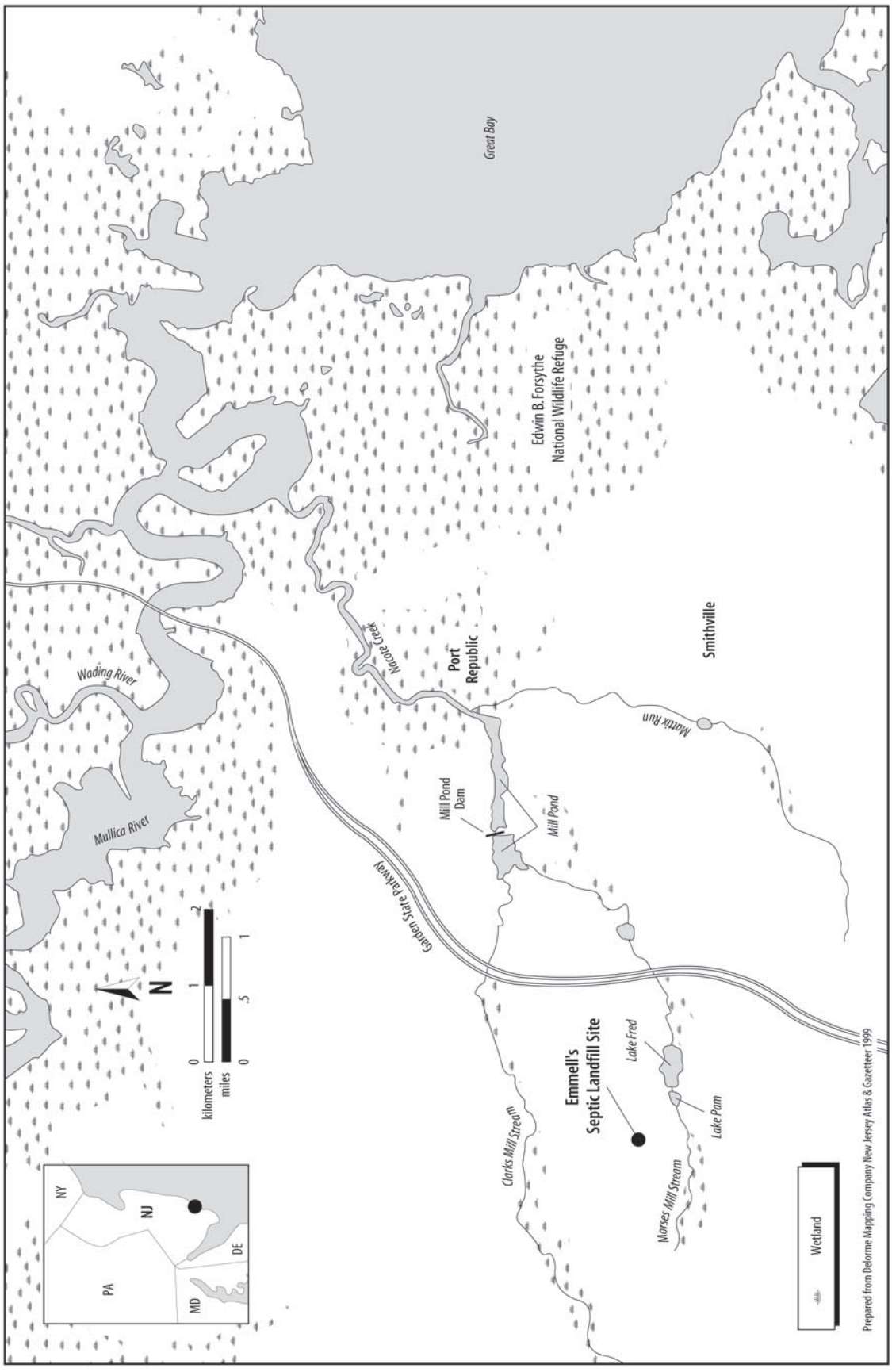

Figure 1. Location of the Emmell's Septic Landfill Site in Galloway Township, New Jersey.

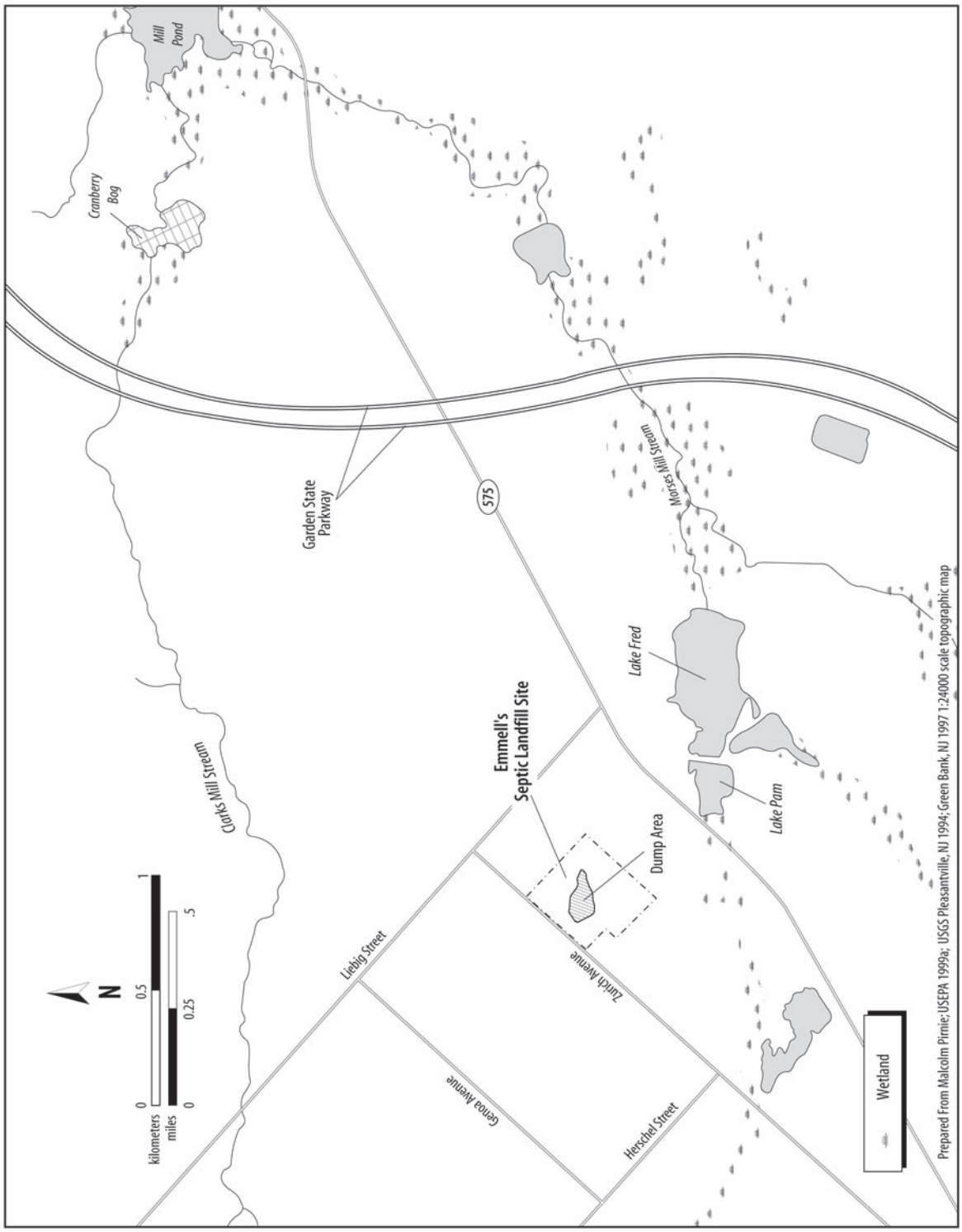

Figure 2. Detail of the Emmell's Septic Landfill Site.

permeability (NJDEP 1997). Groundwater in encountered from 1.3 to 4.6 m (4.4 to 15 ft) bgs, and the direction of flow near the site is southeast towards Morses Mill Stream. The estimated rate of contaminant transport in the groundwater is 0.3 m/day (0.9 ft/day) (NJDEP 1997). There are no surface water pathways from the site to Morses Mill Stream.

The U.S. Environmental Protection Agency (EPA) completed a Site Activity Report in June 1998, and the final Hazard Ranking System Evaluation was completed in April 1999. The EPA placed the site on the National Priorities List in July 1999. The EPA implemented a removal action to address drums, gas cylinders, paint waste, and contaminated soils. Over 400 drums were removed and the removal action was completed in the year 2000. Further actions pending at the site include a groundwater-focused feasibility study, a preliminary human health risk assessment, and a screening level ecological risk assessment (CDM 2001).

NOAA Trust Resources

The NOAA trust habitats of primary concern are the surface water and sediment in Morses Mill Stream, a tributary of the Mullica River (Figure 1). The stream is small with low flows of 3.4 to 5.0 cfs (Weston 1993). Morses Mill Stream meanders through Lake Pam and Lake Fred, two ponds located about 300 m (1,000 ft) downstream of the landfill (Weston 1993). Lake Fred is formed by a small, unnamed dam (Byrne 2002). Morses Mill Stream flows an additional 3.5 km (2.2 mi) to Mill Pond, which is formed by an impassable dam.

Table 1 presents NOAA trust resources found in streams near the landfill. The catadromous American eel is the trust resource documented in Morses Mill Stream (Carberry 2000). American eel can traverse the spillways of lowhead dams and are found throughout the stream from juvenile to adult life stages (Carberry 2000). Warm-water fish including sunfish, minnows, shiners, catfish, and carp use this low-gradient stream (Carberry 2000).

About four km (2.5 mi) downstream of the landfill, anadromous alewife use the area below Mill Pond and Nacote Creek for spawning and as a juvenile nursery. Alewife enter the stream in the spring spawning runs and juveniles reside in the basin until they out-migrate later in the fall. Anadromous striped bass use the Mullica River near the confluence of Nacote Creek, but not the area further upstream (Byrne 2002). There are no plans to put fish passage facilities on the Mill Pond dam (Carberry 2000).

Table 1. NOAA trust resources present in streams near the Emmell's Septic Landfill site in the Mullica River watershed (Carberry 2000, Byrne 2002, Normant 2002).

Species		**Habitat Use**			**Fisheries**	
Common Name	**Scientific Name**	Spawning Area	Nursery Area	Adult Habitat	Rec. Fishery	Comm. Fishery
MARINE/ESTUARINE FISH						
Alewife	*Alosa pseudoharengus*	◆	◆			
American eel	*Anguilla rostrata*		◆	◆		
Striped bass	*Morone saxatilus*		◆	◆		
INVERTEBRATES						
Blue crab	*Callinectes sapidus*	◆	◆	◆	◆	
Eastern oyster	*Crassostrea virginica*	◆	◆	◆		◆

There are no known recreational or commercial fisheries in Morses Mill Stream. Recreational fishing for alewife and striped bass occurs further downstream on the Mullica River (Byrne 2002). There is recreational fishing for blue crab on Nacote Creek, particularly the lower tidal reaches near the Mullica River (Carberry 2000). The waters of Nacote Creek are classified as Special Restricted, which means that permits for depuration are required. This restriction has eliminated recreational shellfish harvesting in Nacote Creek. Commercial harvesting of eastern oysters from leased shellfish beds still takes place in Nacote Creek (Normant 2002).

No health advisories are in effect on Morses Mill Stream, Nacote Creek, or the Mullica River. However, a health advisory is in effect on the Wading River, a tributary to the Mullica River, restricting the consumption of largemouth bass and chain pickerel due to high concentrations of mercury in edible fish tissue (USEPA 2000).

The Edwin B. Forsythe National Wildlife Refuge is located approximately 10 km (6.2 mi) downstream of the site near the mouth of the Mullica River. The U.S. Fish and Wildlife Service actively protects and manages the 16,000 hectares (40,000 acres) of tidal wetlands for migratory birds (USFWS 2000).

Site-Related Contamination

In 1996, the NJDEP collected 20 groundwater samples at the landfill for VOC analyses (NJDEP 1997); the Township of Galloway collected 19 soil samples and seven groundwater samples (Churchill Consulting Engineers 1997). Of the 19 soil samples collected, two were analyzed for PCBs, two for semi-volatile organic compounds (SVOCs), four for VOCs, and 16 for total petroleum hyrocarbons (TPH). The groundwater samples were analyzed for all contaminants. In 1997 and 1998, EPA collected 23 soil samples and 20 groundwater samples for VOC analyses (Weston 1998). Seven of the groundwater samples were also analyzed for trace elements. In addition, 10 test pit samples were collected from areas containing debris and waste material. These samples were analyzed for trace elements, PCBs, VOCs, SVOCs, and pesticides.

Trace elements and PCBs are the primary contaminants of concern at the site. Table 2 presents the maximum concentrations of contaminants detected in soils and groundwater compared to screening guidelines. Trace elements were detected in soils at concentrations that exceeded the screening guidelines; the greatest concentrations were generally found in samples collected from the test pits. Concentrations of chromium, copper, lead, and zinc in groundwater exceeded the AWQC by at least one order of magnitude. Both soil and groundwater samples contained metals at concentrations that exceeded NJDEP Residential Direct Contact Soil Cleanup Criteria and New Jersey Groundwater Quality Standards (NJGQS) (NJDEP 1993, 1999).

In 1996, PCBs were detected in a soil sample at 960 mg/kg, three orders of magnitude greater than the screening guideline (Table 2). In 1998, PCBs were detected in a test pit soil sample at 2 mg/kg. PCBs were not detected in any of the seven groundwater samples that were analyzed for PCBs.

VOCs were detected in soils and groundwater throughout the site; concentrations in groundwater exceeded screening guidelines. Although several VOCs were detected in groundwater at the site, only chlorobenzene exceeded the AWQC (Table 2). Several VOCs were found in groundwater at concentrations that exceeded the NJGQS. Several VOCs were detected in soil at concentrations that exceeded NJDEP soil cleanup criteria. Current data suggests that the VOC plume extends horizontally about 1.2 km east of the site and 4.6 to 7.4 m (15.2 to 24.4 ft) bgs, and that contamination has reached the deeper aquifer. The VOCs at the site do not pose a direct threat to NOAA

resources, although their presence increases the potential for PCBs to migrate through groundwater to NOAA trust resources.

Table 2. Maximum concentrations of contaminants of concern detected in soils and groundwater at Emmell's Septic Landfill site compared to screening guidelines (Churchill Consulting Engineers 1997; NJDEP 1997; Weston 1998).

	Soils (mg/kg)		Water (µg/L)	
Contaminant	On-site soils/test pits	Mean U.S.[a]	Groundwater	AWQC[b]
Trace Elements				
Cadmium	12	0.06	4.4	2.2[c]
Chromium	840	37	180	11
Copper	200	17	93	9[c]
Lead	3,900	16	160	2.5[c]
Mercury	15	0.058	0.48	0.77
Nickel	37	13	ND	52[c]
Silver	3.3	0.05	ND	0.12
Zinc	1,700	48	1,200	120[c]
Organic Compounds				
PCBs	960	0.371[f]	ND	0.014
Volatile Organic Compounds				
1,1,1-trichloroethane	0.014	NA	570	18,000[d,e]
1,1,2-trichloroethane	ND	NA	46.69	9,400
1,1-dichloroethane	ND	NA	156.2	NA
1,1-dichloroethene	ND	NA	96	NA
Benzene	ND	NA	53	5,300[d,e]
Carbon tetrachloride	ND	NA	89	35,200[d,e]
Chlorobenzene	2.8	NA	204	250
cis 1,2-dichloroethene	1.9	NA	5,100	NA
Toluene	5.3	NA	5,800	17,500[d,e]
Trichloroethene	0.22	NA	40	NA
Vinyl chloride	ND	NA	960	NA
Methylene chloride	0.0024	NA	78	11,000[d,e]

NA: Screening guideline not available.

ND: Not detected; detection limits not available.

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 1999b). Freshwater chronic criteria are presented.

c: Freshwater criterion expressed as a function of total hardness; concentration shown corresponds to hardness of 100 mg/L.

d: Chronic criterion not available; acute criterion presented.

e: Value for summation of isomers.

f: Final Preliminary Remedial Goal for the protection of wildlife (Efroymson et al. 1997).

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Stanton Cleaners Area Ground Water Contamination

Great Neck, New York

EPA Facility ID: NYD047650197

Basin: Northern Long Island

HUC: 02030201

Executive Summary

The Stanton Cleaners site operates as a dry cleaning facility approximately 1.5 km (.9 mi) east of Little Neck Bay, an estuary of Long Island Sound. Elevated concentrations of volatile organic compounds (VOCs) have been detected in soils near discharge areas on the site and concentrations of tetrachloroethene (PCE) in groundwater exceed screening guidelines. A groundwater plume contaminated with VOCs is migrating toward Little Neck Bay, although data show attenuation to below screening guidelines a few hundred meters southeast of the site.

