



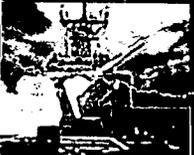
**MALCOLM  
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FINAL

# Preliminary Assessment Portsmouth Naval Shipyard

## Small Arms Range

April 2005



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**FINAL  
PRELIMINARY ASSESSMENT  
PORTSMOUTH NAVAL SHIPYARD, MAINE**

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**April 2005**

Prepared for:

**Naval Facilities Engineering Command  
Engineering Field Activity Northeast**  
10 Industrial Highway  
Mail Stop #82  
Lester, Pennsylvania 19113-2090

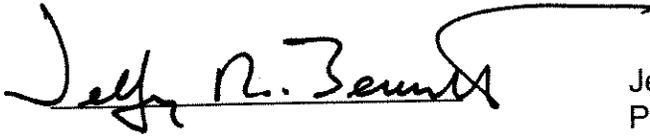
Prepared by:

**Malcolm Pirnie, Inc.**  
104 Corporate Park Drive  
White Plains, New York 10602

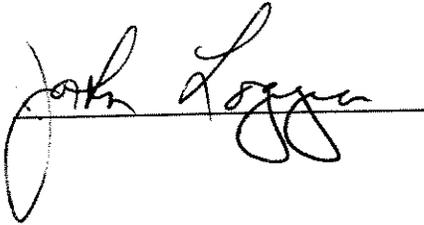
**FINAL  
PRELIMINARY ASSESSMENT  
PORTSMOUTH NAVAL SHIPYARD, MAINE**

DoD Contract Number: N62472-02-D-1300

Reviewed and Approved by:



Jeffrey R. Bennett, P.E., DEE  
Program Officer  
Malcolm Pirnie, Inc.



John Logigian  
Team Leader  
Malcolm Pirnie, Inc.

Malcolm Pirnie, Inc. prepared this report at the direction of Engineering Field Activity Northeast. This document should be used only with the approval of the Engineering Field Activity Northeast. This report is based, in part, on information provided in other documents and is subject to the limitations and qualifications presented in the referenced documents.

**April 2005**

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**ACRONYMS**

°F	Degrees Fahrenheit
BRAC	Base Realignment and Closure
CD	Compact Disc
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CRS	Cultural Resources Survey
CSM	Conceptual Site Model
DERP	Defense Environmental Restoration Program
DoD	Department of Defense
EFANE	Engineering Field Activity Northeast
FUDS	Formerly Used Defense Site
FY	Fiscal Year
HWTF	Hazardous Waste Transfer Facility
ITRC	Interstate Technology Regulatory Council
JILF	Jamaica Island Landfill
LANTDIV	Atlantic Division
MEC	Munitions and Explosives of Concern
MEG	Maximum Exposure Guidelines
MC	Munitions Constituents
MMRP	Military Munitions Response Program
MRP	Munitions Response Program
NAVFAC	Naval Facilities Engineering Command
NCP	National Contingency Plan
NRHP	National Register of Historic Places
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyl
PNS	Portsmouth Naval Shipyard
RG	Record Groups
SARA	Superfund Amendment and Reauthorization Act
TCL	Target Compound List
µg/L	Microgram per Liter
U.S.	United States
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency

## GLOSSARY OF TERMS

**Base Realignment and Closure (BRAC)** – A Department of Defense (DoD) program that focuses on compliance and cleanup efforts at military installations undergoing closure or re-alignment, as authorized by Congress in four rounds of base closures for 1988, 1991, 1993, and 1995. (DERP Management Guidance, September, 2001)

**Closed Range** – A range that has been taken out of service as a range and that either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a DoD component. (DERP Management Guidance, September, 2001)

**Defense Site** – All locations that are or were owned by, leased to, or otherwise possessed or used by the DoD. The term does not include any operational range, operating storage or manufacturing facility, or facility that is used or was permitted for the treatment or disposal of military munitions. (10 U.S.C. 2710(e)(1))

**Discarded Military Munitions** – Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations. (10 U.S.C. 2710(e)(2))

**Explosive Ordnance Disposal (EOD)** – The detection, identification, field evaluation, rendering-safe, recovery, and final disposal of unexploded explosive ordnance (UXO). It may also include the rendering-safe and/or disposal of EO (explosive ordnance) which has become hazardous by damage or deterioration, when disposal of such EO requires techniques, procedures, or equipment which exceed the normal requirements for routine disposal. (OPNAVINST 8027.1G, 14 Feb 92)

**Explosives Safety** – A condition where operational capability and readiness, personnel, property, and the environment are protected from the unacceptable effects of an ammunition or explosives mishap. (DoD Directive 6055.9 July 1996)

**Formerly Used Defense Site (FUDS)** – Real property that was formerly owned by, leased by, possessed by, or otherwise under the jurisdiction of the Secretary of Defense or the Components (including governmental entities that are the legal predecessors of DoD or the Components) and those real properties where accountability rested with DoD but where activities at the property were conducted by contractors (i.e., government-owned, contractor-operated (GOCO) properties) that were transferred from DoD control prior to October 17, 1986. The status of a site as a FUDS is irrespective of current ownership or current responsibility within the federal government. (DERP Management Guidance, September, 2001)

**Munitions Constituents (MC)** – Any materials originating from unexploded ordnance, discarded military munitions or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. (10 U.S.C. 2710 (e)(4))

**Munitions and Explosives of Concern (MEC)** – This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks, means: unexploded ordnance, discarded military munitions or munitions constituents (e.g., TNT, RDX) present in high enough concentrations to pose an explosive hazard. (OUSD(AT&L) 18 December 2003)

**Operational Range** – A range that is under the jurisdiction, custody, or control of the Secretary of Defense and that is used for range activities, or although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities. (10 U.S.C. 101 (e)(3))

**Other than Operational Range** – Encompasses closed, transferred and transferring ranges.

**Range** – A designated land or water area set aside, managed, and used for range activities of the DoD. Ranges include firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access and exclusionary areas, and airspace areas designated for military use in accordance with regulations and

procedures prescribed by the Administrator of the Federal Aviation Administration. (10 U.S.C. 101 (e)(3))

**Transferred Range** – A property formerly used as a military range that is no longer under military control and had been leased by the DoD, transferred, or returned from the DoD to another entity, including federal entities. This includes a range that is no longer under military control but was used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager. (DERP Management Guidance, September, 2001)

**Transferring Range** – A range that is proposed to be transferred or returned from the DoD to another entity, including federal entities. This includes a range that is used under the terms of a withdrawal, executive order, act of Congress, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager or property owner. An operational or closed range will not be considered a “transferring range” until the transfer is imminent. (DERP Management Guidance, September, 2001)

**Unexploded Ordnance** – Military munitions that have been primed, fused, armed, or otherwise prepared for action; have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and remain unexploded either by malfunction, design, or any other cause. (10 U.S.C. 101(e)(5))

## **EXECUTIVE SUMMARY**

The Department of Defense (DoD) has established the Military Munitions Response Program under the Defense Environmental Restoration Program to address munitions and explosives of concern (MEC) (including unexploded ordnance and discarded military munitions) and munitions constituents (MC) at other than operational military ranges and other sites. Closed, transferred, and transferring military ranges and sites not located on an operational range are considered other than operational. This report addresses other than operational ranges and sites at an active installation. It may include transferring and/or transferred ranges and munitions disposal sites associated with an active installation if they are not included in Base Realignment and Closure (BRAC) or Formerly Used Defense Sites (FUDS) programs.

This report represents a Preliminary Assessment (PA) for the Portsmouth Naval Shipyard (PNS), Kittery, Maine. The DoD, United States Navy, and United States Environmental Protection Agency guidance for conducting and documenting PAs were followed and tailored, where appropriate, to address the unique aspects of MEC and MC.

The closed Small Arms Range is located on the eastern end of PNS on the former Jamaica Island. The Small Arms Range was used infrequently by PNS security personnel from 1964 through 1988 (approximate dates according to PNS personnel). Closure was in preparation for the construction of the Hazardous Waste Transfer Facility (HWTF).

In the mid 1990s, PNS conducted an investigation and remediation of soils at the Small Arms Range. Soils were excavated and screened in preparation for the construction of the HWTF. Soil screenings were transported off-site as hazardous waste (due to lead), thereby removing the potential contamination source.

Based on the findings and information gathered during this PA process, it was determined that remedial actions were completed at the Small Arms Range. With regard to groundwater, the chemical of potential concern is expected to be lead, which has low soil mobility. As such, migration of lead from soil to groundwater is unlikely. Lead data are available from four on-site groundwater monitoring wells associated with the HWTF and from groundwater monitoring wells associated with the adjacent Jamaica Island Landfill (JILF). Lead has been detected in the

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groundwater in the on-site wells and the JILF monitoring wells. Given the history of the JILF and the presence of lead in the groundwater beneath the landfill, lead in the groundwater is most likely due to JILF operations. The available groundwater data show no lead concentration gradient across the Small Arms Range and JILF. This finding indicates that the groundwater quality in the area of the Small Arms Range has not been adversely affected by historical range operations.

## 1. INTRODUCTION

The Department of Defense (DoD) has established the Military Munitions Response Program under the Defense Environmental Restoration Program (DERP) to address munitions and explosives of concern (MEC) [including unexploded ordnance (UXO) and discarded military munitions] and munitions constituents (MC) at other than operational military ranges and other sites. Closed, transferred and transferring military ranges and sites not located on an operational range are considered other than operational. This report addresses other than operational ranges and sites at an active installation. It may include transferring and/or transferred ranges and munition disposal sites associated with an active installation if they are not included in Base Realignment and Closure (BRAC) or Formerly Used Defense Sites (FUDS) programs.

The DoD and the United States Navy are currently establishing policy and guidance for munitions response actions under the Navy Munitions Response Program (MRP). However, key program drivers developed to date conclude that munitions response actions will be conducted under the process outlined in the National Contingency Plan (NCP) (40 CFR 300) as authorized by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9605, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), Pub. L. 99-499 (hereinafter CERCLA). This report represents a Preliminary Assessment (PA) for the Portsmouth Naval Shipyard (PNS), Maine, in York County. DoD, Navy, and U.S. Environmental Protection Agency (USEPA) guidance for conducting and documenting PAs were followed and tailored, where appropriate, to address the unique aspects of MEC and MC.

This PA is organized in the following sections:

- [Section 1 – Introduction](#)
- [Section 2 – Installation Background](#)
- [Section 3 – Physical and Environmental Characteristics](#)
- [Section 4 – Summary of Data Collection Effort](#)
- [Section 5 – Site Characteristics](#)

The following supporting information is appended to this PA:

- References ([Appendix A](#))

- Project Source Data – General ([Appendix B](#))
- Project Source Data – Site-Specific ([Appendix C](#))
- Ordnance Technical Data Sheets ([Appendix D](#))

An interactive compact disc (CD) is included with this PA. The CD contains electronic files of the report text, tables, figures, appendices, project source data, additional site photographs, and interactive maps of the installation and site.

### **1.1. Purpose**

This PA summarizes the history of munitions use for the former Small Arms Range at the PNS. The PA provides an assessment of the current conditions with respect to MEC and MC. The PA provides the necessary information for Navy and regulatory decision-makers to: 1) eliminate from further consideration those MEC sites that pose minimal or no threat to public health or the environment; 2) differentiate MEC sites that may not require further munitions response actions from those that will require further investigation and/or munitions response actions; 3) determine if an imminent explosives safety hazard from MEC is present that warrants an accelerated response action; and 4) determine if an imminent hazard from MC to human health, and the environment is present warrants an accelerated response action.

### **1.2. Programmatic Framework**

The regulatory structure for managing Navy MRP sites is guided by a complex mixture of federal, state, and local laws, as well as DoD and Navy regulations and guidance, and provides the necessary information for Navy decision makers. The key legislation, policy, and guidance directing the program includes, but is not limited to, the following:

#### **Defense Environmental Restoration Program (DERP) Management Guidance (September 2001)**

The DERP Management Guidance establishes a MRP element for MEC and MC defense sites. The history of DERP dates back to the Superfund Amendments and Reauthorization Act (SARA)

of 1986<sup>1</sup>. The scope of the DERP is defined in 10 United States Code (U.S.C.) §2701(b), which states that the:

Goals of the program shall include the following: ... (1) The identification, investigation, research and development, and cleanup of contamination from hazardous substances, and pollutants and contaminants. (2) Correction of other environmental damage (such as detection and disposal of unexploded ordnance) which creates an imminent and substantial endangerment to the public health or welfare or to the environment ...

### **Draft DoD Directive Military Munitions Response Policy on Other Than Operational Ranges**

The DoD Directive is scheduled to be finalized in fiscal year (FY) 2004 pending review and concurrence from the DoD services. The Draft DoD Directive 4715.MRP (September 2003 version) states that munitions response will be conducted “in accordance with CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP)”.

### **National Defense Authorization Act (FY02) (Sections 311-313)**

Sections 311-313 of the National Defense Authorization Act of FY02 reinforced the DoD’s 2001 DERP Management Guidance by tasking the DoD to develop and maintain an inventory of defense sites that are known or suspected to contain MEC and MC. Section 311 requires the DoD to develop a protocol for prioritizing defense sites for response activities in consultation with the states and Tribes. Section 312 requires the DoD to create a separate program element to ensure that the DoD can identify and track munitions response funding. Section 313 directs the DoD to provide a comprehensive assessment of MEC and MC at defense sites in the FY02 DERP Annual Report to Congress.

The September 2001 Management Guidance for the DERP and the Defense Authorization Act 2002, described above, established the MRP. The DoD provides program guidance and methods for conducting a baseline inventory of defense sites containing, or potentially containing, MEC and/or MC. The Navy baseline inventory of sites was completed in FY 2002 and was used to establish the sites where PAs are needed to further evaluate the potential for MEC and MC.

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<sup>1</sup> SARA was signed into law on October 17, 1986, and CERCLA of 1980, 42 U.S.C. §9601 et seq. Related sections in Title 10 of the U.S.C. (10 U.S.C. §§2702-2710 and §§2810-2811) further define the program.

### **1.3. Project Management**

This PA is being coordinated and managed by the Navy Engineering Field Activity Northeast (EFANE), a component of the Atlantic Division (LANTDIV) of the Naval Facilities Engineering Command (NAVFAC). The EFANE performs engineering functions for Navy installations throughout the northeast U.S. and is the Program Manager for this PA. Malcolm Pirnie, Inc. has been contracted to prepare this PA. The Navy Remedial Project Manager (RPM) and the installation points of contact (POC) for PNS provided valuable information and assistance throughout the PA data collection process.

### **1.4. Preliminary Assessment Approach**

CERCLA implementing guidance, which was prepared for sites contaminated with hazardous substances, describes the PA as a limited-scope investigation based upon existing and available data. However, the guidance also states that the PA process developed under CERCLA is not equally applicable to all sites and all contaminants and that variation from the guidance may be necessary. Sites containing MEC are prime examples of sites where the generic CERCLA process is incomplete. Unique explosives safety issues associated with MEC cannot be assessed solely with the parameters developed for chemical and hazardous waste contaminants. While this PA generally follows CERCLA guidance, certain elements of the report have been tailored to address the unique explosives safety aspects of MEC.

The PA process for each of the sites involves collecting and reviewing existing and available information about the site. Data collection activities included off-site and on-site research and interviews. It also included a visual survey to assess physical evidence that might indicate the presence of MEC (e.g., discarded munitions items, ordnance penetration holes, scarred trees) and MC (e.g., ground scarring, stressed vegetation, chemical residue) at the site. The Malcolm Pirnie data collection team conducted the on-site portion of the data collection and visual survey on August 25, 2003.

This PA is inclusive and makes use of available data relating to munitions use at the PNS, including historical records, field data, anecdotal evidence, interviews with site personnel, and professional knowledge and experience. It is based, in part, on information provided in documents referenced in [Appendix A](#) and is subject to the limitations and qualifications presented in the referenced documents.

## 2. INSTALLATION BACKGROUND

The PNS is one of four remaining publicly owned shipyards in the nation. PNS is the most experienced Naval shipyard in submarine design, construction, modernization, and maintenance and has a key role in the very-deep ocean submersible and special operations arenas. Today, the PNS's primary mission is the overhaul, repair, modernization, and refueling of LOS ANGELES Class nuclear powered submarines. It is currently the planning yard for the Navy's deepest diving submarine and submersible, as well as other scientific research, defense prototype testing, and submerged rescue platforms. It is also the Ship Availability Planning and Engineering Center for the LOS ANGELES Class. PNS specializes in world-wide fleet support and is an active participant in Northeast Regional Maintenance. The shipyard has an active Technology Transfer Office and has had numerous successes in partnering initiatives involving academia and the private sector.

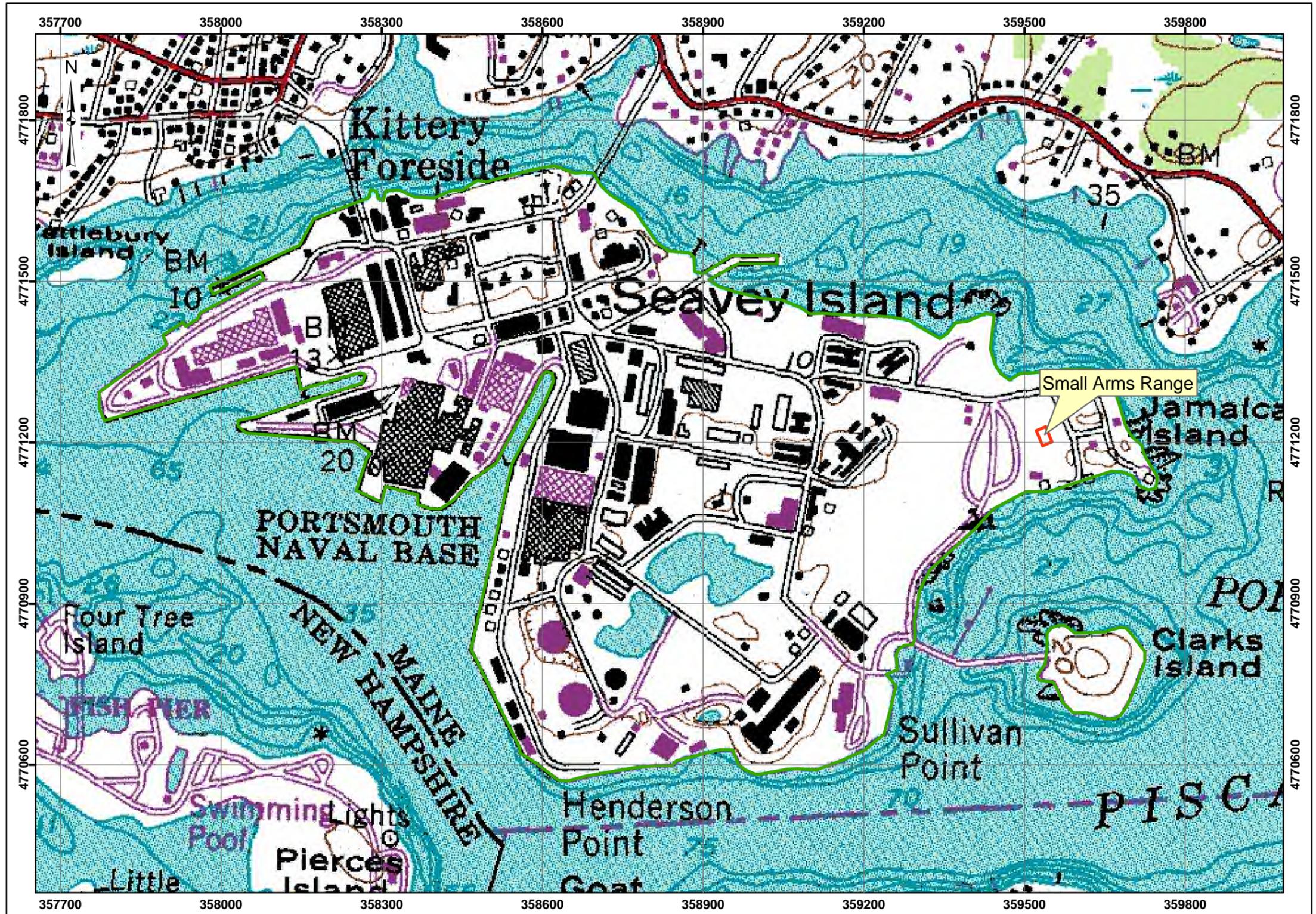
The following sections provide general information about PNS including its location and setting; a brief history of the installation; its missions over time; and a history of munitions related training, storage, and usage.

### 2.1. Location and Setting

PNS is located about 50 miles north of Boston, Massachusetts, at the southernmost tip of Maine. The shipyard fully encompasses Seavey's Island, which sits at the mouth of the Piscataqua River. Seavey's Island was originally five islands: Seavey's Island, Jamaica Island, Pumpkin Island, Dennett's Island, and Clark Island. The inter-island areas of Seavey's Island, Jamaica Island, Pumpkin Island, and Dennett's Island were gradually land filled over time until only one large contiguous island remained. The island is commonly referred to as Seavey's Island and is connected to the smaller, undeveloped Clark's Island by a causeway. Seavey's Island is across the harbor from Portsmouth, New Hampshire, with access to the mainland by two bridges that connect it to Kittery, Maine. PNS encompasses over 297 acres including the main base and a family housing area, which is located off-base in Kittery, Maine. There are 179 buildings with over three million square feet of space, including 49 ship repair/overhaul buildings. PNS has 6,224 lineal feet of berthing and, with its three drydocks, is capable of docking all active classes of submarines including the LOS ANGELES, VIRGINIA, and OHIO Classes. The Jamaica

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Island Landfill (JILF) is located on the eastern end of PNS. The installation location is provided on [Map 2.1-1](#).



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Kittery, ME**

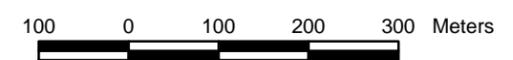


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Map 2.1-1  
Area Location Map

**Legend**

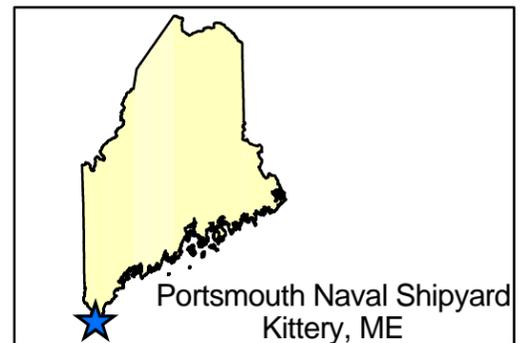
-  Installation Boundary
-  Ranges



Data Source: USGS. 7.5 Minute Series  
Topographic Survey Map  
Kittery, Maine, 1989

Coordinate System: UTM Zone 18N  
Datum: NAD 83  
Units: Meters

Contract: N62472-02-D-1300  
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Date: April 2005



## 2.2. Installation History

The mission of PNS, as stated on the PNS website, is “to keep America’s Navy #1 in the world by serving as a partner on the Navy maintenance team, providing the best value in industrial and engineering support for world-wide nuclear submarine maintenance and inter-service regional maintenance”.

The following history discussion was taken verbatim from the PNS website (July 2003) (<http://www.ports.navy.mil/>):

PNS, [the] Cradle of American Shipbuilding, located in the Piscataqua River Estuary between New Hampshire and Maine where in 1690 the first naval warship in North America was built, is the oldest naval shipyard continuously operated by the United States Government since its establishment in June 1800. At that time, President Thomas Jefferson approved the purchase of an island in the Piscataqua River as a site for a naval shipyard. Continuously, for more than two centuries, the men and women of Portsmouth Naval Shipyard have built and serviced naval vessels for our Nation's defense.

The shipyard launched its first product, the 74-gun warship USS WASHINGTON, in 1815. During World War I, the PNS workforce expanded to nearly 5,000 people as it took on a new and important role--the construction of submarines--in addition to the overhaul and repair of surface vessels. World War II saw the civilian employment rolls swell to over 25,000 men and women. During World War II, over 70 submarines were constructed at PNS, and four submarines were launched on the same day. Following World War II, PNS was the Navy’s center for submarine design and development. The research submarine, USS ALBACORE, with its revolutionary tear-drop shaped hull and round cross section, set the standard for all subsequent submarine hull design world-wide.

In the mid 1950s, the shipyard engaged in an extensive training program to acquaint employees with the special techniques and exacting requirements for the overhaul and construction of nuclear-powered submarines. Soon after, the keel of USS SWORDFISH, the first nuclear-powered submarine built in a naval shipyard, was laid, heralding in a new era for the shipyard. In 1959, USS NAUTILUS, the first nuclear-powered submarine, entered PNS for her first complete

overhaul, the first of any nuclear-powered ship. PNS continued to design and build submarines, including USS DOLPHIN, the Navy's deep diving research submarine, until 1969, when the last submarine built in a public shipyard, the nuclear powered USS SAND LANCE, was launched.

### **2.3. Munitions Related Training / Storage / Usage**

Existing ordnance facilities at PNS currently consist of a magazine used for small arms ammunition storage. This magazine is located northwest of the closed Small Arms Range. Historical ordnance facilities at PNS include the following:

- Ammunition depot (Buildings 31, 32, 33, and 34) - in use until 1964
  - Stored gun powder for cannon balls which were stored at the Gun Park and Shot Park
- Magazines
  - Marine barracks had two magazines used for small arms storage – closed in 1974
  - Building 205 was a dynamite magazine – also closed (date unknown)
  - Magazines located at Small Arms Range – used to store munitions off-loaded from ships docked at the shipyard. Specific munitions types stored are unknown, but storage was temporary while ships were being serviced. All magazines were removed in the 1980s.
- Gun Park and Shot Park
  - Used to store cannons and cannon balls (without gun powder)
- Prison
  - Stored small arms ammunition for security
  - Indoor shooting range (noted on 1916 drawing)
- Small Arms Range
  - Located at eastern end of shipyard
  - Operational from 1964-1988 (approximate dates according to PNS personnel)
  - Small arms only

This PA focuses on the Small Arms Range. The other areas listed above have no record or anecdotal information available to indicate that they were/are locations of MEC or MC. Therefore, the only area subject to the MMRP is the Small Arms Range.

### **3. PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS**

The following sections provide general information for PNS, including its climate; topography; geology; soil and vegetation types; hydrology; hydrogeology; cultural and natural resources; and endangered and special status species.

#### **3.1. Climate**

The overall climate in the Portsmouth region is characterized as variable. The average daily temperature ranges from 13 degrees Fahrenheit (°F) in January and February to 80°F in July. Precipitation is fairly evenly distributed over the year, with an annual total of 42.6 inches.

#### **3.2. Topography**

PNS is located along the coastal plain of southern Maine and New Hampshire. The shipyard is located in the Seaboard Lowland section of the New England physiographic province. PNS is characterized by fairly level terrain with small outcrops of bedrock.

#### **3.3. Geology**

Bedrock geology consists of Silurian-age granofels with a loose overburden of generally well drained glacial till, zero to 200 feet above the bedrock. The Portsmouth Fault, which is the contact between the Kittery and Rye Formations, is reported to reach from New Hampshire to the southeastern end of the shipyard.

#### **3.4. Soil and Vegetation Types**

Soils are typically glacial till, consisting of mixed sand, silt, clay, and gravel deposits. The naturally occurring soil material at the shipyard is classified as Lyman fine sandy loam.

PNS fully encompasses Seavey's Island, which sits at the mouth of the Piscataqua River. Seavey's Island was originally five islands: Seavey's Island, Jamaica Island, Pumpkin Island, Dennett's Island, and Clark's Island. The individual islands were acquired between 1800 and 1959. The inter-island areas between Seavey's Island, Jamaica Island, Pumpkin Island, and

Dennett's Island were land filled until only one large contiguous island remained. According to the Initial Assessment Study of Portsmouth Naval Shipyard, approximately 90 acres of the shipyard is filled land.

PNS is a highly developed, industrial property mostly paved with asphalt, concrete, or buildings with limited vegetative growth. The majority of ground cover consists of landscaping plants, with only scattered remnants of naturally occurring species.

### **3.5. Hydrology**

The shipyard fully encompasses Seavey's Island, which sits at the mouth of the Piscataqua River. The Piscataqua River is a tidal estuary that forms the southern boundary between Maine and New Hampshire. PNS is part of the Piscataqua-Salmon Falls watershed. There are three ecologically distinct environments based on the salinity of the water in this coastal area: the marine ecosystem with a relatively high salt content, an estuarine ecosystem with highly variable salinity, and a freshwater ecosystem with very low salinity. Two fresh-water ponds are located in the central portion of the shipyard. Surface runoff generally travels towards the Piscataqua River (located south, east, and west of the shipyard) and the Back Channel (located directly north of the shipyard).

### **3.6. Hydrogeology**

Groundwater levels are reported to be relatively shallow (approximately 10-15 feet below ground surface). Groundwater beneath PNS is not hydraulically connected to the groundwater that supplies drinking water. Groundwater at the shipyard is influenced by brackish and/or sea water and currently is not used as a source of drinking water nor is it expected to be used as a future source of drinking water. Groundwater flow direction varies across PNS.

### **3.7. Cultural and Natural Resources**

Pursuant to Section 110 of the National Historic Preservation Act of 1966 (as amended), the Navy commissioned a cultural resources inventory and assessment at PNS to identify historic properties within its jurisdiction. The Cultural Resources Survey (CRS) consisted of a Phase IA archaeological investigation, an inventory and assessment of buildings and structures with respect to the National Register of Historic Places (NRHP) Criteria for Evaluation (36 CFR 60.4), and an

evaluation of these buildings with respect to their significance as National Historic Landmarks. The results of these investigations as outlined in the CRS are as follows:

- Potential for prehistoric archaeological resources is highest along the currently undeveloped shorelines of Seavey's, Jamaica, and Clark's Islands.
- Potential for historic archaeological resources dating to the 17th and 18th Centuries exists (ranging from low to high) on Jamaica, Seavey's, and Dennett's Islands.
- Potential for historic archaeological resources dating from 1800 to 1900 also exists on both Dennett's and Seavey's Islands.
- Many buildings at PNS are considered eligible for listing in the NRHP.

Portions of PNS are included in the PNS Historic District, and a subset of that district is listed in the National Register of 1977.

### **3.8. Endangered and Special Status Species**

According to the Initial Assessment Study (1983), the only endangered species found in the area of the PNS is the shortnose sturgeon. No threatened species are known to inhabit PNS.

## 4. SUMMARY OF DATA COLLECTION EFFORT

Five primary sources of information were researched as part of the data collection effort for the PA. The sources of data included:

- 1) Historical archives;
- 2) Personal interviews;
- 3) Installation data repositories;
- 4) Visual survey; and
- 5) Off-site data sources and repositories.

These five sources of data are discussed below, along with their relative application to this PA.

### 4.1. Historical Archive Repositories (off-site)

The data collection team reviewed archival records located at the National Archives in College Park, Maryland, and in Washington, D.C. The data collection team researched the following records and record groups (RG) for documents relating to munitions usage at PNS.

#### Textual Records:

##### **RG 71, Bureau of Yards and Docks**

Naval Property Case Files, Boxes 523\*, 524, 525\*, 526, 758, 759

##### **RG 72, Bureau of Aeronautics**

Entry 67, Confidential Correspondence, 1922-1944, Boxes 1209, 1210

Entry 67-A, Confidential General Correspondence, 1945, Box 308

Entry 62-B, General Correspondence, 1943-1945, Boxes 3476, 3480

Entry 75-A, Secret Correspondence, 1939-1947, Boxes 61, 62, 63

##### **RG 74, Bureau of Ordnance**

Entry 25-I, General Correspondence, 1942, Confidential, Boxes 217, 218

Entry 25-J, General Correspondence, 1942, Restricted, Boxes 604, 606, 607

Entry 25-O, General Correspondence, 1943, Restricted, Boxes 516\*, 718

Entry 25-U, General Correspondence, 1944, Confidential, Boxes 597, 601, 603

Entry 25-V, General Correspondence, 1944, Restricted, Boxes 914\*, 1316, 1342

Entry 1003-A, General Correspondence, 1948, Boxes 236, 238

Entry 1003-B, General Correspondence, 1949, Boxes 670, 672

Entry 5704, Office of Administration, General Subject Files, 1942-1946, Box 22  
Construction and Procurement Subject Files

1945, Boxes 1284\*, 1609, 1626, 1627

1946, Boxes 423, 428

1947, Boxes 320, 324

**Cartographic Records:**

**RG 23, Coast and Geodetic Survey**

Folders for Nautical Charts 329

**RG 57, U.S. Geological Survey**

Quad map series: Kittery, Maine; Portsmouth, New Hampshire

**RG 71, Bureau of Yards and Docks**

Maps for facilities 115, 120\*, codes 1, 2, 3, 15, 16, 32, 34, 42, 44-48

Series I microfilm, Rolls 1\*, 2\*, 3, 8, 9, 10

Series II Index, Boxes 17-19

Series II Microfilm, Reels 100, 101\*

**RG 77, Department of Army**

Army Mapping Service, AMS-V811, V812, V011-S, V012-S

**RG 127, Marine Corps Records**

Administration Maps\*

**RG 385, Naval Facilities Engineering Command, 1917-1989**

Architectural and Engineering Plans, Boxes 253\*, 254, 255

Restricted UIC Architectural and Engineering Plans, Box N1

**Aerial Photos:**

**RG 145, Department of Agriculture, ASCS**

DQW-10K-11, DQW-10K-12

**RG 373, Defense Intelligence Agency**

Cans ON 1202, 1203, 4032, 5495, 7055, 9882, 9888, 34764

**Still Photos:**

**RG 71, Bureau of Yards and Docks**

Entry 71-CA, Construction Projects, 1879-1943, Boxes 414\*, 419, 421

Entry 71-CP, Construction Projects, 1941-1953, Box 82\*

**RG 80, Department of Navy,**

Series 80-G, Boxes 278, 286, 293, 528, 662, 1103, 1261, 1903, 1904, 1944, 1939

**RG 428, Navy Photos (Activities), 1957-1964,**

Series 428GX, Boxes 445, 446, 507, 550, 555-557, 588-589, 606-607, 614, 635, 872, 885

Series 428-GXA, Boxes 26, 69, 108, 109\*, 112, 115

**RG 72, Bureau of Aeronautics:**

Entry 62-B, General Correspondence, 1943-1945, Box 2160\*

(An asterisk [\*] indicates boxes with copy.)

