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RCRA FACILITY ASSESSMENT
PORTSMOUTH NAVAL SHIPYARD
EPA I.D. NO. ME7170022019

PHASE II REPORT

FACILITY INFORMATION, CONCLUSIONS AND RECOMMENDATIONS

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1.0 INTRODUCTION

This report represents a final Phase II RCRA Facility Assessment of Portsmouth Naval Shipyard, located in Kittery, Maine. The report was prepared using the U.S. EPA's Draft RCRA Preliminary Assessment/Site Investigation Guidance Manual (August 1985).

Information available in preparing this report was obtained from the following sources:

(1) The Portsmouth Naval Shipyard response to Section 3007 of RCRA. The response report included the following items:

- o The Portsmouth Naval Shipyard Part B Permit Application.
- o A brief description of four units identified as SWMUs by the operator and two documented releases to the environment.
- o A June 1983, Initial Assessment Study of Portsmouth Naval Shipyard.
- o Draft Report on Verification Step Confirmation Study on Hazardous Waste Sites.

(2) Information contained on file at the Maine Department of Environmental Protection.

(3) A site visit and interviews with the operators.

(4) Plan drawings including:

- o Shipyard Storage Tanks Above and Underground, Drawing ENV-85-1.
- o Solid Waste Management Units Location Map (8 units).

A formal response to information needs identified by the Phase I review was not available at the time of this report. In addition, photographs of the facility were not permitted.

2.0 FACILITY DESCRIPTION

The Portsmouth Naval Shipyard is located on Seavey Island in the Piscataqua River within the town limits of Kittery, Maine. The facility is engaged in the repair and refitting of nuclear submarines for the United States Navy. Historically, the shipyard has been commissioned for shipbuilding at various times since the civil war, and since World War II has been a support facility for nuclear submarines.

Activities that generate hazardous wastes include paint stripping, degreasing and metal surface cleaning operations along with the cleaning and flushing of hydraulic and cooling systems. Wastes generated by the facility are listed in Table 5-1 from the IAS Report (1).

The shipyard has 376 buildings on 278 acres and house trade shops including sheet metal, welding, piping, mechanical and electrical shops. In addition, the facility has a Controlled Industrial Area (CIA) which includes dry docks and submarine berths.

The following Solid Waste Management Units (SWMUs) and locations of releases have been identified at the facility.

1. Hazardous Waste Storage Facility
2. Freon Recovery Operations
3. Industrial Waste Treatment Plant
4. Intermediate Storage Facilities
5. Industrial Waste Outfalls
6. DPDO Storage Yard
7. Interim Storage Areas
8. Jamaica Island Landfill
9. Mercury Burial Sites
10. Tank No. 24
11. Waste Oil Tanks (2) No. 12
12. Boiler Blowdown Tank No. 25
13. Rinse Water Tank No. 27
14. Waste Oil Tank No. 31
15. Oil/Water Separator No. 32
16. Rinse Water Tank No. 34
17. Floor Drain Water Tank No. 26
18. Waste Lube Oil Tank No. 35
19. Waste Oil Tank No. 37
20. Oil/Water Separator No. 38
21. Acid/Alkaline Drain Tank
22. Chemical Cleaning Facility Tank (Bldg. 155)
23. Chemical Cleaning Facility Tank (Bldg. 174)
24. Asbestos Collection Dumpster
25. Burnable Dumpsters
26. Oil/Water Dumpsters
27. Fuel Oil Spill
28. Silver Recovery System

A description of shop activities that generate hazardous wastes is provided below. In addition to shop operations, the facility contains an industrial wastewater treatment system, and Freon and silver recovery operations.

Shipfitters Shop The shipfitters shop is located in Building 92. This shop performs major structural activities such as work on hulls. Activities include the case-hardening of steel components in tanks of melted sodium cyanide. No wastes are generated from this activity. Metal working operations use trichloroethane for degreasing operations and generate approximately 30 gallons of waste solvent and 30 pounds of solvent contaminated rags per year.

Table 5-1

Hazardous Waste Generation,
Portsmouth Naval Shipyard

Shop	Building	Waste	Quantity (Monthly unless otherwise specified)
X-17	75	Acid and rinse	2,000 gal
	75	Alkali and rinse	800 gal
	75	Oil contaminant sorbent	20 lb
X-03	72	Degreaser (dry cleaning solvent)	5 gal
	72	Water treatment tank solids	10 lb
	72	Sorbent	210 lb
X-51	240	Trichloroethylene/detergent	825 gal/yr
	240	Vanguard stripping solution (WS-126)	200 gal/yr
	240	Waste oils	25 gal
	240	Sorbent	10 lb
	240	MEK/acetone/alcohols/trichloroethane/ xylene	55 gal/yr
	240	Epoxy resin	20 gal
X-11	92	Tichloroethane	15 gal/yr
	92	Oil-contaminated rags	30 lb
X-67	238	Freon/Strip-Oxy/solvents	25 gal
	238	Paint contaminated rinse water	2,400 gal
	240	Ultrasonic rinsing solution	30 gal
X-07	44	Degreaser (dry cleaning solvent)	40 gal/yr
	44	Refrigerator oil	5 gal
	44	Waste oil	10-12 gal
	65	Paint wastes	80 gal
X-31	80/300	Waste cutting oil (Cimcool)	2,200 gal
	80/300	Waste cutting oil (Trimsol)	10 gal
	80/300	Waste cutting oil (Joncool)	10 gal
	80/300	Freon	350 gal
	80	Waste hydraulic oil (test table)	4,000-5,000 gal
	80	Waste hydraulic oil (No. 2100/2150)	70 gal
	80/300/24	Oil contaminant sorbent	210 lb
	80	Brush electroplating wastes	10 gal
	240	Chromium contaminated cleaning bath	60 gal
	96	Acid and rinse	1,000 gal
	96	Alkali and rinse	990 gal

Table 5-1
(continued)

Shop	Building	Waste	Quantity (Monthly unless otherwise specified)
X-17	18	Epoxy paint wastes	500 gal
	18	Thinners, xylene, waste paint (also in dry docks)	880 gal
	285	Waste thinner, solvents (also dockside at dry dock 3)	440 gal
	285	Sandblast grit	600 tons
	64	Paint waste	55 gal
X-38	174	Freon, degreasers	230 gal
	174	Test Freon	7,700 gal/yr[1]
	174	Asbestos waste	1 cu yd
	174	Sorbent	310 lb
	96	Acid	3,200 gal/yr
X-56	89	Trichloroethylene	55 gal/yr
	89	Acetone	110 gal
	155	Trisodium phosphate	1,000 gal
	155	Waste hydraulic oil	1,100 gal/yr
	155	Freon	4,600 gal
	155	Lithium bromide	300 gal/yr
X-64	60	Paint wastes	15 gal
	178	Waste asbestos insulation	80 cu yd/yr
X-99	174	Freon still bottoms	20 gal
X-06	74	Degreasers	5 gal
	74	Waste lubricating, hydraulic oils	300 gal
	74	Waste grease	10 lb
	74	Gear lubricating oil	5 gal
	74	Cutting fluid	10-15 gal/yr
	74	Hi-T Degreasol	30 gal
	74	Synthetic lubricating oil	50 gal
:-02	154	Waste oils, degreasers	530 gal

ostly recycled through X-99 Freon still.

ote: This table represents only wastes generated within the shop buildings, with noted exceptions. In addition, there are variable quantities and types of wastes generated in the dry docks. Flushing of various systems by Shops 56 and 38 generates approximately 20,000 gal/yr of acid and alkaline wastes, some containing metal chelate compounds. Steam generator chemical cleaning produces approximately 60,000 gal/yr of acid and alkaline wastes containing chelates.

Sheet Metal Shop The sheet metal shop is located in Building 75. The shop contains metal surface-cleaning operations that use acid and alkaline bath and rinse tanks. Spent solutions are drained to an underground tank (SWMU 21) prior to treatment at a wastewater treatment plant (SWMU 3). Additionally, small spills of hydraulic cutting oils from metalworking operations are cleaned with sorbent material.

Pipefitter Shop The pipefitter shop is located in three principal locations, Buildings 89, 155 and 174. A vapor degreaser is located in Building 89. Clean-out of this unit produced approximately 1000 gallons per year of residual trichloroethylene (F001) until 1979. After 1979, changes in operating procedures reduced this amount to 55 gallons per year. In addition, Building 89 generates approximately 1300 gallons per year of spent acetone from degreasing parts.

Building 155 contains acid and alkaline degreasing baths. Since 1975, dragout and spills have been collected in a holding tank (SWMU 22) before being transferred to the wastewater treatment plant (SWMU 3). Prior to 1975, wastes were diluted and discharged into the river (SWMU 5). Approximately 24,000 gallons of waste per year are generated at this location.

Building 174 contains Freon recovery (SWMU 2) and piping system cleaning operations. Freon is recycled in a distillation unit and used as a degreaser. Flushing operations produce waste trisodium phosphate and lithium bromide solutions which are processed at the wastewater treatment system. Approximately 200 to 300 gallons per year of waste lubricating and hydraulic oils are generated at Building 174. Prior to 1972, waste oils were diluted and discharged to the river (SWMU 5). Since 1972, oily wastes have been transferred to Jamaica Island storage tanks (SWMU 11) prior to off-site disposal.

Machine Shops The machine shop is located in Buildings 96, 80, 300 and 174. The activities include milling, grinding and cutting metals for use in fittings and mechanical equipment. Metal surface-cleaning operations conducted in Buildings 96 and 174 generate waste acids and alkaline rinse baths. Until 1975, wastes from Building 96 were diluted and discharged into the river. After 1975, they were processed at the wastewater treatment system. Wastes from Building 174 have always been stored in an underground tank (SWMU 23) prior to processing at the treatment plant. The annual waste volumes are 28,400 gallons for Building 96 and 12,000 gallons for Building 174.

Buildings 80 and 300 generate large quantities of waste cutting and hydraulic oils. The volumes are approximately 81,500 gallons per year. In addition, 7700 gallons per year of spent solvents are generated at these locations. The spent solvents are collected and transferred in drums to the hazardous waste storage facility (SWMU 1).

The machine shop also operated an electroplating process from the 1940s until 1972 in Building 79. Chromium contaminated wastewaters generated from process activities were dumped into floor drains that discharged to the river near Berth 6 (SWMU 5). Sludges and tank bottoms were disposed with regular trash (1).

Oil and solvent contaminated sorbent and small quantities of asbestos wastes were generated by the machine shop. The spent sorbent material was disposed in a "burnable" dumpster (SWMU 25) while asbestos was transferred to a central collection dumpster (SWMU 24) for disposal on a special contract.

Electric Shop The electric shop is located in Buildings 240, 238 and 174. The electrical shop is responsible for replacing submarine electrical equipment and systems. Spent solvents are generated during degreasing and wire stripping operations and contain trichloroethylene, acetone, methyl ethyl ketone, xylene, trichloroethane and vangard stripping solution. These spent solvents are placed in drums and transferred to the hazardous waste storage facility (SWMU 1) prior to off-site disposal.

Waste oils are also generated from refurbishing electric motors. These wastes are transferred to storage tanks in the Jamaica Island area (SWMU 11) prior to off-site disposal.

Building 238 contains a battery repair and decommissioning facility. Operations generate waste sulfuric acid, lead bearing sludges and lead-plate battery elements. Prior to 1975 waste battery acid and lead sludges were discharged to the river. Since 1975, wastes have been collected in a tank (SWMU 10) and processed at the wastewater treatment plant (SWMU 3). Approximately 3300 gallons per year of wastes are generated. The lead plates reportedly have always been sent to the Defense Logistics Agency for salvage.