Numerous NOAA trust fish and invertebrate species use Little Neck Bay, as well as commercial and recreational fisheries. A health advisory is in place for several fish and invertebrate species within Long Island Sound.

Site Background

The Stanton Cleaners Property consists of approximately 0.1 hectares (.2 acres) in the town of North Hempstead, Nassau County, New York and is approximately 1.5 km (.9 mi) east of Little Neck Bay, an estuarine embayment of Long Island Sound (Figure 1; USEPA 1999). Stanton Cleaners includes a two-story building and a separate boiler room in which a dry-cleaning business has operated since the 1950s (Figure 2). No details on site operations or disposal practices were available for this site. Groundwater contaminated with PCE was first detected in 1979. In 1983, a site inspection revealed accumulated debris and empty drums in the rear yard of the site and a pipe protruding from the rear side of the two-story building. Connected to a dry-cleaning, fluid-water separator, the pipe discharged dry-cleaning wastes directly to the ground (Dvirka and Bartilucci 1998).

A groundwater pathway via the shallow Upper Glacial aquifer is the primary contaminant pathway from the site to NOAA trust habitats. The depth to the water table within the Upper Glacial aquifer ranges at depths of 3.0 to 28.0 m (3.2 to 31 yards) below ground surface (bgs). Groundwater flows southwest near the site and in a more southerly direction south of the site toward Little Neck Bay. Groundwater flow direction appears to be controlled by two hydraulic boundaries: Little Neck Bay, which acts as a natural groundwater discharge area, and drinking water production wells located about 300 m (328 yds) south of the site, which act as local groundwater discharge points during pumping cycles (USEPA 1999). Surface water runoff from the site collects in a shallow sump on the site. Stormwater runoff collects either in a dry well or flows into the storm water collection system where it eventually discharges to Little Neck Bay (Dvirka and Bartilucci 1998).

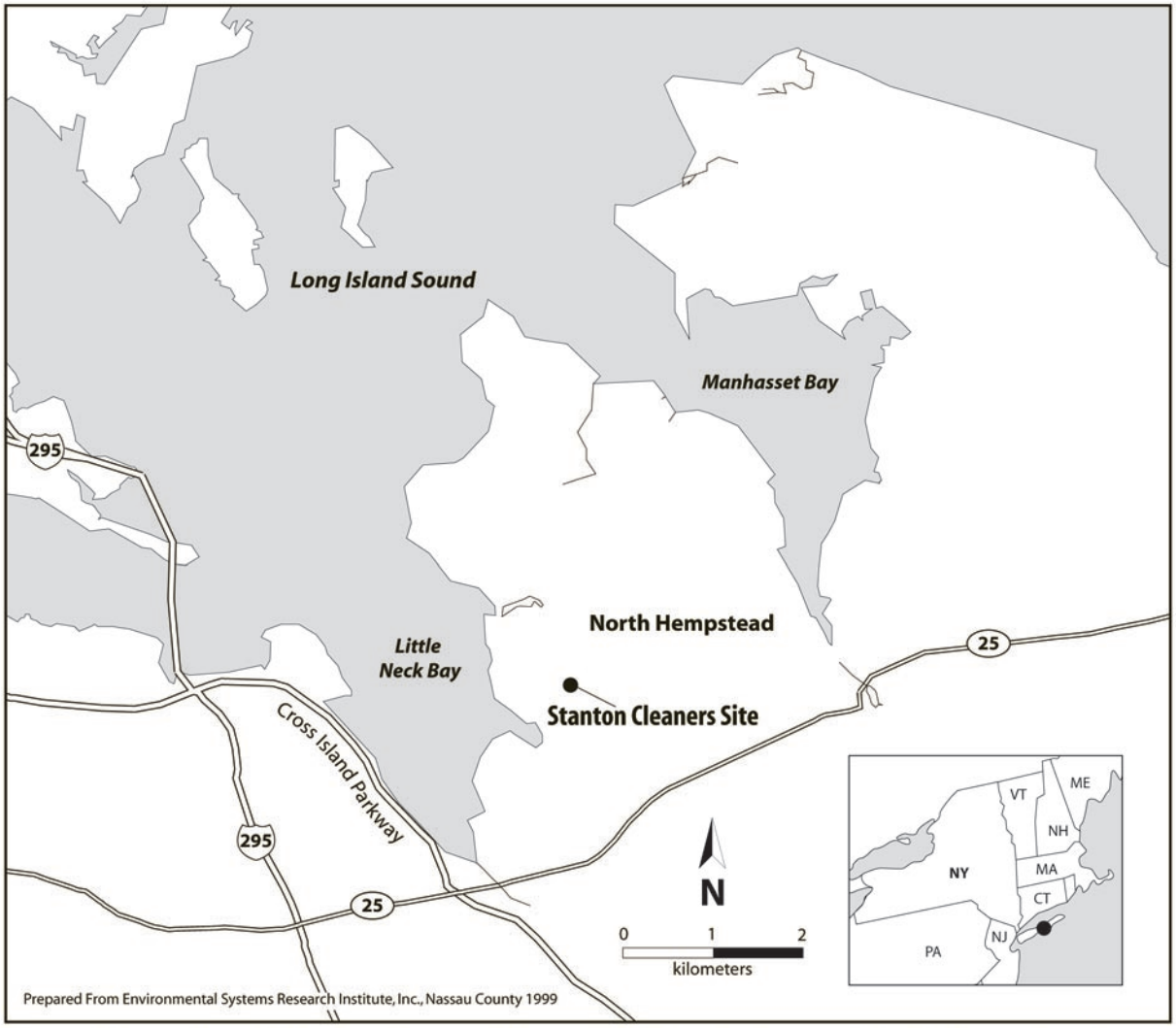

Figure 1. Location of Stanton Cleaners Property Site in the town of North Hempstead, New York.

In April 1985, Stanton Cleaners entered into a consent order with New York State Department of Environmental Conservation (NYSDEC). A groundwater extraction system and air stripper were installed to remove volatile organic compounds (VOCs). However, monitoring of the treated water revealed discharges from the system that exceeded permit limitations. In addition, the system was inoperable much of the time. In 1993, the ineffectiveness of this system to clean up the groundwater contamination and the persistence of soil contamination prompted NYSDEC to add the site to the New York State Registry of Inactive Hazardous Waste Disposal Sites. In April 1997, NYSDEC authorized the preparation of a Remedial Investigation/Feasibility Study, which was completed in November 1999. In January 1999, the U.S. Environmental Protection Agency proposed that the site be listed on the National Priorities List (Dvirka and Bartilucci 1998; USEPA 1999).

NOAA Trust Resources

The NOAA habitat of concern is Little Neck Bay, an estuary within Long Island Sound. Numerous marine and anadromous species use the estuary for spawning, rearing, and adult residence (Table 1).

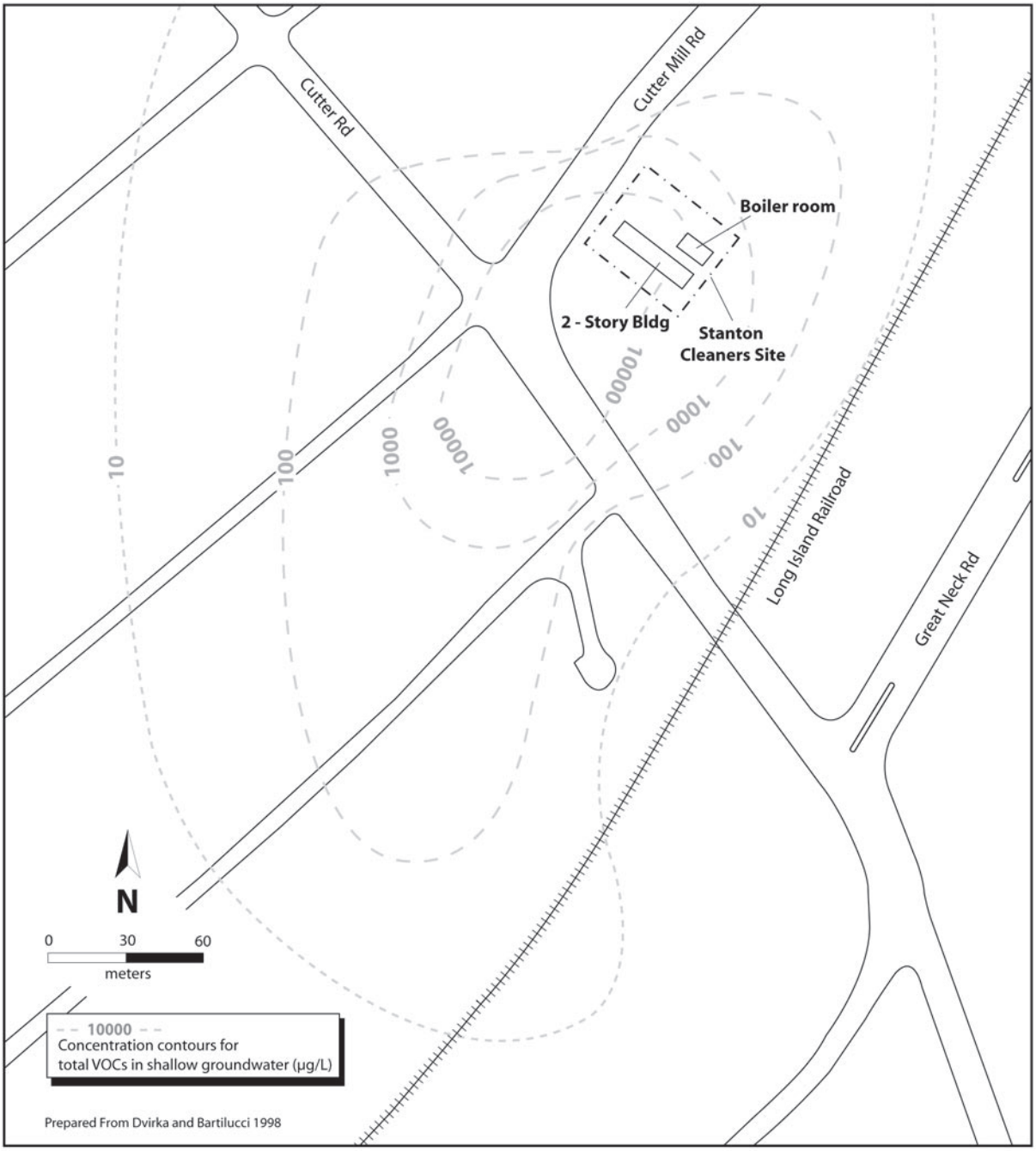

Figure 2. Detailed view of the New York Stanton Cleaners Site with total VOCs concentration contours in groundwater.

Little Neck Bay is a shallow embayment on the southwest shore of Long Island Sound with a maximum depth of 4 m (4.3 yds) MLLW (USGS 1995). Nearshore tidal flats of silty sands can be found at the head of the bay and up much of the eastern shore, nearest the site. Salinities are generally over 20 parts per thousand (ppt). Long Island Sound is a large coastal estuary measuring 170 km (106 mi) long, 34 km (21 mi) wide, with over 800 km (500 mi) of shoreline (USGS 1995; Long Island Sound Foundation 2000).

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

Species		Habitat Use			Fisheries	
Common Name	**Scientific Name**	Spawning Ground	Nursery Ground	Adult Forage	Comm. Fishery	Recr. Fishery
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 sandlance	*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	*Gobiosama spp.*	◆	◆	◆		
Hogchoker	*Trinectes maculatus*	◆	◆	◆		
Killifish	*Fundulus spp.*	◆	◆	◆		
Northern pipefish	*Syngnathus fuscus*	◆	◆	◆		
Northern searobin	*Prionotus carolinus*	◆	◆	◆		
Pollock	*Pollachius virens*		◆	◆		
Red hake	*Urophycis chuss*		◆	◆		
Oyster toadfish	*Opsanus tau*	◆	◆	◆		
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*	◆	◆	◆	◆	◆
Bay shrimp	*Crangon septemspinosa*	◆	◆	◆		
Blue crab	*Callinectes sapidus*		◆	◆		◆
Blue mussel	*Mytilus edulis*	◆	◆	◆		
Eastern oyster	*Crassostrea virginica*	◆	◆	◆		
Grass shrimp	*Palaemonetes pugio*	◆	◆	◆		
Northern quahog	*Mercenaria spp.*	◆	◆	◆	◆	◆
Softshell clam	*Mya arenaria*	◆	◆	◆		

Small forage fish such as silversides, killifishes, gobies, sheepshead minnow, bay anchovy, oyster toadfish, and pipefish are common in Little Neck Bay and Long Island Sound, spending their entire lives within estuaries. Atlantic menhaden and Atlantic herring also are common forage fish that usually spawn in coastal waters, but their larvae are transported to estuaries where they reside through adulthood (Stone et al. 1994).

Larger demersal fish such as winter flounder, windowpane flounder, and skates are common, spending all or most of their lives in the estuary. Fish may spawn in either estuaries or coastal waters of the Sound (Stone et al. 1994).

Several cod species, including tomcod, red hake, and Pollock, use Long Island Sound, but are not as common as in more northern estuaries. Tomcod spawn in nearly fresh water and live in low salinities. Pollock and hake spawn in coastal waters with larval transport to estuaries where they reside as juveniles and adults (Stone et al. 1994).

Most of the remaining fish species exhibit the common marine life cycle of spawning in coastal areas with larval transport to estuaries where juveniles rear. Adults use estuaries seasonally, usually moving offshore during the winter (Stone et al. 1994).

Many of the East Coast anadromous fish species are common to abundant in Long Island Sound. Juvenile white perch, American shad, alewife, blueback herring, and striped bass rear in estuaries through the summer and fall. Adults generally dwell in coastal areas of the Sound (Stone et al. 1994).

The shellfish species spend their entire lives within the estuary. The northern quahog is the most common shellfish species in Long Island Sound, followed by the American oyster. Grass shrimp, bay shrimp, and American lobster are common, spending most or all of their lives within the estuary. Blue crabs are common but not as abundant as in estuaries further south on the East Coast. Both juvenile and adult blue crab use the estuary while brooding females generally move offshore (Stone et al. 1994).

Little Neck Bay supports commercial and recreational fisheries for fish and shellfish. American lobster, tautog, and quahog are the primary commercial fisheries. Recreational species most actively sought include striped bass, winter flounder, tautog, bluefish, American lobster, and hardshell clam (NYSDOH 1999).

The New York State Department of Health issued a general health advisory because of PCB contamination in marine waters of Long Island Sound. This advisory advises against the consumption of crab and lobster hepatopancreas. The advisory also limits the consumption of striped bass to no more than one meal per month and bluefish and American eel to no more than one meal per week (NYSDOH 1999).

Site-Related Contamination

Data collected during field investigations indicate contamination of soils and groundwater at the site. A total of 49 subsurface soil borings and 22 groundwater monitoring wells were sampled during the Remedial Investigation. Samples were analyzed for VOCs, iron, and manganese (Dvirka and Bartilucci 1998; USEPA 1999).

The primary contaminants of concern to NOAA are the VOCs tetrachloroethene (PCE) and trichloroethene (TCE), which were found in soils and groundwater on the facility. The maximum concentrations of PCE and TCE are listed in Table 2, along with appropriate screening guidelines.

Table 2. Maximum concentrations of contaminants of concern found at Stanton Cleaners Area Groundwater Contamination (Dvirka and Bartilucci 1998, USEPA 1999).

	Soils (mg/kg)		Water (µg/L)	
Contaminant	Site Soils	Mean U.S. Soil	Site Groundwater	LOEL[a]
Tetrachloroethene	6,200	NA	18,000	450[b]
Trichloroethene	38	NA	300	2,000[c]

NA: Data not available
a: Lowest Observable Effects Level.
b: Marine chronic value presented.
c: Marine chronic value not available; marine acute value presented.

The greatest concentrations of PCE and TCE in soils were located behind the facility where historical discharges had occurred. Elevated concentrations were observed in nine of 13 borings collected in this area. Although mean U.S. soil concentrations are not available for VOCs in soils, the Remedial Investigation estimated an area of 139 m^2 where VOC concentrations exceeded the New York soil standards of 1.4 mg/kg TCE and 0.7 mg/kg PCE (Dvirka and Bartilucci 1998). Given the average depth of groundwater at approximately 21 m bgs, the Remedial Investigation estimated that up to 2,900 m^3 of soilmay require remediation. Several other VOCs were observed in soils on the site, but at relatively lower concentrations.