## 4.2. Personal Interviews

Malcolm Pirnie's data collection team visited the following offices located at PNS to interview representatives and research records related to the training that was conducted at the Small Arms Range:

- Environmental Department
- Fire Department
- Hazardous Waste Transfer Facility
- Public Safety Office
- Security
- Shipyard Museum

In addition, a local author was interviewed. A summary of the personnel interviewed and general information obtained from each office is presented below.

### **Environmental Department:**

Mr. Kevin LeBoeuf is the Explosives Safety Officer at PNS. He has been the Safety Officer since August 1, 2003. Mr. LeBoeuf confirmed that the closed Small Arms Range at Building 357 is/was the only outdoor range at the shipyard. Due to his recent assignment to PNS, Mr. LeBoeuf had no specific information or knowledge of the Small Arms Range.

Mr. Robert Becker is in charge of Natural Resources at PNS. Mr. Becker has been at PNS since 2000 and has worked in Natural Resources since June 2003. Mr. Becker provided a Selected Natural Resource Inventory Report that was conducted on Clark's Island in 1994.

Mr. Kenneth Plaisted is the head of the Environmental Department. He had no specific information or knowledge of the Small Arms Range.

Ms. Marty Raymond, is the Installation Restoration Program Manager. She did not have any information on the Small Arms Range.

### **Fire Department:**

Mr. Larry Strafen is the Training Officer at the PNS Fire Department. The Fire Department did not have any record of responses to the range or other ordnance incidents at the shipyard.

**Hazardous Waste Transfer Facility:**

Mr. Denis Gagnon is the Facility Manager of the Hazardous Waste Transfer Facility (HWTF) (Building 357). Mr. Gagnon has worked at PNS since 1979 and remembers the Small Arms Range. He provided information regarding the remedial actions and closure of the Small Arms Range in preparation for the construction of Building 357. According to Mr. Gagnon, the range became non-operational in approximately 1981 and was located where the concrete pad now sits for the HWTF. In preparation for the construction of the HWTF, the soils were excavated, screened, and segregated with the recovered metal/material transported off-site as hazardous waste. The current ground elevation is four feet higher than when the range was operational. Building 357 was constructed from 1994-1996, with occupancy in 1996.

Mr. Wally Tate is the Groundwater Data Custodian at Building 357. Mr. Tate provided a spreadsheet with groundwater monitoring data from November 1998 through June 2003 for the four wells located around Building 357. These wells were installed in 1995, during the construction of the HWTF. This data is included in [Appendix B](#).

**Shipyards Museum:**

Mr. James Dolph is the Base Historian for PNS. Mr. Dolph provided information regarding the history of the shipyard, specifically history related to ordnance locations.

**Local Author:**

Mr. Richard E. Winslow III is a local author of many books on the history of the shipyard. Mr. Winslow did not have any recollection of ranges on the installation. He did state that he had not come across anything pertaining to ranges in his research of PNS.

**4.3. On-Site Data Repositories**

Malcolm Pirnie reviewed files and drawings located in the Environmental Department at PNS. Files were made available for review at the site. Malcolm Pirnie made copies of files of interest.

**4.4. Visual Survey**

The data collection team conducted a visual survey of the Small Arms Range as part of the data collection effort for the PA. The purpose of the visual survey was to identify any MEC ordnance

related materials (e.g., expended rounds, fragmentation, range debris, old targets), any evidence of MC (such as ground scarring, stressed vegetation, or chemical residue) and/or surface features that could provide additional information to aid in the characterization of the site. The visual survey was also used to enhance, augment, or confirm the archival data and, in some cases, provide new data to the team. A description of the area surveyed and the results of the survey are provided in [Section 5](#).

#### **4.5. Off-Site Data Sources**

The data collection team visited the following off-site data repositories located near PNS to obtain additional historical information regarding the site:

- Portsmouth Public Library in Portsmouth, New Hampshire
- Kittery Historical and Naval Museum in Kittery, Maine

Available information regarding the Small Arms Range at PNS was sought. Neither of these repositories had any specific information regarding munitions use at PNS or information regarding the Small Arms Range.

## 5. SITE CHARACTERISTICS

The following sections provide site-specific information about the Small Arms Range located on PNS, including its history and site description; land use; access controls and restrictions; visual survey observation and results; contaminant migration routes; and receptors.

### 5.1. SMALL ARMS RANGE

#### *5.1.1. History and Site Description*

The Small Arms Range was used infrequently by PNS security personnel from 1964 through 1988 (approximate dates according to PNS personnel). The closed range area comprises approximately 0.5 acres. The firing point was located at the northwestern end of the range and rounds were fired southeast between the bunkers. There is currently no physical evidence of any structures associated with the range. PNS personnel described the range as “ad hoc construction”. The Repairs and Modifications to the Ammunition Storage Area drawing (1988) showed the northern end of the range open, while the eastern and western sides were wood. A steel plate at the southern end of the range was noted on the drawing. Closure was in preparation for the construction of the HWTF (Building 357). [Map 5.1-1](#) illustrates the Small Arms Range, its features (e.g., firing line, target area), and the surrounding area.

##### **5.1.1.1. Topography**

The Small Arms Range is/was level with little to no change in elevation across the area.

##### **5.1.1.2. Geology**

A general description of the geology of PNS is discussed in [Section 3.3](#). This information is applicable to the Small Arms Range.

##### **5.1.1.3. Soil and Vegetation Types**

A general description of the soil and vegetation of PNS is discussed in [Section 3.4](#). This information is applicable to the Small Arms Range. Overburden materials encountered in the

area of the closed Small Arms Range during the 1994 investigation completed as part of the redevelopment of the area (i.e., construction of the HWTF) were reported to generally consist of brown to tan, fine to coarse, subangular to subrounded sands and gravel, varying from less than one foot to four feet in thickness. This material was interpreted as fill material on the basis of field observations and site history. Vegetation in the vicinity of the HWTF consists of mature trees and manicured lawn.

#### **5.1.1.4.Hydrology**

A general description of the hydrology of PNS is discussed in [Section 3.5](#). This information is applicable to the Small Arms Range.

#### **5.1.1.5.Hydrogeology**

A general description of the hydrogeology of PNS is discussed in [Section 3.6](#). This information is applicable to the Small Arms Range. There are four groundwater monitoring wells located in the general vicinity of the closed Small Arms Range. These wells (HW-1, HW-2, HW-3, and HW-4) were installed in 1995 to monitor the HWTF. Data from November 1998 through June 2003 was obtained and reviewed. Lead was detected in these four monitoring wells at concentrations ranging from one to 16 micrograms per liter ( $\mu\text{g/L}$ ). The Maine Water Quality Criteria Maximum Exposure Guidelines (MEG) is 10  $\mu\text{g/L}$ . Additionally, a network of groundwater monitoring wells monitors the adjacent JILF. A review of the data from 1996-1997 from these wells (presented in the 1999 Groundwater Monitoring Report) demonstrates that the landfill operations have impacted the groundwater. This impact includes lead concentrations in excess of the Maine MEG. Lead was detected in the JILF groundwater monitoring wells at concentrations ranging from 1.2  $\mu\text{g/L}$  to 61.4  $\mu\text{g/L}$ , with one anomalous detection of 267  $\mu\text{g/L}$ . According to the Groundwater Monitoring Report (1999), groundwater flow direction in the vicinity of the closed Small Arms Range is generally to the west (from the JILF).

#### **5.1.1.6.Cultural and Natural Resources**

A general description of the cultural and natural resources of PNS is discussed in [Section 3.7](#). The closed Small Arms Range is not included in the PNS Historic District. The closed range location is considered a low sensitivity pre-historic and historic archaeological resource.

### **5.1.1.7. Endangered and Special Status Species**

A general description of the endangered and special status species at PNS is discussed in [Section 3.8](#). This information is applicable to the Small Arms Range.

#### ***5.1.2. Visual Survey Observations and Results***

A visual survey was conducted on August 25, 2003, as part of the site visit. Present on the visual survey were Ms. Raymond and Mr. Gagnon of PNS and Mr. Ken Kaiser, Ms. Terri Akbas, and Mr. Al Larkins from Malcolm Pirnie. The visual survey consisted of walking over the concrete pad and adjoining parking lot. [Map 5.1-1](#), located at the end of [Section 5](#), illustrates the Small Arms Range boundary and the site reconnaissance path. Additional range/site details are illustrated on [Map 5.1-2](#) also located at the end of [Section 5.1](#).

#### ***5.1.3. Munitions and Munitions Related Materials Associated with the Site***

This section describes the munitions or munitions related materials known or suspected to be at the site, including the types and estimated maximum penetration depths. This includes both MEC and non-hazardous munitions related scrap (e.g., fragmentation, base plates, inert mortar fins).

Specific ordnance types used at the range were not documented; however, typical small arms used for practice include 0.38- and 0.45-caliber pistols and 0.22- and 0.30-caliber rifles. The range was used only for small caliber weapons training. Magazines were located immediately adjacent to the Small Arms Range. The magazines were used to store munitions off-loaded from ships docked at the shipyard. Specific types of munitions stored at these magazines are unknown, but storage was temporary while ships were being serviced at PNS.

Based on the information obtained during the data collection process, no special consideration munitions are known or suspected to have been used at the site; therefore, the Small Arms Range is not suspected to contain chemical warfare materiel filled munitions, electrically fuzed munitions, or depleted uranium associated munitions.

#### **5.1.4. MEC Presence**

The entire site has been subdivided and categorized into one of three levels of MEC presence including: Known MEC Areas, Suspect MEC Areas, and Areas where No Evidence Exists to indicate that MEC is known or is suspected to be at the site. The MEC presence is discussed below.

[Map 5.1-3](#) illustrates the munitions characterization of the Small Arms Range and is provided at the end of [Section 5.1](#).

##### **5.1.4.1. Known MEC Areas**

There are no known MEC areas associated with the range.

##### **5.1.4.2. Suspected MEC Areas**

There are no suspected MEC areas associated with the range.

##### **5.1.4.3. Areas Not Suspected to Contain MEC**

Based on available documents collected and interviews of Environmental Division personnel at PNS during the PA process, the entire 0.50-acre area of the Small Arms Range is not suspected to contain MEC. Only small arms weapons and ammunition were used at the site.

#### **5.1.5. Ordnance Penetration Estimates**

The depth to which munitions penetrate below the ground surface depends on many factors, including the type of soil, the angle of impact, the size of the munition, the velocity at impact, and site-specific environmental conditions. Over the years, the DoD has studied and modeled munitions penetration depths and has issued various guidance and technical documents on the subject. For the purposes of the PA, maximum probable penetration depths are estimated following guidance listed in the latest draft (July 2002) of the DoD Directive on Explosives

Safety issued by the DoD Explosives Safety Board [*DoD Directive 6055.9 (DoD Ammunition and Explosives Safety Standards)*]. The Directive refers to *TM 5.855.1* and *NAVFAC P-1080*.

The guidance documents described above do not apply to small arms. The Small Arms Range was designed so that the small arms ammunition fired at the range would have impacted the berm behind the targets. As described above, soils at the range have been excavated, sieved, and remediated. Only small arms weapons and ammunition were used at the site, with targets set up at the end of a 20-foot by 85-foot firing range. According to “Characterization and Remediation of Soils at Closed Small Arms Firing Ranges”, Interstate Technology Regulatory Council (ITRC), January 2003, given the types of munitions used on the range, it is expected that any MC would be within the top one foot of soil. Any soil that would have been impacted by MC has been removed.

#### ***5.1.6. Munitions Constituents***

The main constituent of concern at small arms ranges is lead, although other metals including antimony, arsenic, copper, tin, iron, and zinc can also be present in small arms ammunition.

A subsurface investigation was conducted in July 1994 by C.T. Male Associates, P.C. in preparation for the construction of the HWTF. The purpose of the investigation was to determine the presence of soil contamination in the area of the proposed HWTF (to be located in the area of the closed Small Arms Range). The investigation consisted of the excavation of test pits and collection of soil samples. The soil samples were analyzed for Target Compound List (TCL) volatiles, TCL semi-volatiles, TCL pesticides/polychlorinated biphenyls (PCBs), Target Analyte List inorganics, and total petroleum hydrocarbons. As stated above, lead is the primary constituent of concern at small arms ranges. No metals were detected in excess of the USEPA health based criteria for soil ingestion.

Soils were excavated and screened in preparation for the construction of the HWTF, thereby removing the potential source of lead contamination. Soil screenings were transported off-site as hazardous waste.

As noted in [Section 5.1.1.5](#), four wells are located on the HWTF property. Data from November 1998 through June 2003 noted lead at concentrations ranging from one µg/L to 16 µg/L. The Maine Water Quality Criteria MEG is 10 µg/L.

Also as discussed in [Section 5.1.1.5](#), lead was detected in the JILF groundwater monitoring wells at concentrations ranging from 1.2 µg/L to 61.4 µg/L, with one anomalous detection of 267 µg/L.

Based on the soil remediation conducted at the closed range (i.e., removal of potential contamination source) and the historic soil and groundwater quality at the Small Arms Range, it is unlikely that MC exist at the range.

### ***5.1.7. Contaminant Migration Routes***

With regard to groundwater, the chemical of potential concern is expected to be lead, which has low soil mobility. Soils were excavated and screened in preparation for the construction of the HWTF, thereby removing the potential source of lead contamination. As such, migration of lead from soil at the Small Arms Range to groundwater is unlikely. A review of the groundwater data indicates the presence of lead in the groundwater beneath the adjacent JILF, as well as beneath the closed Small Arms Range. As stated previously, groundwater flow direction in the vicinity of the closed Small Arms Range is generally to the west (i.e., from JILF). The available groundwater data show no lead concentration gradient across the Small Arms Range and JILF.

### ***5.1.8. Receptors***

There are three groups of potential human receptors (Navy personnel, Navy-escorted visitors [e.g., authorized contractors], and trespassers) and one group of potential biota receptors at the Small Arms Range. Current potential human receptors include Navy personnel, Navy-escorted visitors (e.g., contractors conducting environmental or ecological surveys), and trespassers. PNS has various developmental constraints that could alter or hamper the construction of facilities or place restrictions on new or existing operations. Also, land use is expected to remain as a Navy installation into the foreseeable future. Thus, further development of the closed range is unlikely in the future. Therefore, all current potential receptors are also considered potential future receptors. In addition, contractors hired to perform subsurface work such as utility installation or repair, are considered potential future receptors. Current and future biota receptors include the Portsmouth Naval Shipyard

current flora and fauna present at the site. (See Table 5.1-1 for a listing of common ecological receptors in the area.)

The following receptors could be exposed to surface soil during non-intrusive activities at the Small Arms Range:

- Navy personnel patrolling the area
- Navy personnel working at the HWTF
- Navy-escorted visitors (e.g., contractors conducting environmental or ecological surveys)
- Trespassers (e.g., recreational boaters, fishermen)
- Wildlife (flora and fauna)

The following receptors could be exposed to surface and subsurface soil during intrusive activities in the future at the Small Arms Range:

- Navy personnel patrolling the area
- Navy-escorted visitors (e.g., contractors conducting environmental surveys, ecological surveys, or utility work)
- Trespassers
- Wildlife (flora and fauna)

#### **5.1.8.1.Nearby Populations**

The population of Portsmouth, New Hampshire, is 23,000 residents. The population of Kittery, Maine is 9,500 residents. PNS is home to a combined workforce of approximately 4,400 civilian and military personnel.

#### **5.1.8.2.Buildings Near/Within Site**

Building 357 (HWTF) is located on the closed Small Arms Range property.

### 5.1.8.3. Utilities On/Near Site

Utilities in the vicinity of the closed range include electrical, water, storm drains, and sanitary sewer.

### 5.1.9. Land Use

The closed Small Arms Range is located on the eastern end of PNS on the former Jamaica Island. Past land use at this area included the Small Arms Range and magazines. The magazines were used to store munitions off-loaded from ships docked at the shipyard. Specific types of munitions stored at these magazines are unknown, but storage was temporary while ships were being serviced at PNS. The magazines were removed in the 1980s. Currently, the HWTF occupies the location of the closed Small Arms Range. The HWTF consists of Building 357 and associated paved areas (parking and staging areas). Future land use is anticipated to be unchanged from the current land use.

The land to the east of the closed range is the JILF. From 1945 until approximately 1978, 25 acres of tidal flats between Jamaica and Seavey's Islands were filled with wastes, including chromium-, lead-, and cadmium-plating sludge; asbestos insulation; volatile organic compounds; waste paint and solvents; mercury-contaminated materials; sandblasting grit containing various metal wastes; and dredged sediments from the Piscataqua River. A hazardous waste landfill cover is being constructed on the JILF. After the remedy is complete, a portion of the vegetated areas of the landfill will be used for recreational purposes, and a paved section will be used for vehicle parking and pleasure boat storage. Groundwater quality at the landfill will be monitored by a network of monitoring wells. The mainland on both sides of the river in the immediate vicinity of the shipyard is a densely settled residential area with commercial/light industrial land use activities.

### 5.1.10. Access Controls / Restrictions

PNS fully encompasses Seavey's Island, which sits at the mouth of the Piscataqua River. Vehicles must enter PNS by either of two gated entrances. PNS is a secure site with armed guards at each entrance. All vehicles and personnel are screened prior to entry. There is no fencing surrounding the shipyard. The closed Small Arms Range is located fully within the PNS

boundaries. There is a fence surrounding the HWTF and the associated paved areas. This fence is secured when the facility is not occupied. Security was not evident in the vicinity of the closed range.

The closed Small Arms Range is located in a potentially constrained area with respect to land use. Potential constraints include man-made or natural conditions such as the proximity to the Piscataqua River, proximity to the JILF, and the presence of archaeologically sensitive areas (as discussed in [Section 3.6](#)).

#### ***5.1.11. Conceptual Site Model***

This Conceptual Site Model (CSM) was developed following guidance documents issued by the USEPA for hazardous waste sites and the U.S. Army Corps of Engineers (USACE) for ordnance and explosives sites. Guidance documents included the USEPA's Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (EPA/540/G-89/004) and the USACE CSM Guidance Development of Integrated Conceptual Site Models for Environmental Ordnance and Explosives (OE) Sites, which was final as of February 2003.

The CSM describes the site and its environmental setting. The CSM presents information regarding: 1) MEC and/or MC known or suspected to be at the site; 2) current and future reasonably anticipated or proposed uses of the real property; and 3) actual, potentially complete, or incomplete exposure pathways that link them. The CSM is the basis for the risk evaluation, prioritization, and remediation cost estimate.

The CSM is presented in a series of information profiles that presents information about the site. The information profiles are included in Table 5.1-1 below.

Table 5.1-1: Conceptual Site Model Information Profiles – SMALL ARMS RANGE		
Profile Type	Information Needs	Preliminary Assessment Findings
Range/Site Profile	Installation Name	PNS
	Installation Location	Kittery, York County, Maine
	Range/Site Name	Small Arms Range
	Range/Site Location	Eastern end of PNS on the former Jamaica Island, west of the JILF
	Range/Site History	The Small Arms Range was used infrequently by PNS security personnel from 1964 through 1988 (approximate dates according to PNS personnel). Closure was in preparation for the construction of the HWTF.
	Range/Site Area and Layout	The closed range area comprises approximately 0.5 acres. The firing point was located at the northwestern end of the range and rounds were fired southeast between the bunkers.
	Range/Site Structures	There is currently no physical evidence of any structures associated with the range. PNS personnel described the range as “ad hoc construction”. The Repairs and Modifications to the Ammunition Storage Area drawing (1988) showed the northern end of the range open, while the eastern and western sides were wood. A steel plate at the southern end of the range was noted on the drawing.
	Range/Site Boundaries	N: Parking lot and Building, 357 S: Chain link fence E: Building 357 and the JILF W: Parking lot
	Range/Site Security	PNS is a secure site with armed guards at each of two entrances. All vehicles and personnel are screened prior to entry. There is no fencing surrounding the shipyard. The closed Small Arms Range is located within the PNS boundaries. The range area is not fenced. Security was not evident in the vicinity of the closed range.
Munitions/Release Profile	Munitions Types	Specific ordnance types used at the range were not documented; however, typical small arms used for practice include 0.38- and 0.45-caliber pistols and 0.22- and 0.30-caliber rifles.
	Maximum Probability Penetration Depth	According to “Characterization and Remediation of Soils at Closed Small Arms Firing Ranges”, ITRC, January 2003, given the types of munitions used on the range, it is expected that any MC would be within the top one foot of soil. Small arms are not considered MEC because they do not pose an explosive hazard.
	MEC Density	None

Table 5.1-1: Conceptual Site Model Information Profiles – SMALL ARMS RANGE		
Profile Type	Information Needs	Preliminary Assessment Findings
	MEC Scrap/Fragments	None
	Associated Munitions Constituents	Predominantly lead pellets from shot. Other metals typically found in small arms ammunition include antimony, arsenic, copper, tin, iron, and zinc.
	Migration Routes/Release Mechanisms	Erosion over the long term may result in some lead or steel shot being exposed (although none was detected in the walkover and none is anticipated since the area was investigated and remediated). This erosion is only possible in the landscaped areas since the rest of the site is concrete or paved. Human intervention is not anticipated as current and future land use is to remain as the HWTF and associated paved areas. Groundwater at PNS is monitored for both the HWTF and JILF (adjacent to the closed Small Arms Range).
Physical Profile	Climate	The overall climate in the Portsmouth region is characterized as variable. The average daily temperature ranges from 13°F in January and February to 80°F in July. Precipitation is fairly evenly distributed over the year, with an annual total of 42.6 inches.
	Topography	PNS is located along the coastal plain of southern Maine and New Hampshire. The shipyard is located in the Seaboard Lowland section of the New England physiographic province. PNS is characterized by fairly level terrain with small outcrops of bedrock. The area of the Small Arms Range is level.
	Geology	Bedrock geology consists of Silurian-age granofels with a loose overburden of generally well drained glacial till, zero feet to 200 feet above the bedrock. The Portsmouth Fault, which is the contact between the Kittery and Rye Formations, is reported to reach from New Hampshire to the southeastern end of the shipyard.

**Table 5.1-1: Conceptual Site Model Information Profiles – SMALL ARMS RANGE**

Profile Type	Information Needs	Preliminary Assessment Findings
	Soil	<p>Soils are typically glacial till, consisting of mixed sand, silt, clay, and gravel deposits. The naturally occurring soil material at the shipyard is classified as Lyman fine sandy loam. Overburden materials encountered in the area of the closed Small Arms Range during the 1994 investigation generally consisted of brown to tan, fine to coarse, subangular to subrounded sands and gravel, varying from less than one foot to four feet in thickness. This material was interpreted as fill material on the basis of field observations and site history.</p> <p>The shipyard fully encompasses Seavey’s Island, which sits at the mouth of the Piscataqua River. Seavey’s Island was originally five islands: Seavey’s Island, Jamaica Island, Pumpkin Island, Dennett’s Island, and Clark’s Island. The inter-island areas between Seavey’s Island, Jamaica Island, Pumpkin Island, and Dennett’s Island were land filled until only one large contiguous island remained.</p>
	Hydrogeology	<p>Groundwater levels are reported to be relatively shallow (approximately 10-15 feet below ground surface). There are four groundwater monitoring wells located in the general vicinity of the closed Small Arms Range. These wells were installed in 1995 to monitor the HWTF. Additionally, a network of groundwater monitoring wells monitors the adjacent JILF. Groundwater at the shipyard is influenced by brackish and/or sea water and currently is not used as a source of drinking water, nor is it expected to be used as a future source of drinking water.</p>
	Hydrology	<p>The shipyard fully encompasses Seavey’s Island, which sits at the mouth of the Piscataqua River. The Piscataqua River is a tidal estuary that forms the southern boundary between Maine and New Hampshire. PNS is part of the Piscataqua-Salmon Falls watershed. There are three ecologically distinct environments based on the salinity of the water in this coastal area: the marine ecosystem with a relatively high salt content, an estuarine ecosystem with highly variable salinity, and a freshwater ecosystem with very low salinity. Two fresh-water ponds are located in the central portion of the shipyard. Surface runoff travels towards the Piscataqua River (located to the south, east, and west of the shipyard) and the Back Channel (located directly north of the shipyard).</p>

Table 5.1-1: Conceptual Site Model Information Profiles – SMALL ARMS RANGE		
Profile Type	Information Needs	Preliminary Assessment Findings
Land Use and Exposure Profile	Vegetation	PNS is a highly developed, industrial property with limited vegetative growth. The majority of ground cover consists of landscaping plants, with only scattered remnants of naturally occurring species.
	Current Land Use	The HWTF (Bldg. 357) resides at the location of the closed Small Arms Range. Most of the area is paved for vehicle parking and truck loading/off-loading. The land to the east of the closed range is Jamaica Island.
	Current Human Receptors	The closed Small Arms Range is located at the current site of the HWTF. PNS personnel work in this area daily; however, there is no potential for personnel to contact subsurface soil. Potential receptors would include authorized contractors conducting subsurface utility work. However, this potential is further limited since during construction, the area of the Small Arms Range was raised in elevation by four feet (i.e., only work conducted deeper than four feet would represent a potential pathway for exposure).
	Current Activities (frequency, nature of activity)	Navy personnel activities (working daily at the HWTF) would be non-intrusive (walking over the closed range – currently paved). Trespassers, although unlikely, would be conducting similar non-intrusive activities, such as walking over the closed range.
	Potential Future Land Use	Future development at the range area is unlikely due to the fact that the HWTF construction was completed in 1996. Potential land use constraints include man-made or natural conditions such as the proximity to the Piscataqua River, proximity to the JILF, and the presence of archaeologically sensitive areas (as discussed in <a href="#">Section 3.6</a> ).
	Potential Future Human Receptors	Most likely, the current receptors will continue to be receptors in the future. Potential receptors would include authorized contractors conducting subsurface utility work.
	Potential Future Land Use-Related Activities:	Anticipated future land use and activities are likely to remain the same as the current.
	Zoning/Land Use Restrictions	Potential constraints include man-made or natural conditions such as the proximity to the Piscataqua River, proximity to the JILF, and the presence of archaeologically sensitive areas.
	Demographics/Zoning	According to the U.S. Census Bureau (2000), the population density of York County, Maine was 188 people per square mile. PNS is home to a combined workforce of approximately 4,400 personnel.

Table 5.1-1: Conceptual Site Model Information Profiles – SMALL ARMS RANGE		
Profile Type	Information Needs	Preliminary Assessment Findings
Ecological Profile	Beneficial Resources	Portions of PNS are included in the PNS Historic District; a subset of that district was listed in the National Register in 1977. The closed Small Arms Range is not included in this historic district. The closed range location is considered a low sensitivity pre-historic and historic archaeological resource.
	Habitat Type	The closed range area is developed with a building and associated pavement. Mowed lawn and trees are present in the surrounding areas. The JILF is located to the east of the site. The Piscataqua River surrounds the shipyard and is located to the north, east, and west of the range area.
	Degree of Disturbance	The degree of disturbance is described as “Moderate”, since the range area is and will continue to be used for the HWTF and associated pavement. The current habitat in the range area is expected to be unchanged in the future. Traffic is present daily, and mowing is conducted in the area during the growing season.

Table 5.1-1: Conceptual Site Model Information Profiles – SMALL ARMS RANGE		
Profile Type	Information Needs	Preliminary Assessment Findings
	Ecological Receptors	<p><u>Common wildlife species</u> at PNS include the white-footed mouse, woodland jumping mouse, meadow jumping mouse, house mouse, Norway rat, meadow vole, red-backed vole, starnose mole, masked shrew, smoky shrew, shorttail weasel, longtail weasel, eastern grey squirrel, red squirrel, northern flying squirrel, eastern chipmunk, cottontail rabbit, raccoon, opossum, wood chuck, skunk, muskrat, little brown bat, big brown bat, red fox, and white-tailed deer.</p> <p><u>Other species</u> at PNS include the painted turtle, garter snake, green frog, and leopard frog.</p> <p><u>Common birds</u> include the blue winged teal, green-winged teal, black duck, mallard duck, common goldeneye, bufflehead duck, Canada goose, woodcock, pied-billed grebe, common loon, long-eared owl, marsh hawk, osprey, double-crested cormorant, semi-palmated plover, killdeer, ring-billed gull, common tern, greater scaup, lesser scaup, ruddy duck, crows and ravens, common merganser, turkey vulture, American coot, greater yellow legs, lesser yellow legs, spotted sandpiper, barn owl, flicker, yellow bellied sapsucker, hairy woodpecker, downy woodpecker, house wren, catbird, northern shrike, loggerhead shrike, warblers, vireos, finches, northern thrush, common red poll, house sparrow, redwing blackbird, common grackle, rusty blackbird, brown-headed cowbird, juncos, rufus-sided towhee, nuthatches, buntings, evening grosbeak, pine siskin, belted kingfisher, great black-backed gull, herring gull, mourning dove, tree swallow. Barn swallow, blue jay, common crow, black-capped chickadee, white-breasted nuthatch, robin, starling, slate-colored junco, and wood warblers.</p>
	Federal Endangered Species:	Shortnose sturgeon
	Federal Threatened Species:	None
	State Endangered Species:	Shortnose sturgeon
	State Threatened Species:	None

Table 5.1-1: Conceptual Site Model Information Profiles – SMALL ARMS RANGE		
Profile Type	Information Needs	Preliminary Assessment Findings
	Relationship of MEC/MC Sources to Habitat and Potential Receptors	Remedial actions were taken at the range area prior to the construction of the HWTF. There are no longer MC sources available to habitat or potential receptors. MEC sources were never present in the area of the closed Small Arms Range. There are no current or anticipated complete exposure pathways to ecological receptors.

A key element of the CSM is the exposure pathway analysis. For MEC, a complete or potentially complete exposure pathway must include the following components: 1) a source (e.g., locations where MEC are expected to be found); 2) access (e.g., controlled or uncontrolled access, items on the surface or within the subsurface); 3) an activity (e.g., non-intrusive grounds maintenance or intrusive construction); and 4) receptors (e.g., Navy personnel, construction workers, recreational users or authorized visitors). It is important to recognize that environmental mechanisms (e.g., erosion) and/or human intervention may result in the repositioning of MEC.

For MC, a complete or potentially complete exposure pathway must include the following components: 1) a source (e.g., locations where MC are expected to be found); 2) an exposure medium (e.g., surface soil); 3) an exposure route (e.g., dermal contact); and 4) receptors (e.g., Navy personnel, construction workers, recreational users or authorized visitors). If the point of exposure is not at the same location as the source, the pathway may also include a release mechanism (e.g., volatilization) and a transport medium (e.g., air).

The potential interactions between the source and receptors are assessed differently between MEC and MC. For MC, interaction between the source and receptors involves a release mechanism for the MC, an exposure medium that contains the MC, and an exposure route that places the receptor into contact with the contaminated medium. For MEC, interaction between the potential receptors and an MEC source has two components. The receptor must have access to the source and must engage in some activity that results in contact with individual MEC items within the source area.

**MEC Interactions and Pathway Analysis**

As discussed above, the closed range is not suspected to contain MEC, thus all pathways are incomplete. No MEC pathway analysis figure is provided.

### **MC Interactions and Pathway Analysis**

The pathway analysis for MC is shown in Figure 5.1-1. Potential receptors shown include authorized contractors. Pathways are shown for each medium and are discussed below.

#### Plant/Animal Uptake

Based on remediation activities conducted at the Small Arms Range, biota are not expected to be exposed to MC at the Small Arms Range. Therefore, these pathways are marked as incomplete.

#### Volatilization /Air

Lead is the primary MC of concern at small arms ranges. Lead is not volatile; therefore, it is not expected to volatilize into the air via the soil-to-air pathway. In addition, soils at the closed Small Arms range were remediated and lead screenings were transported off-site. As such, volatilization of contaminants into the air is concluded to be an incomplete pathway for all receptors.

#### Surface Soil

As discussed earlier, the soil at the closed Small Arms Range has been screened and segregated, and the screenings were transported off-site for disposal as hazardous waste prior to the construction of the HWTF. In addition, the elevation of the Small Arms Range area was raised by approximately four feet during the construction of the HWTF. Therefore, all pathways indicating contact with surface soil (i.e., zero to two feet) are marked as incomplete.