Electronics Shop The electronics shop is located in Buildings 238, 240 and 306. The electronics shop is responsible for repairing electronic instruments. Wastes are generated in Building 238 from degreasing and stripping insulation and include Freon, strip-oxy, acetone and trichloroethylene. Approximately 300 gallons of waste are generated per year. Wastes are placed in drums and transferred to the hazardous waste storage facility (SWMU 1).

A transducer repair facility is located in Building 306. The waste generated includes a paraffin-based liquid resulting from the replacement of transducer fluids.

Service Shops The service shop is located in Building 74. The responsibilities of the service shops include service to dry docks and maintenance to production machinery and equipment. Wastes generated by the service shop includes waste lubricating oils and hydraulic oils at an annual rate of 4300 gallons. The waste oils are transferred to underground tanks near Jamaica Island (SWMU 11). The cleanup of tools and equipment generates approximately 420 gallons per year of spent chlorinated solvents that are transferred to the hazardous waste storage facility (SWMU 1).

Paint Shop The paint shop is located in Buildings 18, 64 and 285. The paint shop is responsible for painting submarines both inside and out, cleaning and flushing bilges, and tank preparation for preservative painting.

Prior to the introduction of epoxy resin based paints in the late 1960s, solvents including methyl ethyl ketone and mineral spirits with xylene were used for cleaning purposes. Approximately 900 gallons per year of spent solvents were disposed in drums. Currently methyl ethyl ketone, ethylene glycol monoethylether, and xylene wastes are produced at the three locations. Building 18 generates 4800 gallons per year, Building 285, 2400 gallons per year and Building 64, 600 gallons per year.

Shipwright Shop The shipwright shop is located in Building 45. Approximately 200 gallons per year of spent solvents are generated in mockup building activities. In addition, approximately 80 cubic yards per year of asbestos waste is produced from the removal of submarine insulation.

Transportation Shop The transportation shop is located in Building 154. The maintenance of shipyard vehicles produces approximately 900 gallons of ethylene glycol per year. Prior to 1980, the ethylene glycol was disposed of in the river via a storm sewer. Wastes are now transferred to the hazardous waste storage facility (SWMU 1).

Utilities Shop The utilities shop is located in Building 72. Cleanup of spills around the facility power plant generates 2500 pounds of oil-contaminated sorbent each year. In addition, approximately 120 pounds per year of precipitated solids are generated from the operation of a small boiler feed water treatment system.

Maintenance Shop The maintenance shop is located in Buildings 44 and 65. The maintenance and repair of facility buildings produces approximately 180 gallons of waste oil and 1000 gallons of spent solvents per year.

Printing and Photography Operations The printing and photography operations are located in Building 20. The shop generates approximately 165 gallons per year of tetrachloroethylene and petroleum naphtha from reproduction activities. In addition, silver recovery operations from X-ray film is conducted at the shop. Waste fixer solution is disposed to the sanitary sewer.

3.0 SITE CONDITIONS

FLOOD PLAIN AND SURFACE WATER

The Portsmouth Naval Shipyard is situated on Seavey Island in the Piscataqua River, a tidal estuary that is the boundary between New Hampshire and Maine. The location of this facility and its relationship to regional land use is shown in Figure 1. The present configuration of the Portsmouth Naval Shipyard is a result of expansion to adjacent islands by landfilling. Seavey, Jamaica, and Dennett Islands have been connected by lateral landfill expansion activities as illustrated in Figure 2.

Topographically, this area consists of low-land marshes, tidal mudflats, bays, channels and islands. These characteristics impart a complex physical environment and an extreme irregularity to the coastline. Seavey Island is a relatively flat land mass with elevations at the shipyard ranging from 10 to 20 feet above high water. The shorelines are a combination of steep, rocky banks and low-lying marshlands. Tidal patterns are semidurnal and reportedly fluctuate from 7.5 to 10.0 feet. Locally, spring tides at the shipyard fluctuate an average of 9.2 feet.

Seavey Island is a highly developed area and does not have any natural stream drainages subject to surface flooding that would be potential threats to shipyard facilities. Surface water runoff is controlled by an extensive storm water collection system that directs drainage to specific outlets into the Piscataqua River. It is reported that there is very little natural surface runoff occurring at the shipyard. Two natural ponds drain an open area in the southern portion of the shipyard and a drainage outlet has been constructed from these ponds to the Piscataqua River in order to control excessive amounts of precipitation in these areas. The elevation of the 100-year high tide is 105.00 feet. Based on information available at the time of this report it is unlikely that surface water flooding is a threat to the Solid Waste Management Units (SWMUs) that have been identified at the facility.

A review of a dredging operation study conducted in 1977 at the Portsmouth Naval Shipyard and shop personnel interviews confirmed that prior to 1975 all wastewaters were directly discharged through outfalls into the Piscataqua River. Figure 3 indicates the locations of major outfalls and the berth areas where sediments were found to be contaminated.

Climate in the Portsmouth region is characterized as variable, but is moderated by maritime conditions. The average daily temperature ranges from 80°F in July to 13°F in January and February. Precipitation is evenly distributed during the year, with 2.7 to 4.6 inches falling per month. The mean annual precipitation is 42.6 inches.

Surface water as well as groundwater on Seavey Island is not used as a source of potable water. The town of Kittery supplies water for consumption and industrial facilities through two 12-inch mains, according to an assessment study performed at the shipyard in June, 1983 (1).