The maximum concentrations of PCE in groundwater were two orders of magnitude greater than the AWQC screening value. No other VOCs exceeded screening guidelines. The greatest concentrations of VOCs were observed immediately downgradient of the site and a plume of VOC contamination is migrating in a southwesterly direction toward Little Neck Bay. Total VOCs at a concentration of 10,000 ug/L has been detected approximately 100 m downgradient of the site. Total VOCs of 1,000 ug/L has been detected approximately 150 m downgradient of the site. The total VOC contours of 100 and 10 ug/L are approximately 250 m and 300 m downgradient of the site, respectively (Figure 2).

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Vega Baja Solid Waste Disposal

Rio Abajo Ward, Puerto Rico

EPA Facility ID: PRD980512669

Basin: Cibuco-Guajataca

HUC: 21010002

Executive Summary

The Vega Baja Solid Waste Disposal property is a former municipal landfill located in Rio Abajo Ward, Puerto Rico approximately one km (0.6 mi) west of the Rio Indio. Soil and sediment samples at the site had elevated concentrations of several trace elements. NOAA trust resources including several species of amphidromous fish and shrimp and the catadromous American eel use the Rio Indio and the Rio Cibuco. There has not been enough sampling downgradient of the site to determine the extent of contaminant migration towards NOAA trust habitats.

Site Background

The Vega Baja Solid Waste Disposal (VBSWD) site occupies six hectares (15 acres) in Rio Abajo Ward, Puerto Rico, approximately one km (0.6 mi) west of the Rio Indio. About 2.7 km (1.7 mi) downstream of the site the Rio Indio meets the Rio Cibuco, which flows nearly seven km (4.3 mi) to the Boca del Cibuco (Figure 1).

From 1948 to 1979 the VBSWD property was the site of an unlined, open-burning municipal landfill used for disposal of institutional, commercial, industrial, and domestic waste (Weston 1998). An estimated 850,000 m^3 (1.1 million yd^3) of solid waste were placed in the landfill over the 31-year period of operation. Roughly14,000 kg (30,000 lb) per year of siliceous dust, was landfilled. This is the only documented chemical disposed at the site (Soto 1995). Solid waste disposal activities were discontinued in 1979 without covering or capping the landfill (Budroe 1999). There are now approximately 206 homes across 11 acres of the former VBSWD.

An Expanded Site Inspection and a Hazard Ranking System Package were prepared for the VBSWD site in June 1997 and February 1999, respectively (Soto 1997; Budroe 1999). The U.S. Environmental Protection Agency placed the VBSWD site on the National Priorities List on July 7, 1999 (USEPA 1999b).

Groundwater and surface water runoff provide the primary pathways for the transport of contaminants off the VBSWD property. The site is located in an area characterized by karst topography formed by limestone bedrock. Karst topography can lead to fast groundwater flow and little dissolution of contaminants over a large distance. Depth to groundwater in the area of the site ranges from 0.3 to 37 m (one to 120 ft) below ground surface (bgs) (Budroe 1999). Groundwater generally flows north from the area around the site toward the Atlantic Ocean. An open drainage ditch, which runs through the middle of the VBSDW site and connects to the Rio Indio, is the sole stormwater collection system for the residences in this area (Soto 1997).

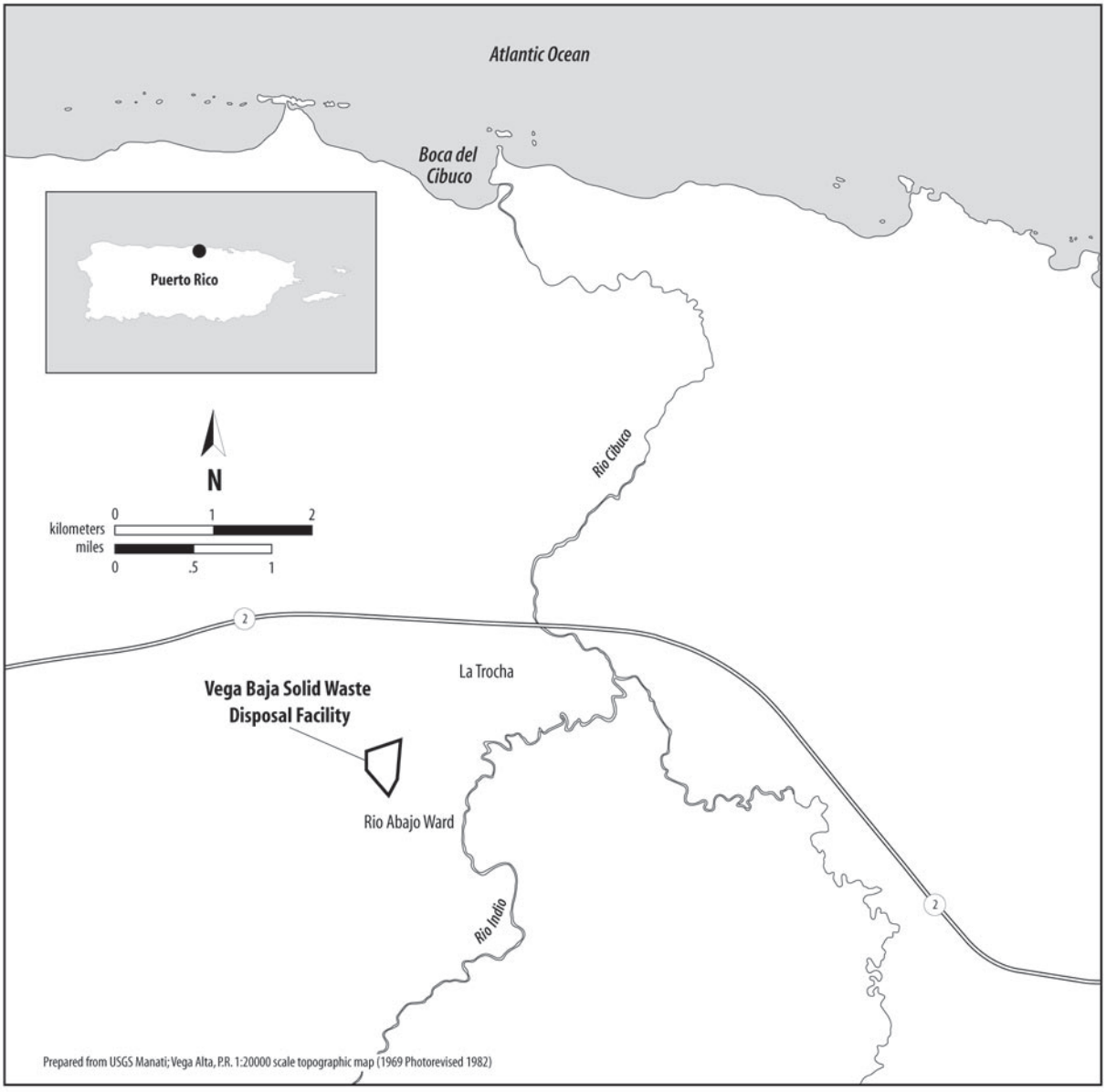

Figure 1. Location of the Vega Baja Solid Waste Disposal facility in Rio Abajo Ward, Puerto Rico.

NOAA Trust Resources

The NOAA trust habitat of concern is Rio Indio, a tributary within the Rio Cibuco basin. The Rio Cibuco watershed is a relatively small river basin covering approximately 257 km² (99 square mi²) above Vega Baja, flowing north from central Puerto Rico to discharge to the Atlantic Ocean (USGS 2000). Most of the fish and invertebrate species within the basin are secondarily derived freshwater species that require a portion of their life cycle in estuarine or marine environments. Both fish and shrimp species exhibit amphidromous life-cycles in which juveniles enter the river, migrating upstream where they reside, mature, and reproduce entirely in fresh water. Eggs or larvae are carried downstream to estuaries where they develop to juvenile stages, whereupon they re-enter

the river. The catadromous American eel also is present in the river. Native amphidromous and catadromous species dominate the freshwater ecosystem of the river, filling many ecological niches from filter- and deposit feeders to top predators. There are no anadromous fish in Rio Indio or Rio Cibuco (Yoshioka 2000). Table 1 lists common amphidromous and catadromous species.

Table 1. NOAA trust resources in the Rio Indio and Rio Cibuco and potential habitat use near the facility (Yoshioka 2000).

Species		**Habitat Use**			**Fisheries**
Common Name	**Scientific Name**	Adult Habitat	Juvenile Nursery	Migratory Corridor	Subsistence/ Recreational Fishery
CATADROMOUS FISH					
American eel	*Anguilla rostrata*	◆	◆	◆	◆
AMPHIDROMOUS FISH					
Bigmouth sleeper	*Gobiomorus dormitor*	◆	◆	◆	◆
Fat sleeper	*Guavina guavina*	◆	◆	◆	
Mountain mullet	*Agonostomous monticola*			◆	◆
River goby	*Awaous tajasica*	◆	◆	◆	
Sirajo goby	*Sicydium plumieri*			◆	◆
AMPHIDROMOUS SHRIMP					
Freshwater prawn	*Macrobrachium acanthurus*	◆	◆	◆	◆
Freshwater prawn	*Macrobrachium carcinus*			◆	◆
Freshwater prawn	*Macrobrachium crenulatum*			◆	
Freshwater prawn	*Macrobrachium faustinum*			◆	
Freshwater prawn	*Macrobrachium heterochirus*			◆	◆
Guabara chagara	*Atya innocous*			◆	◆
Guabara chagara	*Atya lanipes*			◆	◆
Guabara chagara	*Atya scabra*			◆	◆
Unnamed shrimp	*Jonga serrei*	◆	◆	◆	
Unnamed shrimp	*Micratya poeyi*	◆	◆	◆	
Unnamed shrimp	*Potimirrim americana*	◆	◆	◆	
Unnamed shrimp	*Potimirrim mexicana*	◆	◆	◆	
Unnamed shrimp	*Xiphocaris elongata*	◆	◆	◆	

Several amphidromous, goby-like fish species are present in Rio Indio and Cibuco. The river goby, big-mouth sleeper, and fat sleeper are found in low to mid-reaches of streams and are likely to inhabit stream reaches near the Vega Baja facility. The Sirajo goby most often occupies the upper reaches of streams and likely would migrate through stream reaches near the facility. Similarly, the mountain mullet is an amphidromous fish species that occupies the higher elevations of stream systems and would migrate through areas near the facility. The catadromous American eel spawns in the ocean; progeny migrate to the basin as juveniles and reside in the rivers as adults. Because it is found in the middle to upper reaches of the river, it also may occupy reaches near the facility (Yoshioka 2000).

Several amphidromous shrimp species are found in Rio Indio and Rio Cibuco, including a number of moderate- to large-sized freshwater prawns in the genus *Macrobrachium*. *Macrobrachium acanthurus* is a lower-reach species that occupies habitats in the region of the facility whereas *M. carcinus* and *M. heterochirus* occupy the upper reaches of the river. The species *M. faustinum* is uncommon in Puerto Rican streams but may occur in the area. Some moderate-sized freshwater shrimp in the genus *Atya* are also common amphidromous residents, but generally occupy the upper reaches of the river. Several small shrimp species, including *Micratya poeyi*, *Xiphocaris elongata*, *Potimirrim americana*, *P. mexicana*, and *Jonga serrei*, occupy the lower reaches of the river and are more likely to be present near the facility (Yoshioka 2000).

Recreational or subsistence fisheries occur in Rio Indio for the larger *Machrobrachium* prawns, *Atya* shrimp, eel, mountain mullet, big-mouth sleeper, and sirajo goby. Much of these fisheries occur in the upper watershed where these species primarily reside, but some collection may occur downstream of the site (Yoshioka 2000).

Site-Related Contamination

Contaminants have been detected at the site in groundwater, sediment, and soil at concentrations greatly exceeding screening guidelines. As part of a Site Inspection completed in January 1995 for the VBSDW property the Puerto Rico Environmental Quality Board (PREQB) collected six soil samples, five sediment samples, and three groundwater samples from various locations on the property and the Rio Indio (Soto 1995). In June 1996 PREQB and the U.S. Environmental Protection Agency conducted an Expanded Site Inspection that included the collection of 132 soil samples and 37 groundwater samples (Soto 1997). The Region II Superfund Technical Assessment and Response Team collected seven groundwater samples from wells located near the site (Weston 1998).

The primary contaminants of concern to NOAA at the VBSWD site are trace elements. Table 2 summarizes maximum concentrations found during site investigations and lists appropriate screening guidelines.

Elevated concentrations of arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc were all found in soil samples collected at the site. The maximum lead concentration (26,000 mg/kg) in soil exceeds screening guidelines by three orders of magnitude (Soto 1997). Concentrations of copper (3,600 mg/kg), cadmium (21 mg/kg), and silver (20 mg/kg) also exceed screening guidelines by orders of magnitude (Soto 1997).

Contaminants in groundwater samples collected from the site did not exceed AWQC screening guidelines by more than an order of magnitude.

Concentrations of copper (66 mg/kg), chromium (40 mg/kg), and nickel (31 mg/kg) were found to exceed screening guidelines in a Rio Indio sediment sample. The sediment sample containing the maximum lead concentration (72 mg/kg) was collected from the drainage ditch that passes through the middle of the site (Soto 1995).

Table 2. Maximum concentrations of contaminants of concern at the Vega Baja Solid Waste Disposal Site (Soto 1995, 1997; Weston 1998).

	Soil (mg/kg)		Water (µg/L)		Sediment (mg/kg)	
Contaminants	Soils	Mean U.S.[a]	Ground-water	AWQC[b]	Sediment	TEL[c]
TRACE ELEMENTS						
Arsenic	28	5.2	2.4	150	5.2	5.9
Cadmium	21	0.06	3.4	2.2[d]	ND	0.596
Chromium	210	37	ND	11	40	37.3
Copper	3,600	17	34	9[d]	66	35.7
Lead	26,000	16	ND	2.5[d]	72	35
Mercury	1.7	0.058	0.11	0.77	0.53	0.174
Nickel	290	13	ND	52[d]	31	18
Silver	20	0.05	ND	0.12	ND	1.0[e]
Zinc	3,900	48	ND	120[d]	51	123.1

ND Not detected; detection limit not available.

NA Screening guidelines not available.

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

b National Recommended Water Quality Criteria (USEPA 1999a). Freshwater chronic criteria presented.

c TEL; Threshold Effects Level; Freshwater sediment value. Concentration below which adverse effects were rarely observed (geometric mean of the 15 percent concentration in the effects data set) as compiled by Smith et al. (1996).

d Criterion expressed as a function of total hardness; concentrations shown correspond to hardness of $CaCO^3$ 100 mg/L.

e TEL not available; marine Effects Range-Low (ERL) presented. ERL represents the 10^{th} percentile for the dataset in which effects were observed or predicted in studies compiled by Long et al. (1995)

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Kim-Stan Landfill

Selma, Virginia

EPA Facility ID: VAD077923449

Basin: Upper James

HUC: 02080201

Executive Summary

The Kim-Stan Landfill is located next to the Jackson River, a tributary of the James River, which supports a run of anadromous American shad. The landfill operated as a municipal and industrial landfill from 1972 to 1990. Waste oils, sludges, and medical wastes were reportedly disposed of in the landfill, with few controls of surface runoff. Over the period of operation, substantial amounts of runoff flowed through fill areas and ultimately discharged to the Jackson River. Landfill soils, groundwater, surface water, and river sediment are contaminated with trace elements and PAHs at concentrations that exceed screening guidelines. American eel have access to the Jackson River near the site. American shad are present in the James River as far as the Scott's Mill Dam, which prevents further movement of shad upstream.

Site Background

The Kim-Stan Landfill occupies approximately 10 hectares (24 acres) in Selma, Virginia, adjacent to the Jackson River (Figure 1). The Jackson River flows for about 11 km (7 mi) to the James River, which flows for over 320 km (200 mi) to Chesapeake Bay.

The Kim-Stan Landfill operated as a municipal and industrial landfill from 1972 until 1990, when it was shut down by a court order. During these years, an estimated 860,000 tons of solid waste was placed in the landfill. Historical records indicate waste oils contaminated with PCBs, aluminum waste sludges, asbestos, and medical wastes were disposed of at the site. In 1992, a Groundwater Assessment Investigation reported large amounts of surface water flow into the landfill from an adjacent mountain with no provisions for a groundwater interceptor system in place. At that time, an estimated 260,000 L (68,300 gal.) of contaminated leachate and groundwater was discharged daily from the site (CH2M Hill 1993). No floor liners were used in waste disposal areas, no erosion control or storm water management facilities were used, no groundwater monitoring wells were drilled, and no facilities were installed to prevent contaminated surface runoff (Weston 1998).