#### Subsurface Soil

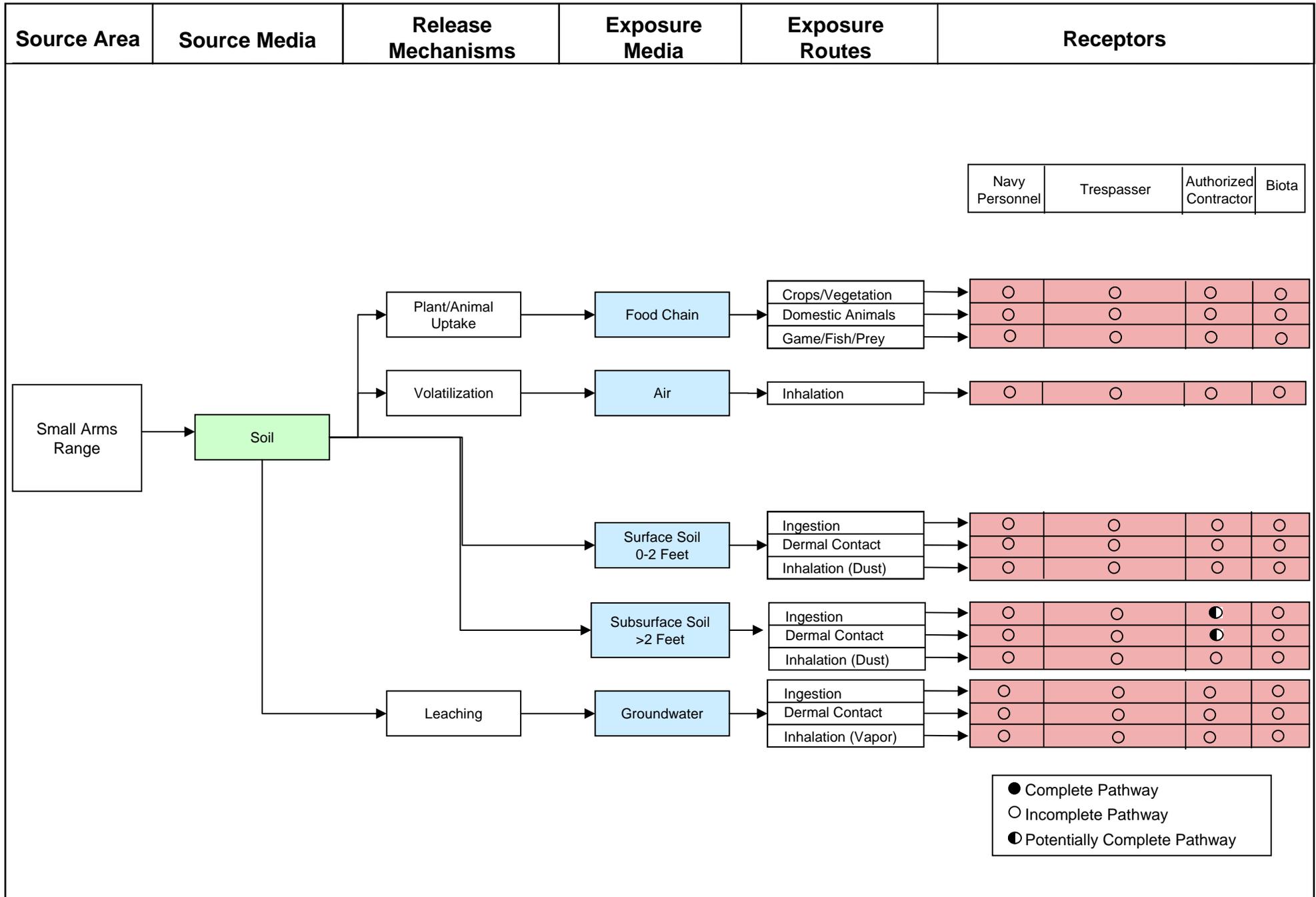
As discussed above, the elevation of the Small Arms Range area was raised by approximately four feet during the construction of the HWTF. Therefore, only subsurface work deeper than four feet would represent a potential exposure pathway.

#### Groundwater

Lead has been detected in the groundwater in the on-site wells and the JILF monitoring wells. However, the available groundwater data show no lead concentration gradient across the Small Arms Range and JILF. Given the history of the JILF and the presence of lead in the groundwater beneath the landfill, lead in the groundwater is most likely due to JILF operations. This finding indicates that the groundwater quality in the area of the Small Arms Range has not been adversely

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affected by historical range operations. The groundwater beneath the shipyard is not used for drinking water; therefore, all pathways are marked as incomplete.



Complete Pathway  
 Incomplete Pathway  
 Potentially Complete Pathway

### ***5.1.12. Summary***

Based upon the information presented in the previous sections, the Small Arms Range was used by Naval security personnel in the practice of firing small caliber weapons from 1964 to 1988 (approximate dates). Historical documentation and PNS personnel indicate that no other explosives or munitions were used at the site. Magazines were located in the vicinity of the Small Arms Range; however, the magazines were used only to store munitions off-loaded from ships docked at the shipyard. Specific types of munitions stored at these magazines are unknown. There is no evidence or record of any discarded military munitions from or near these magazines. Currently, the HWTF occupies the location of the closed Small Arms Range. The HWTF consists of Building 357 and associated paved areas (parking and staging areas).

In the mid 1990s, PNS conducted an investigation and remediation of soils at the Small Arms Range. Soils were excavated and screened in preparation for the construction of the HWTF. Soil screenings were transported off-site as hazardous waste (lead), thereby removing the potential contamination source.

Based on the findings and information gathered during this PA process, it was determined that remedial actions were completed at the Small Arms Range. With regard to groundwater, the MC of potential concern is expected to be lead, which has low soil mobility. As such, migration of lead from soil to groundwater is unlikely. Lead has been detected in the groundwater in the on-site wells and the JILF monitoring wells. Additionally, the available groundwater data show no lead concentration gradient across the Small Arms Range and JILF. Given the history of the JILF and the presence of lead in the groundwater beneath the landfill, lead in the groundwater is most likely due to JILF operations. This finding indicates that the groundwater quality in the area of the Small Arms Range has not been adversely affected by historical range operations.

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Kittery, ME**



**MALCOLM  
PIRNIE**

**Map 5.1-1  
Visual Survey  
Small Arms Range**

**Legend**

-  Installation Boundary
-  Small Arms Range Boundary  
(including Safety Danger Zone) - estimated
-  Site Reconnaissance
-  Structures



Data Source: Kittery, Maine, Digital Orthophoto, 1998  
NSY Portsmouth, GIS Data, 2003

Coordinate System: UTM Zone 19N  
Datum: NAD 83  
Units: Meters

Contract: N62472-02-D-1300  
Edition: Final Preliminary Assessment  
Date: April 2005



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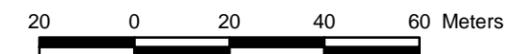


**MALCOLM  
PIRNIE**

**Map 5.1-2  
Range/Site Details  
Small Arms Range**

**Legend**

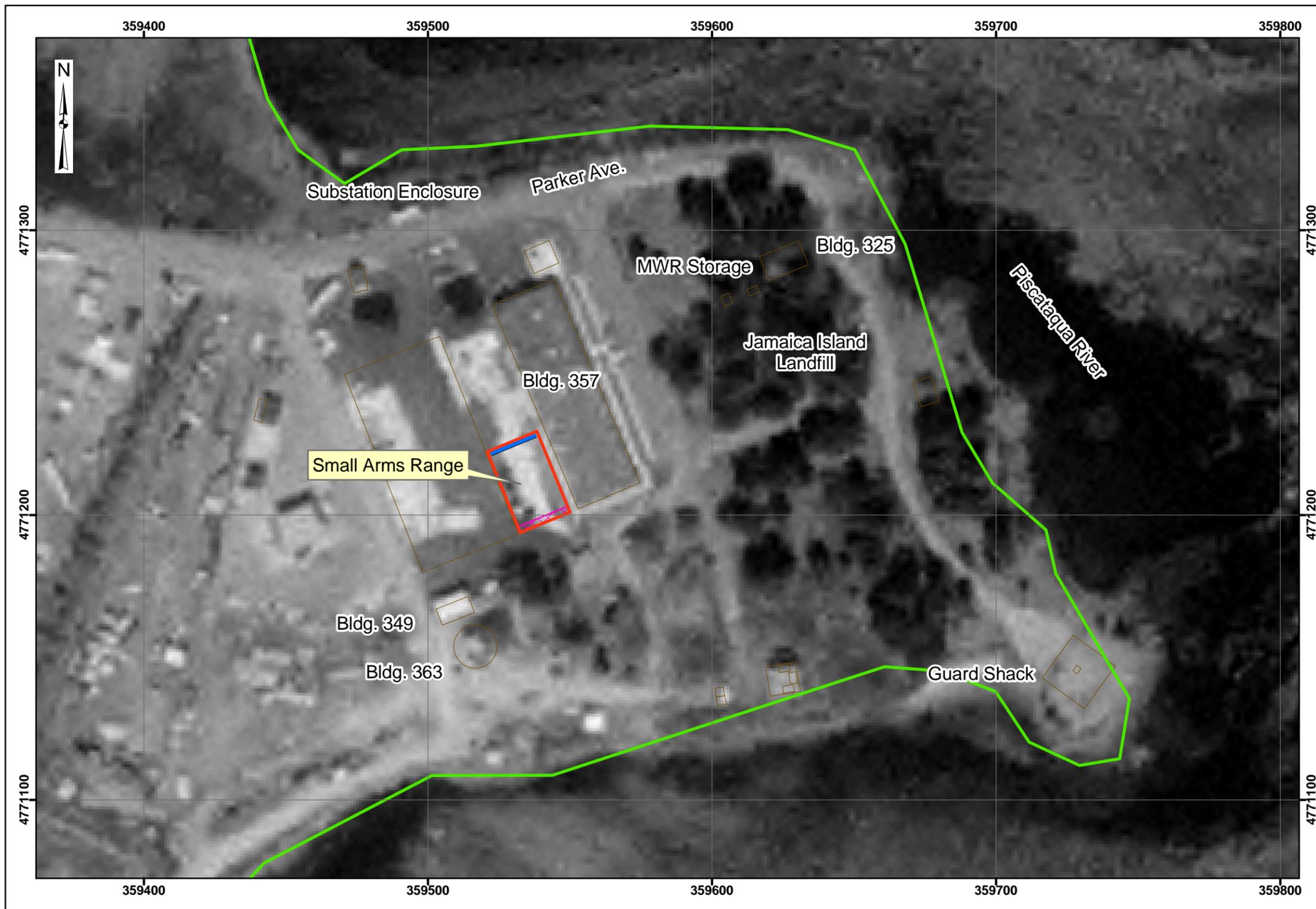
-  Installation Boundary
-  Structures
-  Small Arms Range Boundary  
(including Safety Danger Zone) - estimated
-  Firing Line
-  Target Area



Data Source: Kittery, Maine, Digital Orthophoto, 1998  
NSY Portsmouth, GIS Data, 2003

Coordinate System: UTM Zone 19N  
Datum: NAD 83  
Units: Meters

Contract: N62472-02-D-1300  
Edition: Final Preliminary Assessment  
Date: April 2005



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Kittery, ME**



**MALCOLM  
PIRNIE**

**Map 5.1-3  
Munitions Characterization  
Small Arms Range**

**Legend**

-  Installation Boundary
-  Small Arms Range Boundary  
(including Safety Danger Zone) - estimated
-  Structures
- MEC Presence \***
  -  Known
  -  Suspect

\* There is no evidence of MEC Presence as determined through historical documentation, interview, and/or visual survey. Visual observations and/or historical documentation indicate that MC may be present at the site, but MC Presence has not been confirmed by sampling or other means.



Data Source: Kittery, Maine, Digital Orthophoto, 1998  
NSY Portsmouth, GIS Data, 2003

Coordinate System: UTM Zone 19N  
Datum: NAD 83  
Units: Meters

Contract: N62472-02-D-1300  
Edition: Final Preliminary Assessment  
Date: April 2005



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**File:\Reference\_Documents\Source\_Data\Appendix\_B\Memo\_27\_Feb\_1947.pdf**

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**Aerial Photographs:**

Aerial Photograph, June 1929.

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Aerial Photograph, undated (no later than 1943).

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Aerial Photograph, September 24, 1953.

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Aerial Photograph, September 24, 1953.

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Aerial Photograph, 1960.

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Map of U.S. Navy Yard Portsmouth, N.H. showing Fuel Oil Storage Tank Piping Quay Wall to Tanks, June 6, 1923.

**File:\Reference\_Documents\Source\_Data\Appendix\_B\Map\_1923.pdf**

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Map of U.S. Navy Yard Portsmouth, N.H. showing conditions on June 30, 1928.

**File:\Reference\_Documents\Source\_Data\Appendix\_B\Map\_1928.pdf**

Map of U.S. Navy Yard Portsmouth, N.H. showing conditions on June 30, 1930.

**File:\Reference\_Documents\Source\_Data\Appendix\_B\Map\_1930.pdf**

Map of U.S. Navy Yard Portsmouth, N.H. showing conditions on June 30, 1931.

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Map of U.S. Navy Yard Portsmouth, N.H. showing conditions on June 30, 1935.

**File:\Reference\_Documents\Source\_Data\Appendix\_B\Map\_1935.pdf**

Map of U.S. Navy Yard Portsmouth, N.H. showing conditions on June 30, 1939.

**File:\Reference\_Documents\Source\_Data\Appendix\_B\Map\_1939.pdf**

Map of U.S. Navy Yard Portsmouth, N.H. showing conditions on June 30, 1940.

**File:\Reference\_Documents\Source\_Data\Appendix\_B\Map\_1940.pdf**

Map of U.S. Navy Yard Portsmouth, N.H. showing conditions on June 30, 1943.

**File:\Reference\_Documents\Source\_Data\Appendix\_B\Map\_1943.pdf**

Map of U.S. Navy Yard Portsmouth, N.H. showing conditions on June 30, 1949.

**File:\Reference\_Documents\Source\_Data\Appendix\_B\Map\_1949.pdf**

Location Plan – Utilities. Addition for Polaris Launch System Overhaul, November 11, 1961.

**File:\Reference\_Documents\Source\_Data\Appendix\_B\Map\_Polaris\_1961.pdf**

U.S. Naval Complex Portsmouth, New Hampshire Existing Conditions Map, February 20, 1963.

**File:\Reference\_Documents\Source\_Data\Appendix\_B\Map\_Existing\_1963.pdf**

## **Appendix B: Project Source Data – General**

**FINAL PRELIMINARY ASSESSMENT**

Electronic copies of reference materials for Appendix B are provided on the CD-ROM in folder:

Reference\_Documents\Source\_Data\Appendix\_B

**Links to all reference documents are provided in Appendix A**

**Archival Data Review Log**  
**Preliminary Assessments on MMRP Ranges and Sites**  
**Installation: Portsmouth Naval Shipyard**

Letters/Memos		
Item Number	Regarding	Date
1	U.S. Naval Prison Navy Yard, Portsmouth, N.H. To: Chief of the Bureau of Ordnance. From: Commanding Officer. Subject: Materials and equipment – request for.	8/13/43
2	To: Chief of the Bureau of Ordnance. From: Department of the Navy Office of the Judge Advocate General. Subject: Materials and equipment – request for.	9/20/43
3	To: Chief of Naval Personnel. From: Chief of the Bureau of Ordnance. Subject: Materials and equipment – request for.	9/25/43
4	U.S. Naval Prison Navy Yard, Portsmouth, N.H. To: Chief of the Bureau of Ordnance. From: Commanding Officer. Subject: .30-Caliber machine gun, request for.	2/5/44
5	Grant of Easement from the Fred B. Higgins Company to the United States of America.	3/13/44
6	To: Chief of Naval Personnel. From: U.S. Naval Prison Navy Yard, Portsmouth, N.H. Subject: Training Equipment, request for.	8/26/44
7	To: Chief of Bureau of Ordnance. Via: Chief of Naval Personnel. From: U.S. Naval Prison Navy Yard, Portsmouth, N.H. Subject: Training Equipment, request for.	1/30/45
8	U.S. Naval Prison Navy Yard, Portsmouth, N.H. To: Chief of Naval Operations. From: Chief of the Bureau of Ordnance. Subject: Training Equipment, request for.	3/13/45
9	To: Chief of Bureau of Aeronautics. Via: Chief of Bureau of Naval Personnel From: U.S. Naval Prison Navy Yard, Portsmouth, N.H. Subject: Special Training Devices, request for.	4/6/45
10	To: Commanding General, Harbor Defenses, Boston. From: Captain, U.S.N. Assistant Commandant (Operations). Subject: Dumping Grounds for Explosives, Ammunition, and Chemicals.	5/15/45
11	To: Chief of the Bureau of Ordnance Bureau of Naval Personnel, Washington D.C. From: U.S. Naval Prison Navy Yard, Portsmouth, N.H. Subject: Special Training Devices, request for.	5/16/45
12	To: Chief of the Bureau of Ordnance, Section Ad7b. From: Supply Officer. Subject: Small Arms for recreational purposes, request for.	1/15/47
13	To: Chief of the Bureau of Ordnance, Section Ad7b. From: Supply Officer. Subject: Small Arms for recreational purposes, request for.	2/27/47
14	To: Commandant, First Naval District – Subject: Renewal of Leases.	6/5/47

Maps/Aerial Photographs		
Item Number	Reference	Date
1	Map of U.S. Navy Yard Portsmouth, N.H. showing Fuel Oil Storage Tank Piping Quay Wall to Tanks	6/6/23
2	Map of U.S. Navy Yard Portsmouth, N.H.	6/30/28
3	Map of U.S. Navy Yard Portsmouth, N.H.	6/30/30
4	Map of U.S. Navy Yard Portsmouth, N.H.	6/30/31
5	Map of U.S. Navy Yard Portsmouth, N.H.	6/30/35
6	Map of U.S. Navy Yard Portsmouth, N.H.	6/30/39
7	Map of U.S. Navy Yard Portsmouth, N.H.	6/30/40
8	Map of U.S. Navy Yard Portsmouth, N.H.	6/30/43
9	Map of U.S. Navy Yard Portsmouth, N.H.	6/30/49
10	Location Plan – Utilities. Addition for Polaris Launch System Overhaul	11/11/61
11	U.S. Naval Complex Portsmouth, New Hampshire Existing Conditions Map	2/20/63
12	Aerial Photograph	Jun-29
13	Aerial Photograph	before 1944
14	Aerial Photograph	7/21/44
15	Aerial Photograph	3/15/43
16	Aerial Photograph	7/11/45
17	Aerial Photograph	9/24/53
18	Aerial Photograph	9/24/53
19	Aerial Photograph	9/24/53
20	Aerial Photograph	1960

DECLASSIFIED

Authority **NND 745081**  
By **LCW/NARA** Date **8/10/83**

EXEMPTED FROM AUTOMATIC DOWNGRADING AND  
DECLASSIFICATION BY THE NATIONAL ARCHIVES

REF ID: A61/886-3/  
879/wfp

**U. S. NAVAL PRISON**  
**Navy Yard, Portsmouth, N. H.**

13 August 1943.

**From:** The Commanding Officer.  
**To :** The Chief of the Bureau of Ordnance.  
**Via :** (1) The Commandant, Navy Yard, Portsmouth, N.H.  
(2) The Judge Advocate General.

**Subject:** Materials and Equipment - Request for.

1. It is requested this activity be furnished the following materials and equipment.

One (1) Dummy Loading Machine, 3", 4" or 5" gun with six dummy shells.

One (1) .30 Caliber machine gun with Dummy Ammunition.

Fifty (50) Rounds of 20mm Dummy Ammunition.

2. The above equipment is to be used for instruction purposes in the rehabilitation of prisoners for duty.

J. A. ROSSILL.

-----  
1st Endorsement  
U.S. Navy Yard, Portsmouth, N.H. 14 August 1943

**From:** Commandant.  
**To:** Chief of the Bureau of Ordnance.  
**Via:** Judge Advocate General.

1. Forwarded.

C.M. ELDER  
By direction

092148 00750

DECLASSIFIED

Authority NND 745081  
By LCNARA Date 8/10/2013

A \_\_\_\_\_

B \_\_\_\_\_

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PLA

PLZ

PLC

(PL2a)

PRINT

4

AF 1  
Y 886-3(3)

~~Int-1~~  
on US Nav. Prison Portsmouth ltr. NPI/  
886-3/879/vfp dated 13 August 1943

From: The Chief of the Bureau of Ordnance  
To: The Chief of Naval Personnel

25 SEP 1943

Subj: Materials and Equipment - request for

Ref: (a) BuPers ltr. P-2425-2b of 22 April 1943

1. Forwarded in accordance with reference (a).

2. Equipment requested is available for early delivery upon approval, with the exception that .30 cal. dummy ammunition should be prepared by requesting activity, in accordance with Bureau of Ordnance Circular Letter A23-43 of 13 April 1943.

092543 50089

RMJ/mec

W. H. P. BLANDY

OSr

US Nav. Prison, Portsmouth/  
NPI., Portsmouth  
JAS

H. G. Herrmann  
By direction

092143 00780

mf

Sept. 20, 1943

DECLASSIFIED

Authority NND 745081By LCN/NARA Date 8/05/03DEPARTMENT OF THE NAVY  
OFFICE OF THE JUDGE ADVOCATE GENERAL  
WASHINGTON, D. C.

JAG:E:GAS:ne

20 September 1943

End. 2. On letter of Commanding Officer, Naval Prison,  
Portsmouth, New Hampshire, dated 13 August 1943.

To : Chief of the Bureau of Ordnance.

Subj: Materials and equipment - request for.

1. Forwarded for appropriate action.

2. The training of men confined at the naval prison, in preparation for restoration to duty, is a vital part of the program for the conservation of man power. It is therefore requested that the materials listed in the basic letter, if available, be supplied as soon as possible.

/s/ L. E. BRATTON  
Acting

092143 00750

CC: CO, NP, Portsmouth, N.H.

RG 74, BUORD  
Gen corr, restr, 1943  
Box 516

Feb. 15, 1944

DECLASSIFIED

Authority 745081By LF NARA Date 2/5/03

REFER TO NO.

NF1/S79/EM

NF1  
MNS

**U. S. NAVAL PRISON**  
**Navy Yard, Portsmouth, N. H.**

15 February 1944.

022044 00577

From: The Commanding Officer.  
To : The Chief of the Bureau of Ordnance.

Subject: .30 Caliber machine gun - request for.

References: (a) C.O., NavPri., Portsmouth, N.H. letter  
NF1/S86-3/S79/wfp of 13 August 1943.  
(b) BuOrd's 3rd End. on reference (a), NF1  
(PL2c) 092143 00750 of 25 Sept., 1943.  
(c) BuPers 4th End. P-425-HF Serial 167  
on reference (a) dated 5 Oct., 1943.

1. Information is requested as to the date the subject machine gun will be shipped to this activity.
2. Reference (b) indicates the availability of a .30 caliber machine gun for instruction purposes in the rehabilitation of prisoners for duty.

*J. M. [Signature]*  
J. M. [Signature]  
By direction.

RG 74, BuOrd  
Gun corr, restr., 1944



March 13, 1944

GRANT OF EASEMENT

From the

FRED B. HIGGINS COMPANY

To

THE UNITED STATES OF AMERICA

THIS INDENTURE, made and entered into this 13<sup>th</sup> day of March, in the year of 1944, by and between the FRED B. HIGGINS COMPANY of Boothbay Harbor, County of Lincoln, State of Maine, a corporation existing under and by virtue of the laws of the State of Maine, hereinafter called the Grantor, and THE UNITED STATES OF AMERICA, hereinafter called the Government.

WITNESSETH, That for and in consideration of payment to the Grantor of the sum of One (\$1.00) dollar, the said Grantor hereby grant and convey unto the Government the right of way, privilege, and easement of the land owned by the Grantor for the purpose of erecting a target, or targets thereon, and for the firing at the said target, or targets, said land being described as follows:

Said tract of land located on Damariscove Island, Boothbay Harbor, State of Maine, more particularly described as follows, to wit: The entire area of Damariscove Island, except approximately one (1) acre adjacent to the southern end on which is located the United States Coast Guard Station, and to which title is owned by THE UNITED STATES OF AMERICA.

The Grantor further grants for the use of said lands, including the beaches thereto annexed, and all rights and appurtenances attached to said beach, as a target and for the erection of any target, or targets, on said land and any other structure necessary for the carrying out of the purposes of a target range. The Grantor further extends the rights and privileges and easement at any and all times to enter upon said land, using whatever right of ways are necessary to reach the targets, or target range, and for all purposes necessary to accomplish the purposes for this, this grant of easement is executed.

L20-60-K1  
25211

056476

DECLASSIFIED  
Authority NND 977372  
By NARA Date 4/2/03

RQ 71, BuDoctes  
Naval Prop. Case Files  
R-575 Pittman

~~Grantor~~ Grantor further covenants with the said Government for a right to remove from the premises any and all targets or buildings placed thereon for the purposes of using said land for a target range.

That all property is to be and is to remain the property of the said Government, which was erected thereon by the Government, and may be removed within a reasonable time from the date of the termination of this grant of easement in any way in which it shall elect.

The grant of easement is in full force and effect for a period of one (1) year from the date of execution of this indenture subject to a renewal by agreement of the parties.

TO HAVE AND HOLD said right of way, privilege, and easement unto the Government, its successors and assigns.

And the Grantor hereby bind itself and its heirs, executors, administrators, successors and assigns and all persons whomsoever lawfully claiming to protect this grant of easement.

IN WITNESS WHEREOF, the Grantor have hereunto set its hand and affixed its seal the day and year first above written.

J. M. Higgins Co. (SEAL)  
John M. Higgins Pres. (SEAL)

I, John M. Higgins, certify that I am the President of the corporation named as Grantor in the attached grant of easement, that I, John M. Higgins who signed said grant of easement on behalf of the Grantor, was the President of said corporation; that said grant of easement was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

J. M. Higgins Co. (SEAL)  
John M. Higgins Pres. (SEAL)

State of Maine )  
County of Lincoln) ss.

SUBSCRIBED AND SWORN TO before me this  
, 1944.

15<sup>th</sup> day of March

DECLASSIFIED  
Authority NND 977372  
By NARA Date 4/21/03  
in and for said State

Aug 26, 1944

AUG 31 1944

REFER TO No.

NF1/P11-1/jh

**U. S. NAVAL PRISON  
Navy Yard, Portsmouth, N. H.**

BUR OF NAVAL PERSONNEL  
NAVY DEPARTMENT  
RECEIVED

1944 AUG 29 PM 2 55

26 August 1944

*J-4*

*NF1*

*mms*

020477

092344-00030

To: Chief of Naval Personnel.

Subj: Training Equipment; request for.

1. It is requested that this activity be furnished with the following equipment as early as practicable for use in the rehabilitation and restoration program for general courts martial prisoners who are scheduled to be restored to duty:

*Dummy Training*  
600 Wooden Rifles

*A. Rosell*  
A. A. ROSSELL  
Colonel, U. S. Marine Corps  
Commanding

*S/ 109278*

092344 00030

By *LF* NARA Date *8/5/83*  
Authority *74528*  
DECLASSIFIED

RG 74, BuOrd  
Gen Corr, Rest, 1944  
Box 914

NAVY DEPARTMENT  
BUREAU OF ORDNANCE  
122  
123  
124  
125  
126

NAVY DEPARTMENT  
BUREAU OF ORDNANCE

ROUTE SLIP  
DO NOT WRITE

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Classified by  
Date  
Initials

BUREAU OF ORDNANCE

00000 00030

DECLASSIFIED  
Authority 74509  
By LT NARA Date 8/5/03

Jan 30, 1945

REFER TO No.

NF1/P11-1/Jh  
Serial 46

U. S. NAVAL PRISON  
Navy Yard, Portsmouth, N. H.

30 January 1945

To: Chief, Bureau of Ordnance.  
Via: Chief of Naval Personnel.

Subj: Training Equipment; request for.

1. The following equipment is desired by this activity for use in our current Rehabilitation and Restoration program for general courts-martial prisoners who are scheduled to return to duty.

QUAN

DESCRIPTION

- 1 Mark 15, Mod 3 Torpedo
- 1 Mark 31 Exercise head for Mark 15 Torpedo
- 1 Box ready tools for Mark 15 Torpedo
- 1 Box supply tools for Mark 15 Torpedo
- 1 Mark 7-8, dummy detonator
- 1 Portable pressure gauge
- 1 Pistol, Mark 3, cut away for instruction purposes with depth charges.
- 1 Low-pressure gauge (for testing)
- 2 Ordnance Pamphlet # 642 (for instruction purposes)
- 1 Dummy Booster, for Mark 3 Depth Charge (cut-away)
- 1 Exploder Mechanism, Mark 6, Mod 5 or 6
- 1 Charging Wing Nut & Cable - Safety Strap
- 1 Spare parts for Mark 13 Mod 1 and Mark 15 Mod 3
- 1 20mm Magazine and Ratchet

14 56

*J. A. Roszell*  
J. A. ROSSELL  
Colonel, U. S. Marine Corps  
Commanding

RECEIVED  
3 FEB 1945  
CORRECTIVE SERVICES  
DIVISION

*NF1  
mws  
MH*

030745 1453

032145 0910

DECLASSIFIED  
Authority *745081*  
By *15* NARA Date *8/5/03*

RG 74, BU Ord  
CEP Subj. Files, 1945  
BOX 1284

Pers-52121-DC

End-1 on CO, US Naval Prison, NYd,  
Portsmouth, N.H. ltr NF1/P11/  
jh Ser.46 dated 30 Jan. 1945.

5 March 1945

To: Chief of the Bureau of Ordnance.

14 56

Subj: Training Equipment; request for.

1. Forwarded, recommending approval provided material listed in basic  
correspondence is available from surplus.

By direction of the Chief of Naval Personnel.

EMMETT W. SKINNER  
Colonel, U.S.M.C.  
Director, Corrective Services

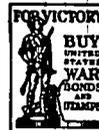
032145-1930  
080745-1930

DECLASSIFIED  
Authority 745081  
By LT NARA Date 8/15/03

In reply refer to Initials  
and No.

Op-05-G1B/REM  
SO 3-14-56  
Serial 28505-G

NAVY DEPARTMENT  
OFFICE OF THE CHIEF OF NAVAL OPERATIONS  
WASHINGTON 25, D. C.



*N71*  
*Plzc*  
*Back 030745-1453*  
*JH*  
*20 MAR 1945*

THIRD ENDORSEMENT on  
CO, US Naval Prison, NYd,  
Portsmouth, N.H. ltr NF1/P11/  
jh Serial 46 dated 30 Jan. 1945.

From: Chief of Naval Operations.  
To : Chief of the Bureau of Ordnance. *U*  
Subject: Training Equipment; Request for. *PLB*

1. Returned.
2. Subject to the exceptions outlined in the second endorsement, the furnishing of the material requested is approved.

032145 6910

*Returned*

Copy to:  
CominCh  
Op-12  
Op-23  
Op-30  
BuPers  
U.S. Naval Prison,  
Portsmouth, N.H.

W. R. PURNELL  
by direction

By *LF* NARA Date *8/5/83*  
Authority *745081*  
DECLASSIFIED

A  
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Pr



PL2c) NFI

Ext-2 on CO, US Naval Prison, NYA, Portsmouth, N.H. ltr NFI/PLI/ Jh Ser. 46 dated 30 Jan. 1945.

From: The Chief of the Bureau of Ordnance.  
To: The Chief of Naval Operations.

MAR 13 1945

Subj: Training Equipment; request for.

1. Forwarded for comment and recommendations. The equipment requested is available with the following exceptions:

<u>Item</u>	<u>Comment</u>
(a) Portable pressure gauge	Can provide one (1) Test Set for Air Chamber which is assumed to be the item desired
(b) Depth Charge equipment (1) Pistol, Mk 3 (Out Away) (2) Low-pressure gauge (3) Exploder Mechanism	Outaway pistols are not available and no procurement is contemplated. Pistol, Mk 3 is obsolete. Recommend the following Depth Charge Equipment:  (a) One (1) Depth Charge Mk 9 Mod 3 (inert) complete with all accessories Mk 6 Mod 1  (b) Ten (10) each, Depth Charge Pistols and Booster Extenders Mk 6 Mod 1  (c) One (1) Depth Charge Test Set Mk 2 Mod 1, complete

1139  
3/13  
1136, 1137 3/13

G. F. HUSSEY, JR.

J. W. Leverton  
By direction

RDG/iv

220  
220 Rg  
3/13

cc: US Naval Prison, NYA Portsmouth, N.H.  
Bureau of Naval Personnel (Pers 52121)

030745 1453

Prepared by RDG Ext. 2265  
13 Mar. 1945

GPO 16-20171

DECLASSIFIED  
Authority 745081  
By 15 NARA Date 8/5/93

Apr 6, 1945

REFER TO No.  
NF1/P11-1(14)  
RJV:hep

**U. S. NAVAL PRISON**  
**Navy Yard, Portsmouth, N. H.**

NF1  
886  
P11-1  
pkc  
LS

042845  
1020

6 April 1945

To: Chief of Bureau of Aeronautics.  
Via: Chief of Bureau of Naval Personnel.  
Subject: Special training devices, request for.

1. The following special training devices are requested for the use of the Aviation Ordnance School at the United States Naval Prison, Portsmouth, New Hampshire:

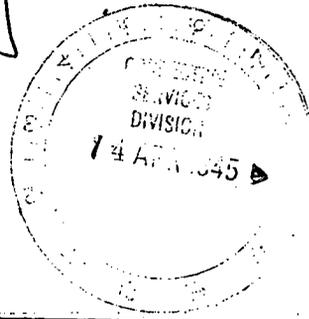
Request:	Device No:	Name of Device:
1	3-A11b	Panoramic Gunnery Trainer
1 (Dummy)	MK21	Bomb Fuse
1 (Dummy)	MK224	Hydrostatic Fuse
1	MK42	Bomb rack
1	MK35	Bomb rack
1		Hundred (100) lb. water fillable bomb.

Item 1  
2  
3  
4  
5  
6

2. This equipment will be used in the retraining of GOMP's who will be restored to duty from the rehabilitation program in effect at this activity.

3. It is requested that the above material be shipped to the Commanding Officer, U.S.Naval Prison, Portsmouth, N.H., marked for the Educational and Training Officer.

*[Signature]*  
A. ROSSELL  
COMMANDING.



Ees  
4216  
7832

By *[Signature]* NARA Date 8/5/93  
Authority 745081  
DECLASSIFIED

RG 74, Bword  
C&P suby Files, 1945  
BOX 1284

Aer-SD-415-WSD  
F11(Devices)

U  
End-2 on CO, USNavPris, Portsmouth, N. H.  
ltr WF1/F11-1(14)/RJV:hep dtd 4-6-45  
with End-1 Pers-52121-DF dtd 4-23-45

70058

From: Chief, BuAer  
To: Chief, BuOrd  
Subj: Special Training Devices - Request for

1. Forwarded for action on items two (2) through six (6).  
BuAer, Special Devices Division is taking action on item one (1), and  
is also supplying Turret and Film which are necessary for use of the  
Gunnery Trainer.



cc: CO, Naval Prison, Portsmouth, N. H.  
Attn: Educational and Training Officer

042845 1020

DECLASSIFIED  
Authority 74508  
By LE NARA Date 8/15/03

**BOARD ROUTE SHEET**

- 1. FORWARD OR MAIL (REV. 1/65)
- 2. HANDLING DESIRED
- 22. Information
- 33. Take appropriate action
- 44. Government and return
- 55. Prepare reply for chief's signature
- 66. See me on this

See reverse side for serial number

DO NOT DETACH

SECTION	RELEASE		REMARKS (Indicate handling desired by number when applicable)
	BY (Initial)	DATE	
Plc	WJ	4/28	Plc Do not consider these items important enough to refer to CNO. Do you agree?
Proc	WJ	5/2	Agree with Plc
Mnt	WJ	5/3	33)
Mnt 2	WJ	5-7	33) (Amor 508069 for MK234 Hydro from NTC, Great Lakes 508073 from NND location 508072 from 15-2 Room 5 Board for MASH)
Mnt 6	WJ	5-9	33) C06921
Mnt 6-2	WJ	5-9	33) items not authorized dropped from Mnt 6-2
Mnt 6b	WJ	5-10	33) will write letter recommending move up to date
Mnt 6	WJ	5/14	33) pages - item written
Mnt 6b	WJ	5/15	33)

6. FINAL DISPOSITION (Adjust to completed before return to file)

ACTION COMPLETED     NO ACTION REQUIRED

By: (Initial) WJ

DECLASSIFIED  
Authority 745084  
By: NARA Date 8/5/03

Mar 13, 1945

MAR 14 9 42 AM '45

(PL2c) NFI

Enc-2 on CO, US Naval Prison, NYd,  
Portsmouth, N.H. ltr NFI/P11/  
jh Ser. 46 dated 30 Jan. 1945.