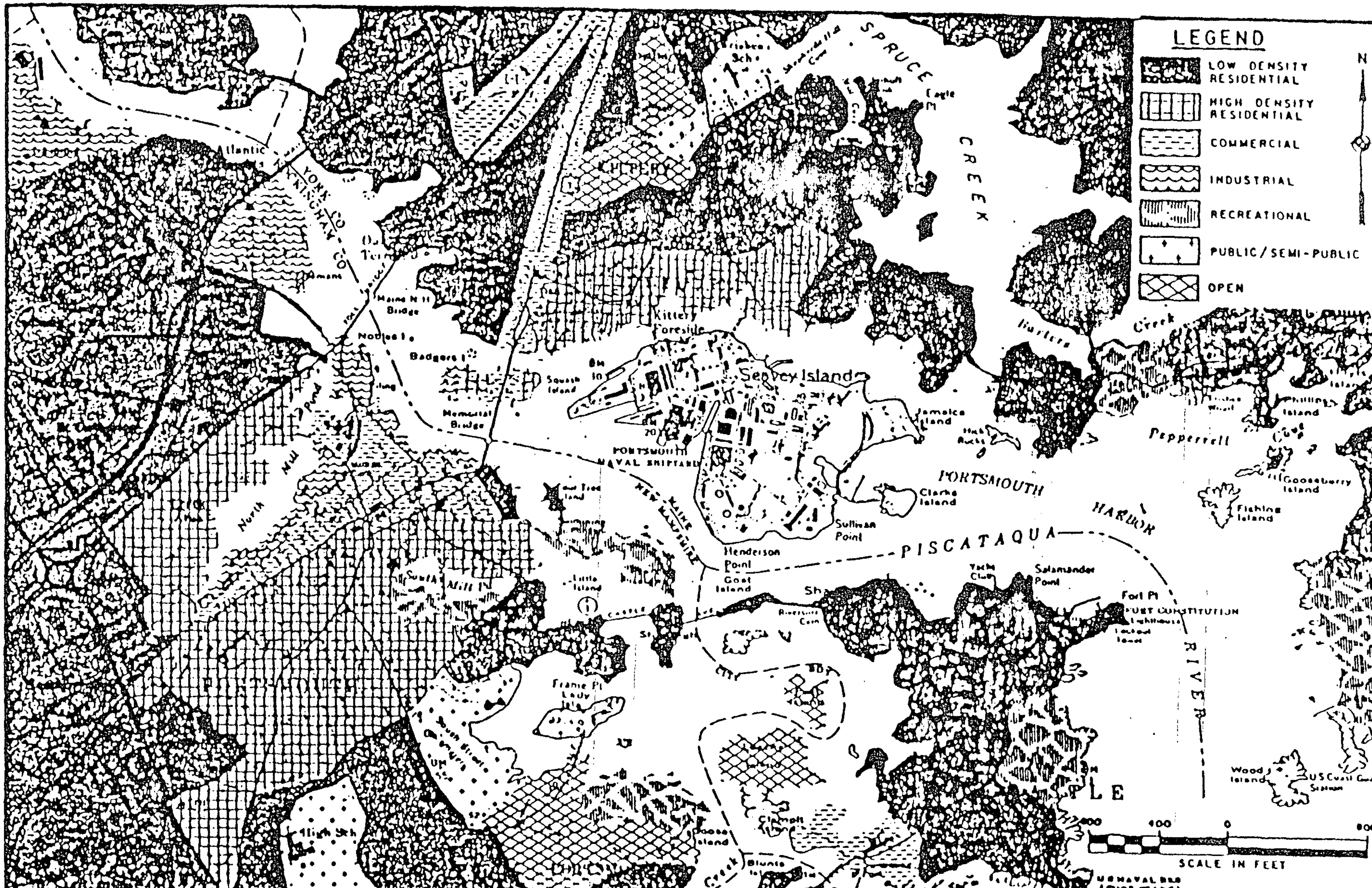

FIGURE 1
REGIONAL LAND USE

INITIAL ASSESSMENT STUDY
PORTSMOUTH NAVAL
SHIPYARD

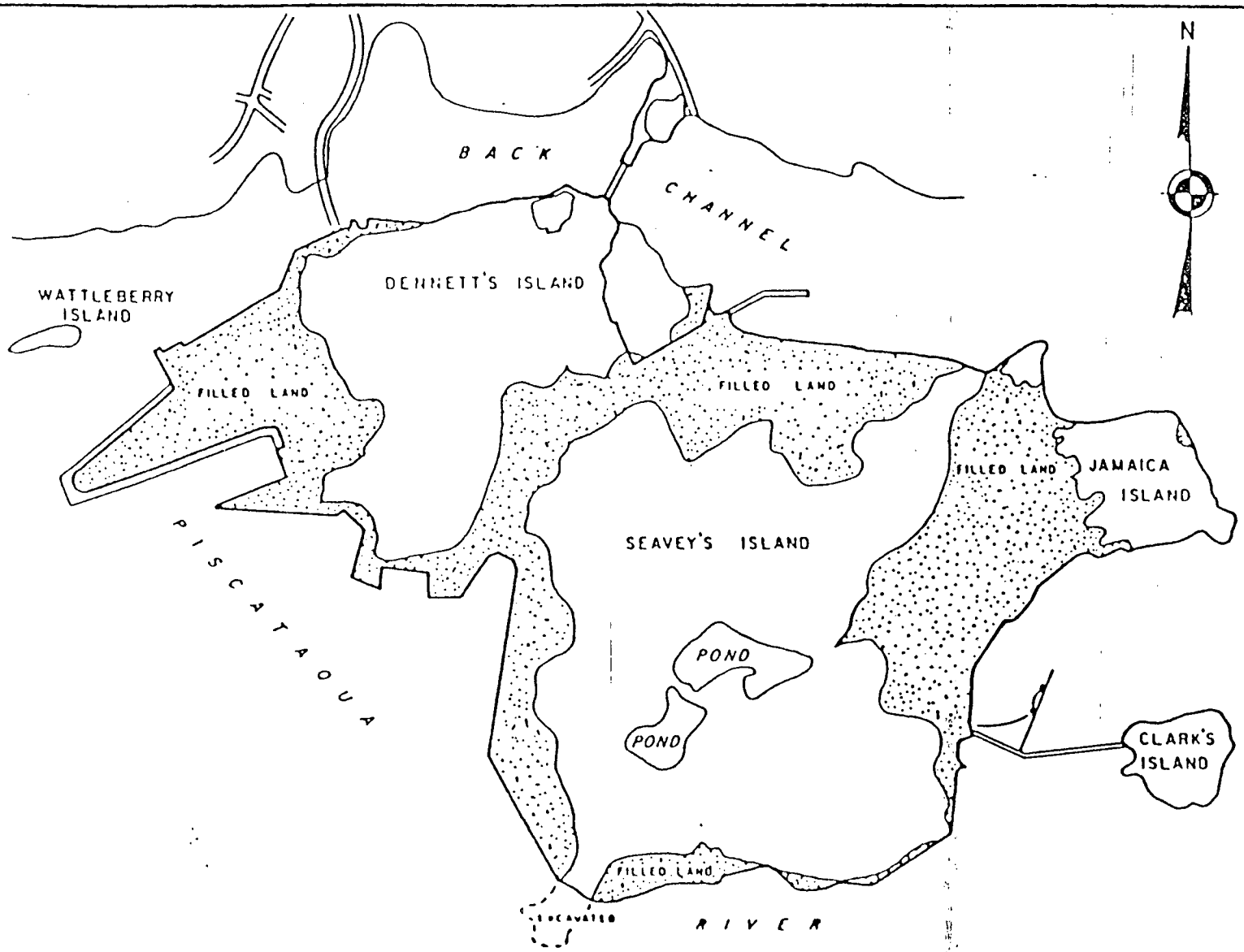

FIGURE 2

ISLANDS COMPRISING PORTSMOUTH NAVAL SHIPYARD

INITIAL ASSESSMENT STUDY
PORTSMOUTH NAVAL
SHIPYARD

GEOLOGY AND SOILS

The bedrock under the Portsmouth Naval Shipyard is principally of the Kittery Formation, a metamorphosed sedimentary rock of Silurian age. Its chief component consists of a variety of metamorphosed sandstones, siltstones and claystones. The Portsmouth Fault is the contact between the Kittery and Rye Formations and reportedly occurs from New Hampshire to the southeastern end of the shipyard.

Seavey Island and the surrounding vicinity has been greatly influenced by glacial activity. Glaciers have scoured and smoothed out the surface of the bedrock and then deposited till over most of the area. Weathering and erosion have exposed some of the bedrock, especially near the sea coast.

The inland water areas continue to accumulate sediments from the erosion of land masses, a process that began millions of years ago.

Much of the coastal area is blanketed by a shallow thickness of soil, sediment and glacial till overlying the bedrock. These unconsolidated materials are generally no greater than 20-50 feet thick but may vary locally.

The Portsmouth Naval Shipyard has increased its acreage by connecting several small islands through dredging and filling of inter-waters during previous activities. Landfilling during the past has increased the thickness of fill to approximately 15 to 20 feet over parts of the island. It is reported that a medium to soft clay exists beneath the fill in the Jamaica Island area of the shipyard.

GROUNDWATER

Groundwater on Seavey Island occurs at shallow depths in unconfined glacial outwash sands and gravels. Recharge, discharge and tidal fluctuations create a local groundwater response that varies in depth from approximately 13 feet at mean low tide to 5 feet at mean high tide. Recharge to the groundwater comes from precipitation that falls on the island, infiltrates the ground, and percolates downward to the water table. There is not sufficient information at present to determine the quantity of precipitation that percolates to the ground water table. Much of the shipyard is developed and groundwater recharge is reduced in these areas. Groundwater outflow to the Piscataqua River and the estuary waters surrounding the island probably accounts for most of the natural discharge from Seavey Island.

There is no groundwater development at the shipyard. Portsmouth Naval Shipyard receives its supply water from the town of Kittery.

Subsurface materials consist of natural stratum and fill. Much of the shipyard was formerly intertidal areas (Figure 2) that has since been filled with dredge spoils, construction wastes and natural materials. The naturally-occurring soil material at Seavey Island is classified as Lyman fine sandy loam. This is overlain by about 3-15 feet of what has been described as "overburden," and underlain by a dense glacial till

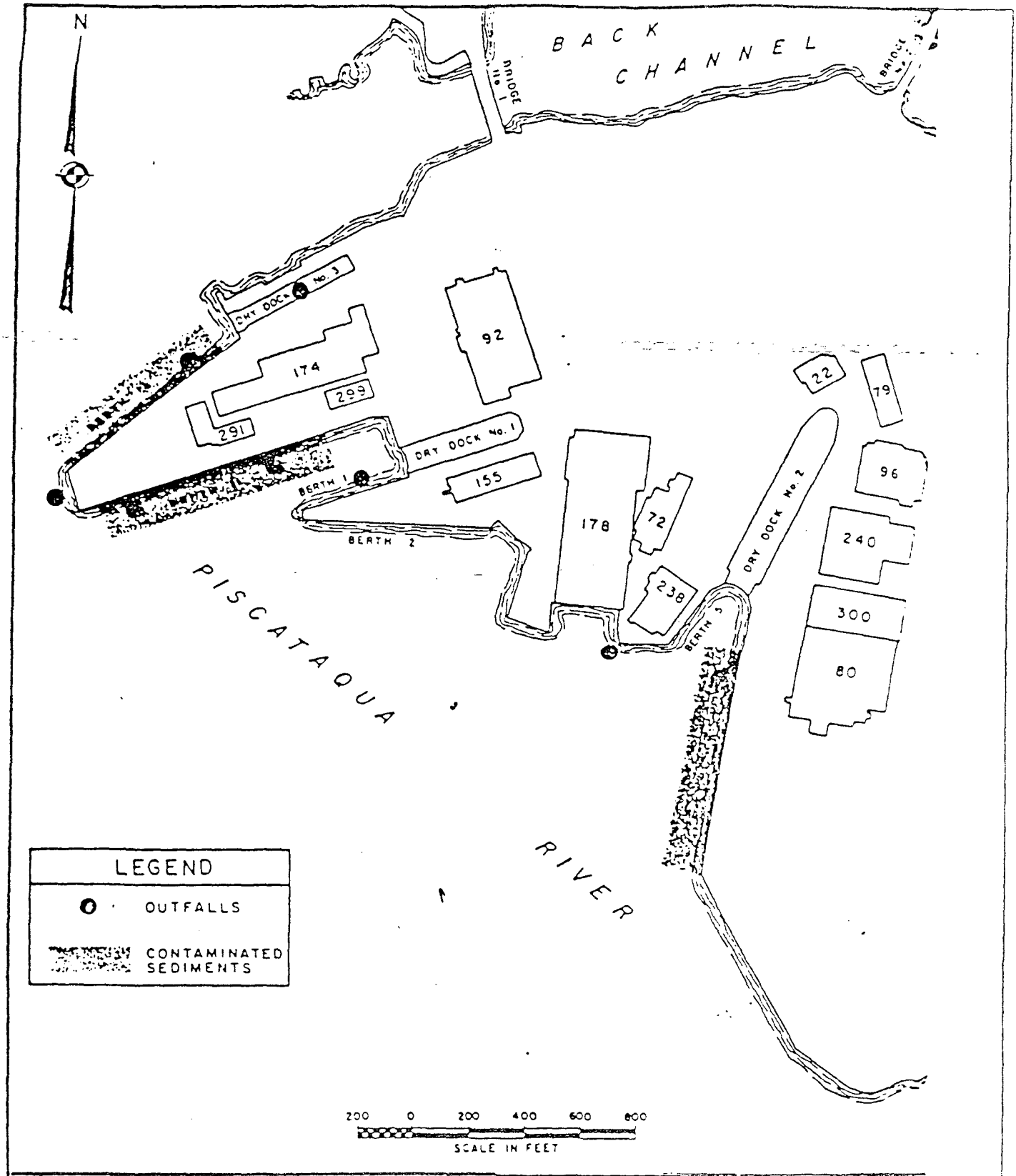

FIGURE 3

INDUSTRIAL WASTEWATER OUTFALLS

INITIAL ASSESSMENT STUDY
PORTSMOUTH NAVAL
SHIPYARD

and bedrock. The depth to bedrock over much of the coastal area is reported to be 0-10 feet. Landfilling activities have increased the thickness of the overburden throughout much of the island.

It has been stated in tidal flushing studies conducted in this area, as reported in Initial Assessment Study of Portsmouth Naval Shipyard, Portsmouth, New Hampshire, dated June, 1983, contaminants released into the water are removed in 6 to 12 tidal cycles. However, this does not address the quantity or concentrations of contaminants released from leachate or near shore sediments. There is documented evidence from data collected at the face of the Jamaica Landfill indicating the presence of high levels of chromium, lead, nickel, PCBs and VOCs in the sediments and biota.

The permeability of the saturated zone on Seavey Island is not known, although it would be undoubtedly highly variable because of the variety of subsurface materials that are present. Leachate rates in disposal areas and especially in areas of high permeability, may tend to be promoted where there is a significant tidal influence on the groundwater table.

Very little information is known about the groundwater on Seavey Island, due to the lack of development of this resource. There are no groundwater monitoring wells at the facility.

WINDS

Wind directions vary seasonally with west-northwest winds dominating in the winter, and southwest-southeast winds increasing during spring and summer. The Portsmouth region is situated in the path of prevailing westerly winds but the area experiences a variety of air inversions from the north, south and east. Localized fog occurs about 15 percent of the time during all months of the year and is dense enough to restrict visibility to less than one mile. Wind speed data at the facility has not been provided.

LAND USE

Land use in the vicinity of the Portsmouth Naval Shipyard consists of high density residential areas immediately to the north (Kittery) and southwest (Portsmouth), recreational areas, and some light commercial industry (Figure 10). The City of Portsmouth, New Hampshire, located southwest of the shipyard at the mouth of the Piscataqua River, is the largest city in the region, having a population of over 25,000 (IAS, June, 1983). Kittery, Maine is a residential community of 11,000 people and is located across the Piscataqua River, north of Portsmouth. The countryside north and west of Kittery consists of forests and some farmland. Along the coast, south of Portsmouth, are small communities and seasonal dwellings.

The shipyard is a highly-developed industrial property with limited vegetative growth. Most of the ground cover consists of landscaping plants, buildings and pavement.

Neighboring industry includes retail and wholesale trade, textile, manufacturing, power plants, and gas storage facilities.

The undeveloped areas around the Portsmouth area, such as Clark's Island which is located immediately east of the shipyard, supports a variety of vegetation and animal life. Clark's Island is an excellent habitat for small mammals and provides a wintering and nesting area for a variety of waterfowl.

Portsmouth Harbor is an estuarine environment that includes tidal marshlands and extensive intertidal zones. This environment supports both a variety of terrestrial and especially aquatic life. Recreational and commercially important fish and shell species are abundant in this area.

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4.0 RELEASE PATHWAYS, TARGET POPULATIONS AND ENVIRONMENT

GROUNDWATER

Groundwater occurs at shallow depths throughout Portsmouth Naval Shipyard and Seavey Island. Groundwater recharge occurs through precipitation which is evenly distributed throughout the year. Recharge is limited in areas where the ground surface is covered. Presently, groundwater is not withdrawn from the island.

Groundwater discharge most likely occurs from the island to the waterways. The process probably follows a typical island recharge/discharge relationship where precipitation percolates to the groundwater table, continues in a downward descent and eventually is forced to discharge as seepage either along the shoreline, or offshore, due to hydrostatic pressure and differences in the fluid densities of fresh and saltwater. Groundwater flow patterns on Seavey Island have not been established, but can be expected to generally follow a course radially outward from the islands towards the Piscataqua River and other surrounding waterways.