Between 1990 and 1998, the Virginia Department of Waste Management and Department of Transportation conducted several remedial actions including covering exposed portions of the landfill with soil; installing erosion controls such as silt fencing, berms, and drainage ditches; off-site disposing of leachate held in a storage basin; building a new channel to route storm water; building a temporary sedimentation basin; and installing monitoring wells (Weston 1998).

Shallow groundwater is the primary pathway for transport of contaminants to NOAA trust resources. Leachate seeps occur at the base of the landfill; and there is a contaminated groundwater plume in the shallow aquifer. Groundwater is encountered at 1.5 m (5 ft) bgs near the landfill; and there are numerous springs in the area. Shallow groundwater flows to the north, discharging

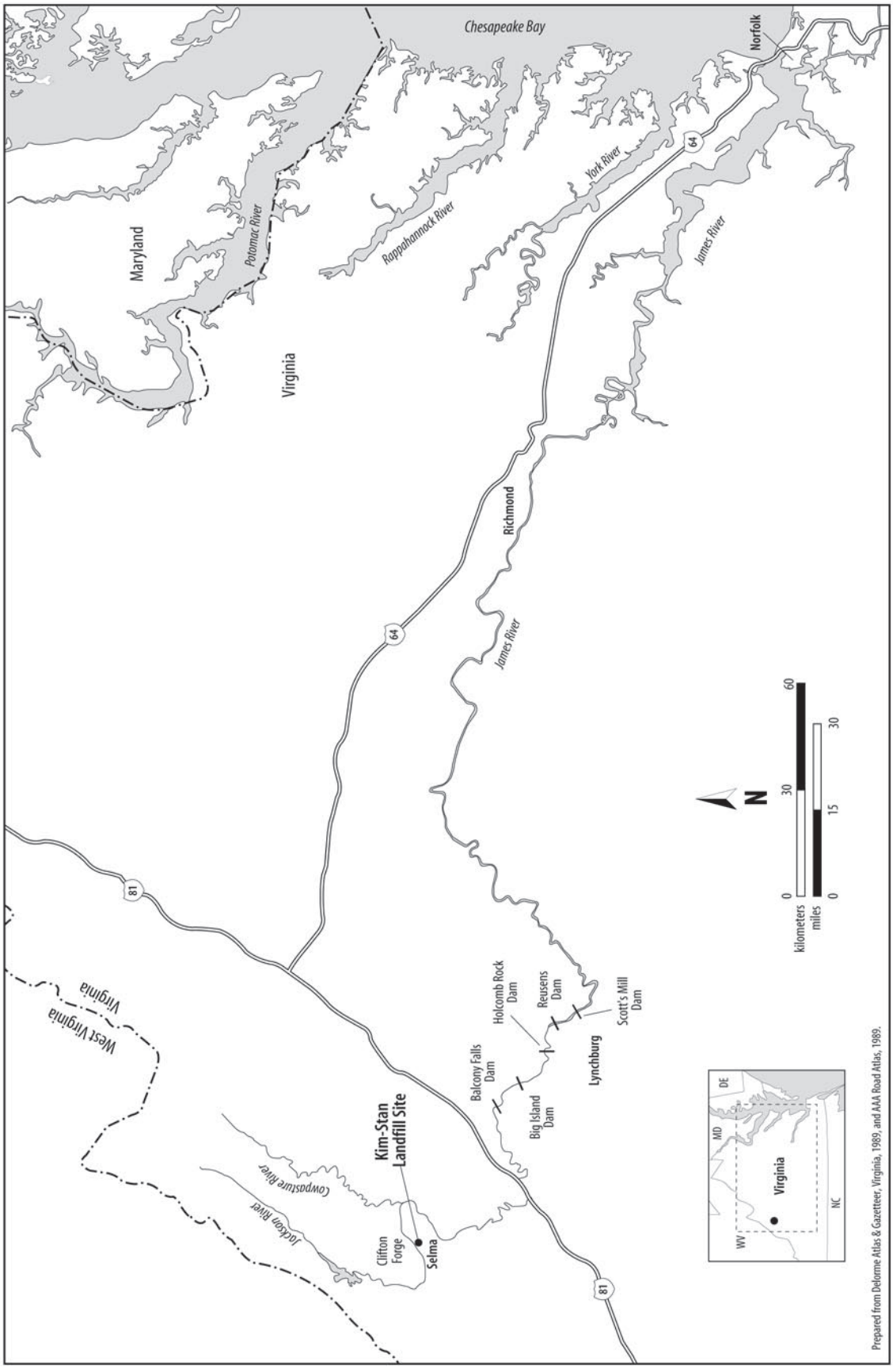

Figure 1. Location of the Kim-Stan Landfill Site in Selma, Virginia.

to the Jackson River. A groundwater study conducted at the landfill found that it takes about 90 days for groundwater to reach the Jackson River (Weston 1998).

The U.S. Environmental Protection Agency placed the Kim-Stan Landfill on the National Priorities List of hazardous waste sites in July 1999 (USEPA 2000a). A Site Inspection report was completed in September 1998 (Weston 1998).

NOAA Trust Resources

The NOAA habitat of concern is the Jackson River, which is adjacent to the landfill (Figure 2). The Jackson River is a moderate size and grade, ranging from 60 to 100 m (200 to 330 ft) wide and up to 3 m (10 ft) deep. River substrates range from fine sands to cobble. The Jackson River is a tributary of the James River near the West Virginia border.

The catadromous American eel is the trust resource that can access the Jackson River near the site. Although fish surveys have not documented eel in the river, eel have been documented in much of the James River basin, over 250 km (150 mi) inland of Chesapeake Bay. American eel is found throughout Virginia streams and has been found in several upper watersheds near the West Virginia border. Eel can traverse lowhead dams and low-grade waterfalls as they migrate upstream to establish residence in fresh water. The habitats and water quality in the Jackson River are suitable for eel (Miller 2000).

Anadromous American shad are gradually being restored to the major river basins of Virginia through the construction of fish passage facilities at formerly impassable dams. Shad are present in the James River as far inland as Lynchburg, Virginia where the Scott's Mill Dam prevents further movement upstream. The Scott's Mill Dam is located approximately 100 km (60 mi) downstream of the Kim-Stan Landfill (Martell 2000). There are no known restoration plans for Scott's Mill Dam in the next five years. Upstream of Scott's Mill Dam is a series of four more dams. The first of these, Reusens Dam, is a hydroelectric dam without fish passage facilities. There is little effort being made to add fish passage to this series of dams. This is due to the low number of American shad that have been found to migrate as far upstream as the Scott's Mill Dam. Should the number of shad reaching Scott's Mill Dam significantly increase there will be a greater effort made towards restoring this series of dams (Weaver 2002).

There are recreational fisheries on the Jackson River and in tributary streams near the landfill (Weston 1998). Warm-water species, including small- and large-mouth bass are sought in the Jackson River while the tributary streams support trout fisheries (Martell 2000). No information was available on recreational fishing in the oxbow ponds located on private property next to the site (Weston 1998).

No health advisories are in effect on the Jackson or James rivers near the Kim-Stan Landfill (USEPA 2000b).

Site-Related Contamination

Environmental investigations on and near the Kim-Stan Landfill report contamination of landfill soil, underlying groundwater, surface water, sediments of the Jackson River, oxbow ponds, and leachate migrating from the landfill. The Site Inspection collected four soil samples from the land

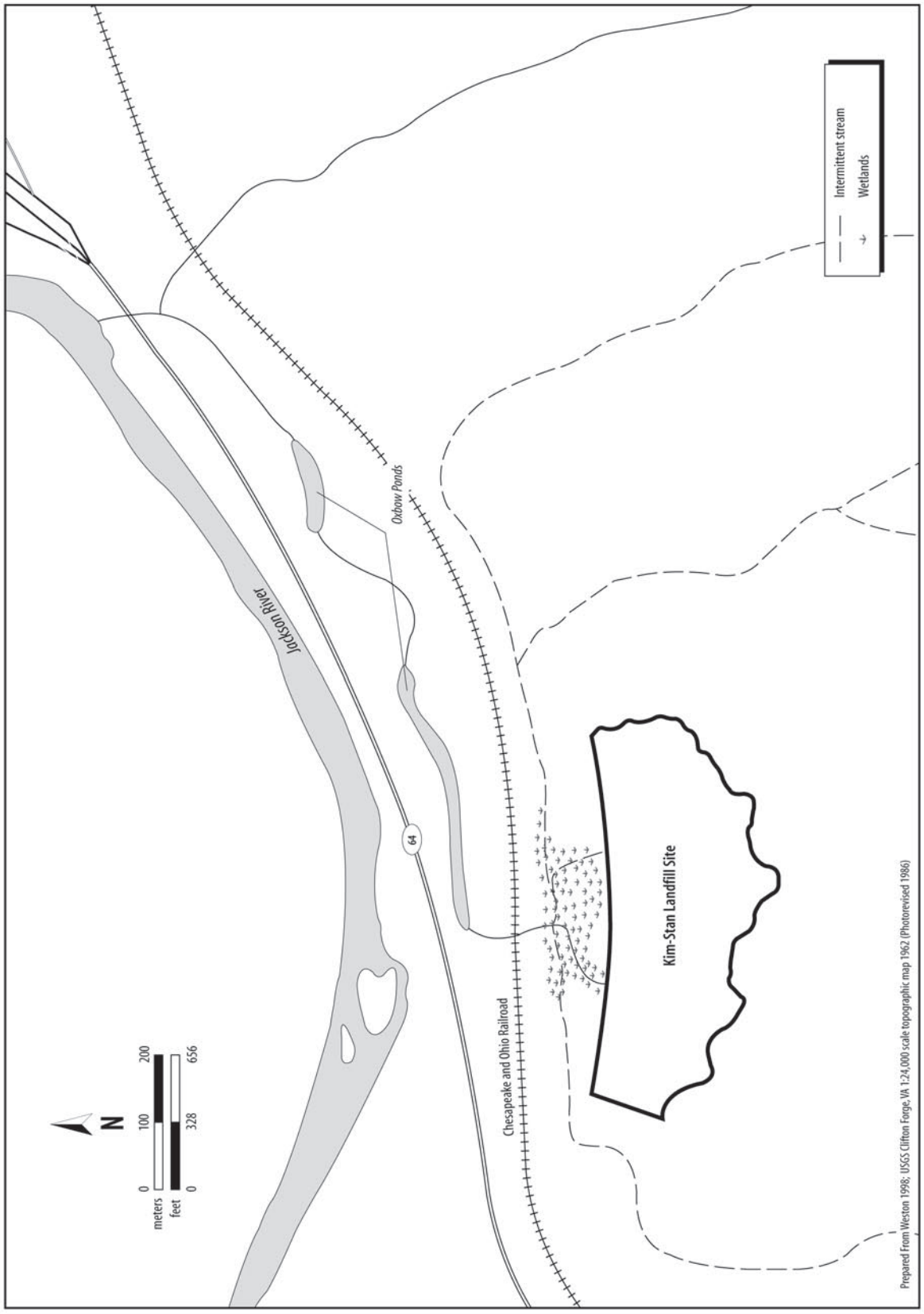

Figure 2. Detail of the Kim-Stan Landfill Site.

fill, two leachate samples from the base of the landfill, groundwater samples from seven wells, and surface water and sediment samples from 14 locations on the landfill, oxbow ponds, and Jackson River (Weston 1998).

The contaminants of concern to NOAA include trace elements and several PAHs, which were observed primarily in landfill soils, pond sediments, and river sediments at concentrations exceeding screening guidelines. The maximum concentrations of contaminants in environmental media on the site are presented in Table 1, along with appropriate screening guidelines.

Concentrations of arsenic, cadmium, copper, lead, mercury, nickel, and zinc in landfill soils exceeded soil screening guidelines. The pesticide DDT and several PAHs were also observed in landfill soil, although there are no screening guidelines for these organic compounds in soil.

Groundwater and surface water samples collected near the landfill were slightly above the AWQC. In the groundwater sample, copper and lead concentrations were an order of magnitude greater than the AWQC. Dieldrin and DDT concentrations exceeded the AWQC in surface water samples collected from an oxbow pond. No contaminants detected in leachate samples exceeded screening guidelines, but the detection limits were above the screening guidelines for several trace elements, pesticides, and the PAH phenanthrene.

Concentrations of eight of the nine trace elements exceeded sediment guidelines in samples collected from the Jackson River next to the landfill or from the oxbow ponds located between the river and landfill. The highest concentrations were measured in the oxbow ponds. Concentrations of eight PAHs also exceeded sediment-screening guidelines; however, the pattern of PAH contamination was different from the pattern of trace elements in sediment. Only one PAH exceeded sediment guidelines in the oxbow ponds while eight PAHs exceeded guidelines in river sediment.

Table 1. Maximum concentrations of contaminants of concern in environmental media at the Kim-Stan Landfill (Weston 1998).

	Soils (mg/kg)		Aqueous Samples (µg/L)				Sediment (mg/kg)		
Contaminant	Surface Soils	U.S. Average Soils[a]	Ground-water	Leachate	Surface water	AWQC[b]	River Sediment	Oxbow Sediment	TEL[c]
TRACE ELEMENTS									
Arsenic	23	5.2	29	<5	<5	150	6.6	24	5.9
Cadmium	0.8		7	<5	6	2.2	0.9	3.1	0.596
Chromium	13	37	84	<10	<10	11	20	24	37.3
Copper	72	17	110	<20	26	9	25	86	35.7
Lead	120	16	26	<2	12	2.5	29	52	35
Mercury	0.1	0.058	0.3	<0.2	<0.2	0.77	<0.1	0.4	0.174
Nickel	33	13	130	<40	280	52	77	60	18
Silver	<1.0		<10	<10	<1.0	0.12	<1.0	<1.0	1.0[d]
Zinc	250	48	590	<20	490	120	380	380	123.1
PESTICIDES									
Dieldrin	<0.003	NA	<0.1	<0.1	0.11	0.056[f]	<0.003	<0.003	2.85
DDT	0.021	NA	<0.1	<0.1	0.2	0.0005	<0.003	0.019	6.98
Heptachlor Epoxide	ND	NA	<0.05	<0.05	<0.05	0.0019	<0.003	<0.003	0.6
PAHs									
Naphthalene	<0.33	NA	<5	<5	0.079	620[e]	0.6	0.045	0.16
Acenaphthene	0.1	NA	<10	<10	<10	520[e]	0.1	<0.33	0.016[d]
Anthracene	<0.33	NA	<10	<10	<10	300[g]	0.36	<0.33	0.0853[d]
Benzo(a)anthracene	<0.33	NA	<10	<10	<10	300[g]	0.97	<0.33	0.0317[d]
Benzo(a)pyrene	0.09	NA	<10	<10	<10	300[g]	0.67	0.04J	0.0319
Benzo(b)fluoranthene	0.1	NA	<10	<10	<10	300[g]	0.69	0.06	NA
Benzo(k)fluoranthene	0.07	NA	<10	<10	<10	300[g]	0.59	0.05	NA
Chrysene	0.2	NA	<10	<10	<10	300[g]	1.1	<0.33	0.0571
Fluoranthene	0.2	NA	<10	<10	<10	300[g]	2.5	0.09	0.111
Phenanthrene	0.3	NA	<10	<10	<10	6.3[f]	1.2	0.08	0.0419
Pyrene	0.2	NA	<10	<10	<10	300[g]	1.9	0.07	0.053

NA Screening guidelines not available.

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 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: TEL; Threshold Effects Level; Freshwater sediment value. Concentration below which adverse effects were rarely observed (geometric mean of the 15 percent concentration in the effects data set) as compiled by Smith et al. (1996).

d: TEL not available; Effects Range-Low (ERL) value presented. The ERL represents the 10th percentile for the dataset in which effects were observed or predicted in studies compiled by Long et al. (1998; 1995).

e: Lowest Observable Effect Level.

f: Proposed criteria.

g: Value for chemical class; marine acute value is presented.

J: Analyte present. Reported value is estimated: concentration is outside the range of accurate quantitation.

< Not detected; value is the detection limit.

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Naval Amphibious Base Little Creek

Virginia Beach, Virginia

EPA Facility ID: VA5170022482

Basin: Lynnhaven-Poquoson

HUC: 02080108

Executive Summary

Naval Amphibious Base Little Creek is a Federal facility on Chesapeake Bay, commissioned in 1945 to provide operational support to Naval ships. Seven separate sites consisting of four landfills, a plating shop, laundry facility, and a pentachlorophenol-treating area have been identified on the facility. Landfilling of industrial wastes; boat maintenance, sandblasting, painting, and repair; and electroplating are among the activities that took place on the facility. Trace elements and PAHs have been detected in soils, groundwater, and sediments of Little Creek Cove at concentrations that exceed screening guidelines. Sampling has not been expanded to include Chesapeake Bay, which contains numerous NOAA trust fish and invertebrate species. There are also commercial and recreational fisheries in the bay, although shellfishing is restricted along the beaches of the facility.