14 56

From: The Chief of the Bureau of Ordnance.  
To: The Chief of Naval Operations.  
Subj: Training Equipment; request for.

MAR 13 1945

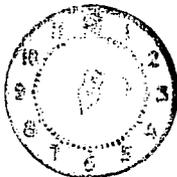
1. Forwarded for comment and recommendations. The equipment requested is available with the following exceptions:

Item	Comment
(a) Portable pressure gauge	Can provide one (1) Test Set for Air Chamber which is assumed to be the item desired.
(b) Depth Charge equipment (1) Pistol, Mk 3 (Cut Away) (2) Low-pressure gauge (3) Exploder Mechanism	Cutaway pistols are not available and no procurement is contemplated. Pistol, Mk 3 is obsolete. Recommend the following Depth Charge Equipment:  (a) One (1) Depth Charge Mk 9 Mod 3 (inert) complete with all accessories Mk 5 Mod 1  (b) Ten (10) each, Depth Charge Pistols and Booster Extenders Mk 6 Mod 1  (c) One (1) Depth Charge Test Set Mk 2 Mod 1, complete

MAR 14 1945



MAR 15 1945



G. F. HUSSEY, JR.

*[Handwritten signature]*

J. W. Loverton  
By direction

RDG/fv

cc:

US Naval Prison, NYd Portsmouth, N.H.  
Bureau of Naval Personnel (Pers 52121)

030745 1453

PRINT

032145 0910

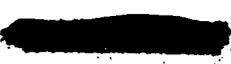
DECLASSIFIED  
Authority 745081  
By NARA Date 8/5/03

RG 74, BuOrd  
C&P Subj. Files, 1945  
Box 1284

8/26/03

C-378 (JELMO)

15 May 1945



To: Commanding General, Harbor Defenses, Boston.

Subj: Dumping Grounds for Explosives, Ammunition, and Chemicals.

Ref: (a) ONO lettr. Op-05-G11B/stl(SO) 378-1 Serial 068705-G dated April 24, 1945.

1. Reference (a) directs the Commandants of Naval Districts to establish an area about ten miles square for use as a dumping ground for the subject material conforming to certain stated restrictions.
2. Examination of all factors involved indicates that the most suitable area for the First Naval District is comprised within a ten-mile square whose center is located in latitude 41°33'N, longitude 65°33'W.
3. Since reference (a) further directs that areas established are to be acceptable to certain other commands and activities including the appropriate U.S. Army authority, an expression of opinion is requested as to the location proposed.

V.D. Harbater,  
 Captain, U.S.N. (Ret.)  
 Assistant Commandant (Operations)



May 16, 1945

REFER TO No.

NF1/P11-1/L4  
RJV:hep

**U. S. NAVAL PRISON**  
**Navy Yard, Portsmouth, N. H.**

*NF1*

*Mm2*

*CF*

16 May 1945

To: The Chief of the Bureau of Ordnance  
Bureau of Naval Personnel  
Washington 25, D.C.

Subject: Special Training Devices, request for.

Reference: (a) Ur ltr Mm2d, dated 14 May 1945.

1. As suggested in paragraph two of reference (a) it is requested that the nose fuze, AN-M103A1 and the hydrostatic tail fuze, AN-Mark 230 Mod 4, be sent to this activity in place of the Mark 221 and the hydrostatic fuze, Mark 224.

051915 0468

*R. J. Verge*

Robert J. Verge, Lt. (j.g.) USNR  
Educational and Training Officer.

*12/15/53*

DECLASSIFIED  
Authority 74508  
By 15 NARA Date 8/15/03

RG 74, BUOrd  
C&P Subj Files, 1945  
Box 1284



January 15, 1947

By 39 NARA Date 9/19/03

In reply address  
Supply Officer,  
U. S. Naval Shipyard,  
Portsmouth, N. H.

U. S. NAVAL SHIPYARD  
SUPPLY DEPARTMENT  
Portsmouth, N. H.

EN6/F41-1/  
NY1-530-EEC/st

15 January 1947

From: Supply Officer.  
To: Chief of the Bureau of Ordnance, Section Ad7b.  
Subj: Small Arms for recreational purposes - Request for.  
Ref: (a) CO, U.S. Marine Barracks, Naval Base, Ptsmh  
memorandum dated 9 Jan. 1947.

1. By reference (a) this activity was requested to procure the following small arms for recreational purposes in the Naval Base small bore range:

U. S. Rifles, Cal. .22	NO. 8
U. S. Pistols, Cal. .22	NO. 8

2. Information is requested as to the availability without exchange of funds of the above items of small arms. These items are not carried in stock at this activity.

W. E. McCAIN.

CC: CO, U.S. Marine Barracks  
U.S. Naval Base Ptsmh N H

S.O.

030447 0603

RG 74, BuOrd  
Construction + Procurement Files  
1947, Box 324



DECLASSIFIED  
Authority NND 917566  
By 39 NARA Date 7/17/02

In reply address  
Supply Officer,  
U. S. Naval Shipyard,  
Portsmouth, N. H.

**U. S. NAVAL SHIPYARD  
SUPPLY DEPARTMENT**  
Portsmouth, N. H.

EN6/F41-1/  
NY1-530-EEC/ptg

27 February 1947

From: Supply Officer  
To: Chief of the Bureau of Ordnance, Section Ad7b  
Subj: Small Arms for recreational purposes - Request for.  
Ref: (a) Prts. Nav. Shipyd ltr EN6/F41-1/ over NY1-530-  
EEC/st dated 15 Jan. 1947.  
Encl: (A) Copy of ref. (a) *W. E. McCain*

*NY1  
MNS-  
1000*

1. Enclosure is forwarded for ready reference.
2. Since no reply has been received to date it will be appreciated if the Bureau will advise what action has been or will be taken regarding subject small arms referred to in reference (a).

030447  
0603

*W. E. McCain*  
W. E. MCCAIN

*Entry 5545  
RG 74 Records of Bureau of Ordnance, Off. of Admin  
Construction & Procurement Subj. Files, 1947  
NY1 1947 - NY2 Jan. Dec. 1947  
Box No. 324*

June 5, 1947

NDI/MI-18  
L41-7-P1 (Conf.)  
L41-68-CH  
L22-7-QP  
L22-68-8q  
L22-68-S.F.  
L22-68-28  
L22-6-8a  
L22-7-21  
L22-7-CH  
L22-7-21  
P-3-6/VFD/asn

5 - JUN 1947

To: Commandant, First Naval District

Subj: Renewal of Leases NOY(R)-35558, 40454, 30454, 28767,  
36788, 30042, 36877, 36801, 35500 and 304-2880.

1. The request for renewal of subject leases has been denied by the Chief of Naval Operations. Accordingly, the Bureau has served Cancellation Notice on the respective lessors effective 30 June 1947. Enclosed herewith are special releases to subject leases in quadruplicate which the Commandant is requested to have executed by the lessors and returned to the Bureau.

2. The Bureau has been informed that Andrew B. Emery, lessor under Lease NOY(R)-30042, is deceased, and that an executor of his estate has been appointed. In order that the release may be properly executed by the executor, and disbursement of rental made, it is requested that a certified copy of the appointment of the executor of the estate of Andrew B. Emery be forwarded to the Bureau together with a special release executed in accordance with said appointment.

3. Inasmuch as subject leases covered areas which were used for dive bombing and/or aerial gunnery purposes, it is requested that the Commandant have a survey made to determine whether or not any live bombs and/or ammunition is present.

RG 71, Naval Prop. Case Files  
Box 523, Kittery

DECLASSIFIED  
Authority  
NND 977372  
By NARA Date 4/10/03

4  
KRI/KI-18  
LAI-7-P1 (Cont.)  
LAI-6B-Oh  
LSP-7-QP  
LSP-60-Sq  
LSP-60-B.R.  
LSP-6B-SE  
LSP-6-Qd  
LSP-7-NI  
LSP-7-Oh  
LSP-7-KI  
P-3-3/PFE/689

Subj: Renewal of Leases 80y(R)-35588, 40484, 39488, 38787,  
38788, 30042, 34577, 36991, 35388 and 804-3380.

mining on the premises covered by any of subject leases.  
The Bureau should be notified when such a survey has been  
completed.

Encl. (NE)  
(1) Special releases in  
quadruplicate.

CC:  
(1) BNAEP  
(2) Com, NAB, IND

Wilfred P. Hencken  
By direction of Chief of Bureau

6-4-47  
PFB

File - Real Estate Files

DECLASSIFIED  
Authority  
M977372  
By NARA Date 4/21/03

June  
9, 29

AN 20120

NUMBER

DATE

TAKEN BY

LOCATION

SUBJECT

*Antennae*

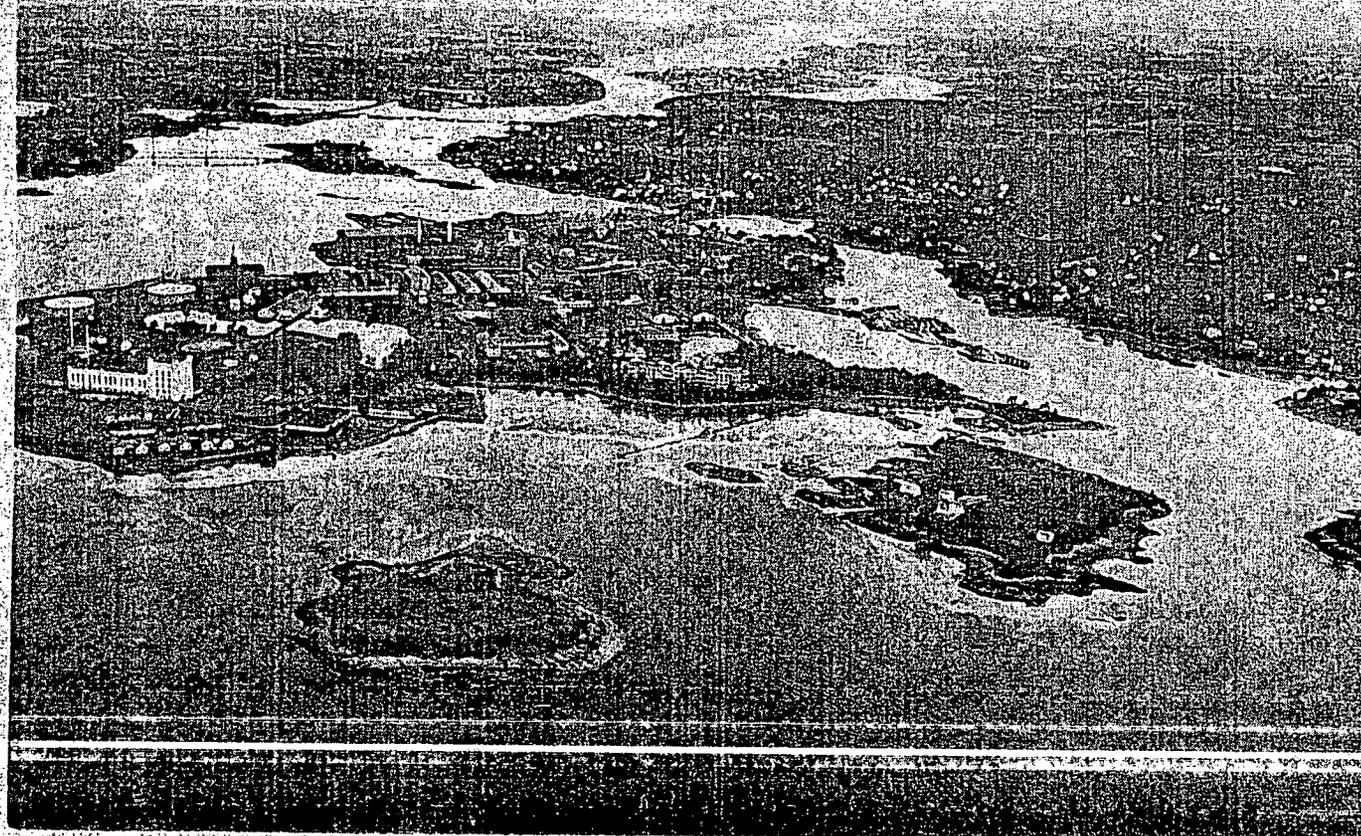
RELEASED FOR PUBLICATION

**RELEASED**

DATE

ISSUED TO

RG 80, Navy Dept  
80-6, 458852



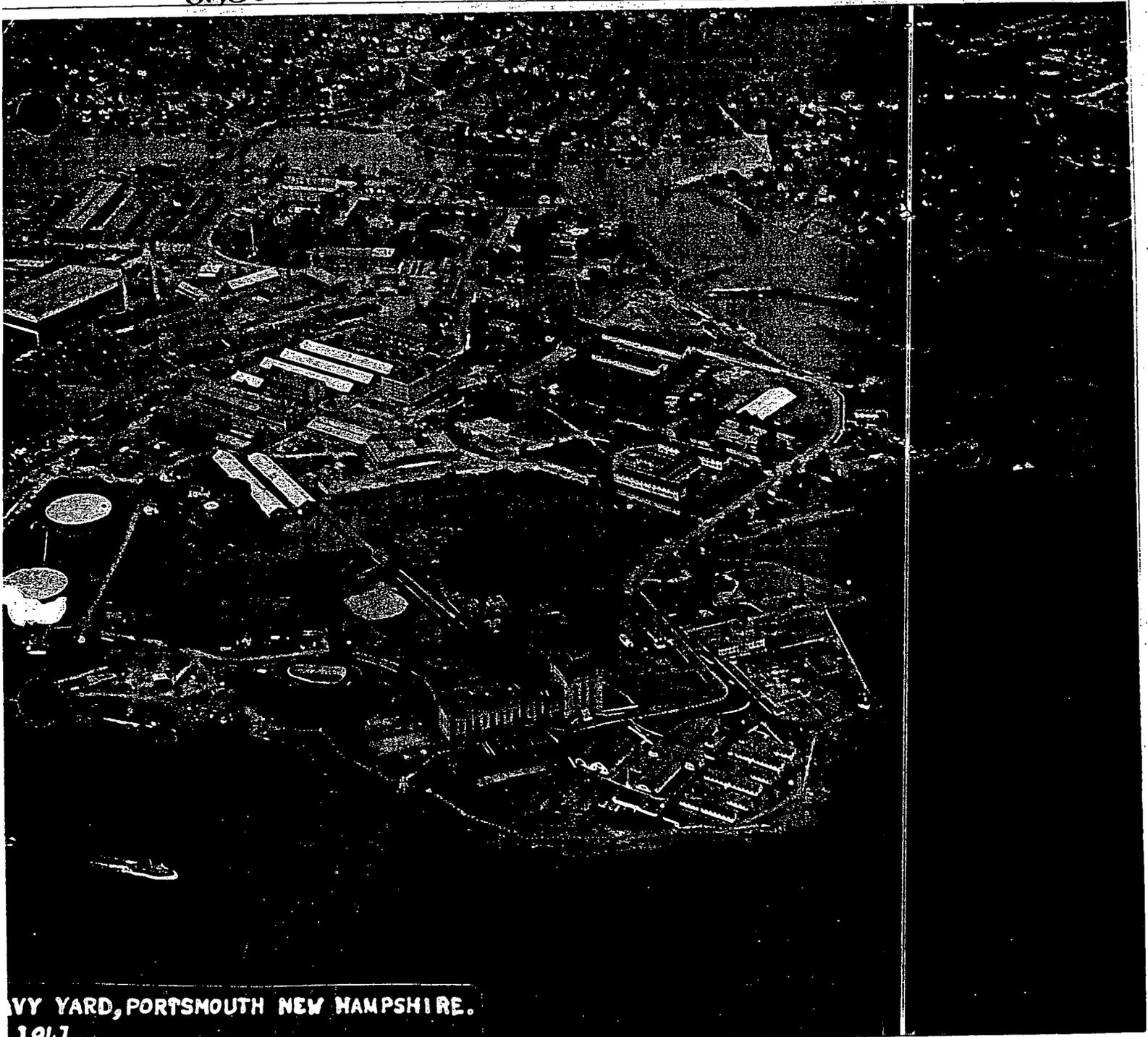
RETURN TO PHOTOGRAPHIC SECTION

BUREAU OF AERONAUTICS

1941

66362

66362 COPY NEG



NAVY YARD, PORTSMOUTH NEW HAMPSHIRE.  
1941.

U. S. GOVERNMENT PRINTING OFFICE 16-10555-1

21 July 1941

RG 80-G, Box 293  
General Records of Dept of Navy, Gen Photos 1918-1945

March 15, 1943

FORM 972 15 JAN 1942

TAKEN BY:

S. Salentia

LOCATION:

SUBJECT:

OFFICIALS AND PERSONNEL

AT THE HEADQUARTERS

OF THE 11th AIRBORNE DIVISION

AT CAMP BUNNELL

AT FORT MONMOUTH

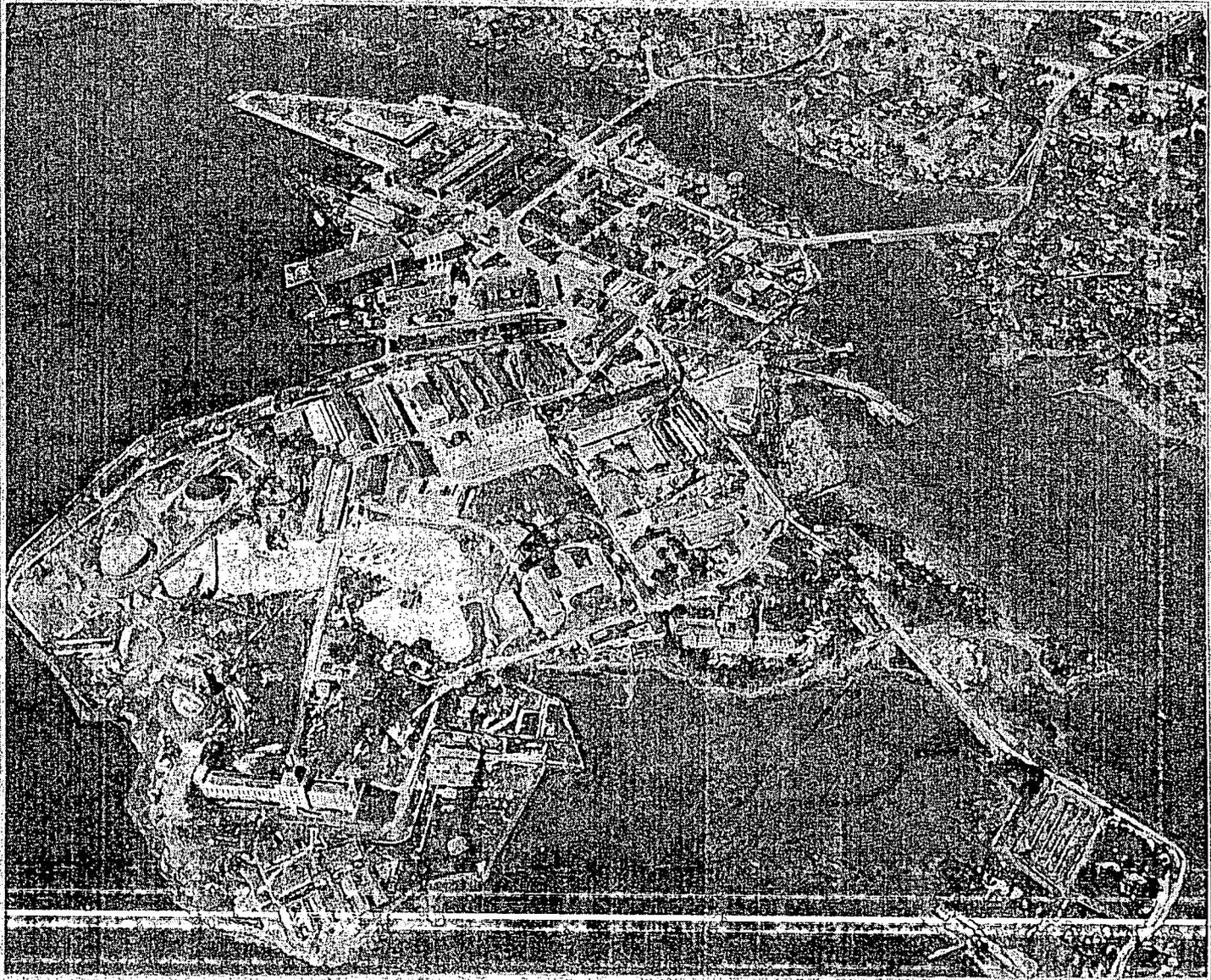
NEW JERSEY

ON 15 MARCH 1943

BY AIRCRAFT

NO. 10

1000 FT. ALTITUDE



DECLASSIFIED  
RELEASED FOR PUBLICATION  
E.O. 12356, Sec. 1.3  
CONFIDENTIAL  
RG 80, SERIES G

Dec 22 1959

DATE:

ISSUED TO:

U.S. NAVAL PHOTOGRAPHIC CENTER

UNCLASSIFIED

DOWNGRADED TO:

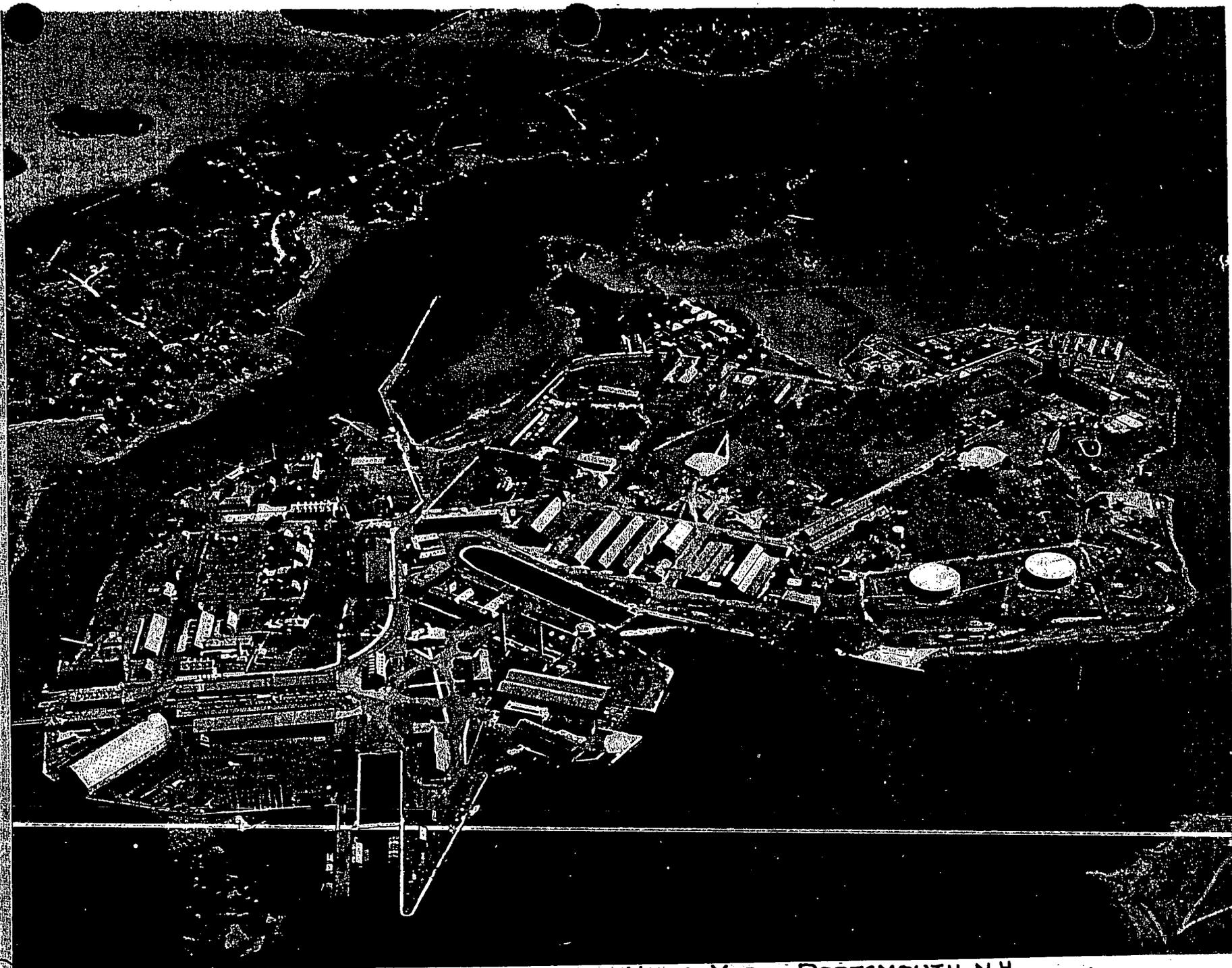
AUTHORITY: CHINFO-LTR-01-250

SEC 63 OF 8 JAN 1957

*W. J. Gaus*  
COMMANDING OFFICER

RG 80, Navy Dept.  
80-6 Brv 278

NOTES:



undated  
(no later than  
1943)

NAVY YARD, PORTSMOUTH, N.H.

26 71  
71-CA

July 11, 1945

334913

NAVY AIR

NUMBER

DATE

TAKEN BY

LOCATION

SUBJECT

Aerials of Portsmouth Navy  
Yard, Portsmouth, N.H.

DECLASSIFIED

E.O. 12356, Sec. 3.3

REPRODUCTION  
RG 80 - SERIES G

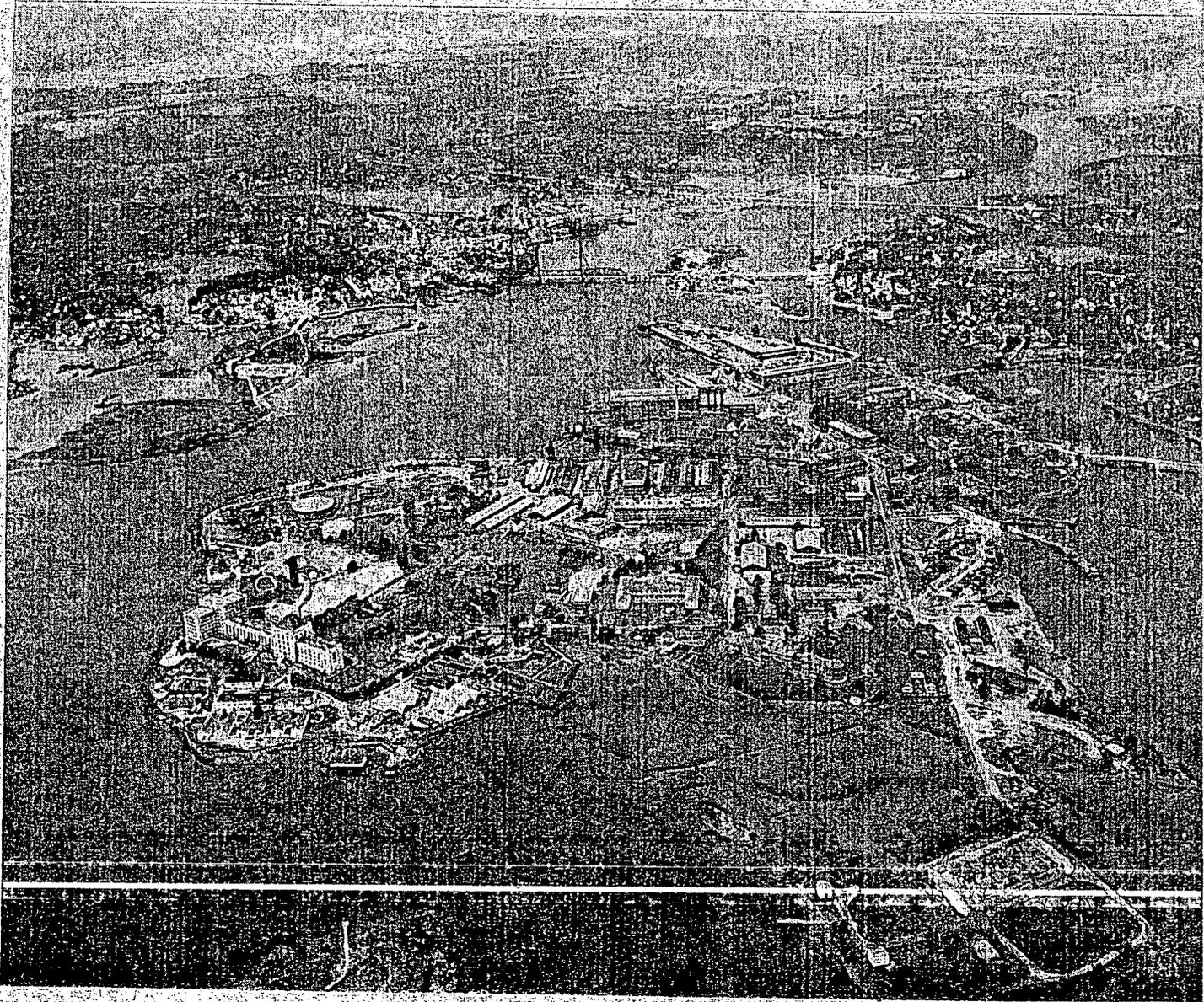
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DATE

ISSUED TO

RG 80, Navy Dept  
80-G, 334913

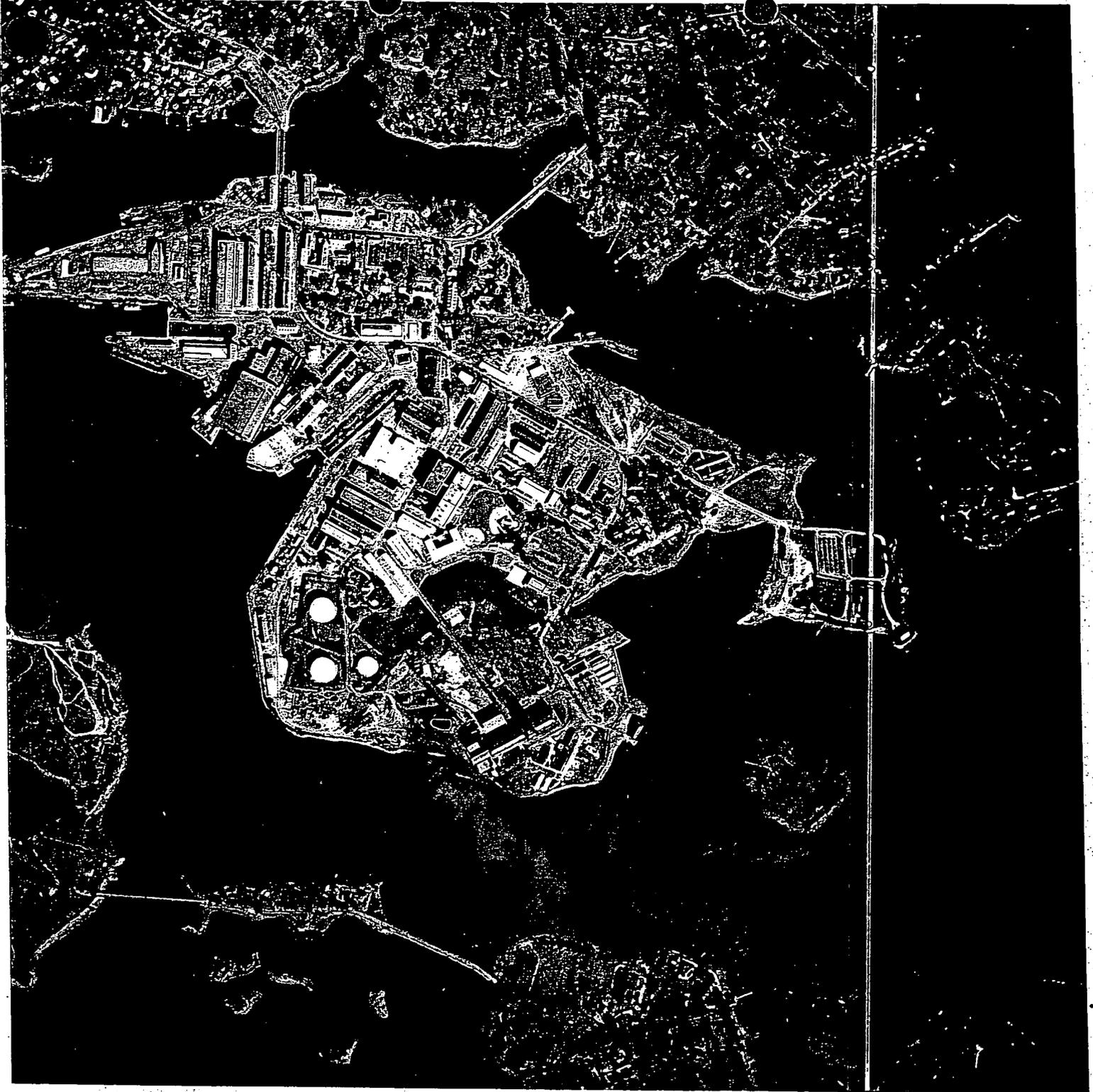
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Sept 24,  
1953