Subsurface soils and fill material vary in permeability. Measurements of this parameter have not been performed but it can be expected that liquids could easily migrate through these subsurface materials into the groundwater and subsequently offshore.

Portsmouth Naval Shipyard has historically disposed of unknown quantities of contaminated sediments in the Jamaica Island Landfill. These sediments were dredged from outfall areas and contained heavy metals, oils and grease, and PCBs. A 2-foot clay cap has been placed over the portion of the landfill where the dredge spoils were disposed. In addition, a clay barrier has been constructed lining the perimeter of a rock dike that borders the shoreline. Sampling and testing of the sediments along the face of the landfill have indicated high levels of chromium, lead, nickel, PCBs and VOCs. Elevated levels of PCBs were detected in lobsters and elevated levels of heavy metals in algae. The source and mechanism of contaminate release is not known.

A fuel oil tank farm exists at the southern end of Seavey Island, southeast of Berth 6. A number of releases have been reported from tanks and associated piping, including a 3,000-gallon release from an underground pipeline in 1978.

The potential for groundwater contamination is very high on Seavey Island, based on existing available data. Landfill areas are likely sources to promote continuing contaminant releases to the groundwater system. The fate of groundwater discharge on Seavey Island has not been documented.

SURFACE WATER

Surface water runoff is controlled primarily by a storm water collection system that directs drainage through various outfalls and ditches around the island. Surface water from the southern portion of the shipyard

drains into a couple of natural ponds and subsequently into the Piscataqua River.

Prior to the construction of the Industrial Waste Treatment Plant in 1976, liquid industrial wastes were discharged through outfalls to the river.

A release pathway to the surface waters exists via the storm drains. In addition, surface water discharge has the potential of carrying contaminants that may exist in the surface soils from present or past disposal practices.

AIR EMISSIONS

Air emissions do not appear to pose a threat to the environment. There have been no reported spills of liquid wastes that resulted in or had the potential of resulting in noxious air emissions. The Naval Shipyard facilities utilize propane, MAPP gas, liquid nitrogen and Freon solvent. Of these, a Freon Recovery Operations is the only listed SWMU. It is reported in IAS, June, 1983 that the condition of sections of old underground piping carrying MAPP gas is questionable.

SUBSURFACE GAS

The potential for subsurface gas generation is higher in the areas of the island where landfilling activities have occurred. Methane gas is commonly generated in landfills where garbage or other decomposable organic matter have been disposed. There is no current available data that indicates this is the case on Seavey Island, although general refuse and trash was disposed of over a long period of time at the Jamaica Island Landfill.

5.0 UNIT CONDITIONS, CONCLUSIONS AND RECOMMENDATIONS

1. Unit Name: Hazardous Waste Storage Facility

Description: This unit is an active container storage area which received its RCRA permit in September 1985. The unit consists of a 9000 square foot asphalt pad that has a capacity of 600 55-gallon drums. The unit includes a hazardous waste operations building which is attached to the south end of the pad. Apparently 8 drums can be stored in the building. The unit is surrounded by an 8-foot chain-link fence. The location of the storage facility is in an area designated as Jamaica Island and is northeast and adjacent to the Jamaica Island Landfill. A letter dated August 9, 1985 from the Natural Resources Council of Maine to the Maine DEP (6) raised concerns that the unit may overlie portions of the Jamaica Island Landfill which may require remedial action.

Wastes stored at this unit are generated on site and shipped off site for disposal. An exception to this is indicated in a June 1986 civil suit by the Maine DEP (14) that identifies off-site hazardous wastes generated at Pease Air Force Base being stored at the unit.

Period of Operation: 1980 to Present

Wastes: Waste oils and waste oils contaminated with spent solvents (F001, F002); chlorinated and non-chlorinated solvents (F001, F002, F003, F005); painting wastes containing F003 and F005; acid/alkaline wastes (D002); and polychlorinated biphenyls.

Release Controls: The concrete pad is surrounded by a 6-inch asphalt containment berm and the area is sloped to a collection sump. The unit is located outside of the 500-year floodplain (5, 30). The storage facility includes segregated areas for the separation of incompatible wastes. Precipitation falling into the containment area is released unless it mixes with a spill (5).

History of Releases: As of January 1985, no hazardous material has been released to the surrounding environment.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: The potential for a release to the air is low. All wastes are stored in closed drums and the area is inspected daily.

GROUNDWATER: The potential for a release to the groundwater is low. The container storage area is surrounded by a secondary containment system with sufficient capacity.

SURFACE WATER: The potential for release to surface waters is low. The unit is surrounded by an asphalt berm to control runoff and, is located outside the 500-year floodplain.

SUBSURFACE GAS: There is no potential for a buildup of subsurface gas. All wastes are stored aboveground in closed containers.

RECOMMENDATIONS: Since this unit is a licensed RCRA facility with frequent inspections and no history of releases, no additional action is required.

2. Unit Name: Freon Recovery Operations

Description: This unit consists of a still and holding tank for reclaiming Freon solvent used in various flushing operations. The still is located in the Controlled Industrial Area (CIA) in Building 174. The associated holding tank is a covered dumpster supported on railroad ties. Visual inspection indicates the tank is in good condition with no evidence of spills. The tank, located adjacent to the building, has a capacity of 4000 gallons. The reclaimed Freon is used on site while still bottoms are drummed and disposed off site. The unit is currently inactive and it is not known if the tank contains reclaimed Freon.

Period of Operation: 1965 to Present

Wastes: Spent Freon solvent consisting of trichlorotrifluoroethane (F002).

Release Controls: The recovery still is located within Building 174. The tank is located in a paved area. Pavement drainage is eventually discharged to surface waters via storm drains.

History of Releases: As of January 1985, the operator indicates that there has been no release of hazardous materials from this unit.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: The potential for a release to the air is low. The recovery still is located within Building 174 and the holding tank is covered.

GROUNDWATER: The potential for a release to the groundwater is low. The unit is surrounded by paved areas and storm sewers.

SURFACE WATERS: There is a moderate potential for small quantities of reclaimed Freon to be released to the river. This would occur in the event of operational spills.

SUBSURFACE GAS: There is no potential for the buildup of subsurface gas. All operations associated with this unit are aboveground.

RECOMMENDATIONS: Since a hazardous waste is recycled at this unit, periodic site inspections should be conducted to observe management practices in the event this unit becomes reactivated in the future.

3. Unit Name: Industrial Waste Treatment Plant

Description: The treatment plant consists of an unknown number of treatment tanks located in the southern end of the shipyard within Building 298. The basic treatment process is heavy metal precipitation through pH adjustment and chemical addition followed by additional pH neutralization. Effluent after treatment is discharged to the Kittery sanitary sewer system. Sludge is stored in a 20 cubic yard roll-off container prior to being disposed off site. The container is kept covered with a tarp and there is no visual evidence of releases. A State permit application has been submitted in September 1985. The treatment plant includes Hazardous Waste Storage Tank No. 23 which has been closed.

Period of Operation: 1976 to Present

Wastes: Alkaline and acidic spent cleaning solutions containing metals including lead, cadmium and chromium; and waste battery acid. The resulting sludge is a metal hydroxide that includes copper, chromium, lead, iron, manganese, nickel, cadmium and zinc. Approximately 800,000 gallons of wastewater is treated annually. In addition, a Consent and Agreement Order (15) has indicated that approximately 10 gallons of acetone per month has been drained to the system in violation of the shipyard's discharge permit.

Release Controls: All tanks are closed top and within Building 298. The building consists of a concrete floor with a spill collection sump and pump for collecting releases.

History of Releases: Reportedly there are no releases from the unit that would affect soil or water characteristics.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: The potential for a release to the air is low. All wastes are treated in closed tanks. In addition, the nature of the wastes does not include volatiles that would be released to the air.

GROUNDWATER: The potential for a release from the unit is low. All tanks are enclosed within Building 298 which contains a secondary collection device. In the past, a moderate potential for a release to the groundwater from underground Tank No. 23 existed.

SURFACE WATERS: The potential of a release to the surface waters is low. A secondary collection device would collect leaks from the unit. Structural failure of one of the larger treatment tanks would cause a release to the pavement surrounding the building and eventually to the river via storm drains.

SUBSURFACE GAS: There is no potential for a buildup of subsurface gas. All wastes are treated aboveground.

RECOMMENDATIONS: Since the industrial waste treatment plant is to be permitted under RCRA and no history of releases exists, no further action is required for this unit.

4. Unit Name: Intermediate Storage Facilities

Description: Four waste holding areas are located at the western end of the facility in the Controlled Industrial Area. Three of the units are located adjacent to the plate yard and a fourth is located near Building 178. The units are mobile and consist of areas surrounded by an 8-foot chain-link fence mounted on H-beam foundations. A February 1985 Industrial Survey Report (13) shows an alternate location of the units south of Building 174. The units serve as temporary holding areas where drummed wastes are stored on pallets prior to transfer to the Hazardous Waste Storage Facility (SWMU 1). The capacity of each area is 9 to 12 55-gallon drums. Reportedly, these units are included in the permit for the Hazardous Waste Storage Facility.

Period of Operation: Not provided.

Wastes: Waste oils and waste oils contaminated with spent solvents (F001, F002); chlorinated and non-chlorinated solvents (F001, F002; F003, F005); painting wastes containing F003 and F005; acid/alkaline wastes (D002); and polychlorinated biphenyls.

Release Controls: There are no runoff controls. The units are bordered by pavement and a 5-foot-wide soil area running the length of three of the units. Each of the areas does include a supply of speedi-dry for containing and cleaning spills.

History of Releases: Reportedly no leaks or releases have occurred from any of these storage areas.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: The potential of a release to the air is low. Wastes are stored in closed drums.

GROUNDWATER: The potential for releases to the groundwater is moderate. Releases to the groundwater would be limited to spills that could infiltrate the unprotected soil area adjacent to three of the units.

SURFACE WATERS: There is a high potential for small releases to the surface waters. Any spills would most likely migrate along the pavement and eventually be discharged to the river via storm drains.

SUBSURFACE GAS: There is no potential for the buildup of subsurface gas. All wastes associated with this unit are stored aboveground.

RECOMMENDATIONS: Due to long-term potential of releases to the unprotected soil area adjacent to plate yard, soil sampling should be conducted consisting of a minimum of one sample adjacent to each of the three areas. The samples should be tested for TOC, PCB and the spent solvents. In addition, temporary berms should be constructed surrounding each area to contain potential releases. Since the units are mobile, the historical location of each unit should also be requested.

5. Unit Name: Industrial Waste Outfalls

Description: Three discharge points along the Piscataqua River were located at the western end of the site. The outfalls were used to discharge liquid industrial wastes prior to construction of the Industrial Waste Treatment Plant. The outfalls were located near Berths 6, 11 and 13, as shown on Figure 8-1.

Period of Operation: 1945 to 1975

Wastes: Industrial wastewaters including wastes from plating and battery shops contained in Buildings 79 and 238.

Release Controls: None

History of Releases: In 1976 sediments in the outfall areas were sampled and tested. The results show heavy metals contamination including mercury, lead, cadmium, chromium, copper and zinc; high concentrations of oils and grease; concentrations of PCBs at one location which were "significantly higher than reported for coastal waters of Maine, England and the Mediterranean Sea"; and concentrations of total cyanide and phenols. Dredging operations were conducted to remove contaminated sediment which were disposed in the Jamaica Island Landfill. The effectiveness of dredging operations is not known.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: There is no potential for past releases to the air. The outfalls are located below the river level.

GROUNDWATER: There exists a low potential of past leakage from the culverts to the groundwater.