Site Background

The Naval Amphibious Base (NAB) Little Creek facility occupies approximately 870 ha (2,150 acres) in Virginia Beach, Virginia, on the shore of Chesapeake Bay and Little Creek Cove, a developed inlet of the Bay (Figure 1). The base was commissioned in 1945 and provides operational support services to homeported ships. Specific operations at the Little Creek facility include vehicle and boat maintenance, boat painting and sandblasting, construction and repair of buildings and piers, mixing and application of pesticides, electroplating of musical instruments, laundry and dry cleaning, medical and dental treatment, and generation of steam for heat. Industrial wastes were landfilled on the facility (USEPA 2000).

Seven sites have been identified by the U.S. Environmental Protection Agency (Figure 2):

- Site 7. Naval Amphibious Base Landfill
- Site 8. Demolition Debris Landfill
- Site 9. Driving Range Landfill
- Site 10. Sewage Treatment Plant Landfill
- Site 11. School of Music Plating Shop Contaminated Soil and Debris/ Neutralization Tank
- Site 12. Exchange Laundry Waste Disposal Area
- Site 13. Pentachlorophenol (PCP) Dip Tank and Wash Rack Area

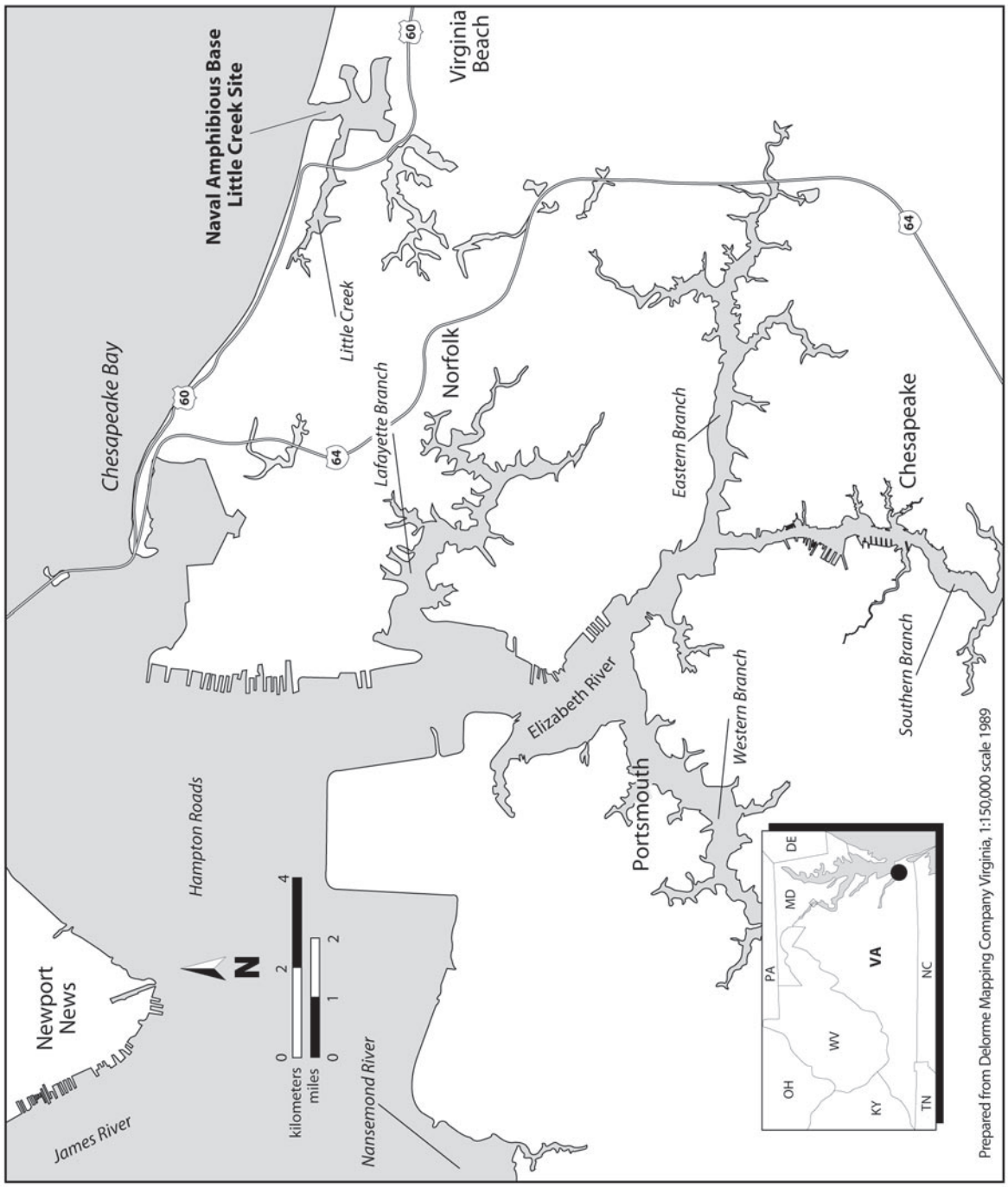

Figure 1. Location of the Naval Amphibious Base Little Creek Facility Site in Virginia Beach, Virginia.

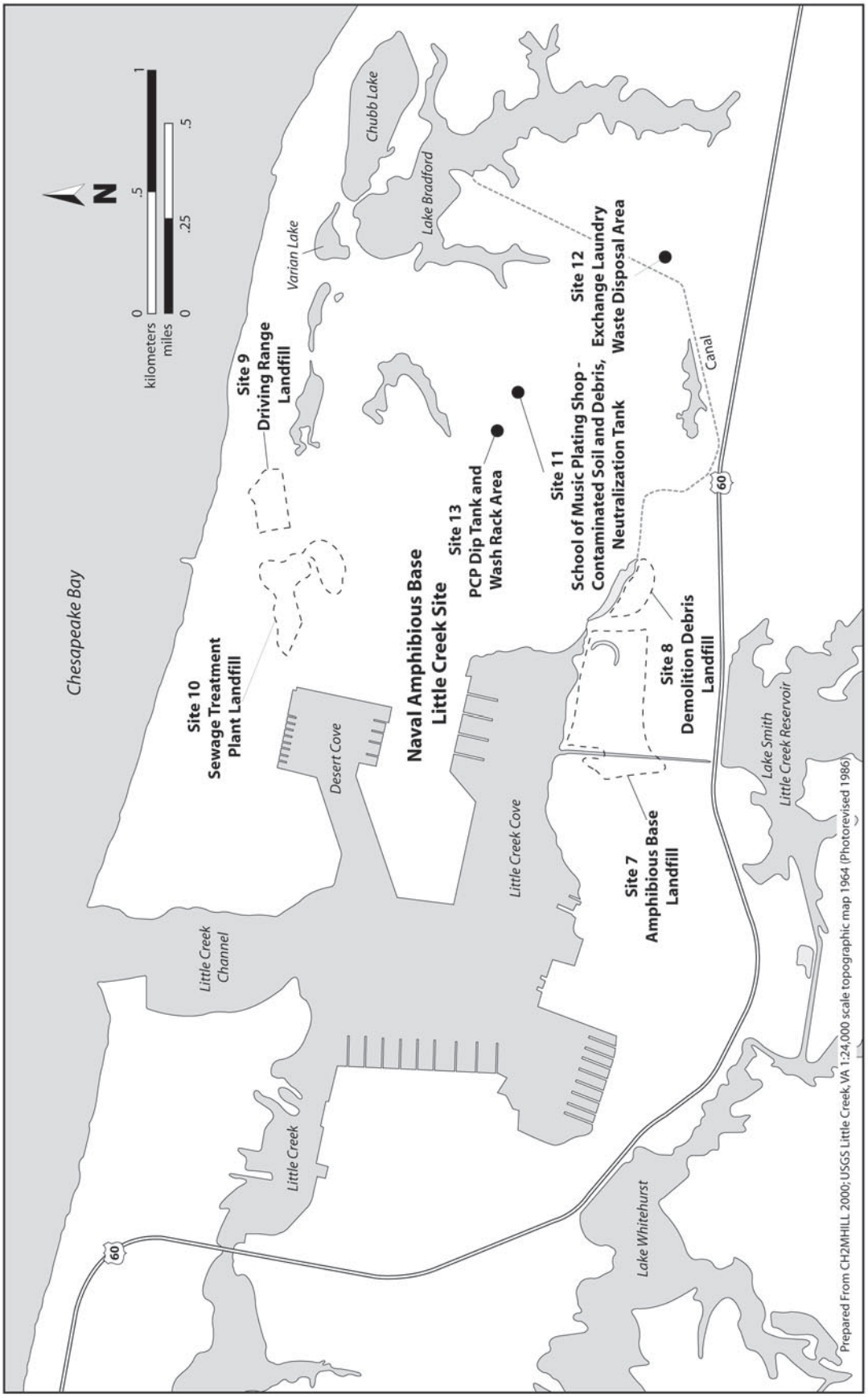

Figure 2. Location of source areas on Naval Amphibious Base Little Creek Site.

Table 1 describes these sites. Groundwater, surface runoff, and storm sewer discharges provide pathways for the off-site transport of contamination. Groundwater is shallow, ranging from <1 m (3 ft) bgs at the Amphibious Base Landfill to approximately 2.5 m (8 ft) bgs in more central areas of the base. Because much of the base is covered with concrete, most surface runoff enters the storm sewer system and discharges to a canal that traverses the southern portion of the base. Specific pathways for individual sites include groundwater discharges to Little Creek Cove and Chesapeake Bay from the four landfills, and stormwater discharges to the canal from the Exchange Laundry, PCP Dip Tank, and Music Plating Shop (CH2M Hill 2000).

Table 1. Source areas on the NAB Little Creek facility (CH2M Hill 2000).

Site Name	Size	Dates Used	Description	Contaminants of Concern
Site 7 Amphibious Base Landfill	15 ha (37 acres)	1962-1979	Solid wastes, waste oils, and metal debris are suspected of disposal. Originally an arm of Little Creek Cove that was filled with dredge spoils.	-Trace elements -PAHs
Site 8 Demolition Debris Landfill	0.8 ha (2 acres)	1971-1979	Landfill accepted construction and demolition debris. Located on the lower portion of the canal before discharging to Little Creek Cove.	-Trace elements -PAHs
Site 9 Driving Range Landfill	2.4 ha (6 acres)	1952-1956	Landfill accepted mostly non-hazardous waste and incinerator ash. Located 150 m (500 ft) south of Chesapeake Bay.	-Trace elements -PAHs
Site 10 Sewage Treatment Plant Landfill	Unknown	1941-1968	Landfill accepted solid wastes, sewage sludge, industrial wastes, and demolition debris. Located 250 m (800 ft) south of Chesapeake Bay.	-Trace elements
Site 11. Music Plating Shop Contaminated Soil and Debris/ Neutralization Tank	Unknown	1964-1974	The plating shop used silver cyanide, copper cyanide, chromic acid, nickel plating baths, and various acids. A neutralization tank received plating wastes that eventually discharged to the storm sewer system, which itself eventually discharged to the canal leading to Little Creek Cove. Located in the east-central portion of the base about 1.2 km (0.7 mi) from the bay and Little Creek Cove.	-Trace elements
Site 12 Exchange Laundry	Unknown	Before 1987	A drycleaning facility that discharged dry-cleaning wastes to a storm sewer that, in turn, discharged to the canal leading to Little Creek Cove. Next to the canal on the southeast portion of the facility.	-Trace elements -VOCs
Site 13 PCP Dip Tank and Wash Rack Area	Unknown	Before 1975	A PCP wood treatment facility operated at this location. PCP-contaminated soils were excavated to a depth of 1.8 to 2.4 m (6 to 8 ft) in 1999. Located near the center of the base about 1 km (0.6 mi) from the bay.	- PCP -Trace elements -VOCs

The U.S. Environmental Protection Agency listed NAB Little Creek on the National Priorities List in May 1999 (USEPA 2000). Remedial investigations have been completed for all of the sites except Site 8, for which a Site Inspection has been completed (CH2M Hill 2000).

Table 2. Fish and invertebrate species present near the NAB Little Creek facility (Stone et al. 1994).

Species		Habitat Use			Fisheries	
Common Name	**Scientific Name**	Spawning Ground	Nursery Ground	Adult Forage	Comm. Fishery	Recr. Fishery
MARINE/ESTUARINE FISH						
Atlantic croaker	*Micropogonias undulatus*		◆	◆		◆
Atlantic herring	*Clupea harengus*		◆	◆		
Atlantic menhaden	*Brevoortia tyrannus*		◆	◆		
Bay anchovy	*Anchoa mitchilli*	◆	◆	◆		
Black drum	*Pogonias cromis*		◆	◆		
Black sea bass	*Centropristis striata*		◆	◆		
Bluefish	*Pomatomus saltatrix*		◆	◆		◆
Butterfish	*Peprilus triacanthus*		◆	◆		
Cownose ray	*Rhinoptera bonasus*		◆	◆		
Gobies	*Gobiosama spp.*	◆	◆	◆		
Hogchoker	*Trinectes maculatus*	◆	◆	◆		
Killifish	*Fundulus spp.*	◆	◆	◆		
Mullets	*Mugil spp.*		◆			
Northern pipefish	*Syngnathus fuscus*	◆	◆	◆		
Northern searobin	*Prionotus carolinus*		◆			
Pinfish	*Lagodon rhomboides*		◆	◆		
Red drum	*Sciaenops ocellatus*		◆	◆		
Red hake	*Urophycis chuss*		◆			
Oyster toadfish	*Opsanus tau*	◆	◆	◆		
Scup	*Stenotomus chrysops*		◆			
Spotted seatrout	*Cynoscion nebulosus*		◆	◆		◆
Sheepshead minnow	*Cyprinodon variegatus*	◆	◆	◆		
Silversides	*Menidia spp*	◆	◆	◆		
Skates	*Raja spp.*		◆	◆		
Summer flounder	*Paralichthys dentatus*		◆	◆		◆
Spot	*Leiostomus xanthurus*		◆	◆		◆
Tautog	*Tautoga onitis*		◆	◆		
Weakfish	*Cynoscion regalis*		◆	◆		
Windowpane flounder	*Scophthalmus aquosus*		◆	◆		
ANADROMOUS/CATADROMOUS FISH						
Alewife	*Alosa pseudoharengus*		◆	◆		
American eel	*Anguilla rostrata*		◆			
American shad	*Alosa sapidissima*		◆	◆		
Blueback herring	*Alosa aestivalis*		◆	◆		
Striped bass	*Morone saxatilis*		◆	◆		
White perch	*Morone americana*		◆	◆		
INVERTEBRATES						
Bay shrimp	*Crangon septemspinosa*	◆	◆	◆		
Blue crab	*Callinectes sapidus*	◆	◆	◆	◆	◆
Blue mussel	*Mytilis edulis*	◆	◆	◆		
Eastern oyster	*Crassostrea virginica*	◆	◆	◆		◆
Grass shrimp	*Paleomonetes gugio*	◆	◆	◆		
Northern quahog	*Mercenaria mercenaria*	◆	◆	◆		◆

NOAA Trust Resources

The NOAA trust habitat of concern is Chesapeake Bay, the largest estuary on the Atlantic coast. Adjacent to the NAB Little Creek facility, the bay is a shallow bank with maximum depths of under 3 m (10 ft) out to about 7 km (4 mi) from shore. Little Creek Cove is a shallow inlet except for a central channel that is maintained by dredging (depth unknown). The cove on the facility is highly developed with seawalls and piers along most of the shoreline. Very little freshwater input discharges to the cove (USGS and NOS/NOAA 1964). Bottom substrates are largely sands. Surface salinities in this portion of Chesapeake Bay range from 15 to 20 ppt with bottom salinities close to normal seawater (Majumdar et al. 1987).

Numerous estuarine and marine species use Chesapeake Bay as a juvenile nursery and adult residence (Table 2). Estuarine residents include bay anchovy, oyster toadfish, sheepshead minnow, killifishes, silversides, pipefish, gobies and hogchoker. All life stages of these species are spent within the estuary and several of the species are highly abundant. Fish such as mullets, bluefish, pinfish, butterfish and the sciaenids (croaker, weakfish, seatrout, spot, drum) are coastal spawners; eggs and larval stages free-drift offshore and juvenile stages migrate to the estuary. Because many of these species are long-lived, juveniles may spend several years in the estuary. Adults of several of the species also can be found within the estuary seasonally. Bluefish, spot, and Atlantic croaker are particularly abundant in the area (Stone et al. 1994).

Several anadromous fish including alewife, blueback herring, American shad, striped bass, and white perch spawn in freshwater portions of the James and Nansemond rivers upstream of the site. Adults are common to abundant in this portion of Chesapeake Bay using the area for adult residence. The catadromous American eel migrate past the site to freshwater residential areas in the rivers (Stone et al. 1994).