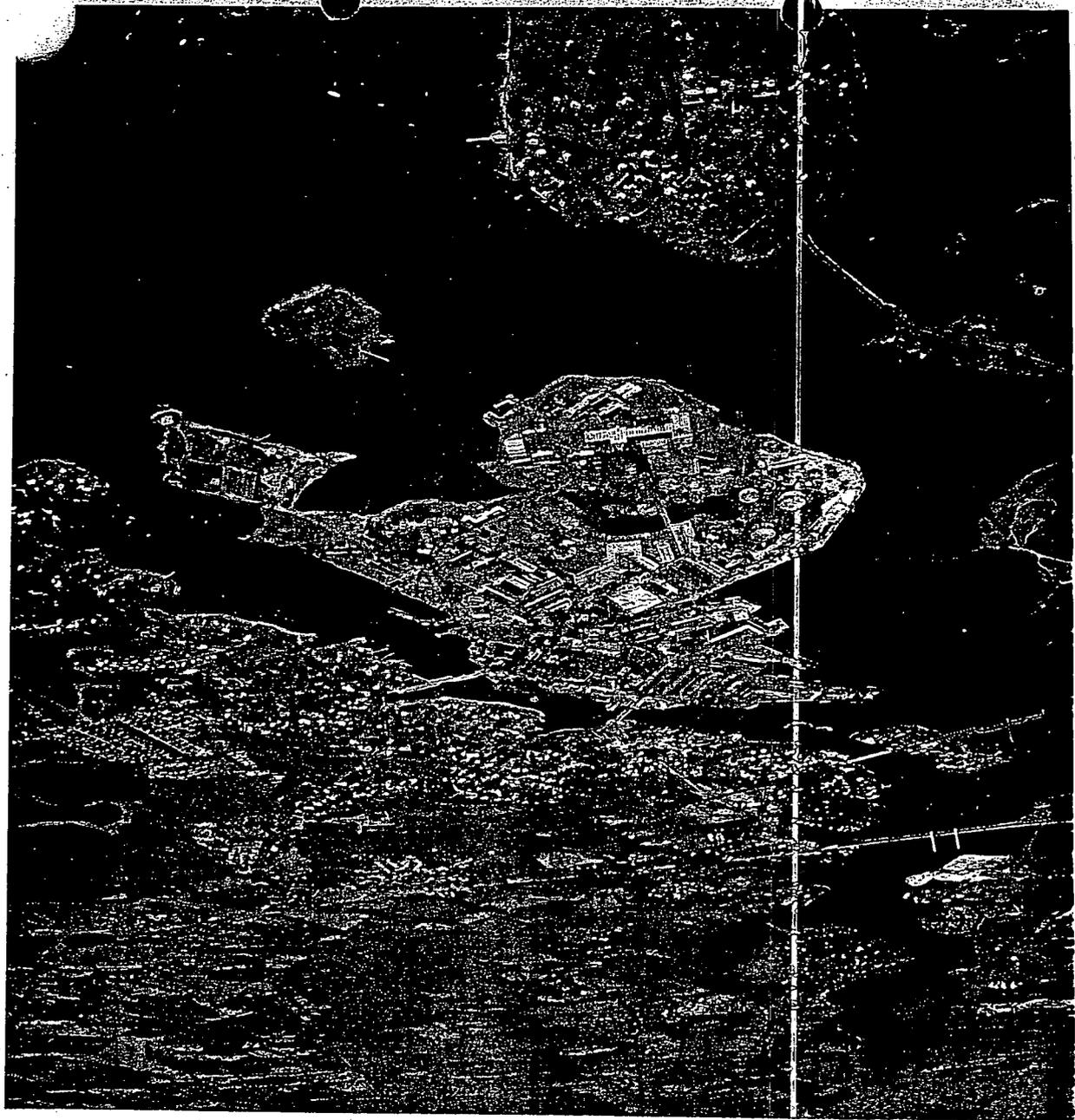


Sept 24, 1953

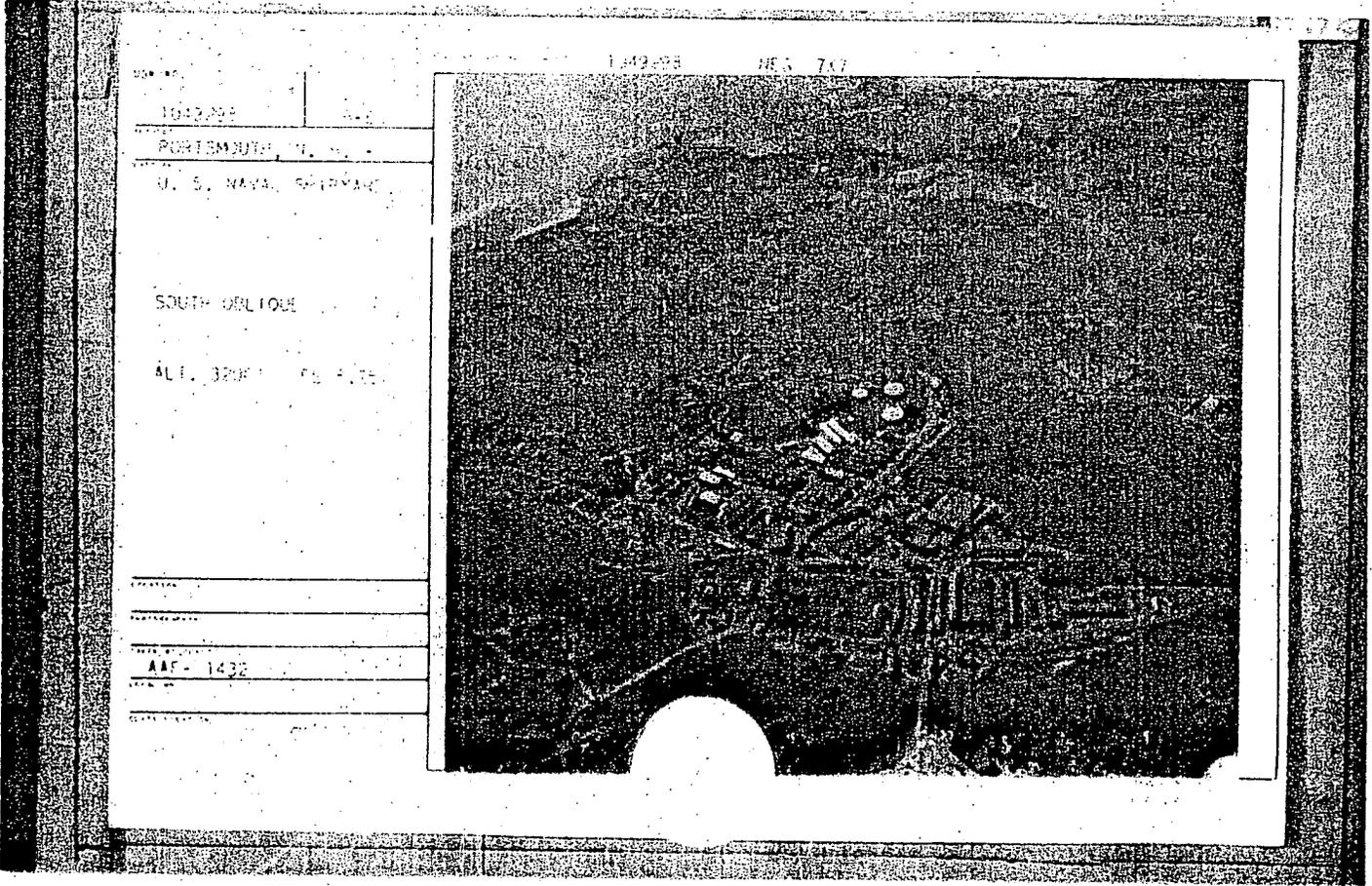


371, BUVED  
1-CP

Sept 24, 1953



2G-71, BUVED  
71-CP  
-OX 97



AG 428-GXA  
Records of Dept. of Navy 1947-  
Box 108 of 148

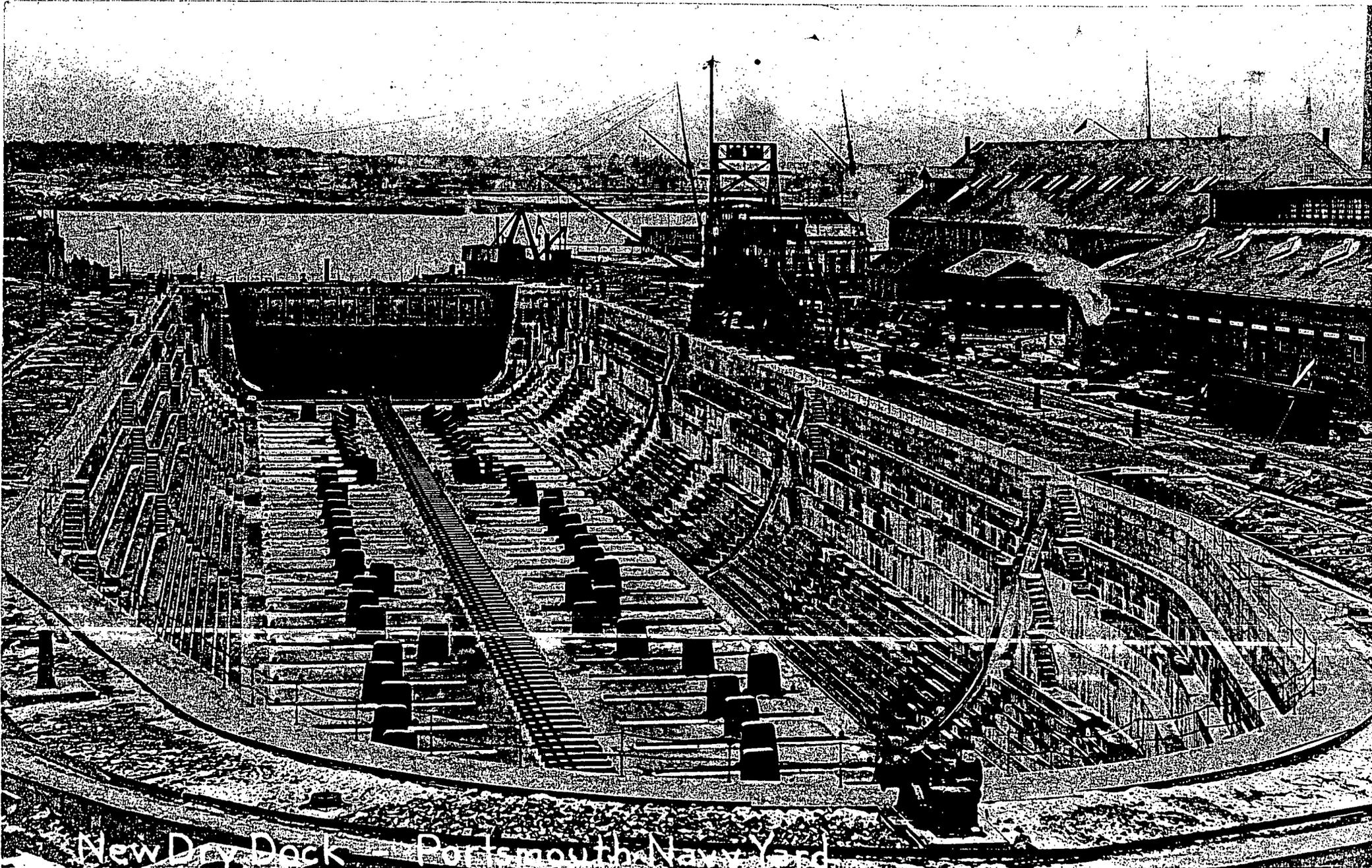
PORTSMOUTH NH

C120

General Office Building,  
Portsmouth Navy Yard, N. H.



C1910



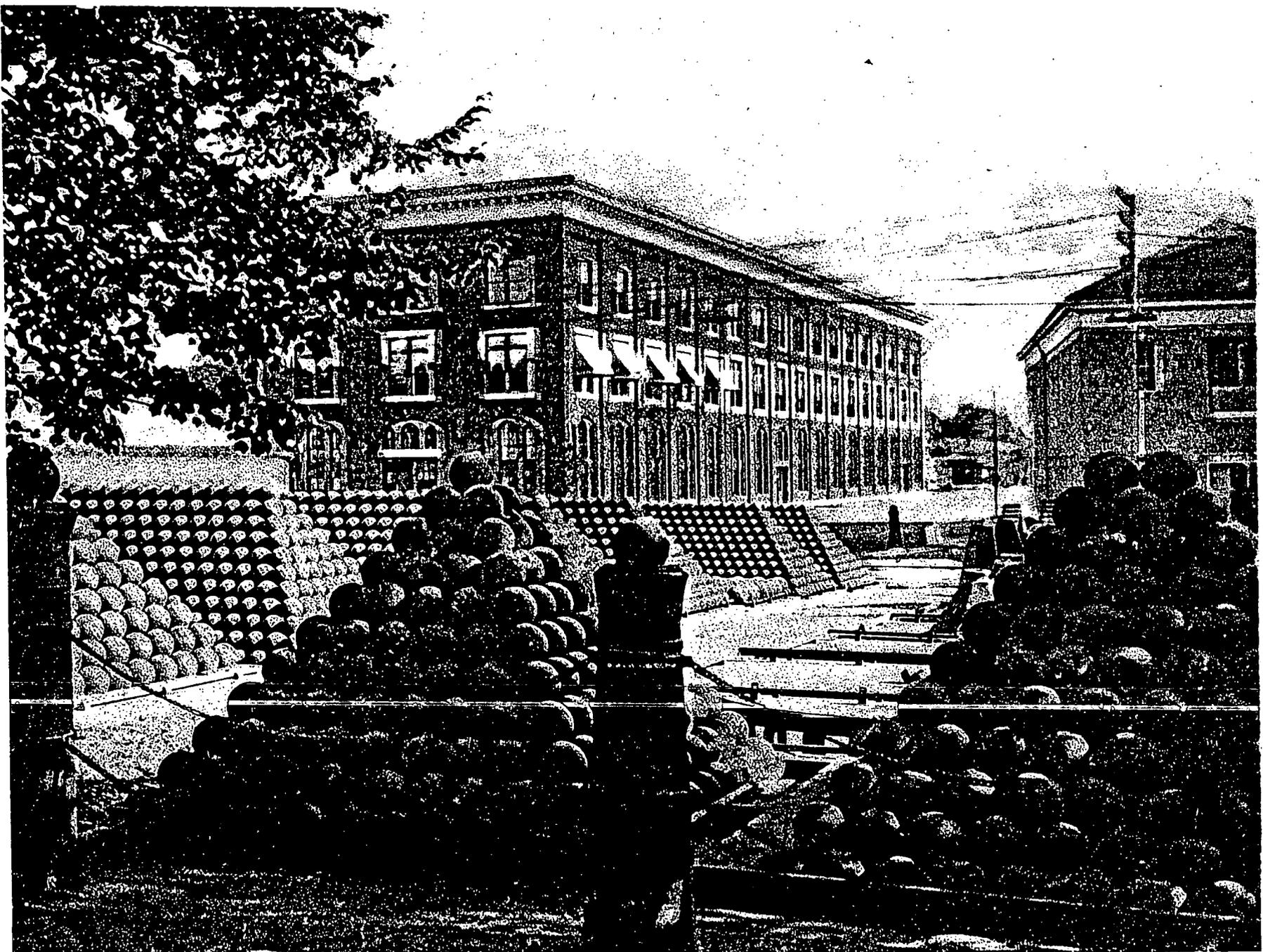
New Dry Dock - Portsmouth Navy Yard

C1920

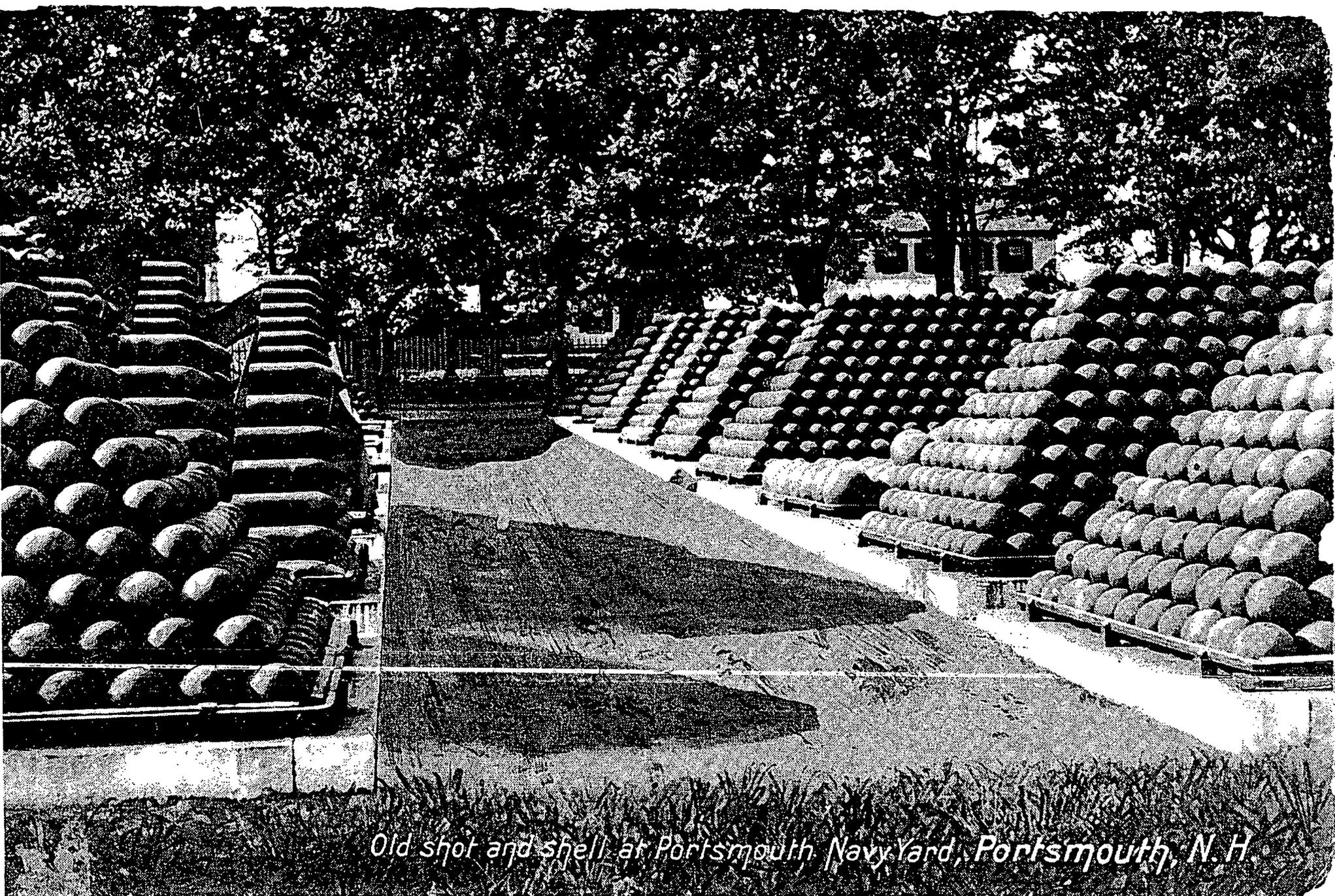


Gun Park, Portsmouth, Navy Yard

Gun Park  
C190



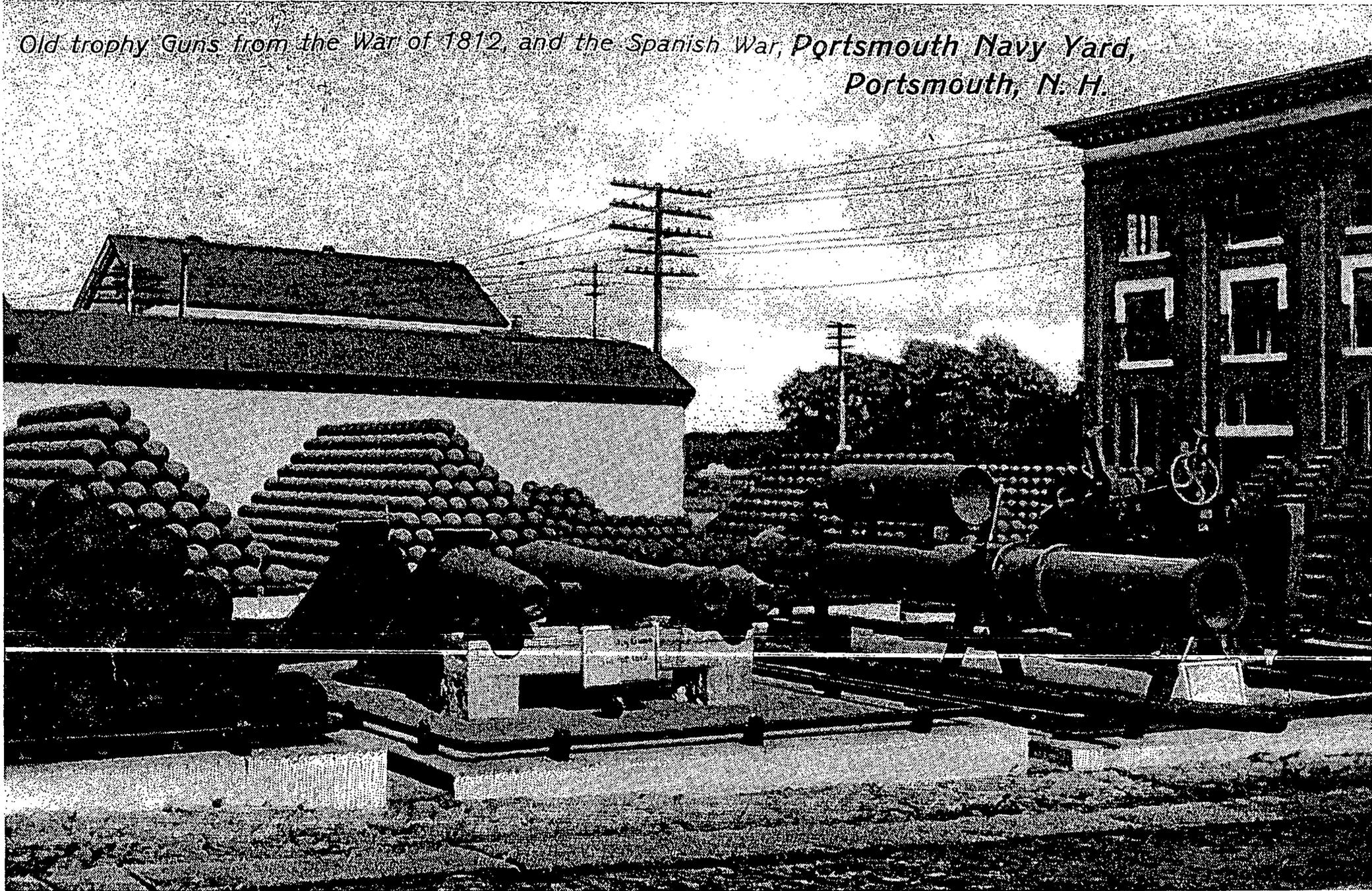
Gun Park  
(Shot + Shell Park)  
c1910



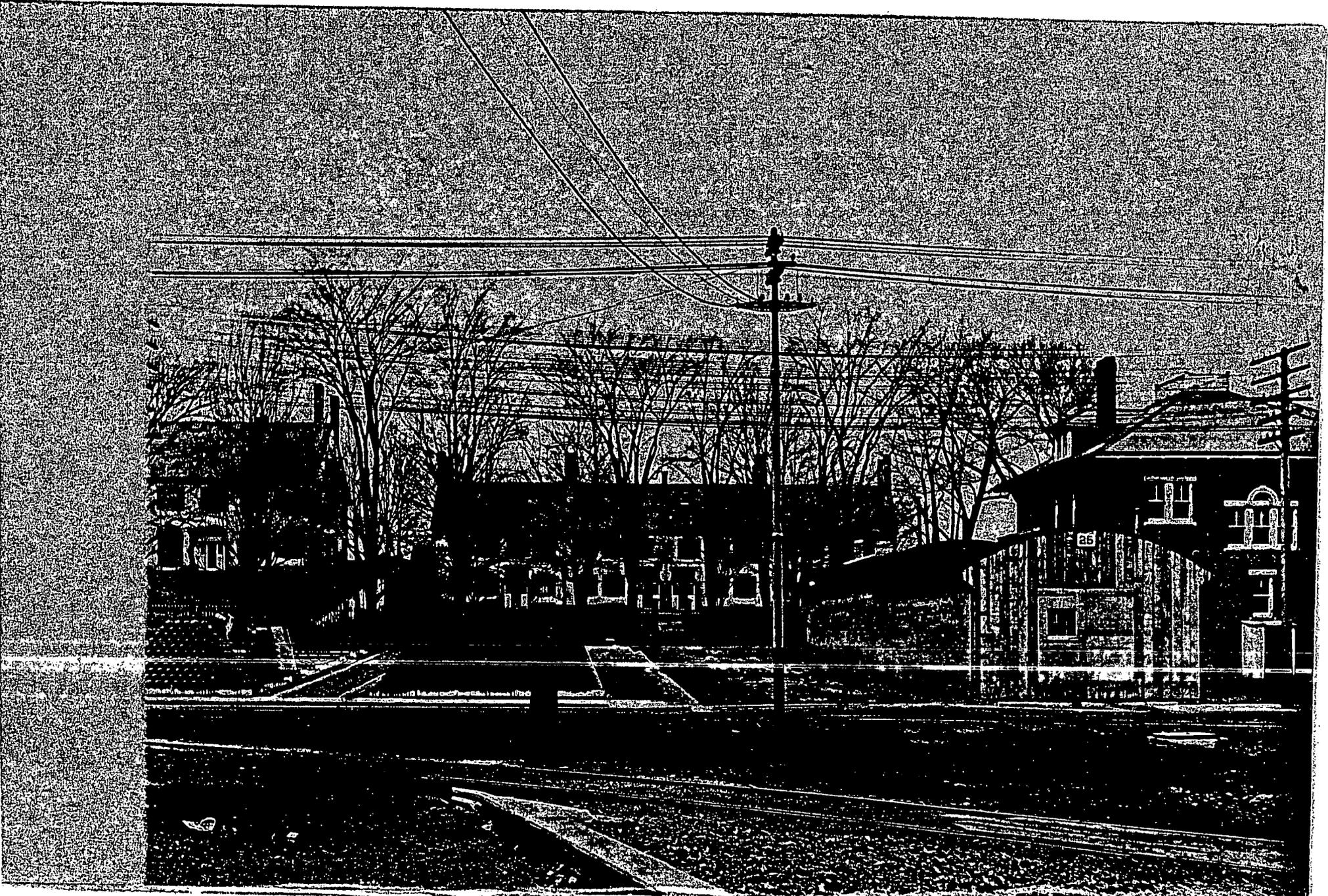
*Old shot and shell at Portsmouth Navy Yard, Portsmouth, N. H.*

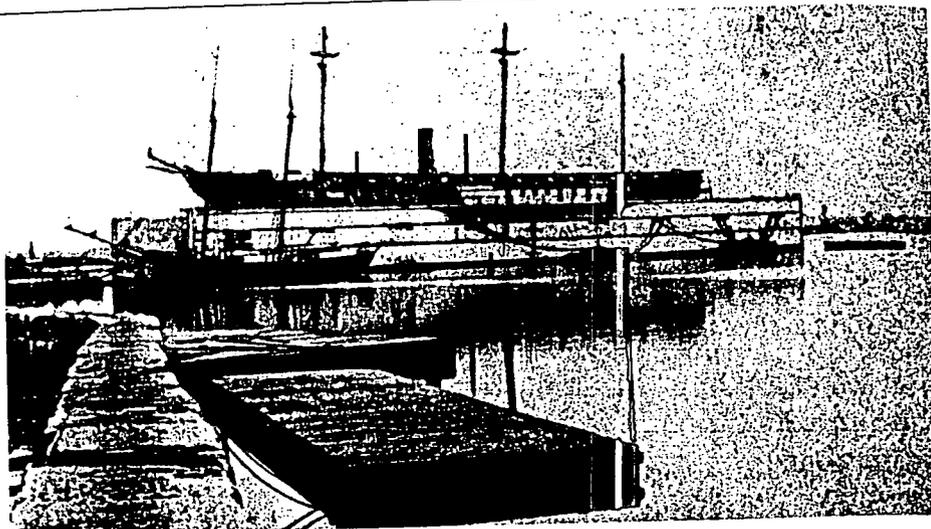
C1920

*Old trophy Guns from the War of 1812, and the Spanish War, Portsmouth Navy Yard,  
Portsmouth, N. H.*

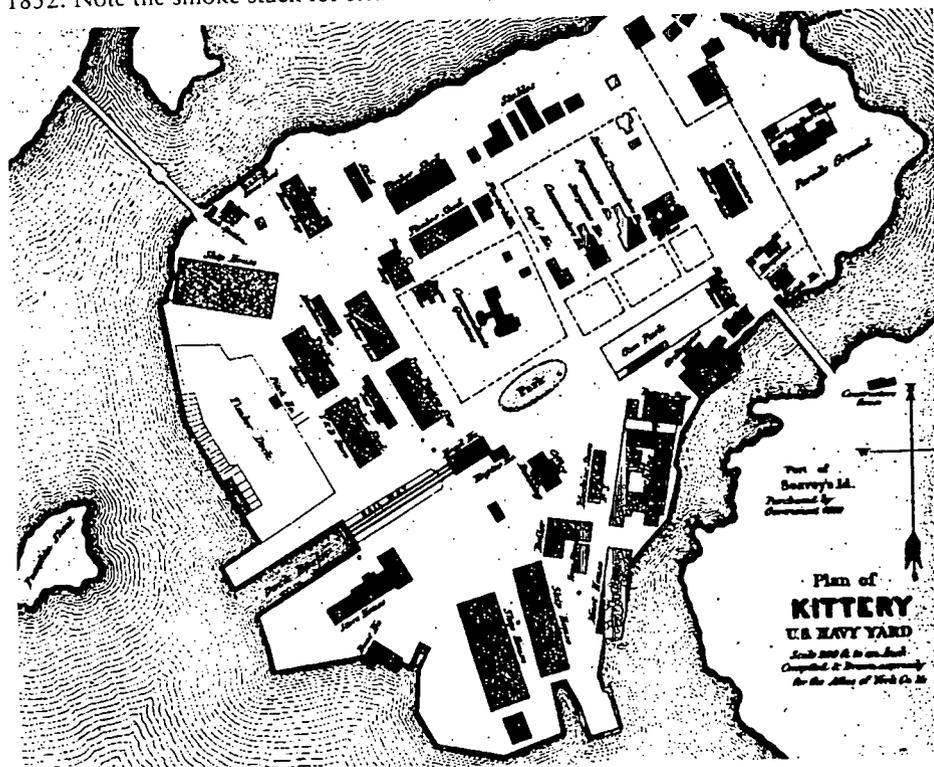


C1920





USS *Minnesota* in 1865, shown in the floating dry dock which was built at the yard in 1852. Note the smoke stack for steam boiler. (PNSM)

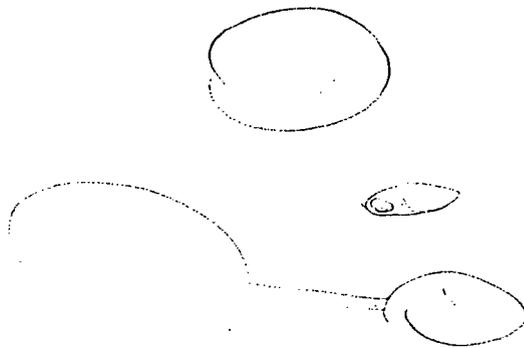


Plan of PNS in 1868 during post-Civil War expansion of the yard after surviving the talks of closure. (PNSM)

Portsmouth Kittery Naval Shipyard  
in old photographs

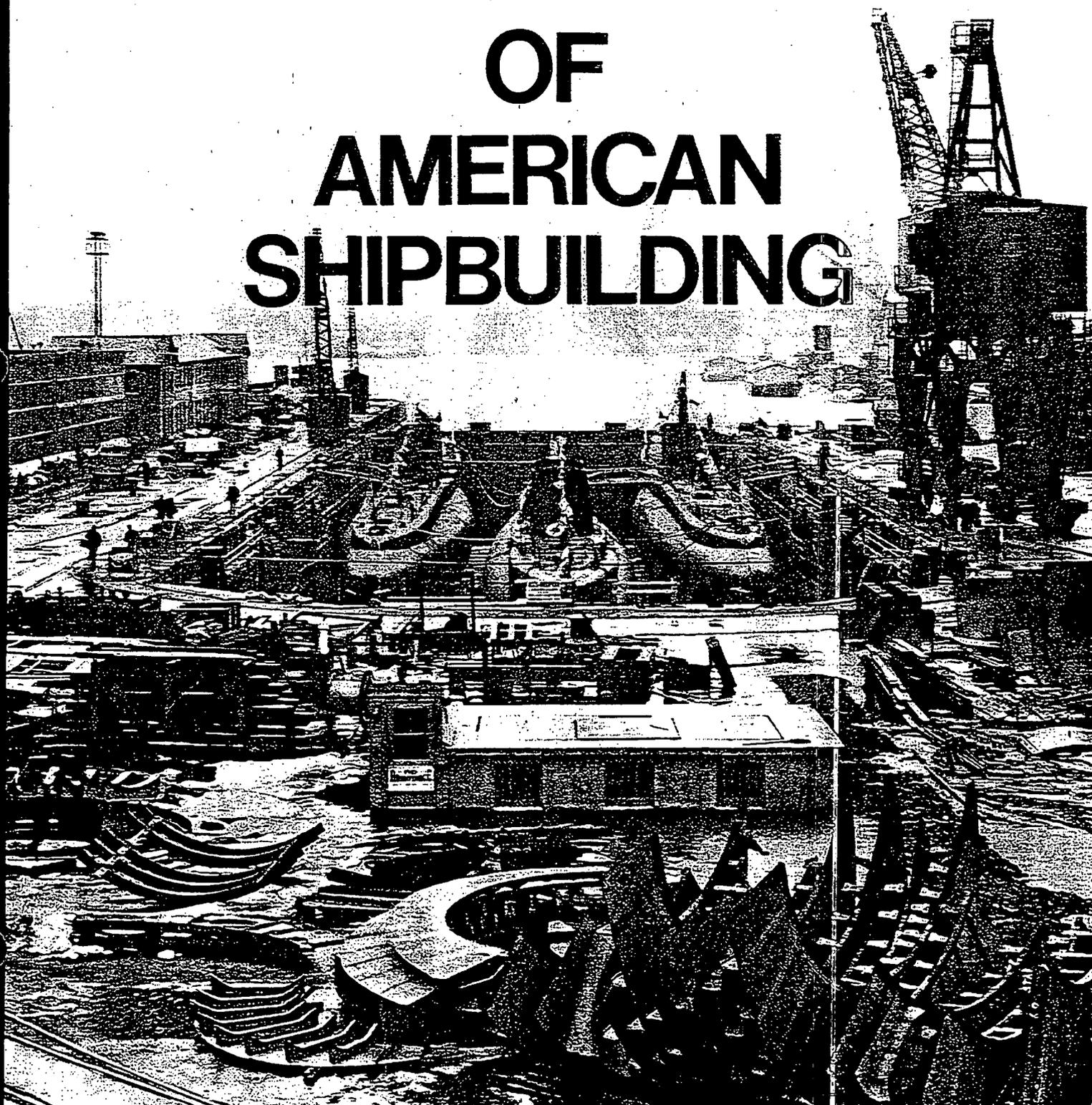
Robert H. Whitaker

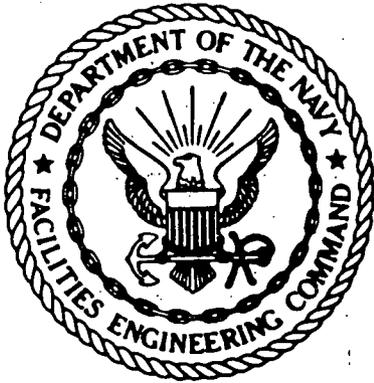
Dated 1993



Portsmouth Naval Shipyard  
Portsmouth, New Hampshire

# CRADLE OF AMERICAN SHIPBUILDING

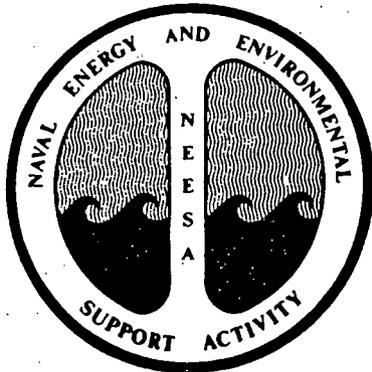




June 1983

**INITIAL ASSESSMENT STUDY OF  
PORTSMOUTH NAVAL SHIPYARD  
PORTSMOUTH, NEW HAMPSHIRE**

**NEESA 13-032**



**NAVAL ENERGY AND ENVIRONMENTAL  
SUPPORT ACTIVITY**

**Port Hueneme, California 93043**

**RELEASE OF THIS DOCUMENT REQUIRES PRIOR NOTIFICATION  
OF THE CHIEF OFFICIAL OF THE STUDIED ACTIVITY.**

INITIAL ASSESSMENT STUDY  
NAVAL SHIPYARD, PORTSMOUTH, NEW HAMPSHIRE

UIC: 00102

Prepared by:

Roy F. Weston, Inc.  
Weston Way  
West Chester, Pennsylvania 19380

Contract No. N62474-82-C-C352

Initial Assessment Study Team Members

Raymond Kane, Team Leader  
Charles Dobroski, Biologist  
John Gilbert, Chemical Engineer  
Fred McGarry, Environmental Engineer  
Richard Kraybill, Hydrogeologist  
Steven Gertz, Health Physicist  
Patricia Saia, Technical Editor

NEESA Contract Coordinator

Kent D. Adams, Environmental Engineer

Prepared for:

NAVY ASSESSMENT AND CONTROL  
OF INSTALLATION POLLUTANTS (NACIP) DEPARTMENT  
Naval Energy and Environmental Support Activity (NEESA)  
Port Hueneme, California 93043

June 1983

## EXECUTIVE SUMMARY

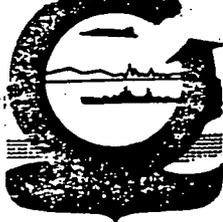
This report presents the results of an Initial Assessment Study (IAS) conducted at the Portsmouth Naval Shipyard, Portsmouth, New Hampshire. The purpose of an IAS is to identify and assess sites posing a potential threat to human health or the environment due to contamination from past hazardous materials operations.