SURFACE WATERS: Large releases of hazardous wastes to the surface waters has been documented in sediment and biota.

SUBSURFACE GAS: No potential exists for the buildup of subsurface gas due to the nature of the wastes.

RECOMMENDATIONS: Additional sediment sampling should be conducted to determine the effectiveness of dredging activities. If contamination is detected, programs should be implemented to characterize the extent of contamination and remediate the release.

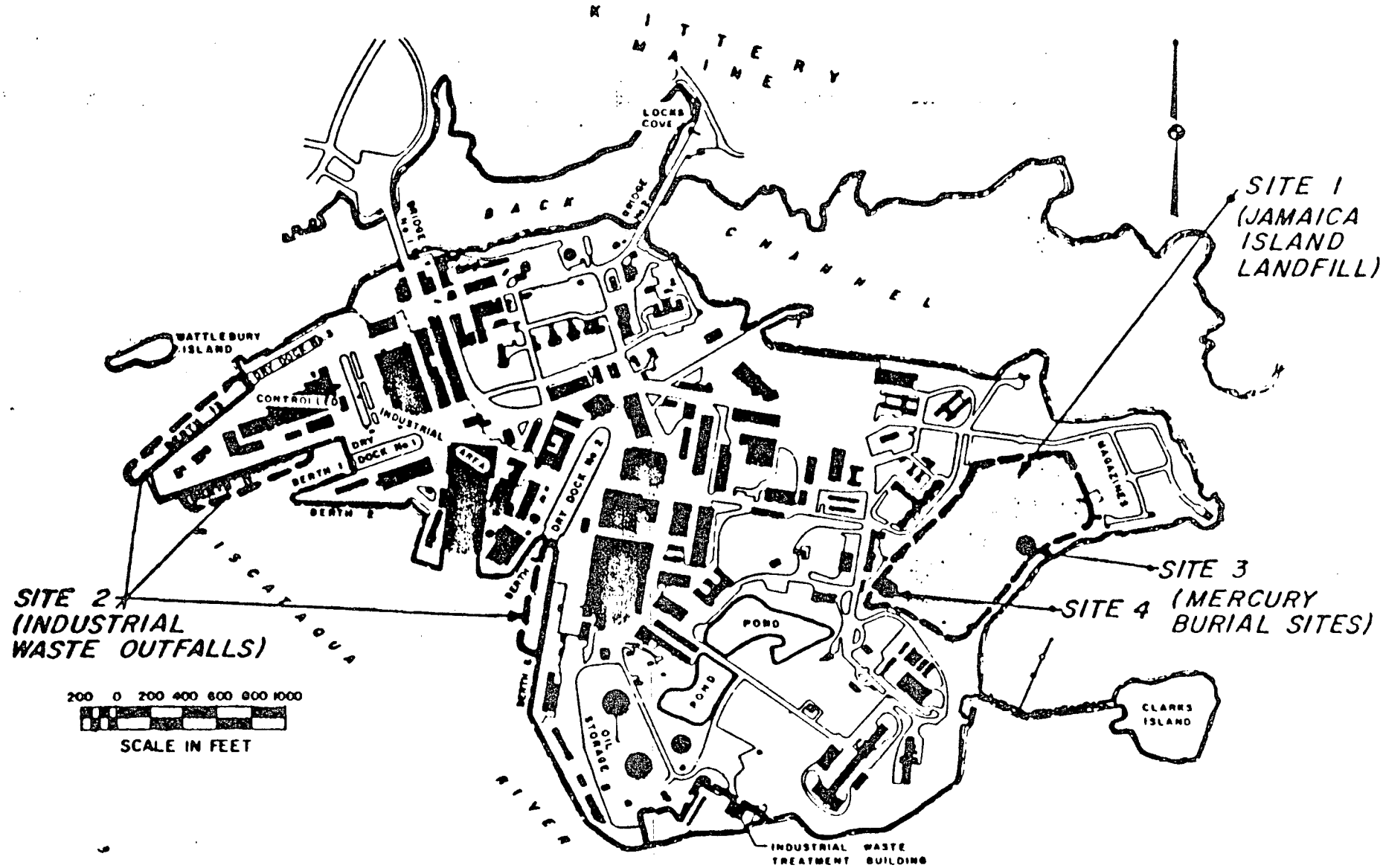

FIGURE 8-1
PORTSMOUTH NSY DISPOSAL SITES

INITIAL ASSESSMENT STUDY
PORTSMOUTH NAVAL
SHIPYARD

6. Unit Name: DPDO Storage Yard

Description: The Storage Yard is a 4-acre site that served as a temporary storage area for refuse prior to off-site recycling or disposal. The unit is located at the southern end of the facility adjacent to the Piscataqua River.

Period of Operation: The unit has been in operation over 30 years.

Wastes: Lead and nickel-cadmium battery elements, motors, typewriters, paper products, and scrap metal.

Release Controls: There are no release controls. Visual inspection indicates ponding of precipitation in some areas and direct runoff to the river in other areas.

History of Releases: Verification and characterization studies (2) which included soil sampling have found extremely high concentrations of chromium, cadmium, lead, and nickel in the soils. Table 14 of the report (2) includes analyses of sediment samples with contaminant values as high as 107,087 ppm of lead, 770 ppm of nickel and 203 ppm of chromium. These appear to be the only parameters tested. Whole pieces of battery cells have reportedly at times been littered over the riverbank and in the river itself. Reddish brown soil staining can be observed in several areas of the site. Mussel and algae samples collected off the face of the Storage Yard have shown elevated levels of lead (1).

The Verification Step Report (2) recommends additional sampling and analysis to identify the extent of the contamination. A proposed sampling plan is contained in the report. However, the draft report recommendations are dated February 1984. Since then, no additional action has been taken. In addition, interviews with a facility representative during the site visit indicate that no additional investigation is planned at this time.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: The potential for a release to the air is low due to the non-volatile nature of the wastes.

GROUNDWATER: The potential for a release to the groundwater is high. Documented soil contamination indicates contaminants have migrated to the unsaturated zone.

SURFACE WATERS: There is documentation of releases to the river from mussel and algae sampling. Additional releases to surface waters may be continuing due to uncontrolled runoff.

SUBSURFACE GAS: The potential for the buildup of subsurface gas is low due to the nature of the wastes.

RECOMMENDATIONS: Additional soil sampling should be conducted to determine the extent of contamination horizontally and vertically. The horizontal extent of sampling should not be limited to the storage area but should extend down the riverbank and include river sediments. Samples should be tested for metals, TOC and PCBs. Remedial action should then be implemented to halt the spread of contaminants from the area, and remove contaminated sediments along the riverbank.

7. Unit Name: Interim Storage Areas

Description: Four waste storage areas were used for the storage of drummed facility wastes prior to construction of the current Hazardous Waste Storage Facility, Building 313. The areas were located in the Plate Yard and Buildings 55, 98 and 227. Building 98 contained a mercury waste storage area. A closure plan for the storage areas has been approved by the State of Maine.

Period of Operation: ? to 1981

Wastes: Waste oils and waste oils contaminated with spent solvents (F001, F002); chlorinated and non-chlorinated solvents (F001, F002, F003, F005); painting wastes containing F003 and F005; acid/alkaline wastes (D002); polychlorinated biphenyls; and mercury wastes.

Release Controls: The Plate Yard storage area consisted of a paved area with no berms adjacent to an exposed soil area. The other storage areas were contained within buildings with concrete floors.

History of Releases: Reportedly no record of spills or leaks are on record for these areas. Site inspection by the Maine DEP indicate the areas are clean with no visual evidence of past releases.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: There is no potential for a release to the air. The units are closed with all wastes and waste residues removed.

GROUNDWATER: There is a low potential of a past release from the storage areas within buildings. Leakage and spills at the Plate Yard may have infiltrated the adjacent soil area. This soil area is located between the plate yard and the intermediate storage areas (SWMU 4). Recommendations for soil sampling included with SWMU 4 will adequately detect potential contamination.

SURFACE WATERS: The potential of a past release to the surface waters from the storage areas enclosed in buildings is low. Releases from the Plate Yard may have migrated to the river via storm drains.

SUBSURFACE GAS: There is no potential of the buildup of subsurface gas. All wastes were stored aboveground.

RECOMMENDATIONS: No further action is required for this unit. The facility has closure plans which have been approved by the Maine DEP.

8. Unit Name: Jamaica Island Landfill

Description: This unit is located at the eastern end of the facility adjacent to the Piscataqua River (Figure 4). The landfill covers an area of 25 acres and contains an unknown amount of materials considered as hazardous waste. Table 1 indicates some of the types and quantities of materials that were disposed at the site.

Prior to landfilling activities, tidal flats separated Jamaica Island from Seavey Island. Over a 20-30 year period this area was filled with hazardous and nonhazardous wastes. In 1978, the shipyard received approval to dredge over 10,000 cubic yards of sediment from Berths 6, 11 and 13, and to dispose of the material in the area of the landfill illustrated in Figure 4. The material was placed on top of a portion of the landfill and was encapsulated by a clay barrier wall along the Piscataqua River and a clay cap to prevent infiltration. Visual inspection indicates that the portion of the landfill with a clay cap is graded and vegetated. Other portions of the landfill are poorly drained with ponding, tire tracks and scattered debris.

Sediment analyses conducted in 1976 at Berths 6, 11 and 13 indicated that the dredge spoils contained significant concentrations of heavy metals.

Period of Operation: Approximately 1945 to 1978

Wastes: In addition to general refuse, trash and construction rubble, the unit accepted incinerator ash, plating sludges containing chrome, lead and cadmium; asbestos insulation; volatile organics including TCE, methylene chloride, toluene and MEK; acetylene and chlorine gas cylinders; contaminated dredge spoils containing chromium, lead, small amounts of PCB, mercury and possibly phenols; waste paints and solvents; and spent sandblasting grit. Personnel have indicated that waste oils containing PCBs may also have been disposed at the site prior to construction of a holding tank in 1972. In addition, a 1971 study (18) indicates the disposal of 30 drums of unknown material and 500 5-gallon containers of fire fighting chemicals.

Release Controls: A 2-foot clay cap has been placed over the portion of the landfill that accepted contaminated dredge spoils. In addition, a clay barrier has been constructed lining the inside of the rock dike.

History of Releases: Sampling and testing of sediments along the face of the landfill have indicated high levels of chromium, lead, and nickel. In addition, PCBs were detected in lobsters as high as 8.8 ppm and analyses on mussels showed elevated levels of nickel and PCBs. Elevated levels of chromium, cadmium, lead and nickel were detected in algae samples from the area.

TABLE 1

HAZARDOUS MATERIALS DISPOSED OF AT JAMAICA ISLAND LANDFILL

Substance	Estimated Quantity	Time Period	Comments
Plating sludges			
Chrome	5,000 - 10,000 pounds	1945-1972	Sludges were mixed in with normal refuse and were disposed of directly into landfill. Exact location unknown.
Lead	5,000 - 10,000 pounds	1945-1972	
Cadmium	5,000 - 10,000 pounds	1945-1972	
Asbestos insulation	Several thousand pounds	1945-1960	Exact location unknown.
Volatile organics			
TCE, methylene chloride, toluene, MEK	20,000 gallons	1955-1975	Drums were taken to the landfill where wastes were drained out directly onto the ground.
Acetylene and chlorine gas cylinders	100-200 cylinders	1955	Cylinders were buried full.
Contaminated dredge spoils containing:		1978	Total spoils deposited was 108,000 cubic yards. Small amounts of PCBs and mercury were also found in dredge spoils. Dredge material came from sediments at Berths 6, 11 and 13.
Chromium	5,000 pounds		
Lead	20,000 pounds		
Waste paints and solvents	500,000 gallons	1945-1965	Probably disposed of in whole drums.
Spent sandblasting grit	50,000 tons/year	1945-1975	Scattered throughout site.