Several invertebrates are present in the estuary including blue crab, grass shrimp, Eastern oyster and northern quahog. Juvenile and adult blue crab are abundant; mating and larval stages also are observed in the estuary, although females usually migrate to coastal waters to brood and release eggs. Grass shrimp, oyster, mussel, and quahog spend all life stages in the estuary (Stone et al. 1994).

The Hampton Roads area just west of the facility supports substantial commercial and recreational fisheries. Popular recreational species include bluefish, croaker, spot, weakfish, flounder, blue crab, oyster, and quahog (Majumdar et al. 1987). Commercial fisheries are primarily for blue crab (O'Reilly 2000). The Virginia Department of Health restricts bivalve harvests along the beaches of NAB Little Creek because of potential point and non-point industrial discharges (Wright 2000).

Site-Related Contamination

Environmental investigations on the NAB Little Creek facility have found soil and groundwater contamination at most of the sites at concentrations exceeding screening guidelines. Surface water and sediment contamination above screening guidelines have also been measured in Little Creek Cove and the canal. Remedial investigations have been conducted for Sites 7, 9, 10, 11, 12, and 13, while a Site Inspection has been completed for Site 8. Groundwater and soil investigations were conducted at all of the sites. Surface water and sediment investigations were conducted adjacent to Site 12 in the canal, Site 8 in the lower canal, and Site 7 in Little Creek Cove. No investigations of Chesapeake Bay have been conducted (CH2M Hill 2000). In addition, no sediment samples were analyzed for tributyltin, a contaminant commonly associated with sand blast grit and ship painting facilities.

Table 3. Maximum concentrations of contaminants of concern at source areas on NAB Little Creek (CH2M Hill 2000).

	Soils (mg/kg)				Groundwater (ug/L)					Surface Water (ug/L)			Sediments (mg/kg)			
Contaminant	Site 7	Site 9	Site 10	Mean U.S. Soils[a]	Site 7	Site 9	Site 10	Site 12	Site 13	Site 7	Site 12	AWQC[b]	Site 7	Site 12	Site 8	ERL[c]
TRACE ELEMENTS																
Arsenic	3.5	3.1	4	5.2	58	6.9	47	130	40	10	23	36	8.9	7.5	5.4	8.2
Cadmium	1.4	0.53	ND	0.06	ND	1.5	8.6	17	ND	ND	7.5	9.3	3.1	ND	ND	1.2
Chromium	27	14	9.7	37	27	ND	13	150	170	16	150	50	22	21	13	81
Copper	78	24	17	17	15	8.3	8.8	69	49	36	310	3.1	86	36	ND	34
Lead	640	170	20	16	6.4	4.4	8.9	88	43	11.2	310	8.1	140	110	23	46.7
Mercury	0.07	ND	ND	0.058	ND	ND	ND	1.3	ND	0.14	0.79	0.94	0.32	0.28	ND	0.15
Nickel	18	6.5	5.8	13	25	33	120	75	67	ND	140	8.2	25	14	11	20.9
Silver	ND	0.88	ND	0.05	ND	ND	4.7	ND	ND	ND	ND	0.95[g]	1.4	ND	ND	1.0
Zinc	320	85	65	48	380	330	8,900	260	190	260	3,800	81	210	380	88	150
SVOCs																
Anthracene	0.22	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA	300[d]	0.088	NA	0.25	0.0853
Benzo(a) anthracene	0.71	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA	300[d]	0.088	NA	0.82	0.261
Benzo(a) pyrene	0.45	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA	300[d]	0.068	NA	0.62	0.43
Benzo(b) fluoranthene	0.51	0.057	0.037	NA	ND	ND	ND	ND	ND	ND	NA	300[d]	0.91	NA	1.4	NA
Benzo(k) fluoranthene	0.38	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA	300[d]	0.16	NA	ND	NA
Chrysene	0.39	0.047	ND	NA	ND	ND	ND	ND	ND	ND	NA	300[d]	0.96	NA	0.76	0.384
Fluoranthene	1.3	0.052	0.041	NA	ND	ND	ND	1.0	ND	ND	NA	16[e]	2.4	NA	1.8	0.6
Fluorene	0.06	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA	300[d]	ND	NA	ND	0.019
Phenanthrene	0.83	ND	ND	NA	ND	ND	ND	1.0	ND	ND	NA	4.6[f]	0.4	NA	0.96	0.24
Pyrene	ND	0.075	0.059	NA	ND	ND	ND	1.0	ND	ND	NA	300[d]	1.9	NA	1.5	0.665
Pentachloro-phenol	ND	ND	ND	NA	ND	ND	ND	ND	63	ND	NA	7.9	ND	NA	ND	NA
VOCs																
Tetrachloro-ethene	ND	ND	ND	NA	ND	ND	ND	12,000	1,000	ND	15	450[e]	ND	3	ND	NA

NA Not available.
ND Not detected, detection limit not available.
a Shacklette and Boerngen (1984), except for silver and cadmium which are mean concentr tions in the earth's crust as reported by Lindsay (1979).
b Ambient water quality criteria for the protection of aquatic organisms (USEPA 1999). Marine chronic criteria presented.
c Effects Range-Low (ERL) value presented. The ERL represents the 10th percentile for the dataset in which effects were observed or predicted in studies compiled by Long et al. (1995, 1998).
d Value for chemical class; marine acute value is presented.
e LOEL: lowest observed effect level; marine chronic value presented.
f Proposed criteria.
g Chronic criteria have not been developed; acute value is presented.

Table 3. Maximum concentrations of contaminants of concern at source areas on NAB Little Creek (CH2M Hill 2000).

	Soils (mg/kg)				Groundwater (ug/L)					Surface Water (ug/L)			Sediments (mg/kg)			
Contaminant	Site 7	Site 9	Site 10	Mean U.S. Soils[a]	Site 7	Site 9	Site 10	Site 12	Site 13	Site 7	Site 12	AWQC[b]	Site 7	Site 12	Site 8	ERL[c]
TRACE ELEMENTS																
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Chromium	27	14	9.7	37	27	ND	13	150	170	16	150	50	22	21	13	81
Copper	78	24	17	17	15	8.3	8.8	69	49	36	310	3.1	86	36	ND	34
Lead	640	170	20	16	6.4	4.4	8.9	88	43	11.2	310	8.1	140	110	23	46.7
Mercury	0.07	ND	ND	0.058	ND	ND	ND	1.3	ND	0.14	0.79	0.94	0.32	0.28	ND	0.15
Nickel	18	6.5	5.8	13	25	33	120	75	67	ND	140	8.2	25	14	11	20.9
Silver	ND	0.88	ND	0.05	ND	ND	4.7	ND	ND	ND	ND	0.95[g]	1.4	ND	ND	1.0
Zinc	320	85	65	48	380	330	8,900	260	190	260	3,800	81	210	380	88	150
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Benzo(a) pyrene	0.45	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA	300[d]	0.068	NA	0.62	0.43
Benzo(b) fluoranthene	0.51	0.057	0.037	NA	ND	ND	ND	ND	ND	ND	NA	300[d]	0.91	NA	1.4	NA
Benzo(k) fluoranthene	0.38	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA	300[d]	0.16	NA	ND	NA
Chrysene	0.39	0.047	ND	NA	ND	ND	ND	ND	ND	ND	NA	300[d]	0.96	NA	0.76	0.384
Fluoranthene	1.3	0.052	0.041	NA	ND	ND	ND	1.0	ND	ND	NA	16[e]	2.4	NA	1.8	0.6
Fluorene	0.06	ND	ND	NA	ND	ND	ND	ND	ND	ND	NA	300[d]	ND	NA	ND	0.019
Phenanthrene	0.83	ND	ND	NA	ND	ND	ND	1.0	ND	ND	NA	4.6[f]	0.4	NA	0.96	0.24
Pyrene	ND	0.075	0.059	NA	ND	ND	ND	1.0	ND	ND	NA	300[d]	1.9	NA	1.5	0.665
Pentachloro-phenol	ND	ND	ND	NA	ND	ND	ND	ND	63	ND	NA	7.9	ND	NA	ND	NA
VOCs																
Tetrachloro-ethene	ND	ND	ND	NA	ND	ND	ND	12,000	1,000	ND	15	450[e]	ND	3	ND	NA

NA Not available.
ND Not detected, detection limit not available.
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b Ambient water quality criteria for the protection of aquatic organisms (USEPA 1999). Marine chronic criteria presented.
c Effects Range-Low (ERL) value presented. The ERL represents the 10th percentile for the dataset in which effects were observed or predicted in studies compiled by Long et al. (1995, 1998).
d Value for chemical class; marine acute value is presented.
e LOEL: lowest observed effect level; marine chronic value presented.
f Proposed criteria.
g Chronic criteria have not been developed; acute value is presented.

The contaminants of concern to NOAA include the trace elements and PAHs. These substances were detected in soils and groundwater at the identified sites and in surface water and sediments of the canal and Little Creek Cove. Table 3 lists maximum concentrations of contaminants of concern along with appropriate screening guidelines.

Maximum concentrations of cadmium, copper, lead, mercury, nickel, silver, and zinc at three of the landfills exceeded mean U.S. soil concentrations. The greatest concentrations were observed at the Amphibious Base Landfill (Site 7), followed by the Driving Range Landfill (Site 9) and Sewage Treatment Plant Landfill (Site 10). Few exceedances of soil guidelines were observed at the Demolition Debris Landfill (Site 8). Several PAHs also were detected in landfill soils, although soil screening guidelines are not available for these substances.

Screening guidelines were not substantially exceeded in groundwater for most contaminants. Concentrations of nickel and zinc beneath the Sewage Treatment Plant Landfill, copper and lead beneath the Exchange Laundry, and copper beneath the PCP Drip Tank exceeded the AWQC by an order of magnitude or greater. The VOC tetrachloroethene also was observed to exceed groundwater screening concentrations beneath the Exchange Laundry. Elevated concentrations of PCP also were detected beneath the PCP Drip Tank.

Concentrations of eight trace elements and four PAHs in sediment samples collected in Little Creek Cove adjacent to the Amphibious Base Landfill exceeded sediment screening guidelines. In addition, seven PAHs exceeded screening guidelines in sediment samples collected in the lower canal adjacent to the Demolition Debris Landfill just before discharging to Little Creek Cove. Further upstream in the canal, adjacent to the Exchange Laundry, concentrations of five trace elements exceeded sediment screening guidelines. The PAHs or other persistent organic contaminants were not analyzed for in canal sediment adjacent to the Exchange Laundry, so it is not known whether these substances are present at concentrations of concern in the upper canal.

Several trace elements (chromium, copper, lead, nickel, and zinc) exceeded the AWQC by an order of magnitude or greater in surface waters of Little Creek Cove adjacent to the Amphibious Base Landfill and in the canal adjacent to the Exchange Laundry.

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Solitron Microwave

Port Salerno, Florida

EPA Facility ID: FLD045459526

Basin: Everglades

HUC: 03090202

Executive Summary

The Solitron Microwave site conducted plating operations and manufactured microwave components, solid state resistors, and cable from 1963 to 1987. Soils, groundwater, surface water, and sediments on the site are contaminated with several trace elements at concentrations exceeding screening guidelines, but neither surface pathways nor groundwater off the site have been investigated. Surface runoff from the site flows to a ditch that in turn flows to a tributary of the Manatee Pocket, an estuarine embayment of the Indian River estuary. Groundwater also flows toward the Manatee Pocket. NOAA trust fish and invertebrate species use the Manatee Pocket and the Indian River estuary. Commercial and recreational fisheries are active in the estuary. The estuary also provides habitat for the federally endangered Florida manatee.

Site Background

The Solitron Microwave site consists of nearly 8 ha (20 acres) in Port Salerno, Martin County, Florida. The site is about 400 m (437 yd) from an unnamed tributary, which flows for an additional 800 m (875 yd) before discharging to the Manatee Pocket, an estuarine embayment of the St. Lucie River. The St. Lucie River flows northward for an additional 2 km (1.2 mi) before discharging to the Indian River estuary (Figures 1 and 2).

The Solitron Microwave site conducted plating operations and manufactured microwave components, solid state resistors, and cable from 1963 to 1987 under two different owners (Solitron and General R.F. Fittings; Weston 1999b). Hazardous wastes generated by the site included cadmium, cyanide, chromic acid, acetone, mixed solvents, mineral spirits, toluene, and caustic waste. Until 1965 all acid and plating room wastes were discharged to a drainage ditch leading to the Manatee Pocket. From 1968 to 1970, wastes were diverted to a 4,500 L (1,190 gal) tank for cyanide treatment followed by acid treatment and sand filtering, before discharging to the drainage ditch. After 1970, treated wastes were discharged to an unlined percolation pond (Figure 2). In 1989, approximately 200 m^3 (260 yd^3) of sediment were removed from the pond (Weston 1999b).

In July 1998, the Solitron Microwave site was placed on the EPA's National Priorities List (Weston 1999b). In December 1999, a Remedial Investigation and Screening Ecological Risk Assessment were completed on the site (Weston 1999b, Weston 1999a).

There are both surface and groundwater contaminant transport pathways off the site. The surface pathway is via site discharges to a drainage ditch along Cove Road that flows to an unnamed tributary of the Manatee Pocket. The shallow water table aquifer beneath the site is 0.6 m (0.6 yd) below ground surface and flows north-northeast towards the unnamed tributary and Manatee Pocket (Weston 1999b).

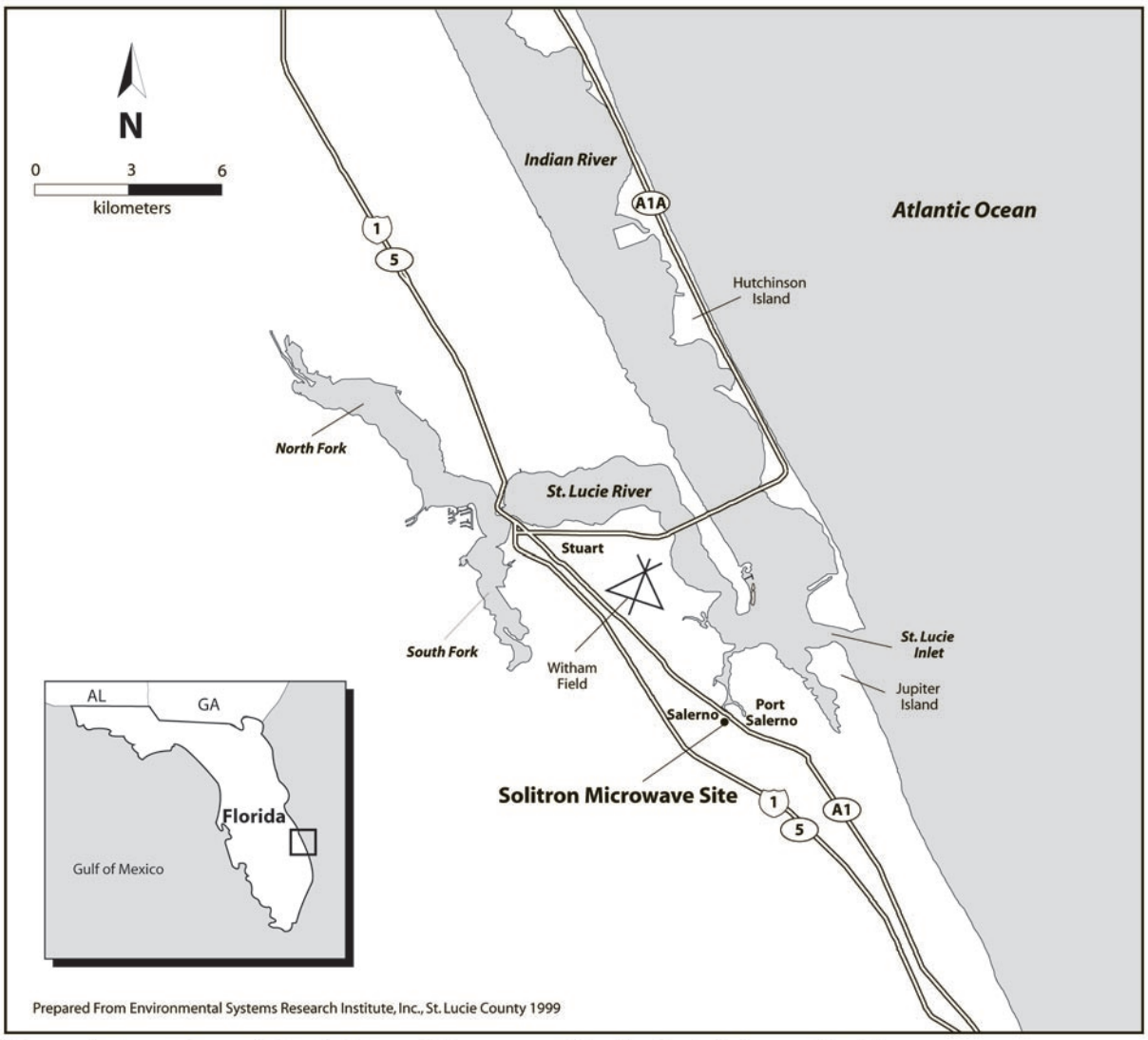

Figure 1. Location of the Solitron Microwave Site in Port Salerno, Florida.