Based on information from historical records, aerial photographs, field inspections, and personnel interviews, a total of four potentially contaminated sites were identified at Portsmouth. Each of the sites was evaluated with regard to contamination characteristics, migration pathways, and pollutant receptors.

The study concludes that, while none of the sites poses an immediate threat to human health or the environment, one site warrants further investigation under the Navy Assessment and Control of Installation Pollutants (NACIP) Program, to assess potential long-term impacts. A confirmation study, involving actual sampling and monitoring of the site, is recommended to confirm or deny the existence of the suspected contamination and to quantify the extent of any problems that may exist. The site recommended for confirmation is the Jamaica Island Landfill, which is an area that was used for disposal of a variety of potentially toxic and hazardous materials over a 25-year period.

The results of the confirmation study will be used to evaluate the necessity of conducting mitigating actions or cleanup operations.

# NEPSS



Naval  
Environmental  
Protection  
Support  
Service

## FOREWORD

The Navy initiated the Navy Assessment and Control of Installation Pollutants (NACIP) program in OPNAVNOTE 6240 ser 45/733503 of 11 September 1980. The purpose of the program is to systematically identify, assess, and control contamination of the environment resulting from past hazardous materials management operations.

An Initial Assessment Study (IAS) was performed at the Naval Shipyard (NSY), Portsmouth, New Hampshire by a team of specialists from Roy F. Weston, Inc. of West Chester, Pennsylvania. Further confirmation study under the NACIP program was recommended at one area at the activity. Chapters dealing with significant findings, conclusions, and recommendations are presented in the earlier chapter of the report. The later technical chapters provide more in-depth discussion on important aspects of the study.

Questions regarding NACIP should be referred to the Commanding Officer, NEESA 112N, Port Hueneme, California 93043, AUTOVON 360-3351, FTS 799-3351, or commercial (805) 982-3351.

DANIEL L. SPIEGELBERG, LCDR, CEC, USN  
Environmental Officer

Naval Energy and Environmental Support Activity

## ACKNOWLEDGEMENTS

Roy F. Weston, Inc. would like to acknowledge the support and assistance provided to us by several individuals during the course of this study. In particular, we wish to express our gratitude to the following:

- Captain D.J. Briselden, Public Works Officer, Portsmouth NSY
- Mr. Ken Plaisted, Public Works, Portsmouth NSY
- Mr. Kent Adams, NEESA
- Mr. Robert Kowalczyk, Northern Division Naval Facilities Engineering Command

In addition, numerous individuals from the various shops and departments at the Shipyard provided useful information on past disposal practices that was invaluable to the success of the study.

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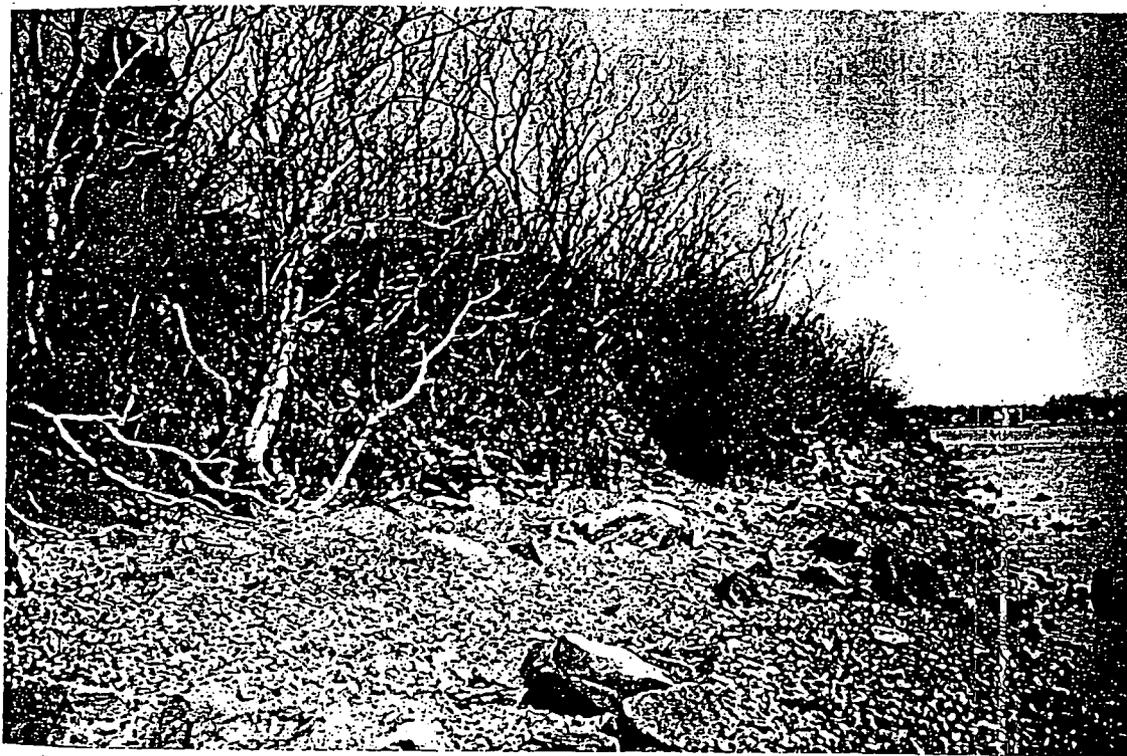
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SELECTED NATURAL RESOURCE INVENTORY  
OF  
CLARK ISLAND  
PORTSMOUTH NAVAL SHIPYARD

Senior Project - Natural Resources 775  
University of New Hampshire  
Spring 1994



Prepared by: Christine Diem  
Amy Mills  
Kristen Mitchell  
John Terninko  
Ian Warden

RECOMMENDATIONS FOR THE  
MANAGEMENT OF CLARK'S ISLAND, PORTSMOUTH NAVAL SHIPYARD,  
KITTERY, MAINE

DECEMBER 2, 1994

A COOPERATIVE EFFORT BETWEEN: THE UNIVERSITY OF NEW HAMPSHIRE,  
JACKSON ESTUARINE LABORATORY, AND THE UNITED STATES  
DEPARTMENT OF THE NAVY

PROJECT MEMBERS: STEVE BINGEL, STEVE COLE, JEFFREY GAGNE,  
TOM GIFFEN, HEIDI PACKARD, AND SEAN VAN FLEET

## **Executive summary**

This report documents the combined results of an intensive natural resources assessment done by the University of New Hampshire's NR775 senior project teams of the spring and fall semesters of 1994. The assessment was commissioned by the Department of the Navy, Portsmouth Naval Shipyard, Kittery, Maine. The purpose of this assessment is to assist in developing a management plan of Clark's Island as an Ecological Reserve Area as defined by the Navy.

Based on the combined assessments of the NR775 spring and fall teams, Clark's Island was deemed a logical candidate as an Ecological Reserve Area. The fall team updated the vegetation survey started by the spring semester by using:

- \* visual surveys
- \* field guides
- \* consultation with UNH professors

A comprehensive wildlife species survey was completed using:

- \* visual surveys
- \* auditory surveys (birds)
- \* sooted track panels
- \* live mammal trapping

The island was also considered for its possible educational and research value using:

- \* research of local interpretive nature trails
- \* a collection of literature describing interpretive programs

Finally, the island was assessed for the possibility of attracting potential wildlife species that aren't currently present.

Potential species include:

- \* Ospreys
- \* Cavity nesting waterfowl
- \* Migratory waterfowl and shorebirds
- \* Migratory songbirds

This required contacting local, state and regional authorities such as:

- \* Maine Inland Fisheries
- \* Maine Audubon Society
- \* Maine regional biologists
- \* UNH College of Life Sciences and Agriculture (COLSA) professors

# CULTURAL RESOURCES SURVEY

## *PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE*

*Prepared By*

The Louis Berger Group, Inc.

*Pursuant To*

NAVFAC Contract No. N62472-94-D-1397, Appendix D and  
NAVFAC Contract No. N62472-97-D-1390, Appendix J

*Submitted To*

Engineering Field Activity Northeast  
Naval Facilities Engineering Command

*Prepared For*

Portsmouth Naval Shipyard  
Kittery, Maine

Final  
February 2003

# Cultural Resources Survey

## Portsmouth Naval Shipyard, Kittery, Maine

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- Appendix D: Correspondence
- Appendix E: List of Preparers

TABLE M-1

**BUILDINGS AND STRUCTURES AT PNS LISTED IN OR ELIGIBLE FOR LISTING IN THE  
NATIONAL REGISTER AS OF FEBRUARY 2003**

BUILDING NUMBER	DATE	ORIGINAL USE	PRESENT USE	EVALUATION
2	1864	Storehouse	Shop	NRED-C
7	1837	Mast Shed, Rigging Loft	Storage, Sail Loft	NRED-C, NHLE, ASME
13	1859	Administrative Offices	Admin. Offices, Communications, Police Station	NRD-C, ASME
14	1853	Head House and Engine House	Admin. Offices, Bank	NRD-C, ASME
15	1855	Boiler Room	Post Office, Admin. Offices	NRD-C, ASME
18	1826, 1940	Smithy, Foundry, Machine Shop	Admin. Offices, Restaurant	NRD-C, ASME
20	1865, 1911, 1946	Metalworking Shop	Laboratory, Print Shop	NRD-C
22	1857, 1918, 1940, 1947	Ordnance Building	Officers' Club, Theater, Library	NRD-C
27	1864	Paint Shop	Administrative Offices	NRD-C
29	1865, 1942	Timber Shed	Fire Station, Admin. Offices	NRD-C
31	1859, 1942	Magazine (Ordnance)	Navy Exchange, Service Station	NRD-C
32	1848	Magazine (Ordnance)	Storage	NRD-C
33	1855	Loaded Shell House	Storage	NRD-C
34	1857, 1943	Unloaded Shell House		NRD-C
35	1851	Lime House, Stable	Garage (Qtrs. K), Storage	NRD-C
40	1851, 1943	Stable	Storage	NRD-C
41	ca. 1880	Boiler House	Administrative Offices	NRD-C
42	1849, 1918, 1941	Timber Shed	Public Works Shop	NRD-C, ASME

NR = Listed in National Register  
 NRD-C = National Register District, Contributing Element  
 NRD-NC = National Register District, Non-Contributing Element

NHLE = National Historic Landmark, Eligible  
 NE-I = Not Eligible, Lacks Integrity  
 NE-S = Not Eligible, Lacks Significance  
 NE-A = Not Presently Eligible, Reevaluate When 50 Years of Age

NRE = National Register Eligible  
 NRED-C = National Register Eligible District, Contributing Element  
 NRED-NC = National Register Eligible District, Non-Contributing  
 Element  
 ASME = American Society of Mechanical Engineers Landmark

TABLE M-1 (continued)

BUILDING NUMBER	DATE	ORIGINAL USE	PRESENT USE	EVALUATION
43	1853, 1920	Timber Shed	Public Works Storage	NRD-C
44	1859, 1942	Timber Shed	Public Works Shop	NRD-C
45	1894	Saw Shed	Service Shop	NRD-C, ASME
46	1894	Incinerator	Incinerator	NRED-C, ASME
55	1849, 1930, 1943	Oakum House	Acetylene Plant	NRD-C
59	1865	Boat House, Carpenter Shop	Admin. Supply Storage	NRD-C
60	1902-1904	Shop	Production Shop Storage	NRD-C
62	1873, 1945	Gas House	Public Works Shop	NRD-C
63	1874	Cart and Wheel Shed	Public Works Storage	NRD-C
64	1869-70, 1941	Fire Engine House	Shop	NRD-C
65	1874	Tool Shed, Paint Shop	Storage	NRD-C
72	1902, 1908, 1928, 1941-42	Central Power Plant	Central Power Plant	NRED-C
74	1902	Shop	Production Shop	NRD-C
75	1901	Foundry	Metal Shop	NRD-C
76	1902	Smithy/Welding	Forge	NRED-C
79	1902, 1939	Machine Shop	Admin./Instruction	NRED-C
85	1902	Latrine	Latrine	NRED-C
86	1905, 1941, 1989	Supply Department	Offices	NRD-C, NHLE
89	1904	Chain and Rigging Loft	Instruction and Repair	NRED-C
91	1906	Pumphouse for Dry Dock 2	Pumphouse for Dry Dock 2	NRED-C, ASME
92	1905, 1939, 1941	Steam Engine/Steel Plant	Shipfitting Shop, Mold Loft	NRED-C
93	1908, 1942, 1943	Prison, Disciplinary Barracks	Vacant	NRED-C

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TABLE M-1 (continued)

BUILDING NUMBER	DATE	ORIGINAL USE	PRESENT USE	EVALUATION
96	1906	Boiler and Steel Shop	Storage	NRED-C
99	1891	Hospital	General Instruction	NRE
106	1912-13	Garage/Toolhouse	Garage, Qtrs. 192	NRED-C
115	1932	Addition to Building Ways	Quality Assurance	NRED-C
129	1918	Saw Mill	Saw Mill	NRE
150	1940	Submarine Offices	Quality Assurance	NRED-C
155	1941	Pipe Shop	Pipe Shop	NRED-C
161	1941-42, 1952	Gate House 2	Gate House 2	NRD-C
162	1941	Substation #2	Substation #2	NRED-C
163	1942	Valve House, Water Tank	Valve House, Water Tank	NRD-C
165	1942	Time Clock House	Electric Distrib.	NRED-C
175	1942	Substation #3	Substation #3	NRED-C
176	1942, 1950, 1966	Torpedo Storage/Overhaul	Shop	NRED-C
178	1942, 1943, 1944	Submarine Assembly/Building Ways	Storage	NRED-C
179	1942	Residence	Guest House	NRD-C
184	1943	Galvanizing Plant	Welding Lab/School	NRE
186	1942	Garage and Quarters	Garage and Quarters	NRD-C
188	1943	Sand and Salt Storage	Storage	NRD-C
192	1944	Officers' Qtrs., Prison Res.	Residence	NRED-C
238	1953-55	Battery Plant	Battery Plant	NRED-C
240	1955	Electrical/Electronics Shop	Electrical Shop	NE-A
241	1952	Sunday School	Sunday School	NE-S
242	1953	Screen House	Screen House	NRED-NC

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TABLE M-1 (continued)

BUILDING NUMBER	DATE	ORIGINAL USE	PRESENT USE	EVALUATION
263	1947	Bus Stop Shelter	Bus Stop Shelter	NRD-C
264	1942	Bus Stop Shelter	Bus Stop Shelter	NRD-C
266	1942	Elevated Water Tank	Elevated Water Tank	NRD-C
303	1976	Electronics Test Facility	Electronics Test Facility	NRED-C
345	1991	Field Shop	Field Shop	NRED-NC
347	1977	Weld House	Weld House	NRED-C
M1	ca. 1825	Marine Barracks	Enlisted Barracks, Mess	NRD-C
M4	Between 1860 and 1883	Marine Bakery	Naval Reserve Center	NRD-C
M6	Between 1860 and 1883	Marine Carpenter Shop	Public Affairs	NRD-C
H1	1913	Hospital	Medical Clinic	NRED-C
H3	1917, 1934	Contagious Ward	Residence	NRED-C
H4	1917, 1926	Contagious Ward	Residence	NRED-C
H5	1917, 1931	Contagious Ward	Residence	NRED-C
H13	1917	Latrine	Garage	NRED-C
H21	1942, 1945	Nurses' Qtrs.	Qtrs.	NRED-C
H23	1942, 1979	Barracks	Barracks/Offices	NRED-C
H27	1945, 1961	Hospital Cmdr.'s Residence	Hospital Cmdr.'s Residence	NRED-C
H29	1944-45, 1986	Neuro-Psychiatric Ward	Offices	NRED-C
Qtrs. A	1815, 1873, 1926, 1936	Residence	Residence	NRD-C
A2	1930	Greenhouse, Qtrs. A	Vacant	NRD-C
A3	1916	Garden Shed/Root Cellar, Qtrs. A	Vacant	NRD-C
A7	1946	Stable/Tool House, Qtrs. A	Stable/Tool House/Storage	NRD-C
Qtrs. B	1849	Residence	Residence	NRD-C

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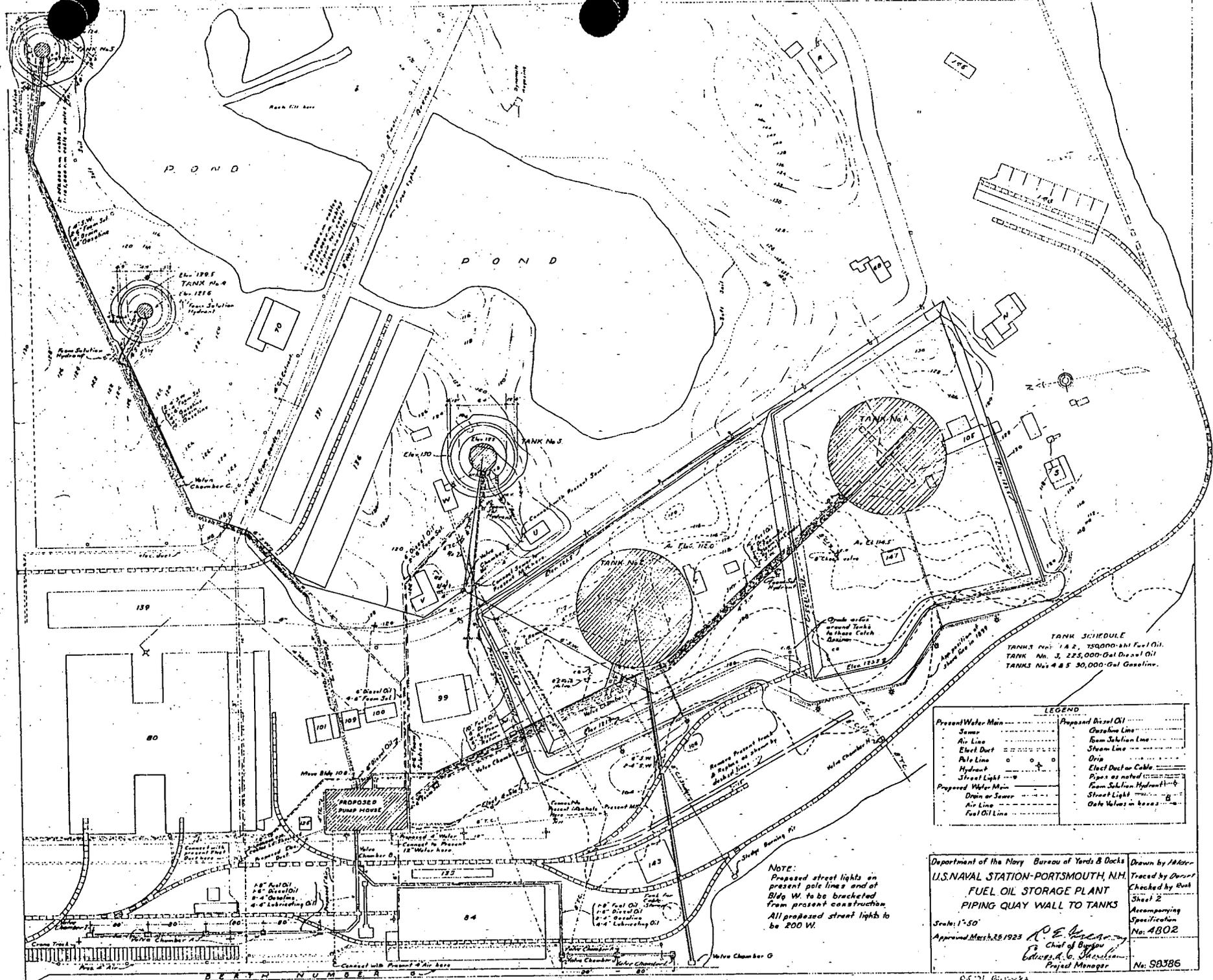
TABLE M-1 (continued)

BUILDING NUMBER	DATE	ORIGINAL USE	PRESENT USE	EVALUATION
A9	1849, 1939	Shed, Qtrs. B	Garage, Qtrs. B	NRD-C
Qtrs. C, D	1834, 1936	Residence	Residence	NRD-C
A10	1835	Storage	Storage, Qtrs. C	NRD-C
Qtrs. E, F	1833	Residence	Residence	NRD-C
A12	1835	Shed, Qtrs. E, F	Garage	NRD-C
Qtrs. G, H, I, J	1828-1836	Residence	Residence	NRD-C
A15	1835	Shed, Qtrs. G-I	Garage	NRD-C
Qtrs. K	ca. 1867	Barracks	Residence	NRD-C
Qtrs. L	1864, 1942	Residence	Residence	NRD-C
Qtrs. O	1901	Residence	Residence	NRD-C
Qtrs. P	1901	Residence	Residence	NRD-C
Qtrs. Q	1914	Prison Commander's Residence	Residence	NRED-C
A58	1920	Garage, Qtrs. Q	Garage	NRED-C
Bridge 1	1913	Road/Railroad Bridge	Road/Railroad Bridge	NRED-C
Bridge 2	1942	Road Bridge	Road Bridge	NRED-C
Dry Dock 1	1943	Submarine Repair/Construction	Submarine Repair	NRED-C
Dry Dock 2	1906	Surface Vessel Repair/Construction	Submarine Repair	NRED-C, ASME
Dry Dock 3	1943	Sub. Repair Construction	Submarine Repair	NRED-C

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**TANK SCHEDULE**

TANK No. 1 & 2	750,000-Gal Fuel Oil
TANK No. 3	225,000-Gal Diesel Oil
TANKS No. 4 & 5	50,000-Gal Gasoline

**LEGEND**

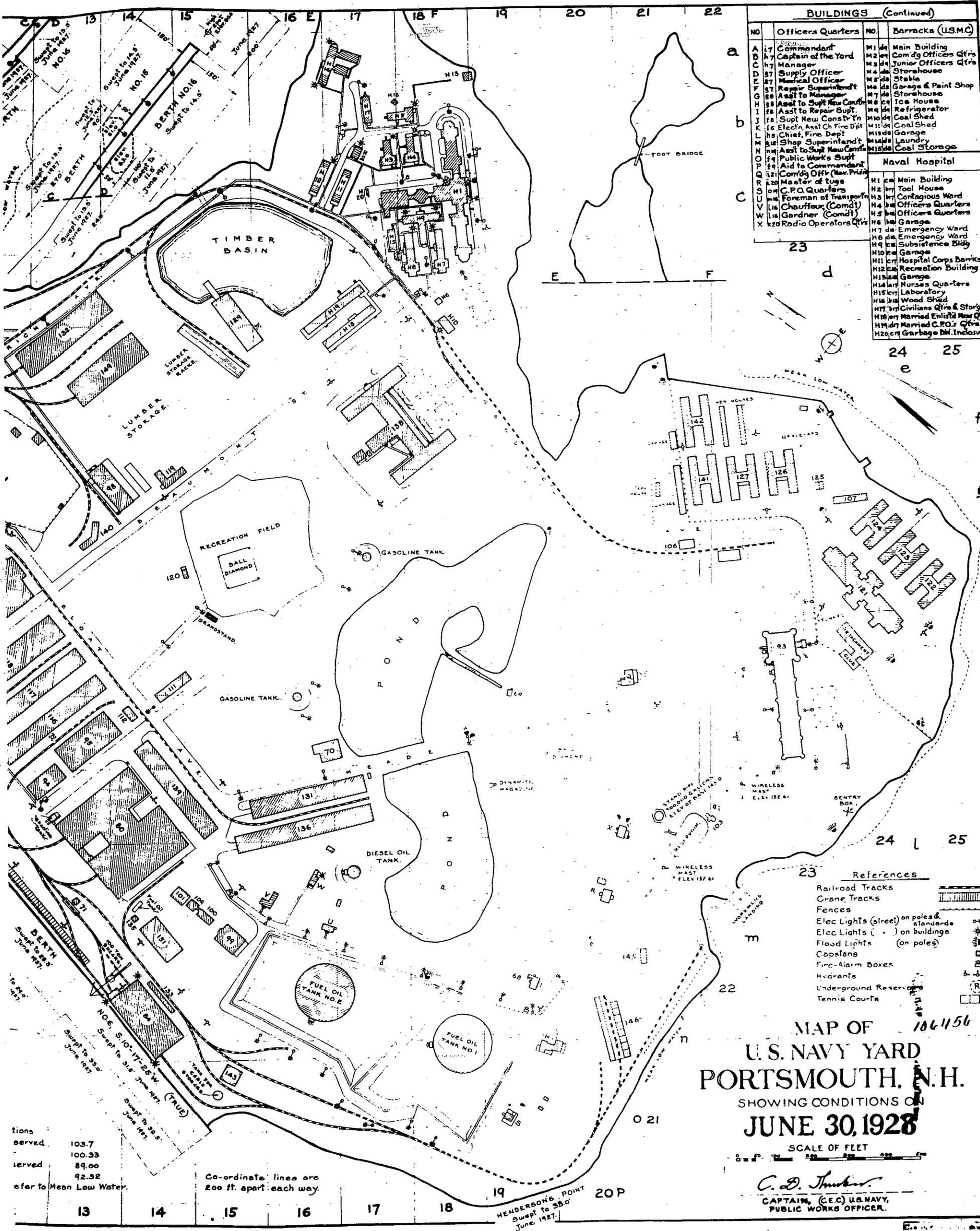
Present Water Main	Proposed Diesel Oil
Steam	Overhaul Line
Air Line	Ram Substn Line
Elect Duct	Steam Line
Pole Line	Drain
Hydrant	Elect Duct or Cable
Street Light	Pipes as noted
Proposed Water Main	Ram Substn Hydrant
Drain or Sewer	Street Light
Air Line	Gate Valves in boxes
Fuel Oil Line	

**NOTE:**  
 Present street lights and pole lines to be bracketed from present construction.  
 All proposed street lights to be 200 W.

Department of the Navy Bureau of Yards & Docks  
 U.S. NAVAL STATION-PORTSMOUTH, N.H.  
**FUEL OIL STORAGE PLANT**  
**PIPING QUAY WALL TO TANKS**  
 Scale: 1"=50'  
 Approved March 25, 1923  
 R. E. [Signature]  
 Chief of Bureau  
 [Signature]  
 Project Manager  
 Drawn by [Signature]  
 Traced by [Signature]  
 Checked by [Signature]  
 Sheet 2  
 Accompanying Specifications No. 4802  
 No. 58386

R. E. [Signature]  
 136-43-2 6/6/23

1478



BUILDINGS (Continued)			
NO	Officers Quarters	NO	Barracks (USMC)
A 17	Commandant	M 1	Main Building
B 7	Captain of the Yard	M 2	Comdg Officers Qtrs
C 7	Manager	M 3	Junior Officers Qtrs
D 57	Supply Officer	M 4	Storehouse
E 57	Medical Officer	M 5	Stable
F 57	Repair Superintendent	M 6	Garage & Paint Shop
G 58	Asst to Manager	M 7	Storehouse
H 1	Asst to Supt New Constr'n	M 8	Ice House
I 1	Asst to Repair Supt.	M 9	Refrigerator
J 1	Supt New Constr'n	M 10	Coal Shed
K 1	Chief, Fire Dept	M 11	Coal Shed
L 1	Shop Superintendent	M 12	Garage
M 1	Asst to Supt New Constr'n	M 13	Laundry
N 1	Public Works Supt	M 14	Coal Storage
O 1	Aid to Commandant	Naval Hospital	
P 1	Comdg Offr (Nav. Priv)	H 1	Main Building
Q 1	Master of Tugs	H 2	Tool House
R 1	C.P.O. Quarters	H 3	Contagious Ward
S 1	Foreman of Transport	H 4	Officers Quarters
T 1	Chauffeur (Comdt)	H 5	Officers Quarters
U 1	Gardner (Comdt)	H 6	Garage
V 1	Radio Operators Qtrs	H 7	Emergency Ward
X 1		H 8	Emergency Ward
		H 9	Subsistence Bldg
		H 10	Garage
		H 11	Hospital Corps Banks
		H 12	Recreation Building
		H 13	Garage
		H 14	Nurses Quarters
		H 15	Laboratory
		H 16	Wood Shed
		H 17	Civilians Qtrs & Storage
		H 18	Married Enlisted Men Qtrs
		H 19	Married C.P.O.'s Qtrs
		H 20	Garbage Bn. Inclusion

tions served 103.7  
 served 100.33  
 served 89.00  
 refer to Mean Low Water 92.32

Co-ordinate lines are 200 ft. apart each way.