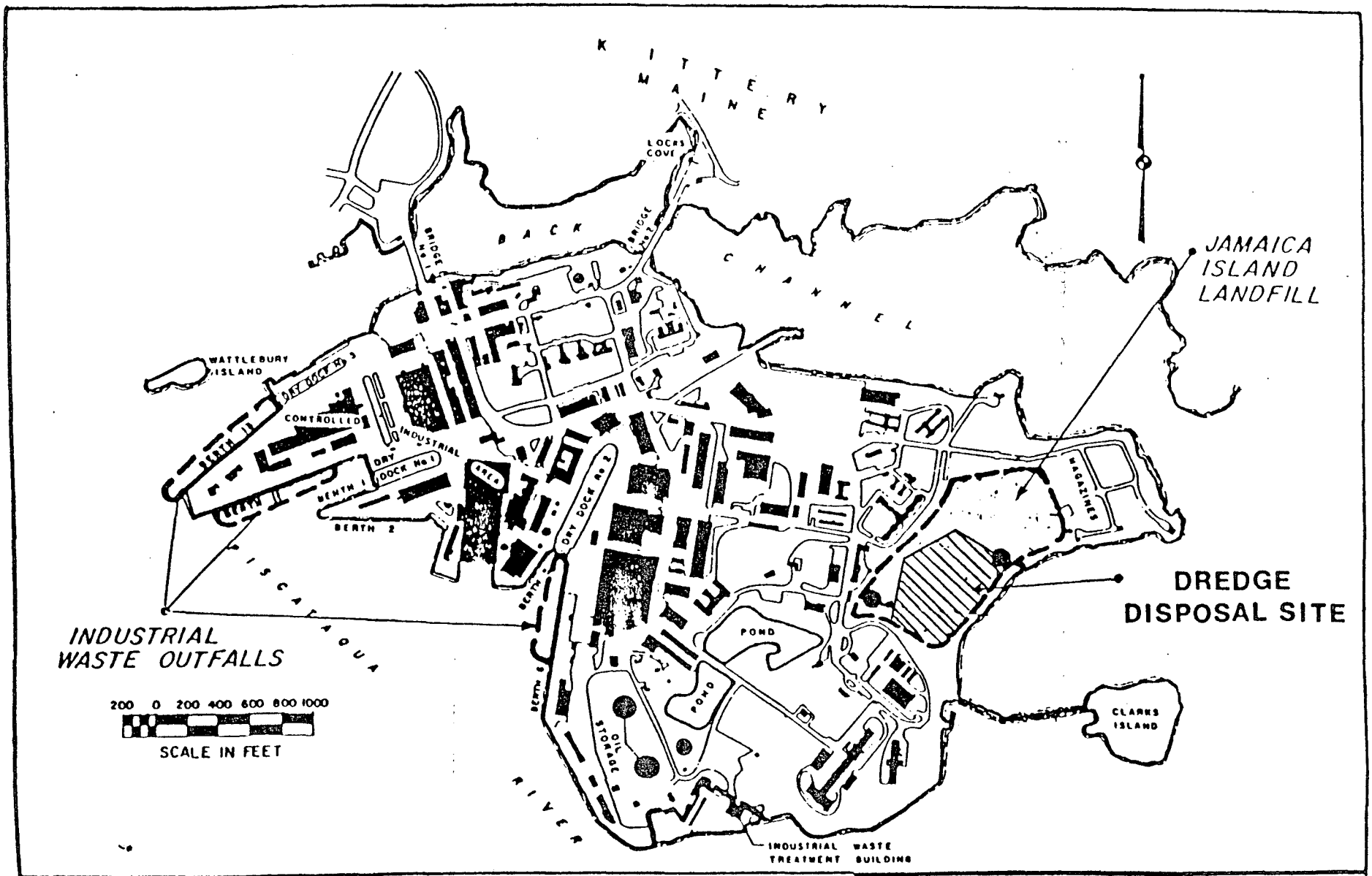

FIGURE 4

PORTSMOUTH NSY DISPOSAL SITES

INITIAL ASSESSMENT STUDY
PORTSMOUTH NAVAL
SHIPYARD

The Verification Step Report (2) summarizes the findings of the IAS Report (1). The report states that the results of sediment and biota sampling indicates contamination along the entire face of the landfill. Contaminants were found at all sampling stations along the face of the landfill as well as at all depths. In addition, a "hot spot" of contamination was identified along the southern face of the landfill. Table 8, from the Verification Step Report shows extremely high levels of contaminants from sediment samples with values as high as 67,247 ppm of chromium, 3,822 ppm of nickel and 625 ppm of lead.

The Verification Step Report (2) recommends additional sampling and analysis to determine if the landfill is continuing to release contaminants and identify the extent of the contamination. A proposed sampling plan is included in the report. However, the draft report recommendations are dated February 1984. Since then, no additional action has been taken. In addition, interviews with a facility representative during the site visit indicate that no additional investigation is planned at this time.

A 1971 study (18) by an outside consultant indicated that wastes used as fill between Seavey Island and Jamaica Island included incinerator residue. The report characterized the residue as the most objectionable component of the fill wastes and stated the potential for groundwater pollution is high.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: The potential for vapor releases from the Jamaica Island Landfill is high. It is reported that approximately 100-200 acetylene and chlorine gas cylinders were buried full in 1955. In addition, 20,000 gallons of volatile organics, including TCE, methylene, chloride, toluene and MEK were drained directly onto the ground at the landfill during a period from 1955-1975. There are also unknown quantities and types of gas tanks or cylinders and volatile wastes that have been placed in this landfill.

GROUNDWATER/SURFACE WATERS: The potential for continuing contaminant releases into the groundwater, Piscataqua River and surrounding estuaries is high. The site is underlain by discontinuous clay and till deposits of varying permeabilities, and is partially covered by a two-foot clay cap to prevent infiltration. A clay barrier was also emplaced along the perimeter of the landfill against a riprap dike that separated shoreline waters from the edge of the fill.

The effectiveness of the clay cap and barrier is in question. Available data indicates that tidal fluctuations are causing inundation of the landfill and the dredge spoils. This could be resulting in a release pathway whereby contaminants from the landfill are migrating from beneath the site into the Piscataqua River. In addition, precipitation may be promoting leaching of landfill materials to the groundwater.

SUBSURFACE GAS: The potential for subsurface gas generation is high. The landfill accepted general refuse and other organic wastes from approximately 1945 to 1978. Methane gas is commonly produced in landfills, when garbage containing organic materials decompose. There is also a high potential for the generation of other hazardous vapors and gases as described under the potential for air releases.

RECOMMENDATIONS: A remedial investigation should be initiated as soon as possible to determine the extent of contaminant migration released from the Jamaica Island Landfill. The investigation should include the following:

- Additional identification and location of wastes disposed in the landfill.
- A soils and sediment investigation that would be capable of providing the lateral and vertical extent of contamination in and around the landfill. The soil investigation should extend to all areas shown as fill on Figure 2 of this report unless the shipyard can justify otherwise.
- Unsaturated zone monitoring to detect migration of contaminants above the water table.
- Installation of a monitoring well network that would be capable of detecting all potential contaminant migration paths as well as the effectiveness of the clay cap and barrier.
- Periodic air monitoring to evaluate whether hazardous vapors or gases are migrating through the landfill cover.
- A risk assessment of the commercial fishing (i.e. lobsters) in the area.

Results of the remedial investigation should be reviewed to proceed with acceptable clean-up activities.

9. Unit Name: Mercury Burial Sites

Description: Two mercury burial areas are located within the Jamaica Landfill Area. One is located at the southwest end of the landfill while the other is located at the east end adjacent to the Piscataqua River.

Period of Operation: 1973 to 1975

Wastes: Mercury contaminated wastes including fluorescent bulbs, thermometers, mercury switches and rags, brooms, and dust pans contaminated with mercury.

Release Controls: The wastes were encapsulated in 4-foot-diameter concrete pipe sections with the ends capped with one foot of poured concrete. The concrete vaults were buried under 8 to 10 feet of fill. There are approximately 6 vaults in each of the two areas. Visual inspection indicates that the areas are vegetated with no signs of erosion or distress.

History of Releases: There is no record of a release from the concrete capsules.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: The potential for a release to the air is low. The wastes are encapsulated and buried.

GROUNDWATER: The potential for a release to the groundwater is low. The wastes are encapsulated in concrete.

SURFACE WATERS: The potential for a release to the surface waters is low. The wastes are encapsulated and buried.

SUBSURFACE GAS: There is no potential for the buildup of subsurface gas due to the nature of the waste.

RECOMMENDATIONS: No further action is required for this unit.

10. Unit Name: Tank No. 24

Description: This unit is an underground, 9680-gallon holding tank for waste battery acid resulting from battery disposal operations. The unit is located outside of Building 238. The unit has been closed and wastes are now collected in a portable chemical tank. As part of a Consent Agreement and Order (15), the Part B Application has been amended to include this activity.

Period of Operation: 1974 to 1984

Wastes: Sulfuric acid contaminated with lead (pH <2).

Release Controls: Not provided.

History of Releases: In 1984 a 2-inch hole was discovered at the bottom of the tank due to groundwater inflow when empty. The period of potential release is not known. The tank has since been taken out of service and is to be removed according to a closure plan approved by the State of Maine.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: There is no potential for a release to the air. The underground tank is closed.

GROUNDWATER: There is documentation of a release to the groundwater. There is no potential for additional releases since the tank is closed.

SURFACE WATERS: There is low potential for a release to the surface waters. Leakage from the aboveground portable tank could be released to the surface waters via storm drains.

SUBSURFACE GAS: There is a low potential for the buildup of subsurface gas due to the nature of the waste.

RECOMMENDATIONS: Since there is documentation of a release of unknown quantity from an underground tank that is located below the water level, groundwater detection monitoring wells should be installed. Samples should be tested for pH and metals.

11. Unit Name: Waste Oil Tanks (2) No. 12

Description: These units are railroad tank cars two 8000-gallon underground tanks constructed of steel. The tanks are buried side by side at the northeastern end of the Jamaica Landfill Area. The tanks are used to store oily wastes prior to off-site disposal.

Period of Operation: 1943 to Present

Wastes: Waste Oils from facility shops including cooling and cutting oils, motor oils, transmission oils, and hydraulic oils. A Consent and Agreement Order (15) has indicated that degreaser solvents have in the past been labeled as waste oils and may have been stored in these tanks. In addition, a February 1985 Industrial Survey Report (13) indicates that plant personnel have admitted placing small quantities of waste cleaning solvents into dumpsters which were emptied into the underground waste oil tanks at Jamaica Island.

Release Controls: There are no known releases from this unit.

History of Releases: In 1979 the tanks were excavated and inspected. There was no evidence of releases at that time.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: There is a low potential of a release to the air. Wastes are stored in closed underground tanks.

GROUNDWATER: There is a moderate potential for a release to the groundwater. The tanks have not been inspected or tested for leaks since 1979 and there is no runoff controls for spills during waste addition and removal.

SURFACE WATERS: There is a moderate potential for a release to the surface waters. Groundwater releases may be flushed out to the river and runoff from spills may migrate to the river.

SUBSURFACE GAS: There is a low potential for the buildup of subsurface gas due to the apparent low fraction of volatiles.