NOAA Trust Resources

The NOAA habitats of concern are the unnamed tributary stream, Manatee Pocket, St. Lucie River, and Indian River, all of which are tidal estuarine habitats of the Atlantic Ocean. Estuarine areas are generally less than 5 m (5.4 yd) deep (NOAA 1997), while sediments range from silty sands to fine grain sands. Salinities range from under 10 parts per thousand (ppt) in the unnamed tributary to 32 ppt in the Indian River. The unnamed tributary is tidally influenced at Cove Road. In tidally influenced areas of the stream, the riparian zone is composed of estuarine wetlands dominated by scrub-shrub and broadleaf vegetation (Weston 1999a). Shore habitats in the Manatee Pocket are composed primarily of sheltered rocky shores and seawalls with some exposed estuarine wetlands and sand beaches. Sand beaches dominate the St. Lucie and Indian rivers near the site, with some areas of exposed tidal flats and estuarine wetlands. For its entire length, the Indian River is a long shallow estuary that parallels the coast, separated from the Atlantic Ocean by a series of barrier islands (RPI 1996).

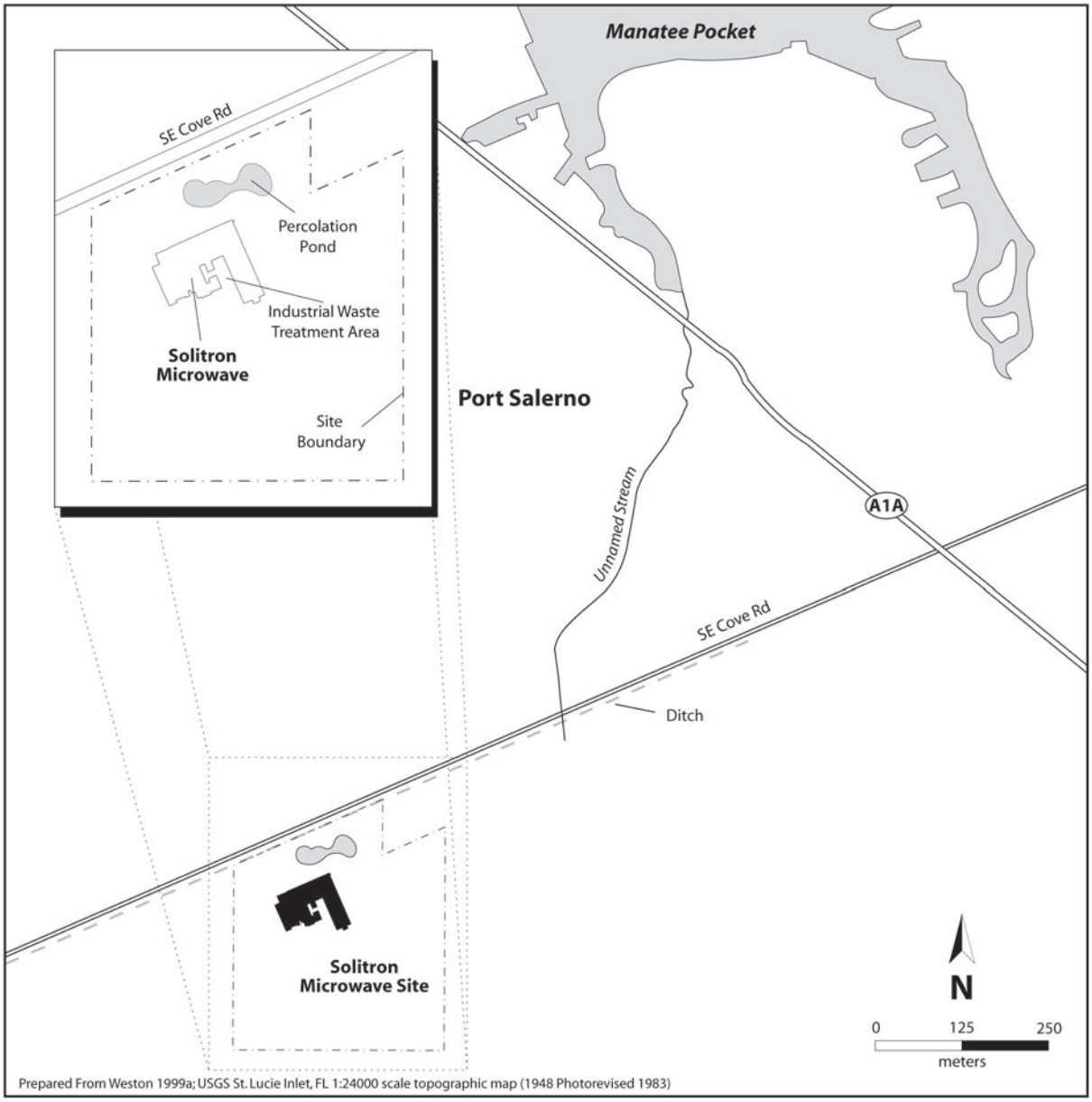

Figure 2. Detail of the Solitron Microwave Site.

Estuarine fish and invertebrate species use the Manatee Pocket, St. Lucie River, and Indian River (Table 1). Small foraging fish such as sheepshead minnow, bay anchovy, hardhead catfish, pinfish, and silversides generally spend their entire lives in estuaries. They also are common to small tidal streams and likely use the lower reaches of the unnamed tributary to Manatee Pocket (Nelson et al. 1991).

Many of the larger fish use the estuaries of the Manatee Pocket and St Lucie River as a juvenile nursery and seasonal adult habitat with spawning and larval stages generally occurring in coastal or offshore waters. The Scianids (seatrout, drums, croaker, spot, and kingfish), mullets, and groupers usually spawn in coastal waters where eggs hatch and larvae develop. The juvenile stages are transported to estuaries where they develop and the adults spend varying times within the estuary. Adult seatrout, drums, and mullet can occupy estuaries nearly year-round while croaker, spot, and kingfish usually make seasonal migrations (Nelson et al. 1991).

Table 1. Fish and invertebrate species in estuarine waters of the Manatee Pocket, St. Lucie River, and Indian River (Krum 2000 and Nelson 1991).

Species		Habitat Use			Fisheries	
Common Name	**Scientific Name**	Spawning Ground	Nursery Area	Adult Forage	Comm. Fishery	Recr. Fishery
ESTUARINE FISH						
Atlantic menhaden	*Brevootia tyrannus*	◆	◆	◆		
Atlantic croaker	*Micropogonias undulatus*		◆	◆		◆
Bay anchovy	*Anchoa mitchilli*	◆	◆	◆		
Black drum	*Pogonias cromis*		◆	◆		◆
Bluefish	*Pomatomus saltatrix*		◆			
Crevalle jack	*Caranx hippos*		◆			
Florida pompano	*Trachinotus carolinus*		◆			
Gag	*Mycteroperca microlepis*		◆			◆
Gray snapper	*Lutjanus griseus*		◆	◆		◆
Hardhead catfish	*Arius felis*	◆	◆	◆		◆
Jewfish	*Epinephelus itajara*		◆	◆		◆
Ladyfish	*Elops saurus*		◆	◆		◆
Lane snapper	*Lutjanus synagris*		◆	◆		
Permit	*Trachinotus falcatus*		◆			◆
Pigfish	*Orthopristis chrysoptera*		◆	◆		◆
Pinfish	*Lagodon rhomboides*	◆	◆			
Red grouper	*Epinephelus morio*		◆			◆
Red drum	*Sciaenops ocellatus*		◆	◆		◆
Sand seatrout	*Cynoscion arenarius*		◆	◆		◆
Sheepshead	*Archosargus probatocephalus*		◆	◆		◆
Sheepshead minnow	*Cyprinodon variegatus*	◆	◆	◆		
Silversides	*Menidia spp.*	◆	◆	◆		
Snook	*Centropomus undecimalis*		◆	◆		◆
Southern kingfish	*Menticirrhus americanus*		◆	◆		◆
Spanish mackerel	*Scomberomorus maculatus*		◆			
Spot	*Leiostomus xanthurus*		◆	◆		◆
Spotted seatrout	*Cynoscion nebulosus*		◆	◆		◆
Striped mullet	*Mugil cephalus*		◆	◆		◆
White grunt	*Haemulon plumieri*		◆	◆		◆
White mullet	*Mugil curema*		◆	◆		◆
INVERTEBRATES						
American oyster	*Crassostrea virginica*	◆	◆	◆	◆	◆
Blue crab	*Callinectes sapidus*		◆	◆	◆	◆
Grass shrimp	*Paleomonetes pugio*	◆	◆	◆		
Pink shrimp	*Penaeus duorarum*		◆			
Spiny lobster	*Panulirus argus*		◆	◆		◆
Stone crab	*Menippe mercenaria*	◆	◆	◆	◆	◆

Other fish such as snook, tarpon, ladyfish, and snappers (including the grunts and gag) have juvenile stages that are often associated with tidal stream, canal, and mangrove habitats and likely are present within the upper tidal reaches of the Manatee Pocket or lower portions of the unnamed stream. Adults are present seasonally in the St. Lucie and Indian rivers. Species such as bluefish, permit, crevalle jack, pompano, and Spanish mackerel are coastal species, but juveniles are known to inhabit the St. Lucie and Indian rivers (Nelson et al. 1991).

Several invertebrate species are found commonly in the Manatee Pocket, St. Lucie River, and Indian River estuary (Table 1). All life stages of oyster and grass shrimp are found in the estuary. Blue crabs spend juvenile and adult stages in the estuary although spawning females usually migrate offshore. Stone crabs spend all life stages in the estuary. Post-larvae and juvenile pink shrimp use the estuary. Adult shrimp generally move to coastal areas where larval development, foraging and spawning occur. Adult spiny lobsters are found in the estuary seasonally, but the species is highly migratory and little is known of their migratory habits (Nelson et al. 1991).

Recreational fisheries are present in the Indian and St Lucie rivers for most of the larger species, concentrating on the Scianids, snappers, and groupers, with shellfisheries for blue crab, stone crab, and oyster. There are commercial fisheries for crab and oyster near the confluence of the St. Lucie and Indian rivers (RPI 1996). There are no consumption advisories for the estuary (Krum 2000).

The federally endangered manatee uses the Indian River year-round and resides in the estuary. The federally endangered green, leatherback, and loggerhead sea turtles are found in coastal waters of the Atlantic Ocean on the eastern side of the barrier island that forms the Indian River. The sea turtles spawn on the sandy beaches of the barrier island, but would not likely be affected by site-related contaminants because they generally do not enter estuaries (RPI 1996).

Site Related Contamination

Data collected during field investigations detected contamination in soils, surface water, and sediments at the site. Nineteen soil borings were collected in source areas during the Remedial Investigation. Groundwater samples were collected from 62 monitoring and Direct Push Technology wells on and immediately off the site. Six surface water samples were collected in concrete tanks and the percolation pond on the site. Three sediment samples were collected in the percolation pond. No surface water or sediment samples were collected in the Manatee Pocket, unnamed tributary, or the drainages leading to the tributary (Weston 1999b).

The primary contaminants of concern to NOAA are trace elements and, possibly, the chlorinated pesticides, which were both measured at concentrations exceeding screening guidelines on the site. Several volatile organic compounds (VOCs) also were detected in environmental media on the site, but at concentrations below screening guidelines. Table 2 summarizes maximum contaminant concentrations in environmental media and lists the appropriate screening guidelines.

The maximum concentrations of cadmium, copper, nickel, silver, and zinc in soils exceeded soil guidelines; cadmium, copper, and silver exceeded the guidelines by one to three orders of magnitude. The greatest concentrations of trace elements were observed near the building in the industrial waste treatment area. Much lower concentrations, generally below soil screening guidelines, were measured in soil samples collected away from the main building nearer the percolation pond.

Table 2. Maximum contaminant concentrations of concern in soil, groundwater, and sediment at the Solitron Microwave site (Weston 1999a,1999b).

	Soils (mg/kg)		Water (µg/L)			Sediment (mg/kg)	
Contaminant	Soils	Mean Soils[a]	Ground-water	Surface Water	AWQC[b]	Sediment	ERL[g]
TRACE ELEMENTS							
Arsenic	ND	5.2	280	ND	36	ND	8.2
Cadmium	5.3	0.06	11	1	9.3	5.2	1.2
Chromium	39	37	3,300	27	50	23	81
Copper	1,300	17	2,200	100	2.4	240	34
Lead	4.4	16	32	7	8.1	2.6	46.7
Mercury	ND	0.058	1.7	ND	0.025[c]	ND	0.15
Nickel	120	13	1,600	120	8.2	340	20.9
Silver	110	0.05	48	ND	1.9[d]	14	1.0
Zinc	69	48	790	380	81	86	150
PESTICIDES							
Toxaphene	170	NA	ND	ND	ND	ND	NA
DDT	ND	NA	ND	ND	0.001	4.2	0.001
DDE	ND	NA	ND	ND	14[e]	2.4	0.002
VOCs							
1,1,1-Trichloroethane	15	NA	6.0	ND	31,200[e]	ND	NA
Trichloroethene	9.6	NA	4,100	ND	2,000[e]	ND	NA
Tetrachloroethene	35	NA	360	ND	9,320[f]	ND	NA
1,2-Dichloroethene	6.0	NA	5,000	ND	224,000[e]	ND	NA

NA: Data not available

ND: Not detected; detection limits not available

a: Shacklette and Boerngen (1984), except for silver and cadmium which are mean concentrations in the earth's crust as reported by Lindsay (1979).

b: Quality Criteria for Water (USEPA 1993). Marine chronic criteria presented unless otherwise noted.

c: Criterion expressed as total recoverable metal.

d: Chronic criterion not available; acute criterion presented.

e: Marine acute Lowest Observable Effects Level.

f: Freshwater acute Lowest Observable Effects Level.

g: Effects range-low; the concentration representing the lowest 10th percentile for the data in which effects were predicted in studies compiled by Long et al. (1995).

The pesticide toxaphene was detected in one soil sample in the main waste treatment area. In addition, several VOCs were measured in soils. The greatest VOC concentrations were in the industrial waste treatment area with very low concentrations away from the main building. Soil screening guidelines are not available for VOCs or pesticides.

The maximum concentrations of chromium, copper, nickel, and silver in groundwater samples exceeded AWQC screening guidelines by an order of magnitude or greater. Trace element contamination in the groundwater appears to be distributed downgradient of the site. One contaminated well is adjacent to the Solitron building, two more are near the percolation pond, and an additional two wells are to the northeast, adjacent to Cove Road. This is consistent with the northeasterly

flow of groundwater beneath the site. However, two wells located about 100 m (109 yards) southwest of the site, in an upgradient direction, also contained concentrations of several trace elements that exceeded screening guidelines. Several VOCs also were detected in the groundwater at concentrations below screening guidelines.

Surface water concentrations of copper and nickel in the Percolation Pond and copper, nickel, and zinc in tanks within the main waste treatment area exceeded screening guidelines. Organic compounds were not detected in surface water samples.

Sediment concentrations of cadmium, copper, nickel, and silver exceeded Screening guidelines in two of three sediment samples collected in the Percolation Pond (Long et al. 1995). In addition, sediment concentrations of the pesticide DDT and its metabolite DDE were found at concentrations exceeding screening guidelines in one of three sediment samples in the Percolation Pond.

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Klag Bay Site

Sitka, Alaska

EPA Facility ID: AK0002364768

Basin: Baranof-Chichagof Islands

HUC: 19010203

Executive Summary

Klag Bay, on Chichagof Island, Southeast Alaska, is the location of the Chichagof Mine, a former gold and silver mine which operated from 1906 to 1942. The mine produced an estimated 600,000 tons of gold and silver, with about 500,000 tons of waste rock deposited directly to the nearshore of Klag Bay. Tailing and sediment samples collected in the bay contain trace elements at concentrations exceeding sediment-screening guidelines. Klag Bay contains NOAA trust marine species as well as two anadromous salmon streams that have runs of sockeye, coho, chum, and pink salmon. There are both subsistence and recreational fisheries in the bay.