MAP OF 1064156  
 U.S. NAVY YARD  
 PORTSMOUTH, N.H.  
 SHOWING CONDITIONS ON  
**JUNE 30, 1928**  
 SCALE OF FEET

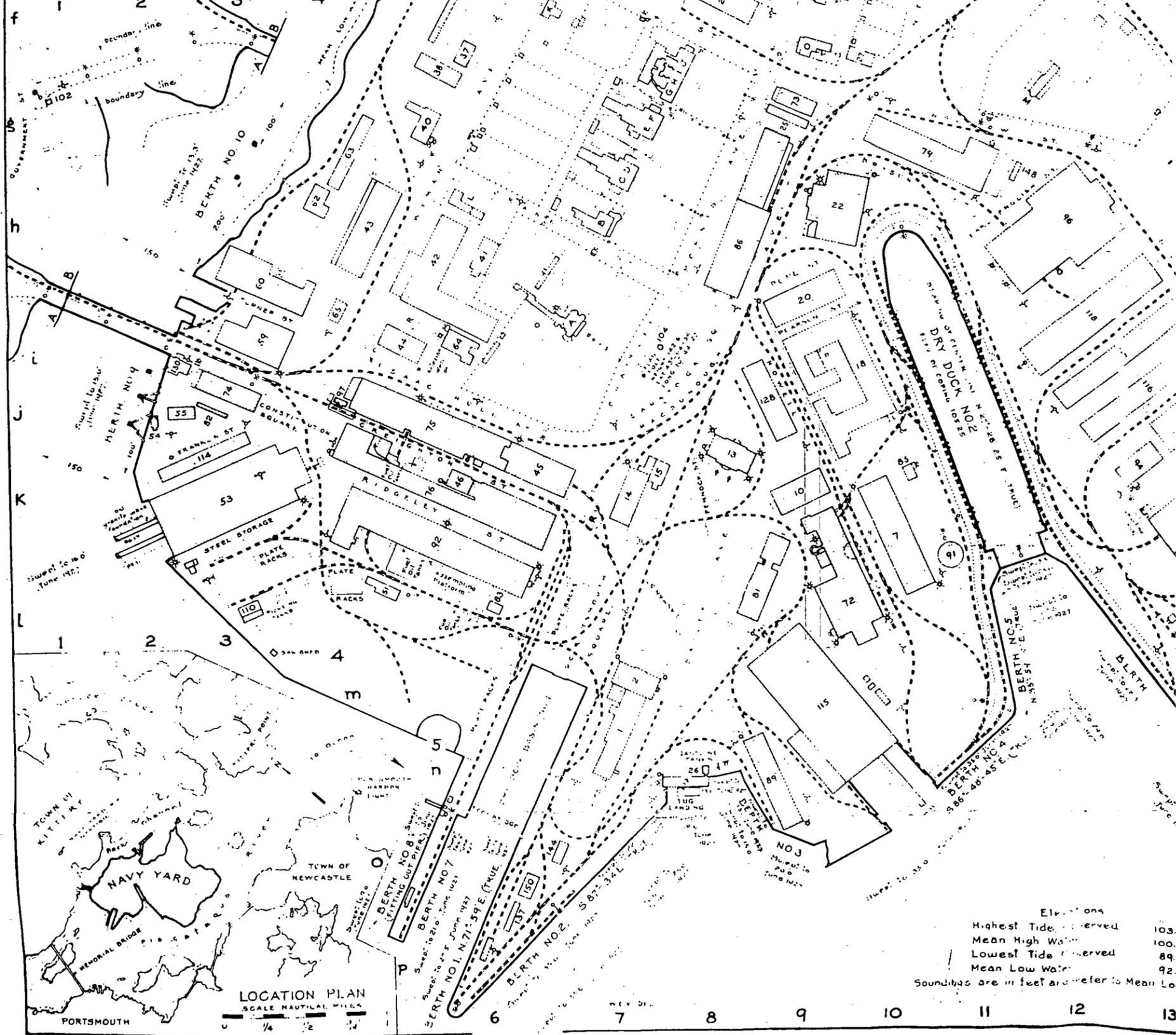
C. D. Tucker  
 CAPTAIN, (E.C.) U.S. NAVY,  
 PUBLIC WORKS OFFICER.

RA 71, BuDocks, Series F microfilm, Reel 1

**BUILDINGS**

I.D. - Industrial Dept. S.D. - Supply Dept. M.&S. - Medicine & Surgery.  
Mil. - Military Dept. U.S.M.C. - U.S. Marine Corps.

No.	Shop, Storehouses, Etc.	No.	Shop, Storehouses, Etc.	No.	Shop, Storehouses, Etc.	No.	Shop, Storehouses, Etc.
1	Storehouse	63	Cart Shed	103	Radio Station	140	Oil Storehouse
2	Storehouse	64	Fire Engine House	104	Band Stand	141	Barracks (Nav. Prison)
3	Landing House for Yard Craft	65	Water Wagon & Pub. Works Storehouse	106	Garage (Nav. Prison)	142	Barracks (Nav. Prison)
4	Laws & Riggers Shop	66	Officers Quarters	107	Coal Shed (O.H.) Vacant	143	Coal Storage
5	Rigging & Sail Loft	67	Dynamiters Tool House	108	Metal Washing Plant	144	Auxiliary Electrical Shop
6	New Construction Storehouse	68	Ice House	109	Prisoners Tools	145	Stone Crusher
7	Administration Bldg & Warrant Officers Vacant	69	Scale House	110	Latrine	146	Scrap Metal Yard
8	Dry Kiln & Varnish Rm	70	Central Power Plant	111	Boat Storehouse		
9	Storehouse & Garage	71	Dispensary	112	Sub Building Ways		
10	Storehouse & Latrine	72	Sheet Metal Shop	113	Boat Storehouse		
11	Recreation Rooms & Restaurant	73	Foundry	114	Storehouse		
12	Officers Garages	74	Smith, Copper & Galvanizing Shops	115	Oil Storehouse		
13	Mess Hall	75	Electrical & Electrical Mfg Shops	116	Gas Chamber for Instruction in Rescue Breathing Apparatus		
14	Paint Shop	76	Machine Shop	117	Machine & Carpenter Shop & Clothing Factory (Nav. Prison)		
15	Storehouse	77	Office Building	118	Barracks (Nav. Prison)		
16	Magazine	78	Dry Kiln (Vacant)	119	Barracks (Nav. Prison)		
17	Magazine	79	Coal Plant	120	Barracks (Nav. Prison)		
18	Used temporarily as Storehouses by U.S.M.C.	80	Latrine	121	Pump House		
19	Garage (Officers)	81	Supply Office & Storehouse	122	Barracks (Nav. Prison)		
20	Stable	82	Outside Mach. Shop	123	Barracks (Nav. Prison)		
21	Stable & Comd's Car	83	Pump Well (D.D.#2)	124	Barracks (Nav. Prison)		
22	Storehouse	84	Shipfitters Shop & Mold Loft	125	Barracks (Nav. Prison)		
23	Shipwrights & Joiner Shop	85	Naval Prison	126	Barracks (Nav. Prison)		
24	Boat Storehouse	86	Commissary Stores	127	Barracks (Nav. Prison)		
25	Building Trades Shop	87	Pattern Shop	128	Barracks (Nav. Prison)		
26	Diesel Engine Storage	88	Boiler Shop	129	Barracks (Nav. Prison)		
27	Incinerator	89	Scale House	130	Barracks (Nav. Prison)		
28	Vacant	90	Storehouse for Combustibles	131	Barracks (Nav. Prison)		
29	Apprentice School	91	Cold Hospital (Vacant)	132	Barracks (Nav. Prison)		
30	Boat Storehouse	92	Boiler Rm (O.H.) Vacant	133	Barracks (Nav. Prison)		
31	Boat Shop	93	Stable (O.H.) Vacant	134	Barracks (Nav. Prison)		
32	Public Wks Storehouse	94	Water Meter (Vacant)	135	Barracks (Nav. Prison)		



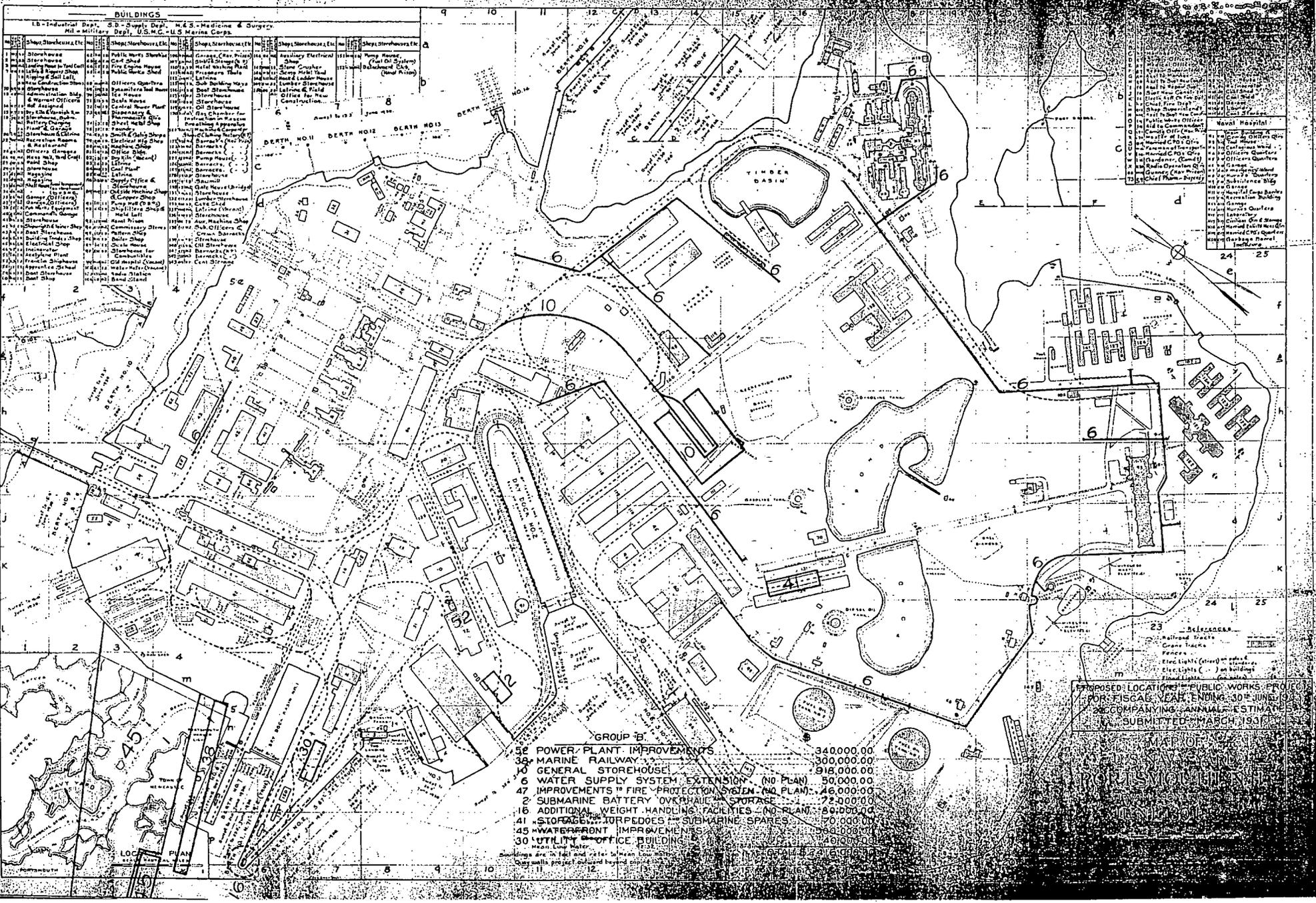
Elevations  
 Highest Tide Observed 103.  
 Mean High Water 100.  
 Lowest Tide Observed 89.  
 Mean Low Water 92.  
 Soundings are in feet and refer to Mean Low

LOCATION PLAN  
 SCALE NAUTICAL MILES  
 1/4 1/2 3/4

PORTSMOUTH

BUILDINGS		S. S. - Supply Dept.		M. S. - Medicine & Surgery	
1	2	3	4	5	6
101	102	103	104	105	106
107	108	109	110	111	112
113	114	115	116	117	118
119	120	121	122	123	124
125	126	127	128	129	130
131	132	133	134	135	136
137	138	139	140	141	142
143	144	145	146	147	148
149	150	151	152	153	154
155	156	157	158	159	160
161	162	163	164	165	166
167	168	169	170	171	172
173	174	175	176	177	178
179	180	181	182	183	184
185	186	187	188	189	190
191	192	193	194	195	196
197	198	199	200	201	202
203	204	205	206	207	208
209	210	211	212	213	214
215	216	217	218	219	220
221	222	223	224	225	226
227	228	229	230	231	232
233	234	235	236	237	238
239	240	241	242	243	244
245	246	247	248	249	250
251	252	253	254	255	256
257	258	259	260	261	262
263	264	265	266	267	268
269	270	271	272	273	274
275	276	277	278	279	280
281	282	283	284	285	286
287	288	289	290	291	292
293	294	295	296	297	298
299	300	301	302	303	304
305	306	307	308	309	310
311	312	313	314	315	316
317	318	319	320	321	322
323	324	325	326	327	328
329	330	331	332	333	334
335	336	337	338	339	340
341	342	343	344	345	346
347	348	349	350	351	352
353	354	355	356	357	358
359	360	361	362	363	364
365	366	367	368	369	370
371	372	373	374	375	376
377	378	379	380	381	382
383	384	385	386	387	388
389	390	391	392	393	394
395	396	397	398	399	400

BUILDINGS		S. S. - Supply Dept.		M. S. - Medicine & Surgery	
1	2	3	4	5	6
401	402	403	404	405	406
407	408	409	410	411	412
413	414	415	416	417	418
419	420	421	422	423	424
425	426	427	428	429	430
431	432	433	434	435	436
437	438	439	440	441	442
443	444	445	446	447	448
449	450	451	452	453	454
455	456	457	458	459	460
461	462	463	464	465	466
467	468	469	470	471	472
473	474	475	476	477	478
479	480	481	482	483	484
485	486	487	488	489	490
491	492	493	494	495	496
497	498	499	500	501	502
503	504	505	506	507	508
509	510	511	512	513	514
515	516	517	518	519	520
521	522	523	524	525	526
527	528	529	530	531	532
533	534	535	536	537	538
539	540	541	542	543	544
545	546	547	548	549	550
551	552	553	554	555	556
557	558	559	560	561	562
563	564	565	566	567	568
569	570	571	572	573	574
575	576	577	578	579	580
581	582	583	584	585	586
587	588	589	590	591	592
593	594	595	596	597	598
599	600	601	602	603	604
605	606	607	608	609	610
611	612	613	614	615	616
617	618	619	620	621	622
623	624	625	626	627	628
629	630	631	632	633	634
635	636	637	638	639	640
641	642	643	644	645	646
647	648	649	650	651	652
653	654	655	656	657	658
659	660	661	662	663	664
665	666	667	668	669	670
671	672	673	674	675	676
677	678	679	680	681	682
683	684	685	686	687	688
689	690	691	692	693	694
695	696	697	698	699	700



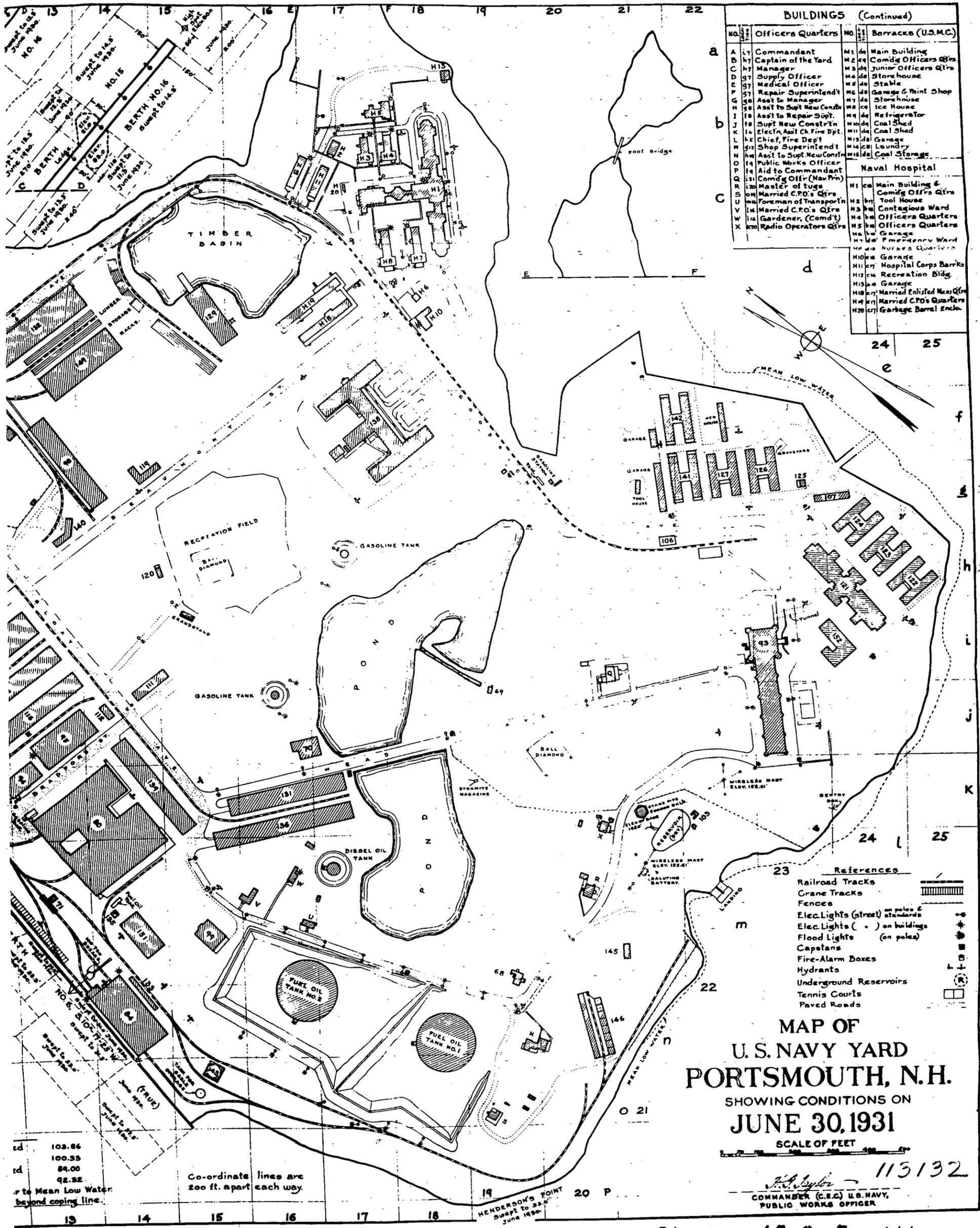
GROUP 'B'

52 POWER PLANT IMPROVEMENTS	340,000.00
38 MARINE RAILWAY	300,000.00
10 GENERAL STOREHOUSE	918,000.00
6 WATER SUPPLY SYSTEM EXTENSION (NO PLAN)	50,000.00
47 IMPROVEMENTS IN FIRE PROTECTION SYSTEM (NO PLAN)	46,000.00
2 SUBMARINE BATTERY OVERHAUL STORAGE	72,000.00
16 ADDITIONAL WEIGHT HANDLING FACILITIES (NO PLAN)	80,000.00
41 STORAGE OF TORPEDOES AND SUBMARINE SPARES	70,000.00
45 WATERFRONT IMPROVEMENTS	500,000.00
30 UTILITIES OFFICE BUILDING	40,000.00
1200000.00	

Buildings are to fall and site between low water and high water. Quay walls project outward beyond limits.

PROPOSED LOCATIONS FOR PUBLIC WORKS PROJECT FOR FISCAL YEAR ENDING 30 JUNE 1931 AND ACCOMPANYING ANNUAL ESTIMATE SUBMITTED MARCH 1931

1431



BUILDINGS (Continued)			
NO.	DESCRIPTION	NO.	DESCRIPTION
A 1	Commandant	M 1	Main Building
B 1	Captain of the Yard	M 2	Comdg Officers Qtrs
C 1	Manager	M 3	Junior Officers Qtrs
D 1	Supply Officer	M 4	Storehouse
E 1	Medical Officer	M 5	Stable
F 1	Repair Superintendent	M 6	Garage & Paint Shop
G 1	Asst to Manager	M 7	Storehouse
H 1	Asst to Supt New Constr	M 8	Ice House
I 1	Asst to Repair Supt	M 9	Refrigerator
J 1	Supt New Constr	M 10	Coal Shed
K 1	Elect. Asst Ch. Fire Dpt.	M 11	Coal Shed
L 1	Chief, Fire Dept.	M 12	Garage
M 1	Shop Superintendent	M 13	Laundry
N 1	Asst to Supt New Constr	M 14	Coal Storage
O 1	Public Works Officer	Naval Hospital	
P 1	Aid to Commandant	H 1	Main Building
Q 1	Comdg Offr (Nav. Pm)	H 2	Comdg Offrs Qtrs
R 1	Master of tugs	H 3	Tool House
S 1	Married C.P.O.'s Qtrs	H 4	Contagious Ward
T 1	Foreman of Transport	H 5	Officers Quarters
U 1	Married C.P.O.'s Qtrs	H 6	Garage
V 1	Gardener, (Comd't)	H 7	Emergency Ward
X 1	Radio Operators Qtrs	H 8	Horses Quarters
		H 9	Garage
		H 10	Recreation Bldg.
		H 11	Hospital Corps Barrks
		H 12	Garage
		H 13	Married Enlisted Men Qtrs
		H 14	Married C.P.O.'s Quarters
		H 15	Garage Barrel Encl.

- References
- Railroad Tracks
  - Crane Tracks
  - Fences
  - Elec. Lights (street) on poles
  - Elec. Lights ( ) on buildings
  - Flood Lights (on poles)
  - Capstans
  - Fire-Alarm Boxes
  - Hydrants
  - Underground Reservoirs
  - Tennis Courts
  - Paved Roads

**MAP OF  
U. S. NAVY YARD  
PORTSMOUTH, N. H.  
SHOWING CONDITIONS ON  
JUNE 30, 1931**

SCALE OF FEET

113132  
COMMANDER (E.C.) U.S. NAVY,  
PUBLIC WORKS OFFICER

Co-ordinate lines are  
200 ft. apart each way.

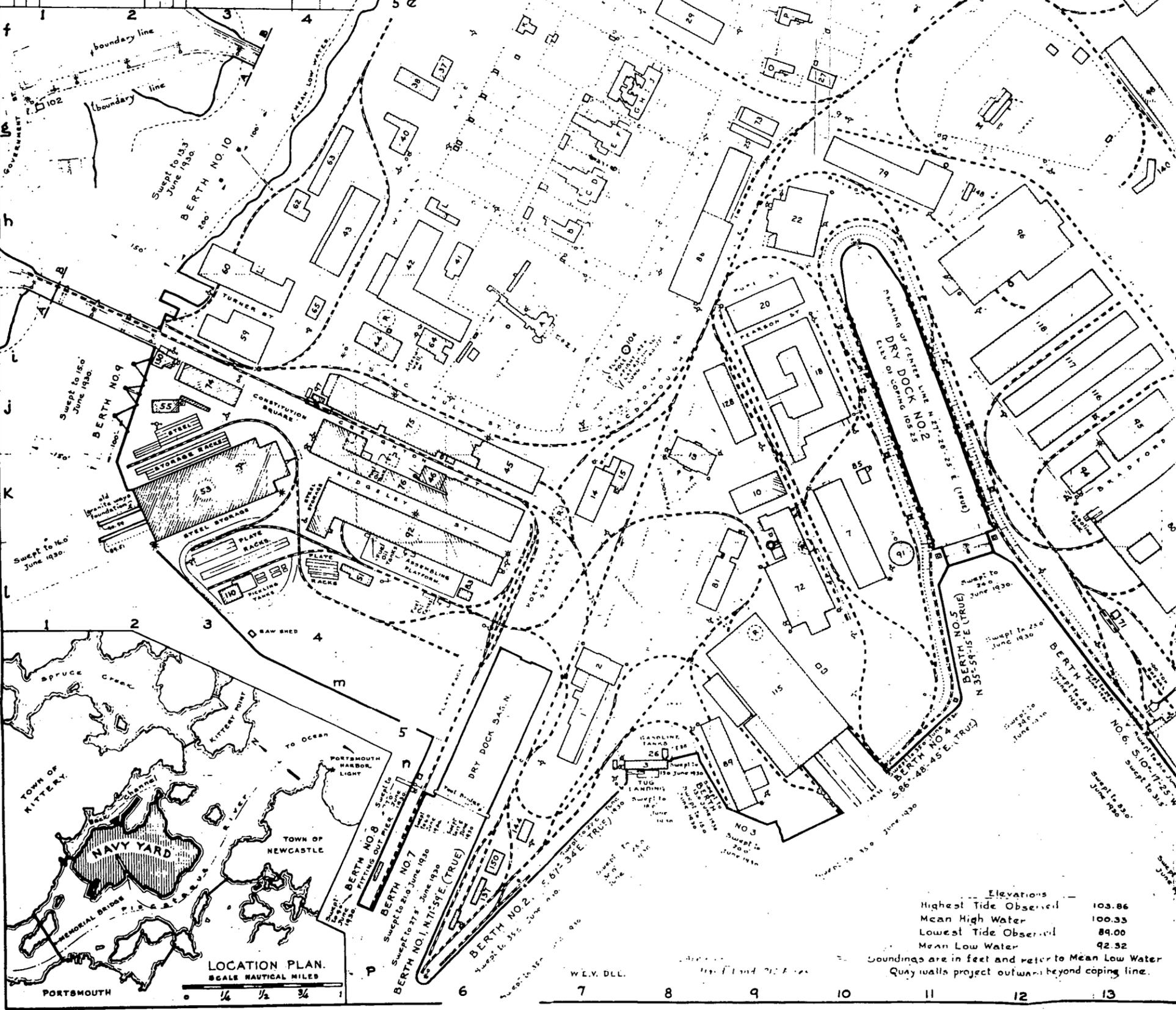
9-14-31 Portsmouth, N.H.  
120-3-111

RG 71, Budocks  
Series I microfilm, Reel 1

**BUILDINGS**

I.D. - Industrial Dept., S.D. - Supply Dept., M.&S. - Medicine & Surgery,  
Mil. - Military Dept., U.S.M.C. - U.S. Marine Corps

No.	Dept.	Description	No.	Dept.	Description	No.	Dept.	Description	No.	Dept.	Description
1	Mil.	Storehouse	62	Mil.	P.W. Storehouse	106	Mil.	Garage, (Nav Prison)	144	Mil.	Auxiliary Flea Shop
2	Mil.	Storehouse	63	Mil.	Cart Shed	107	Mil.	Stable Storage (N.P.)	145	Mil.	Stone Crusher
3	Mil.	Landing House (for Yard Craft)	64	Mil.	Fire Engine House	110	Mil.	Metal Washing Plant	146	Mil.	Scrap Metal Yard
4	Mil.	Labrs & Riggers Shop	65	Mil.	P.W. Shed	111	Mil.	Prisoners Tools	148	Mil.	Hook & Ladder No. 1
5	Mil.	Rigging & Sail Loft	66	Mil.	Quarters	112	Mil.	Latrine	149	Mil.	Lumber Storage
6	Mil.	New Construction Stores	67	Mil.	Dynamiters Tool House	115	Mil.	Sub Building Ways	150	Mil.	Latrine & Field Office for New Construction
7	Mil.	Storehouse	68	Mil.	Ice House	116	Mil.	Boat Storehouse			
8	Mil.	Administration Bldg.	69	Mil.	Scale House	117	Mil.	Storehouse			
9	Mil.	Storehouse	70	Mil.	Central Power Plant	118	Mil.	Storehouse			
10	Mil.	Dry Kiln & Varnish Room	71	Mil.	Dispensary & Pharmacia's Qtrs	119	Mil.	Oil Storehouse			
11	Mil.	Battery Charging, Submarine	72	Mil.	Sheet Metal Shop	120	Mil.	Gas Chamber for Instruction in Rescue Breathing Apparatus			
12	Mil.	Plant & Garage	73	Mil.	Foundry	121	Mil.	Machine & Carpenter Shops & Clothing Factory (N.P.)			
13	Mil.	Storehouse & Latrine	74	Mil.	Smith & Galvng Shops	122	Mil.	Barracks (Nav Prin)			
14	Mil.	Recreation Rooms & Restaurant	75	Mil.	Electrical Mfg Shop	123	Mil.	Barracks ( )			
15	Mil.	Officers Garages	76	Mil.	Machine Shop	124	Mil.	Barracks ( )			
16	Mil.	Mess Hall, Yard Craft	77	Mil.	Office Bldg.	125	Mil.	Pump House ( )			
17	Mil.	Paint Shop	78	Mil.	Dry Kiln (Vacant)	126	Mil.	Barracks ( )			
18	Mil.	Storehouse	79	Mil.	Latrine	127	Mil.	Barracks ( )			
19	Mil.	Magazine	80	Mil.	Coal Plant	128	Mil.	Storehouse			
20	Mil.	Shell House (used temporarily as storehouse by U.S.M.C.)	81	Mil.	Latrine	129	Mil.	Storehouse			
21	Mil.	Garage, (Officers)	82	Mil.	Supply Office & Storehouse	130	Mil.	Mill			
22	Mil.	Garage, (Officers)	83	Mil.	Outside Machine Shop & Copper Shop	131	Mil.	Gale House			
23	Mil.	Pub. Works Equipment	84	Mil.	Pump Well (D.P.#2)	132	Mil.	Storehouse			
24	Mil.	Command's Garage	85	Mil.	Shipfitters Shop & Mold Loft	133	Mil.	Lumber Storehouse			
25	Mil.	Storehouse	86	Mil.	Naval Prison	134	Mil.	Coal Shed			
26	Mil.	Shipwrights & Joiner Shop	87	Mil.	Commissary Stores	135	Mil.	Latrine (Vacant)			
27	Mil.	Boat Storehouse	88	Mil.	Pattern Shop	136	Mil.	Storehouse			
28	Mil.	Building Trades Shop	89	Mil.	Boiler Shop	137	Mil.	Aux. Machine Shop			
29	Mil.	Electrical Shop	90	Mil.	Scale House	138	Mil.	Sub. Officers & Crews Barracks			
30	Mil.	Incinerator	91	Mil.	Storehouse for Combustibles	139	Mil.	Storehouse			
31	Mil.	Acetylene Plant	92	Mil.	Old Hospital (Vacant)	140	Mil.	Oil Storehouse			
32	Mil.	Franklin Shiphouse	93	Mil.	Water Meter (Vacant)	141	Mil.	Barracks (N.P.)			
33	Mil.	Acetylene Pl. (Vacant)	94	Mil.	Radio Station	142	Mil.	Barracks ( )			
34	Mil.	Storehouse	95	Mil.	Band Stand	143	Mil.	Coal Storage			
35	Mil.	Boat Shop	104	Mil.							

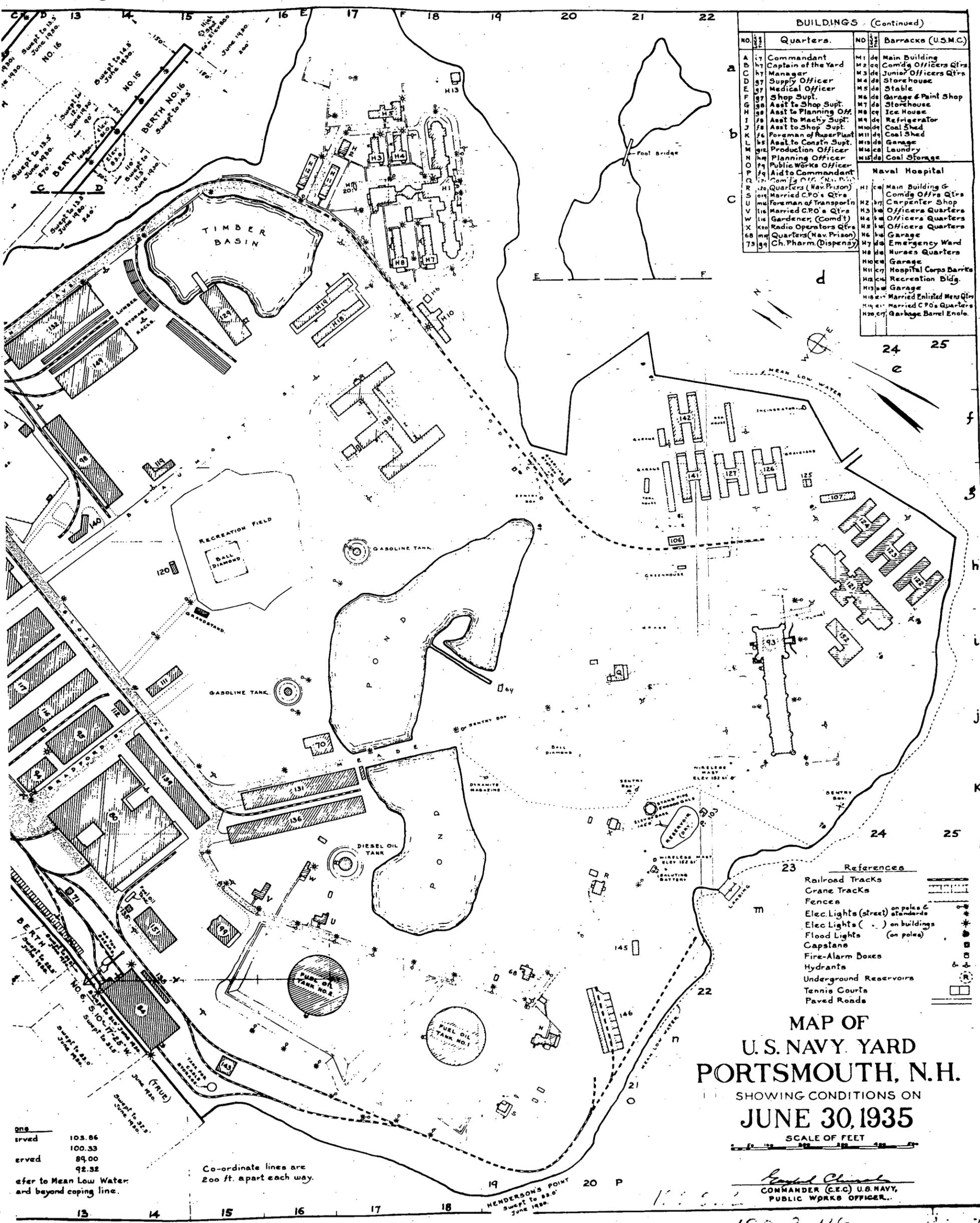


Elevations  
 Highest Tide Observed 103.86  
 Mean High Water 100.33  
 Lowest Tide Observed 89.00  
 Mean Low Water 92.32  
 Soundings are in feet and refer to Mean Low Water  
 Quay walls project outward beyond coping line.

LOCATION PLAN.  
 SCALE NAUTICAL MILES  
 0 1/4 1/2 3/4 1

W.E.V. DLL.