RECOMMENDATIONS: Since the unit accepts waste oils including cutting oils from several sources, a waste analysis of the contents of each tank should be requested to determine if the waste oil is ignitable or contains hazardous constituents. If so, periodic pressure testing for leaks should be required.

Units 12 through 17, 19 through 21, and 23 are underground tanks with limited information available. A description of each unit follows. Afterwards general conclusions and recommendations applicable to all these units is provided.

12. Unit Name: Boiler Blowdown Tank No. 25

Description: This unit is a 3800-gallon underground, steel tank, located adjacent to Building 72.

Period of Operation: 1974 to Present

Wastes: Boiler blowdown.

Release Controls: Not provided.

History of Releases: Not provided.

13. Unit Name: Rinse Water Tank No. 27

Description: This unit is a 700-gallon underground tank constructed of steel. The tank is located in the northwestern portion of the facility adjacent to Building 76.

Period of Operation: 1974 to Present

Wastes: Unspecified rinse water.

Release Controls: Not provided.

History of Releases: Not provided.

14. Unit Name: Waste Oil Tank No. 31

Description: This unit is a 750-gallon underground tank constructed of steel. The tank is located on the east side of Building 72 adjacent to an oil/water separator.

Period of Operation: 1976 to Present

Wastes: Unspecified Waste Oil.

Release Controls: Not provided.

History of Releases: Not provided.

15. Unit Name: Oil/Water Separator No. 32

Description: This unit is a 5400-gallon fiberglass tank. The unit is apparently a partially buried oil/water separator.

Period of Operation: 1976 to Present

Wastes: Apparently waste oils and wastewaters associated with waste oils.

Release Controls: Not provided.

History of Releases: Not provided.

16. Unit Name: Rinse Water Tank No. 34

Description: This unit is a 750-gallon underground tank constructed of steel. The tank is located adjacent to Building 174 in the northwestern portion of the facility.

Period of Operation: 1978 to Present

Wastes: Unspecified rinse water.

Release Controls: Not provided.

History of Releases: Not provided.

17. Unit Name: Floor Drain Water Tank No. 26

Description: This unit is a 700-gallon underground tank constructed of steel. The tank is located adjacent to Rinse Water Tank No. 34 outside of Building 174.

Period of Operation: 1974 to Present

Wastes: Unspecified floor drain water.

Release Controls: Not provided.

History of Releases: Not provided.

19. Unit Name: Waste Oil Tank No. 37

Description: This unit is a 500-gallon underground tank constructed of steel. The tank is located adjacent to the side of the Jamaica Landfill Area. The unit is currently out of service.

Period of Operation: 1985 to ?

Wastes: Waste oil from unspecified activities.

Release Controls: Not provided.

History of Releases: Not provided.

20. Unit Name: Oil/Water Separator No. 38

Description: This unit is apparently a partially buried oil water separator constructed of steel. The unit is located adjacent to Waste Oil Tank No. 37 near the Jamaica Landfill Area. The unit is currently out of service.

Period of Operation: 1985 to ?

Wastes: Apparently waste oil and associated wastewater from an unspecified source.

Release Controls: Not provided.

History of Releases: Not provided.

21. Unit Name: Acid/Alkaline Drain Tank

Description: A 695-gallon underground tank is located outside the Sheet Metal Shop, Building 75. The tank is used to store spent acid/alkaline metal surface-cleaning solutions and solid residues from metal working operations.

Period of Operation: Not provided.

Wastes: Unspecified waste acid and alkaline metal surface-cleaning solutions and solid residues.

Release Controls: Not provided.

History of Releases: Not provided.

23. Unit Name: Chemical Cleaning Facility Tank (Building 174)

Description: This unit is a 2270-gallon underground tank located between Building 174 and Dry Dock 3. The tank is part of a chemical cleaning facility.

Period of Operation: Not provided.

Wastes: Unspecified waste acid and alkaline metal surface-cleaning solutions and solid residues.

Release Controls: Not provided.

History of Releases: Not provided.

GENERAL CONCLUSIONS AND RECOMMENDATIONS FOR THE UNDERGROUND TANKS

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: The potential for a release to the air is low. Wastes are stored in closed underground tanks.

GROUNDWATER: There is a moderate potential for releases to the groundwater. The underground tanks have not been tested for leaks so releases would go undetected.

SURFACE WATERS: There is a moderate potential for releases to the surface waters via the groundwater. The apparent hydrogeology could cause a flushing of groundwater contaminants to the river.

SUBSURFACE GAS: There is a low potential for the buildup of subsurface gas based on the nature of the wastes.

RECOMMENDATIONS: Waste analysis should be requested for each of the units to determine the potential presence and concentrations of hazardous constituents. Units found to store wastes containing hazardous constituents or hazardous wastes should be periodically tested for leaks. If releases are detected, remedial investigations should be implemented.

18. Unit Name: Waste Lube Oil Tank No. 35

Description: This unit is a 4500-gallon aboveground tank constructed of steel. The tank is located in the central portion of the facility adjacent to Building 300. The tank is reportedly only used on a contingency basis for spills collected in a sump within Building 300. Visual observations during a site visit indicate that the tank is in good condition with no evidence of a release.

Period of Operation: 1982 to Present

Wastes: Waste lube oil from unspecified activities.

Release Controls: The tank is mounted a few feet above a concrete pad with no berms. The pad is surrounded by pavement.

History of Releases: Not provided.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: There is a low potential for a release to the air. Wastes are enclosed in a tank.

GROUNDWATER: There is a low potential for a release to the groundwater. The tank is in good condition and is surrounded by pavement.

SURFACE WATERS: There is a low potential for a release to the surface waters due to the infrequent use. Spills could be released to the river via storm drains.

SUBSURFACE GAS: There is no potential for a buildup of subsurface gas. All wastes are stored aboveground.

RECOMMENDATIONS: **No further action is required for this unit.**

22. Unit Name: Chemical Cleaning Facility Tank (Building 155)

Description: This unit is a 4000-gallon aboveground tank for collecting spills and wastes from metal surface cleaning operations. The unit is part of a chemical cleaning facility in Building 155.

Period of Operation: Not provided.

Wastes: Unspecified waste acid and alkaline metal surface-cleaning solutions and spills.

Release Controls: Not provided.

History of Releases: Not provided.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: The potential for a release to the air is low. The unit is contained within a building.

GROUNDWATER: The potential for a release to the air is low. The tank is located within a building with a concrete floor.

SURFACE WATERS: The potential for a release to the surface waters is low. The unit is contained within a building.

SUBSURFACE GAS: There is no potential for the buildup of subsurface gas. All wastes are aboveground.

RECOMMENDATIONS: A waste analysis should be requested to determine the pH and the potential presence of hazardous constituents, particularly metal contaminants. If the wastes are hazardous or contain hazardous constituents, periodic inspection of the tank, including shell thickness, should be required.

24. Unit Name: Asbestos Collection Dumpster

Description: This unit is a central collection dumpster for asbestos waste generated by machine shops and the Shipwright Shop. The dumpster has a capacity of 30 cubic yards. A site inspection has revealed that in addition to the central dumpster, numerous rolloff dumpsters for asbestos are located throughout the facility. The dumpsters are color coded and accept only asbestos waste. Asbestos waste is disposed off site. There are no manifest records for the wastes.

Period of Operation: Not provided.

Wastes: Asbestos.

Release Controls: Most of the dumpsters have loose flap lids and all asbestos is contained in double lined polyethylene bags and sealed.

History of Releases: Not provided.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: The potential for a release to the air is low. The asbestos is sealed in double lined bags.

GROUNDWATER: The potential for a release to the groundwater is low due to the solid nature of the waste.

SURFACE WATERS: The potential for a release to the surface waters is low. The asbestos is sealed in double lined bags and stored inside rolloff dumpsters.

SUBSURFACE GAS: There is no potential for the buildup of subsurface gas due to the nature of the waste.

RECOMMENDATIONS: No further action is necessary for these units.

25. Burnable Dumpsters

Description: Disposal dumpsters for burnable wastes including waste sorbent materials. A site inspection has revealed that there are numerous burnable dumpsters throughout the site. Operators have indicated that wastes are shipped off site to an incinerator. The facility representatives did not know the location or owner of the incinerator.

Period of Operation: Not provided.

Wastes: Waste sorbent materials, contaminated spent solvents, oils and other facility wastes.

Release Controls: Wastes are stored in rolloff dumpsters and all dumpsters are color coded.

History of Releases: Not provided.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: The potential for a significant release to the air is low due to the small quantities of volatile hazardous wastes.

GROUNDWATER: The potential for a release to the groundwater is low. The wastes are stored with sorbent material, in dumpsters and on paved areas.

SURFACE WATERS: The potential for a release to the surface waters is low due to the predominately solid nature of the wastes. Spills around the dumpsters would be released to the river via the storm drains.

SUBSURFACE GAS: There is no potential for the buildup of subsurface gas. All wastes are stored aboveground.

RECOMMENDATIONS: Since burnable wastes that include hazardous wastes should only be incinerated at RCRA licensed incinerators, the operator should be required to keep manifests on all hazardous wastes stored in the dumpsters (i.e., sorbent materials with spent solvents). Identification of the location and operator of the incinerator(s) where this material has been disposed should be requested. If the incinerator(s) are not RCRA units, details of waste management and incineration should be requested.

26. Unit Name: Oil/Water Dumpsters

Description: Dockside dumpsters at the submarine berths are used for the cleanout of submarine bilges and various tanks. The dumpsters act as crude oil/water separators. Resulting oil wastes are pumped to tanks in the Jamaica Island area.

Period of Operation: Not provided.

Wastes: Acidic and alkaline cleaning solutions and oil water mixtures.

Release Controls: Not provided.

History of Releases: A Consent and Agreement Order (15) has indicated that since January 1981, at least eleven prohibited oil discharges to coastal waters caused by the overflow of the bilge slop and waste oil tanks at the submarine berths have occurred at the shipyard. Between January 15, 1985 and January 27, 1985, four such spills occurred due to operator negligence. A civil suit by the Maine DEP identifies additional spills including two additional spills in 1985 and a spill in May 1986.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: There is a moderate potential for small releases to the air. Spent cleaning solutions could release volatile fractions if left uncovered.

GROUNDWATER: There is a moderate potential for releases to the groundwater. There are no overtopping controls or runoff controls for these units; however, releases would most likely be to the surface waters.

SURFACE WATERS: There are documented releases to the coastal waters. In addition, there is a high potential for future releases to the surface waters. Overtopping and spills would have a direct path of release to the river.

SUBSURFACE GAS: There is no potential for the buildup of subsurface gas. All wastes are stored aboveground.

RECOMMENDATIONS: Due to chronic releases to the environment from these units, a formal response to the information needs listed in the Phase I report should be requested to determine if additional action is necessary for these units.

27. Unit Name: Fuel Oil Spill

Description: A fuel oil tank farm exists southeast of Berth 6. The tanks were constructed in the early 1920s. Reportedly the age of the tanks and associated piping has resulted in an increasing number of breakage, seepage and leakage incidence.

Period of Operation: Early 1920s to Present

Wastes: N/A

Release Controls: Not provided.

History of Releases: In addition to chronic releases noted above, there was a 3000-gallon release from a ruptured underground pipeline near Berth 6 in 1978. The pipeline was reportedly excavated and sealed by a contractor. No additional information on the release is available.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: There is a low potential for significant releases to the air. Fuel oil is stored in closed tanks. Small quantity releases to the air may occur from spills and leakage.

GROUNDWATER: There is documentation of releases to the ground. Due to the age of the tank field, there is a high potential for additional releases that may go undetected.

SURFACE WATERS: Due to the apparent hydrogeology of the area, there is a high potential of releases migrating to the river.