Site Background

The Chichagof Mine is adjacent to Klag Bay, a small estuary on Chichagof Island, Southeast Alaska, about 80 km (50 mi) northwest of Sitka (Figure 1). The mine operated as a silver and gold mine from 1906 to 1942. Although there has been no actual mining since 1942, people have explored the property, particularly since the early 1980s. Now, old ruins are the only remnants of historical mining operations (Ecology and Environment 1999).

Ore was originally processed using mercury amalgamation. This process consisted of passing crushed ore in a water slurry over amalgamation tables coated with mercury. The larger particles of gold would adhere to the tables while the remaining slurry was drained onto drying pans. The remaining waste rock, called tailings, were placed in waste piles. A process method using cyanide, in which ores are finely crushed and treated with a cyanide compound to dissolve the gold, may or may not have been used at the mine. A cyanide plant was constructed between 1923 and 1931 but there are conflicting reports regarding whether it was used. The floatation process was used after 1932 in which about 0.5 kg (1 lb) of oil combined with four tons of water and one ton of superfine ore were agitated to form an oily froth that picked up the gold particles (Ecology and Environment 1999).

The total production for the mine was on the order of 600,000 tons. No metals other than silver and gold were recovered from the ore. Therefore, the tailings likely contain metals and metalloids from the ore host rock and may be concentrated by the milling and gold recovery process. Arsenic, lead, and zinc are trace elements commonly associated with sulfide ore gold deposits. In addition, the tailings may contain mercury from the amalgamation process (Ecology and Environment 1999).

The direct disposal of mine tailings to Klag Bay has provided the primary pathway for the transport of contaminants to NOAA trust resources. The bulk of tailings were discharged directly into the intertidal and subtidal zones of the bay (Figure 1). An estimated 500,000 tons were deposited on reportedly a substantial portion of the present beach. A smaller amount of tailings was disposed

Figure 1. Location of the Klag Bay Site, Sitka, Alaska.

of in an upland tailings pile above the beach. Information on other potential surface or groundwater pathways was not reported (Ecology and Environment 1999).

A combined Preliminary Assessment/Site Inspection Report was prepared for the U.S. EPA in March 1999, which continues to evaluate the site. The site has not yet been proposed for listing on the National Priorities List (Ecology and Environment 1999).

NOAA Trust Resources

The NOAA trust habitat of concern is Klag Bay, a small estuarine embayment in Southeast Alaska. Very little information on the physical characteristics of this relatively remote bay was available. Previous studies sampled depths of up to 20.1 m (66 ft) and sediments ranged from gravelly sands to clayey silts (Ecology and Environment 1999). Two anadromous salmon streams, Chichagof Creek and Fish Camp Creek, empty into Klag Bay (Ecology and Environment 1999). Chichagof Creek flows to the bay approximately 0.8 km (0.5 mi) northwest of the mine and Fish Camp Creek flows to the bay approximately 3 km (1.9 mi) southeast of the mine (Figure 1). Although there is no evidence yet that the two natal streams were impacted by the mine, their presence makes the bay a valuable nursery and migratory corridor for anadromous salmon. NOAA trust species use Klag Bay and selected important species are presented in Table 1.

Chichagof Creek has spawning runs of pink, chum, and coho salmon, while Fish Camp Creek has spawning runs of sockeye and coho salmon. Adults migrate past the former mine during the spring and summer each year to reach Chichagof Creek. Juvenile salmon use nearshore areas of the bay as a juvenile nursery for up to several months before outmigrating to the Pacific Ocean (Ecology and Environment 1999). The anadromous Dolly Varden char has also been observed in Klag Bay, but it is not known whether the species uses Chichagof or Fish Camp creeks for spawning (Powell 2000).

Although comprehensive fish surveys have not been conducted in Klag Bay, species commonly observed in the marine waters of Southeast Alaska would likely reside in the bay (Davidson 2000). All of the marine fish in Table 1 are commonly found in Southeast Alaska and most are coastal-shelf species that occupy bays, estuaries, and coastal waters for all of their life stages. Most of these fish do not make large migratory movements, although seasonal movements in relation to food availability, temperature, and spawning may occur (ADFG 2000a).

Several invertebrate species are common in Southeast Alaska and likely inhabit Klag Bay, including Dungeness crab, red king, tanner, and snow crabs, and pinto abalone (ADFG 2000b). Blue mussels have been observed in the intertidal and nearshore subtidal areas of the bay (Davidson 2000).

Native Alaskans have established, substantial subsistence fisheries on Fish Camp Creek for sockeye salmon from late July through early August. There are also subsistence fisheries on Chichagof Creek, although not to the same degree as the sockeye fishery on Fish Camp Creek. There is recreational fishing on both streams and in Klag Bay. Klag Bay is closed to commercial fishing, largely to protect the sockeye run at Fish Camp Creek, although commercial harvests take place outside of the bay (Ecology and Environment 1999).

Two marine mammals common to the area are listed under the Endangered Species Act of 1972. The threatened Steller sea lion and endangered humpback whale are commonly observed, and range freely throughout Southeast Alaska. The nearest documented haulout area for Steller sea lions is about 10 km (6 mi) west of Klag Bay. It is not known whether humpback whales enter Klag Bay (Ecology and Environment 1999).

Table 1. NOAA trust resources common to Southeast Alaska and Klag Bay (ADFG 2000a; ADFG 2000b; Davidson 2000).

Species		Habitat Use			Fisheries	
Common Name	Scientific Name	Spawning Area	Nursery Ground	Adult Forage	Subsistence	Recreational
ANADROMOUS FISH						
Chum salmon	*Oncorhynchus keta*	◆[a]	◆	◆	◆	
Coho salmon	*Oncorhynchus kisutch*	◆[a]	◆	◆	◆	◆
Dolly Varden char	*Salvelinus malma*		◆	◆		
Pink salmon	*Oncorhynchus gorbuscha*	◆[a]	◆	◆	◆	◆
Sockeye salmon	*Oncorhynchus nerka*	◆[a]	◆	◆	◆	◆
MARINE FISH						
Black rockfish	*Sebastes melanops*		◆	◆		◆
C-O sole	*Pleuronichthys coenosus*		◆	◆		
Copper rockfish	*Sebastes caurinus*		◆	◆		◆
Dusky rockfish	*Sebastes ciliatus*		◆	◆		◆
Flathead sole	*Hippoglossoides elassodon*		◆	◆		
Great sculpin	*Myoxocephalus polyacanthocephalus*		◆	◆		
Kelp greenling	*Hexagrammos decagrammus*	◆	◆	◆		
Lingcod	*Ophiodon elongatus*		◆	◆		
Pacific halibut	*Hippoglossus stenolepis*		◆	◆		◆
Pacific herring	*Clupea pallasi*		◆	◆		
Pacific cod	*Gadus macrocephalus*		◆	◆		◆
Pacific tomcod	*Microgadus proximus*	◆	◆	◆		
Quillback rockfish	*Sebastes maliger*		◆	◆		◆
Red Irish lord	*Hemilepidotus hemilepidotus*	◆	◆	◆		
Sablefish	*Anoplopoma fimbria*		◆	◆		
Sand sole	*Psettichthys melanostictus*		◆	◆		
Silvergray rockfish	*Sebastes brevispinis*		◆	◆		◆
Speckled sanddab	*Citharichthys stigmaeus*		◆	◆		
Starry flounder	*Platichthys stellatus*	◆	◆	◆		
Walleye pollock	*Theragra chalcogramma*		◆	◆		
Yelloweye rockfish	*Sebastes ruberrimus*		◆	◆		◆
Yellowfin sole	*Pleuronectes asper*	◆	◆	◆		
Yellowtail rockfish	*Sebastes flavidus*		◆	◆		◆
INVERTEBRATES						
Blue mussel	*Mytilus edulis*	◆	◆	◆		
Dungeness crab	*Cancer magister*	◆	◆	◆		
Pinto abalone	*Haliotis kamtschatkana*	◆	◆	◆		
Red king crab	*Paralithodes camtschaticus*			◆		
Snow crab	*Chionoecetes opilio*			◆		
Tanner crab	*Chionoecetes bairdi*			◆		

a spawning areas for Pacific salmon are in Fish Camp or Chichagof creeks.

Site-Related Contamination

Environmental investigations adjacent to the former mine and within Klag Bay have found source and sediment contamination at concentrations that exceed screening guidelines. The Preliminary Assessment/Site Inspection collected seven tailing samples and 12 sediment samples in Klag Bay. Tailing samples were collected in the intertidal zone along the western shore of the bay while sediment samples were collected in both the intertidal and nearshore subtidal zones. All samples were analyzed for trace elements (Ecology and Environment 1999).

Concentrations of arsenic, cadmium, copper, lead, mercury, nickel, silver, and zinc in both tailing and sediment samples exceed sediment-screening guidelines in Klag Bay (Table 2). Elevated concentrations were widespread in both media; concentrations of at least one trace element exceeded sediment-screening guidelines in every sample collected.

In general, the greatest concentrations were observed in tailing samples where arsenic concentrations exceeded sediment screening guidelines by at least an order of magnitude. Concentrations ranged from 140 to 840 mg/kg in the seven tailing samples collected. Concentrations of lead, mercury, and silver in tailing samples approached an order of magnitude above guidelines (Table 2).

Elevated concentrations of trace elements were also widespread in sediment samples collected in the bay. Concentrations of mercury exceeded guidelines by an order of magnitude (Table 2). Mercury concentrations ranged from 0.5 to 4.5 mg/kg in sediment samples collected in the bay. Although generally not as elevated as in tailing samples, concentrations of arsenic, cadmium, lead, nickel, and silver also exceeded screening guidelines in most samples collected in the bay (Table 2). Elevated concentrations appear to be distributed throughout the inner bay and into the outer bay. Fewer trace elements exceeded screening guidelines in samples collected in the outer bay, but the extent of contamination in the outer bay is not known.

Table 2. Maximum concentrations of contaminants of concern to NOAA in tailings and sediment samples collected in Klag Bay (Ecology and Environment 1999).

	Sediment (mg/kg)		
Contaminant	Tailings Samples	Sediment Samples	ERL[a]
Arsenic	840	250	8.2
Cadmium	0.83	2.7	1.2
Chromium	35	32	81
Copper	98	50	34
Lead	350	80	46.7
Mercury	1.1	4.5	0.15
Nickel	53	37	20.9
Silver	7.4	2.5	1.0
Zinc	360	140	150

a Effects Range-Low (ERL) represents the tenth percentile for the dataset in which effects were observed or predicted in studies compiled by Long et al. (1995; 1998).

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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
UST Underground Storage Tank

Glossary of terms

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

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.

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.

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.

Egestion To discharge or excrete from the body.

Emergent wetland, subclass: nonpersistent 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.

Environmental medium An environmental category that surrounds or contacts humans, animals, plants, and other organisms (e.g., surface water, groundwater, soil, or air) and through which chemicals or pollutants move.

Estuary A 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).

Forage To search for food.

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

Hydrologic Unit Code (HUC) The U.S. is divided into hydrologic units for water-resources planning and data management. Hydrologic units represent natural and human-imposed stream-drainage 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.

Isomers Different substances that have the same formula.

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

Marsh A type of wetland that does not accumulate appreciable peat deposits and is dominated by herbaceous vegetation. Marshes may

be fresh- or saltwater, tidal or non-tidal (see: wetlands).

Materiel (or matériel) The equipment, apparatus, and supplies of a military force.

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

National Priorities List (NPL) A list of hazardous waste sites, compiled by EPA, 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 EPA to investigate and clean up these sites.

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

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

Pelagic Of, relating to, or living in open seas rather than waters adjacent to land or inland waters.

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.

Polychlorinated biphenyls (PCBs) Are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor. PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors, and old microscope and hydraulic oils.

Run-Off 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 The percentage of salt in water.

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.

Trustee 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.

Wastewater The spent or used water from a home, community, farm, or industry that 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.

Appendix

70 Appendix

Appendix

Table 1. List of the 329 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
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

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
Peter Cooper	1999	NYD980530265
Port Washington Landfill	1984	NYD980654206
Rowe Industries Groundwater Contamination	1987	NYD981486954
Sidney Landfill	1989	NYD980507677
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
Halby Chemical	1986	DED980830954
Kent County Landfill	1989	DED980705727

Region 3 *cont.*

Delaware *cont.*	**Date**	**EPA Facility ID**
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
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
Pennsylvania		
Austin Avenue Radiation Site	1993	PAD987341716
Boarhead Farms	1989	PAD047726161
Bridesburg Dump	1984	PAD980508402

Region 3 *cont.*

Pennsylvania *cont.*	Date	EPA Facility ID
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
C & R Battery Co., Inc.	1987	VAD049957913
Chisman Creek	1984	VAD980712913
Former Nansemond Ordnance Depot	2002	VAD123933426

Region 3 *cont.*

Virginia *cont.*	**Date**	**EPA Facility ID**
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
Sixty-Second Street Dump	1984	FLD980728877
Solitron Microwave	***2002***	***FLD045459526***
Standard Auto Bumper Corp.	1989	FLD004126520

Region 4 *cont.*

Florida *cont.*	Date	EPA Facility ID
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
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
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
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
Old Navy Dump/Manchester Lab (USEPA/NOAA)	1996	WA8680030931
Pacific Sound Resources (Wyckoff West Seattle)	1995	WAD009248287

Region 10 *cont.*

Washington *cont.*	**Date**	**EPA Facility ID**
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

84 Appendix

Table 2. List of published reports (927), which include 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				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				NJD0001900281
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.				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 GW Area				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				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
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
Ordnance Products, Inc.	1995			MDD982364341

Region 3 *cont.*

Maryland *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
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
USAF Andrews Air Force Base			1994	MD0570024000
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
Woodbury Chemical Co. (Princeton Plant)	1989			FLD004146346

Region 4 *cont.*

Florida *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
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
USAF Keesler AFB				MS2570024164
North Carolina				
ABC One Hour Cleaners	1989			NCD024644494
Camp Lejeune Military Res. (U.S. Navy)	1989			NC6170022580
Charles Macon Lagoon & Drum Storage				NCD980840409

Region 4 *cont.*

North Carolina *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
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				NDC087336335
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
Macalloy Corporation				SCD003360476
Naval Shipyard - Charleston				SC0170022560
Naval Weapons Station - Charleston				SC8170022620
Palmetto Recycling, Inc.				SCD037398120

Region 4 *cont.*

South Carolina *cont.*	**WSR**	**PNRS**	**USAF**	**EPA FACILITY ID**
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

Tennessee	
Tennessee Chemical Co.	TND003337839

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 *cont.*	**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 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
New Orleans Naval Air Station				LA6170022788
Petro-Processors of Louisiana, Inc.				LAD057482713

Region 6 *cont.*

Louisiana *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Ponchatoula Battery Company				LAD062644232
PPG Industries Inc.				LAD008086506
Shell Oil Co. (Norco Mfg. Complex)				LAD008186579
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 Co. - Swan Lake Plant				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
Hamilton Army Airfield				CA3570024288
Hewlett-Packard (620-640 Page Mill Road)	1989			CAD980884209
Hexcel Corporation				CAD058783952
Intersil Inc./Siemens Components	1989			CAD041472341
Iron Mountain Mine	1989	1989		CAD980498612
J.H. Baxter & Co.				CAD000625731
Jasco Chemical Corp.	1989			CAD009103318

Region 9 *cont.*

California *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
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
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
Naval Air Station Lemore				CA3170024381
Naval Shipyard Long Beach				CA1170090483
Naval Supply Center Pt Molate Site				CA0170090021
Newmark Ground Water Contamination				CAD981434517
North Island Naval Air Station				CA7170090016
Oakland Naval Supply Ctr./Alameda Fac				CA1170090012
Pacific Coast Pipe Lines	1989			CAD980636781
Pacific Missile Test Center				CA9170027271
Point Loma Naval Complex				CA1170090236
Port Hueneme Naval Constr. Battalion Ctr.				CA6170023323
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 Sta.				CA0170024491

Region 9 *cont.*

California *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
Shell Oil Co. Martinez				CAD009164021
Simpson-Shasta Ranch				CAD980637482
Sola Optical USA, Inc.	1989			CAD981171523
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
Treasure Island Naval Station - Hunters Pt. Annex	1989	1989		CA1170090087
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
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

Region 9 *cont.*

Hawaii *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
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				
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***

Region 10 *cont.*

Alaska *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
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				IDD980665459
Oregon				
Allied Plating, Inc.	1987	1988		ORD009051442
Coos Bay				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
Portland Harbor (Lower Willamette River)		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

Region 10 *cont.*

Washington *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
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
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

Region 10 *cont.*

Washington *cont.*	WSR	PNRS	USAF	EPA FACILITY ID
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

Donald L. Evans
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Under Secretary for Oceans and Atmosphere and NOAA Administrator

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