SUBSURFACE GAS: There is a moderate potential for the accumulation of volatile gases in the unsaturated soil zone due to chronic releases.

RECOMMENDATIONS: Due to the age of the tank farm and the increasing number of releases, all tanks, pipes and fittings should be inspected and tested for leaks. Results of the testing for leaks should be reviewed to determine the need for unsaturated and saturated zone monitoring wells.

28. Unit Name: Silver Recovery System

Description: The silver recovery system consists of an electrolytic recovery unit for the recovery of silver from film developing solutions. Solutions are batch fed to the system and waste solutions after silver recovery collect directly in a 55-gallon drum and are sent to the hazardous waste storage facility (SWMU 1).

Period of Operations: Not provided.

Wastes: N/A

Release Controls: The unit is located within a fenced area inside a building with concrete floors.

History of Releases: Not provided.

CONCLUSIONS REGARDING POTENTIAL FOR RELEASES

AIR: There is no potential of a release to the air due to the nature of the waste.

GROUNDWATER: There is a low potential for a release to the groundwater. The system is within a building which is surrounded by pavement.

SURFACE WATERS: There is a low potential for a release to the surface waters. Spills may be released to the river via a storm drain.

SUBSURFACE GAS: There is no potential for a buildup of subsurface gas. All operations are aboveground.

RECOMMENDATIONS: No further action is necessary for this unit.

6.0 REFERENCES

(1) Initial Assessment Study (IAS) of Portsmouth Naval Shipyard, Portsmouth, New Hampshire, June 1983, by the Naval Energy and Environmental Support Activity.

(2) Draft Report on Verification Step for Confirmation Study on Hazardous Waste Sites at Naval Shipyard Portsmouth, Kittery, Maine, February 29, 1984.

(3) Portsmouth Naval Shipyard, RCRA Part B Permit Application, Revised May 1985.

(4) Portsmouth Naval Shipyard Response to Section 3007 of RCRA, January 1985, Identification of Existing and Past SWMUs.

(5) Hazardous Waste News, June 9, 1986, Maine Sues Navy for State Hazardous Waste Violations.

(6) Natural Resources Council of Maine, August 9, 1985, Letter to the Maine DEP, Portsmouth Naval Shipyard License.

(7) Main DEP, July 25, 26, 1985, Hazardous Waste Inspection Trip Report.

(8) Maine DEP, Board of Environmental Protection, Findings of Fact and Order, undated.

(9) Maine DEP, May 15, 1985, Public Hearing for Portsmouth Naval Shipyard Hazardous Waste Application.

(10) Maine DEP, July 12, 1984, Summary of Site Visit.

(11) Portsmouth Naval Shipyard, December 18, 1980, Letter to Maine DEP, Special Condition No. 1 on Interim License for Hazardous Waste Facility.

(12) Portsmouth Naval Shipyard, February 11, 1981, Letter to Maine DEP, Requested Information.

(13) U.S. EPA, Region 1, February 6, 1985, RCRA Industrial Survey Report, Enforcement Summary.

(14) Maine DEP, June 3, 1986, Civil Action for Injunction and Penalties Against Portsmouth Naval Shipyard.

(15) Maine DEP, Consent Agreement and Order for Portsmouth Naval Shipyard, Undated.

(16) Portsmouth Naval Shipyard, November 9, 1984, Letter to Maine DEP, Facility Excavation.

(17) Portsmouth Naval Shipyard, October 1984, Report of Release.

(18) Study Report of Solid Waste Disposal Methods at Portsmouth Naval Shipyard, June 25, 1971.

(19) Maine DEP, September 9, 1985, Letter to Portsmouth Naval Shipyard, Request for Information.

ADDENDUM TO RCRA FACILITY ASSESSMENT
PORTSMOUTH NAVAL SHIPYARD

January 1988

The following is an addendum to the RCRA Facility Assessment (RFA) for Portsmouth Naval Shipyard. The original RFA for this facility was conducted and finalized on July 1, 1986 by A. T. Kearney, Inc. and Baker/TSA, Inc. under contract with the United States Environmental Protection Agency (EPA), Region I. Changes have occurred at the facility which have changed the RFA.

It should be noted that the RFA contains recommendations which do not necessarily reflect the opinions and policies of the EPA. These recommendations were made by the contractor to the EPA. Where EPA disagrees with the contractors recommendations, an explanation will be given in this addendum.

The following are explanations and/or changes to the July 1, 1986, RFA.

Page 16: Air Emissions

This paragraph should state specifically that in their undisturbed state, the Solid Waste Management Units (SWMUs) found at the shipyard do not pose a threat to human health or the environment. When investigative and corrective activities begin, the air emissions may pose more of a threat.

Page 19: SWMU 2 - Freon Recovery Operations

This unit was inactive at the time of the site visit and was subsequently certified closed on May 28, 1987. Prior to the closure certification, the soil around the holding tank was tested for volatile organic compounds (VOCs) and found to contain no contamination. This unit was operative from 1965 to 1987.

The recommendations for this unit should reflect the fact that the unit was closed and certified in accordance with a state approved closure plan. No further investigation is warranted at this time.

Page 20: SWMU 3 - Industrial Waste Treatement Plant

From the description of this unit, the status of Waste Storage Tank No. 23 is unclear. This was an underground tank located outside Bldg. 298 and stored hazardous waste from the Industrial Waste Treatment Plant. In October, 1986, Tank No. 23 was closed and removed from the ground. The soils around the tank were tested for EP toxicity and pH, and no contamination was found in the soils. ME DEP is in the process of licensing the Industrial Waste Treatment Plant for the treatment of hazardous waste. No further investigation is required at this time.

Page 21: SWMU 4 - Intermediate Storage Facilities

This unit consisted of four storage areas which have always been located outside the Plate Yard and near Building 178. They were all certified closed under a State approved closure plan on July 31, 1987. Prior to the closure certification, the areas were tested for VOCs and found to be clean. This unit was operative from 1983 to 1986.

The recommendations for this unit should reflect the fact that the unit was closed and certified in accordance with a state-approved closure plan. No further investigation is warranted at this time.

Page 26: SWMU 7 - Interim Storage Areas

This unit consisted of four storage areas of drummed waste located in the Plate Yard and inside Buildings 55, 98 and 227. These areas were in operation until 1981. On August 4, 1987, three of the four areas (those areas located in the Plate Yard and Buildings 55 and 98) were certified closed in accordance with a State approved closure plan. The storage area located in Building 227 was found to have residual amounts of PCBs contaminating the building. The shipyard has contracted out the work to have the building decontaminated and ME DEP is monitoring the progress of the decontamination activities.

The recommendations for this unit should consider that three of the four areas were certified closed in accordance with a State-approved closure plan and the State is monitoring the decontamination activities at the fourth area. No further investigation is required at this time.

Page 32: SWMU 9 - Mercury Burial Sites

The recommendations for this unit should consider that the mercury wastes were buried in concrete vaults whose conditions are unknown. Concrete is a porous material and will eventually deteriorate presenting the potential for a release of the mercury wastes. Due to the unknown nature of the concrete vaults, there is a potential for a release from this unit and further investigation is warranted.

Page 33: SWMU 10 - Tank No. 24

This unit consisted of an underground tank which was removed from the ground in October of 1986. At that time, the soils surrounding the tank were analyzed for pH and for EP toxicity for lead. The results of these analyses showed no contamination of the soils.

The recommendations for this unit should reflect the fact that the underground tank no longer exists and the soils were analyzed and found to be free of contamination. However, since this tank

was located close to the river's edge, sediment samples should be analyzed in this area for lead.

Page 34: SWMU 11 - Used Oil Tanks (2) No. 12

This unit consists of two buried 8000 - gallon railroad tank cars which store oily wastes. In 1979, these tank cars were excavated for visual inspection but not removed from the ground. In 1984, the tank cars were hydrostatically tested for leaks and found to be tight.

Page 36 - 38 SWMUs 12 through 23 - Waste Storage Tanks

Below is a chart showing the information regarding SWMUs 12 through 23.

WASTE STORAGE TANKS

SWMU	NAME	CAPACITY	OPERATIVE DATES	WASTES	RELEASES
12	Boiler Blowdown Tank No. 25	3800 gal.	1974-Present	Boiler blowdown	None
13	Rinse Water Tank No. 27	700 gal.	1974-Present	Rinse waters from Bldg. 76	None
14	Used Oil Tank No. 31	750 gal.	1976-Present	Used Oil from Bldg. 72	None
15	Oil/Water Separator Tank No. 32	5400 gal.	1976-Present	Oily Waste-waters from Bldg. 72	None
16	Rinse Water Tank No. 34	750 gal.	1978-Present	Rinse Waters from Bldg. 174 (contaminated w/paint stripping wastes & solvents)	None
17	This unit does not exist. The description of this unit in the RFA is a combination of SWMUs 16 and 23.				
18	Used Lube Oil Tank No. 35	4500 gal. aboveground	1982-Present	Used Lubrication Oils from Bldg. 300	None
19	Used Oil Tank No. 37 from Tank 38	500 gal.	1985-Present	Used Oils	None
20	Oil/Water Separator Tank No. 38	?	1985-Present	Oily Waste waters	None

21	Acid/Alkaline Tank No. 28	695 gal.	1974-Present	Waste acid & alkaline cleaning solutions from Bldg. 75	None
22	Hose Cleaning Facility Tank	4000 gal. aboveground	1974-Present	Oil wastewaters from Bldg. 155	None
23	Rinse Water Tank No. 26	2270 gal.	1978-Present	Rinse Waters from Bldg. 174 (contaminated w/paint stripping wastes and solvents)	None

With the exceptions of SWMUs 17, 18, 19, 20 and 22, further investigation of the above tanks is warranted. This investigation should at least consist of waste analyses and tank tightness testing.

SWMU 17 does not exist and warrants no further investigation. SWMUs 18, 19 and 20 are new tanks and warrant no further investigation at this time.

The recommendations made regarding SWMU 22 should be consistent with the conclusions made regarding the potential for a release from this unit. Since the potential for a release to any media is low, no further investigation is warranted at this time.

Page 42: SWMU 24 - Asbestos Collection Dumpster

The description of this unit is confusing. This unit is a central collection roll-off container of capacity 30 cubic yards. The unit is located adjacent to the Hazardous Waste Storage Facility (SWMU 1) and collects asbestos waste from 7 or 8 (10 cubic yard capacity) dumpsters located in several locations around the shipyard. This unit predates 1980 and they are operative today.

Page 43: SWMU 25 - Burnable Dumpsters

The description of this unit is confusing and misleading. This unit consists of over 100 dumpsters which collect burnable wastes consisting of mostly paper. The wastes from this unit are incinerated. Sorbent materials were in the past collected in these dumpsters, but hazardous wastes were not and are not presently incinerated. Because there has been no evidence of a release of hazardous wastes or hazardous constituents from this unit, no further investigation is warranted at this time.

Page 46: SWMU 28 - Silver Recovery System.

The silver recovery operation, as described in the RFA, no longer operates as such. Prior to March, 1986, the shipyard had two (2) silver recovery areas; one in Bldg. 18 and one in Bldg. 86. In March, 1986, these two areas ceased recovering the silver and an

area was set up in Bldg. 136 for silver recovery. Several sites exist around the shipyard which generate wastes with high silver content (Bldgs. 18, 42, 73, 86 and H-1). The wastes from these buildings are brought to Bldg. 136 for silver recovery. The non-recoverable wastes are drummed and stored at the Hazardous Waste Storage Facility (SWMU 1) prior to off-site disposal. This unit predates 1980 and is operative today.