1935



BUILDINGS (Continued)			
NO.	DESCRIPTION	NO.	DESCRIPTION
A 17	Commandant	H1 de	Main Building
B 17	Captain of the Yard	H2 de	Comdg Officers Qtrs
C 17	Manager	H3 de	Junior Officers Qtrs
D 17	Supply Officer	H4 de	Storehouse
E 17	Medical Officer	H5 de	Stable
F 17	Shop Supt.	H6 de	Garage & Paint Shop
G 17	Asst to Shop Supt.	H7 de	Storehouse
H 17	Asst to Planning Off.	H8 de	Ice House
I 17	Asst to Machy Supt.	H9 de	Refrigerator
J 17	Asst to Shop Supt.	H10 de	Coal Shed
K 17	Foreman of Power Plant	H11 de	Coal Shed
L 17	Asst. to Constn Supt.	H12 de	Garage
M 17	Production Officer	H13 de	Laundry
N 17	Planning Officer	H14 de	Coal Storage
O 17	Public Works Officer		
P 17	Aid to Commandant		
R 17	Quarters (Nav. Prison)	H1 ce	Naval Hospital
S 17	Married CPO's Qtrs	H1 ce	Main Building G
T 17	Foreman of Transport	H2 ce	Comdg Officers Qtrs
U 17	Married CRO's Qtrs	H3 ce	Carpenter Shop
V 17	Gardener (Comdt)	H4 ce	Officers Quarters
W 17	Radio Operators Qtrs	H5 ce	Officers Quarters
X 17	Quarters (Nav. Prison)	H6 ce	Officers Quarters
Y 17	Ch. Pharm. (Dispensy)	H7 ce	Garage
Z 17		H8 ce	Emergency Ward
		H9 ce	Nurses Quarters
		H10 ce	Garage
		H11 ce	Hospital Corps Bldg.
		H12 ce	Recreation Bldg.
		H13 ce	Garage
		H14 ce	Married Enlisted Mens Qtrs
		H15 ce	Married CPO's Quarters
		H16 ce	Garbage Barrel Encls.

103.86  
 100.33  
 89.00  
 92.32  
 refer to Mean Low Water  
 and beyond coping line.

Co-ordinate lines are 200 ft. apart each way.

HENDERSON'S POINT  
SWEEP TO 89.0'

R. C. Church  
 COMMANDER (G.C.) U.S. NAVY,  
 PUBLIC WORKS OFFICER.

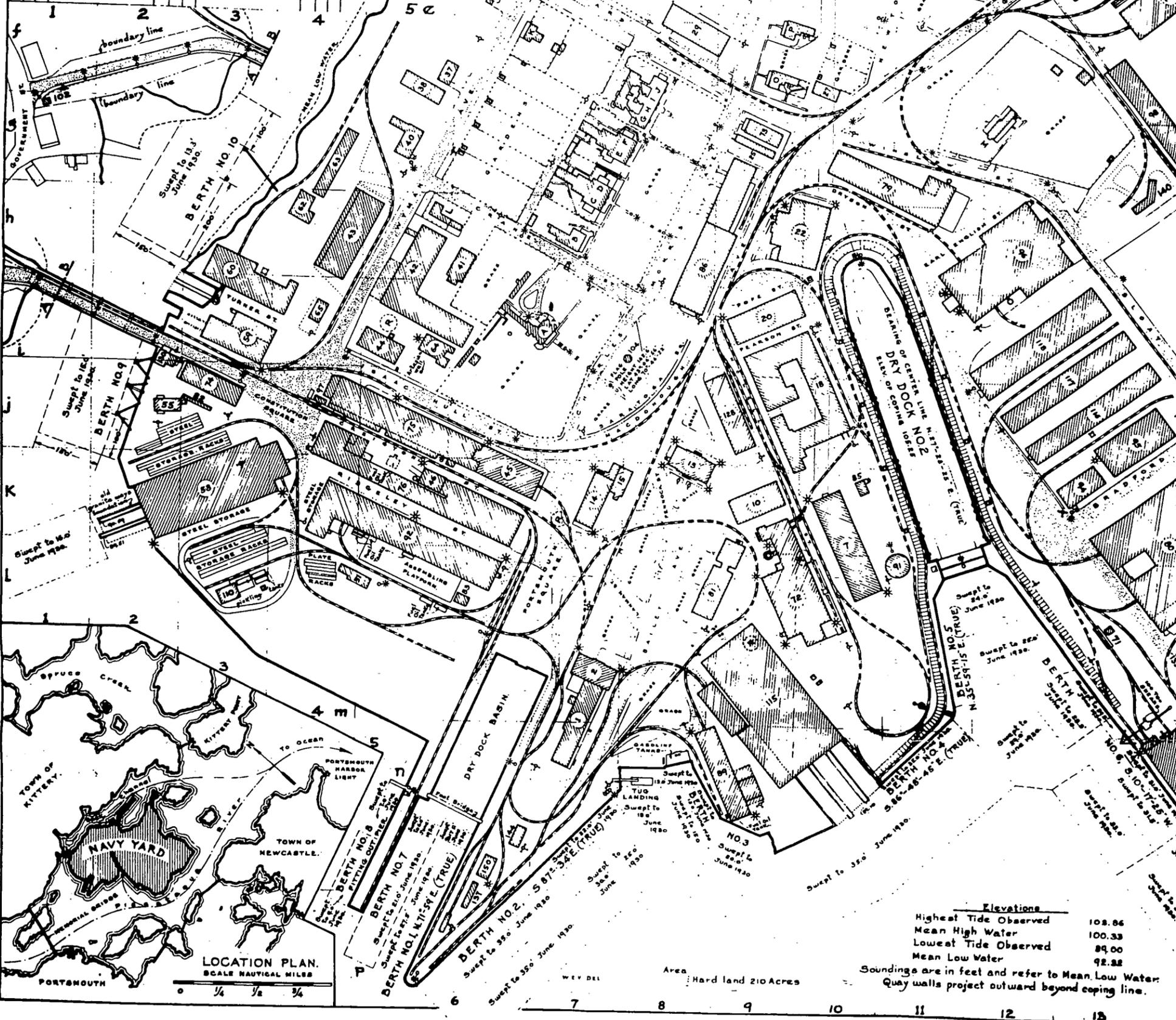
120-3-116

RA 71, Budicks  
Series I microfilm, Reel 1

**BUILDINGS**

I.D. - Industrial Dept. S.D. - Supply Dept. M.&S. - Medicine & Surgery  
 Mil. - Military Dept. U.S.M.C. - U.S. Marine Corps.

No.	Shops, Storehouses, Etc.	No.	Shops, Storehouses, Etc.	No.	Shops, Storehouses, Etc.	No.	Shops, Storehouses, Etc.	No.	Shops, Storehouses, Etc.
1	Warehouses	62	R.W. Storehouse	106	Garage, (Nav. Prison)	144	Auxiliary Elec Shop	151	Pump House (F.O.S.)
2	Warehouses	63	Cart Shed	107	Stables & Storage (N.P.)	145	Stone Crusher	152	Detachment Club (N.P.)
7	Labs & Riggers Shop	64	R.W. Storehouse	108	Metal Washing Plant	146	Scrap Metal Yard		
	Rigging & Sail Loft	65	Quarters	109	Prisoners Tools	147	Lumber Storage		
10	Warehouses	66	Dynamite Tool House	110	Sub. Building Ways	148	Latrine & Field Office		
13	Administration Bldg.	67	Ice House	111	Boat Storehouse	149	For New Construction		
14	Warehouses	68	Scale House	112	Storehouse				
15	Dry Kiln & Warmth Room	69	Central Power Plant	113	Storehouse				
16	Warehouses, Submarine	70	Dispensary & Pharmacy	114	Oil Storehouse				
17	Battery Charging Plant & Garage	71	Pharmacists Qtrs.	115	Gas Chamber for Instruction in Rescue				
18	Warehouses & Latrine	72	Foundry	116	Breathing Apparatus				
19	Recreation Rooms & Restaurant	73	Smith & Welding Shop	117	Machine & Carpenter Shop				
20	Officers Garages	74	Electrical Mfg. Shop	118	Shops & Clothing Factory (N.P.)				
21	Paint Shop	75	Machine Shop	119	Barracks (Nav. Prin.)				
22	Warehouses & Fire Eng. Magazine (House)	76	Office Bldg. & Dry Kiln (Vacant)	120	Barracks (-)				
23	Shell House (and temporary)	77	Latrine	121	Pump House (-)				
24	Garage (Officers)	78	Coal Plant	122	Barracks (-)				
25	Garage (Officers)	79	Latrine	123	Barracks (-)				
26	Garage (Officers)	80	Supply Office & Storehouse	124	Storehouse				
27	Garage (Officers)	81	Outside Machine Shop & Copper Shop	125	Sawmill				
28	Garage (Officers)	82	Pump Well (No. 2)	126	Gate House				
29	Garage (Officers)	83	Shipfitters Shop & Mold Loft	127	Storehouse				
30	Garage (Officers)	84	Naval Prison	128	Lumber Storehouse				
31	Garage (Officers)	85	Vacant	129	Coke Shed				
32	Garage (Officers)	86	Pattern Shop	130	Latrine (Vacant)				
33	Garage (Officers)	87	Boiler Shop	131	Storehouse				
34	Garage (Officers)	88	Scale House	132	Aux. Machine Shop				
35	Garage (Officers)	89	Storehouse for Combustibles	133	Sub. Officers & Crews Barracks				
36	Garage (Officers)	90	Old Hospital (Vacant)	134	Storehouse				
37	Garage (Officers)	91	Water Meter (Vacant)	135	Oil Storehouse				
38	Garage (Officers)	92	Radio Station (Vacant)	136	Barracks (N.P.)				
39	Garage (Officers)	93	Band Stand	137	Barracks (-)				
40	Garage (Officers)	94		138	Coal Storage				



**Elevations**

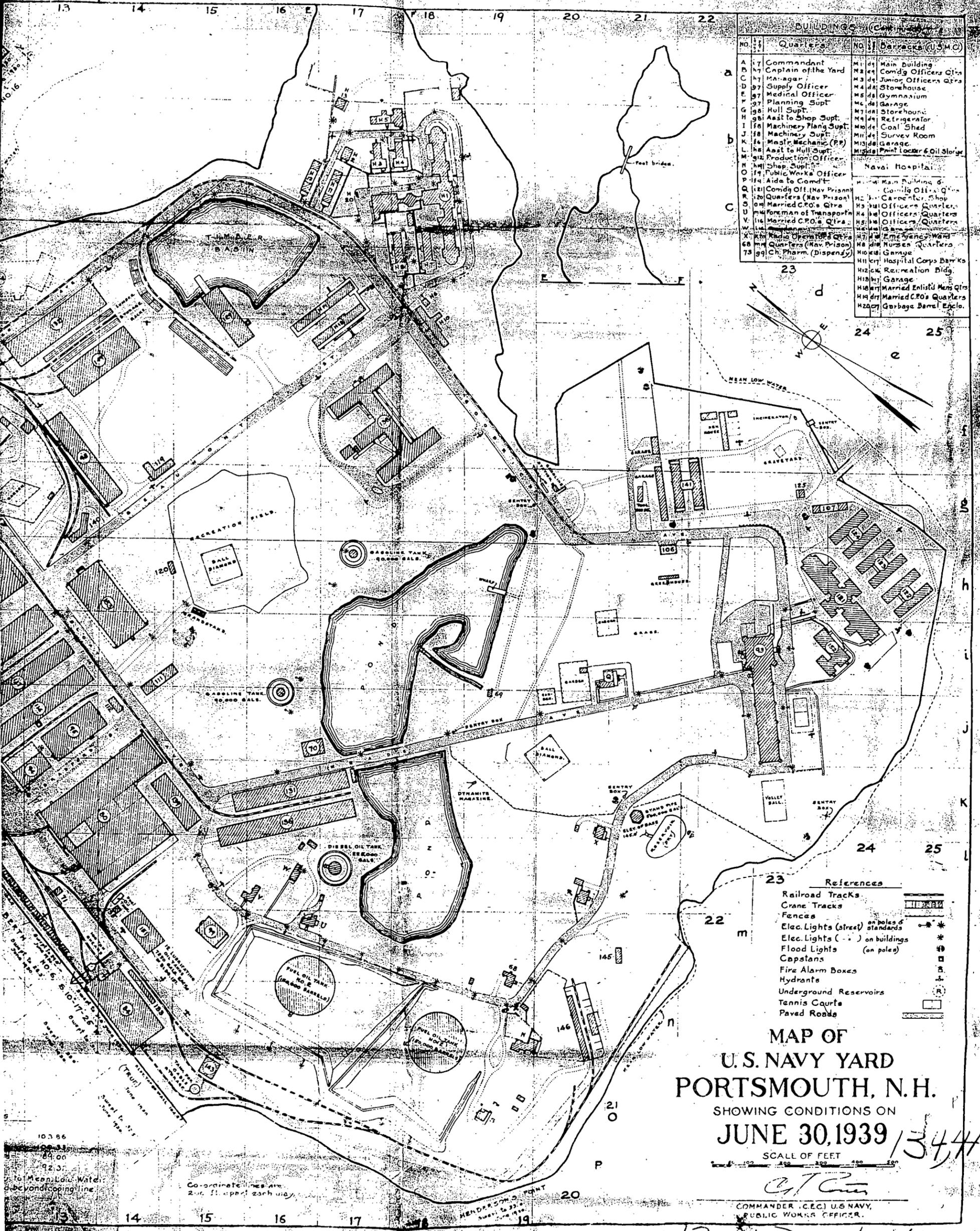
Highest Tide Observed	108.86
Mean High Water	100.33
Lowest Tide Observed	89.00
Mean Low Water	92.88

Soundings are in feet and refer to Mean Low Water.  
 Quay walls project outward beyond coping line.

**LOCATION PLAN.**  
 SCALE NAUTICAL MILES

Area: Hard land 210 Acres

1939



BUILDINGS (CONTINUED)			
NO.	NAME	NO.	NAME
A 17	Commandant	M 101	Main Building
B 17	Captain of the Yard	M 102	Comdg Officers Qtrs
C 17	Manager	M 103	Junior Officers Qtrs
D 17	Supply Officer	M 104	Storehouse
E 17	Medical Officer	M 105	Gymnasium
F 17	Planning Supt.	M 106	Garage
G 17	Hull Supt.	M 107	Storehouse
H 17	Asst to Shop Supt.	M 108	Refrigerator
I 17	Machinery Plant Supt.	M 109	Coal Shed
J 17	Mech. Supt.	M 110	Survey Room
K 17	Master Mechanic (P.P.)	M 111	Garage
L 17	Asst to Hull Supt.	M 112	Paint Locker & Oil Storage
M 17	Production Officer		
N 17	Shop Supt.		
O 17	Public Works Officer		
P 17	Aide to Comdt		
Q 17	Comdg Off. (Nav Prison)		
R 17	Quarters (Nav Prison)		
S 17	Married C.P.O.'s Qtrs		
U 17	Foreman of Transport		
V 17	Married C.P.O.'s Qtrs		
W 17	Quarters (Nav Prison)		
X 17	Quarters (Nav Prison)		
Y 17	Quarters (Nav Prison)		
Z 17	Quarters (Nav Prison)		
17 17	Ch. Pharm. (Dispensary)		

References	
Railroad Tracks	—+—+—+—
Crane Tracks	—+—+—+—
Fences	—+—+—+—
Elec. Lights (street) on poles & standards	—+—+—+—
Elec. Lights ( ) on buildings	—+—+—+—
Flood Lights (on poles)	—+—+—+—
Capstans	—+—+—+—
Fire Alarm Boxes	—+—+—+—
Hydrants	—+—+—+—
Underground Reservoirs	—+—+—+—
Tennis Courts	—+—+—+—
Paved Roads	—+—+—+—

MAP OF  
 U.S. NAVY YARD  
 PORTSMOUTH, N.H.  
 SHOWING CONDITIONS ON  
 JUNE 30, 1939  
 SCALE OF FEET  
 1" = 100'

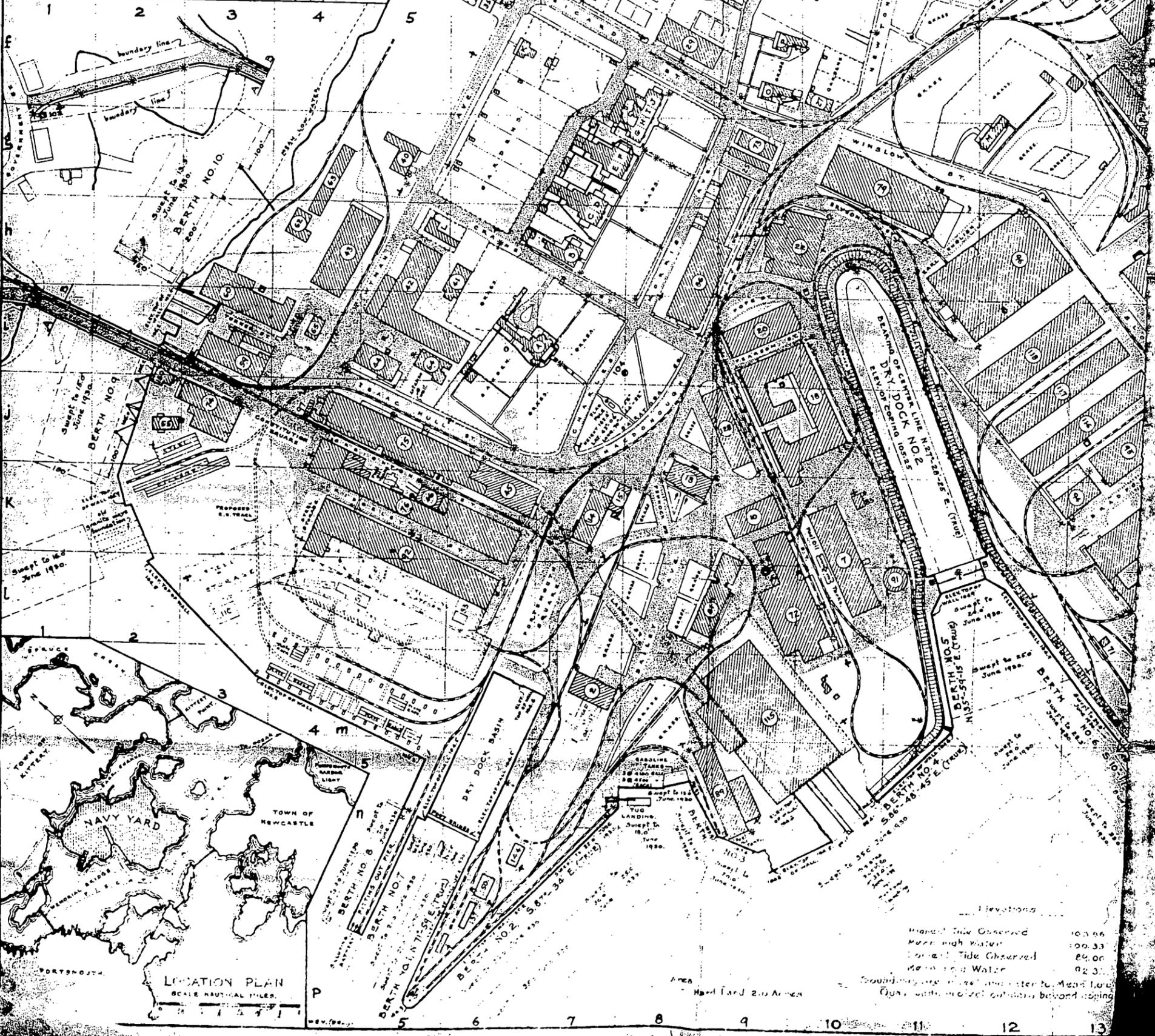
COMMANDER (C.E.C.) U.S. NAVY,  
 PUBLIC WORKS OFFICER.

120-3-114

**BUILDINGS**

1D - Industrial Dept. 8D - Supply Dept. M.E.S. - Medicine & Surgery  
 Mil - Military Dept. U.S.M.C. - U.S. Marine Corps

No.	Shop, Storehouse, Etc.	No.	Shop, Storehouse, Etc.	No.	Shop, Storehouse, Etc.	No.	Shop, Storehouse, Etc.
2	Model Building	64	Varnish Room	106	Garage (Nav. Prison)	144	Lumber Storage
7	Labrs & Rigging Shop	65	Public Works	107	Fire Equip. Garage	150	Latrine & Field Office for New Construction
10	Rigging & Sail Loft	66	Plumbing Shop	110	Metal Washing Plant	151	Pump House (P.O.S)
13	Storehouse	67	Quarters	111	Prisoners Tools	152	Detachment Club (C.P.)
14	Administration Bldg.	68	Dynamite/Tul House	112	Latrine	153	Supply Office & Storehouse
15	Storehouse & Public Works Dept.	69	Ice House	116	Sub. Building Ways	154	Transportation Equipment & Storage
18	Metallurgical Laboratory	70	Scale House	117	Boat Storehouse		
19	Storehouse & Submarine	71	Central Power Plant	118	Storehouse		
20	Battery Charging Plant & Garage	72	Dispensary & Pharmacy	119	Storehouse		
21	Recreation Rooms	73	Sheet Metal Shop	120	Oil Storehouse		
22	Restaurant	74	Foundry	121	Gas Chamber for Instruction in Rescue Breathing Apparatus		
23	Officers Garages	75	Smith & Welding Shop	122	Machine & Carpenter Shops & Clothing Factory (N.P.)		
24	Paint Shop	76	Apprentice School	123	Parracks (Nav. Prison)		
27	Storehouse & Fire Eng.	77	Electric Shop	124	Parracks ( )		
28	Magazine (House)	78	Machine Shop (Insk)	125	Latrine ( )		
29	Magazine	79	Office Bldg.	126	Pump House ( )		
30	Shell House	80	Coal Plant	127	Storehouse		
31	Shell House	81	Supply Office & Storehouse	128	Gate House		
32	Garage	82	Outside Machine Shop & Copper Shop	129	Storehouse		
33	Command's Garage	83	Pump Well (P.O.S)	130	Lumber Storehouse		
34	Storehouse	84	Shipfitters Shop & Mold Loft	131	Coke Shed		
35	Shipwright & Joiner Shop	85	Naval Prison	132	Latrine (vacant)		
36	Boat Storehouse	86	Accounting Dept. & Submarine Office	133	Storehouse		
37	Building Trades Shop	87	Pattern Shop	134	Storehouse		
38	Electrical Shop	88	Structural Shop	135	Oil Storehouse		
39	Incinerator	89	Scale House	136	Storehouse		
40	Auxiliary Welding Shop	90	Storehouse for Combustibles	137	Coal Storage		
41	Acetylene Plant	91	Old Hospital (vacant)	138	Aux. Elec. Shop		
42	Storehouse & Labor Board	92	Water Meter (vacant)	139	Stone Crusher		
43	Boat Shop	93	Dand Stand	140	Scrap Metal Yard		
44	Public Works						
45	Storehouse						
46	Cart Shed						



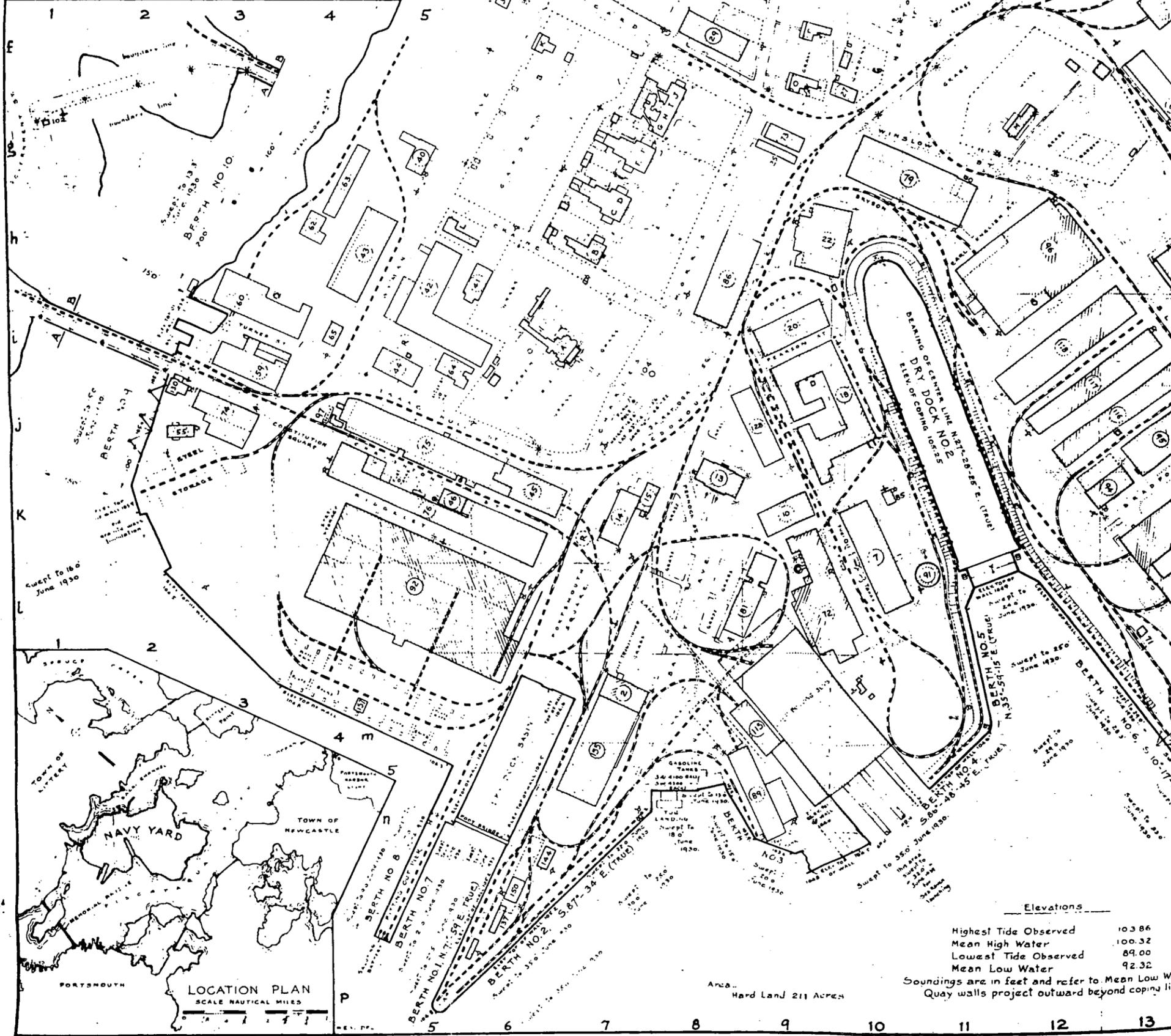
LOCATION PLAN  
 SCALE NAUTICAL MILES

Elevations  
 Mean High Water 103.66  
 Mean Low Water 89.00  
 Mean Sea Water 92.3  
 Mean Tide 92.3  
 Soundings are in feet and water to Mean Tide  
 (92.3) with one foot outside beyond sounding

**BUILDINGS**

I D - Industrial Dept., S D - Supply Dept., M & S - Medicine & Surgery  
 Mil - Military Dept., U.S.M.C. - U.S. Marine Corps

No. 2 Model Building	No. 64 Varnish Room	No. 106 Garage (Vacant)	No. 142 Canteen
No. 7 Labs & Rigging Shop	No. 65 Public Works	No. 107 Fire Exting. Station	No. 143 Lath & Field Office
No. 10 Rigging & Sail Loft	No. 68 Quarters	No. 111 Prison	No. 151 New Construction
No. 13 Administration Bldg	No. 69 Dynamite Tool House	No. 112 Jail	No. 152 Detachment Club
No. 14 Storehouse & Public Works Dept.	No. 70 Ice House	No. 113 Tool Storage	No. 153 Mess Office
No. 15 Metalurgical Laboratory	No. 71 Scale House	No. 114 Storehouse	No. 154 Transportation
No. 18 Storehouse & Submarine Battery Charging Plant	No. 72 Central Boiler Plant	No. 115 Storehouse	No. 155 Equipment Storage
No. 22 Storehouse & Lathery Reception Rooms & Restaurant	No. 73 Dispensary	No. 116 Oil Storehouse	No. 156 Niter Store
No. 25 Officers Garages	No. 74 Sheet Metal Shop	No. 117 Gas Chamber for Instruction in Rescue	
No. 27 Paint Shop	No. 75 Foundry	No. 118 Breathing Apparatus Shop	
No. 31 Storehouse & Fire Engine Magazine (House)	No. 76 Smith & Welding Shop	No. 119 Machine & Carpenter Shop	
No. 32 Magazine	No. 77 Apprentice School	No. 120 Shops (Fitting Factory)	
No. 34 Joiner Shop	No. 78 Elec. Mfg. Shop	No. 121 Barracks (Nav. Dept.)	
No. 41 Joiner Shop	No. 79 Machine Shop Inside	No. 122 Barracks	
No. 42 Shoemaker & Joiner Shop	No. 80 Machine Shop	No. 123 Barracks	
No. 43 Boat Storehouse	No. 81 Office Bldg	No. 124 Barracks	
No. 44 Building Shop	No. 85 Lathery	No. 125 Camp House	
No. 45 Electrical Shop	No. 86 Lathery	No. 126 Storehouse	
No. 46 Incinerator	No. 87 Lathery	No. 127 Saumill	
No. 55 Acetylene Plant	No. 84 Outside Machine Shop	No. 131 Gate House	
No. 59 Lathery	No. 91 Copper Shop	No. 132 Lumber Storehouse	
No. 60 Lathery	No. 92 Pump Well (D.P. 2)	No. 133 Coke Shop	
No. 62 Public Works	No. 93 Ship Fitters Shop	No. 135 Lathery (Vacant)	
No. 63 Cart Shed	No. 94 Mold Loft	No. 136 Storehouse	
	No. 95 Naval Person	No. 137 Aux. Machine Shop	
	No. 96 Accounting Dept. & Submarine Office	No. 138 Club Officers & Crews Barracks	
	No. 97 Barracks		
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	No. 198 Barracks		
	No. 199 Barracks		
	No. 200 Barracks		



**Elevations**

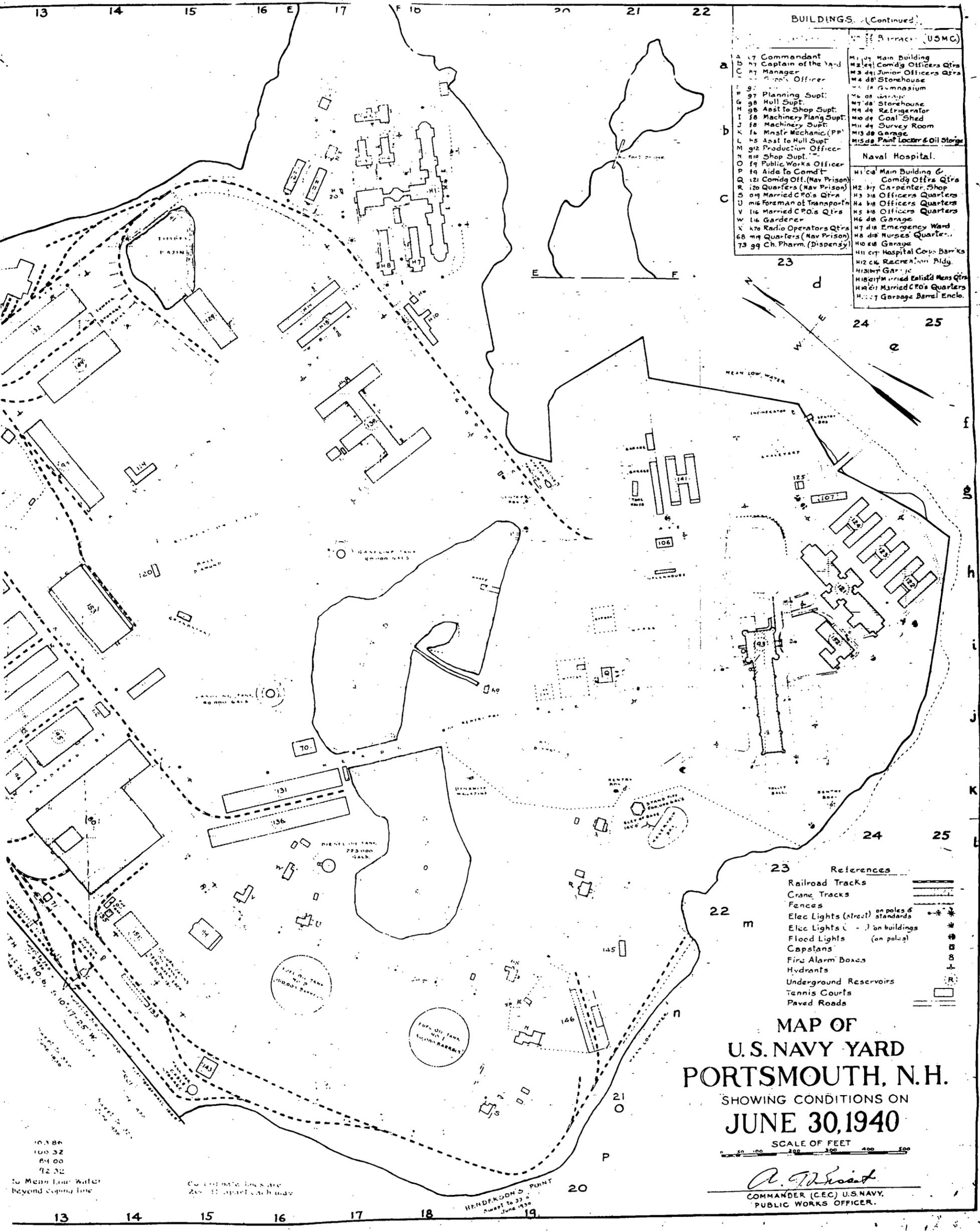
Highest Tide Observed	103.86
Mean High Water	100.32
Lowest Tide Observed	89.00
Mean Low Water	92.32

Soundings are in feet and refer to Mean Low Water  
 Quay walls project outward beyond coping line

**LOCATION PLAN**  
 SCALE NAUTICAL MILES

Area - Hard Land 211 Acres

1940



**BUILDINGS. (Continued)**

A 17	Commandant	M 104	Main Building
B 17	Captain of the Yard	M 105	Comdg Officers Qtrs
C 17	Manager	M 301	Junior Officers Qtrs
	Ship's Officer	M 401	Storehouse
F 97	Planning Supt.	M 108	Gymnasium
G 98	Hull Supt.	M 109	Storehouse
H 98	Asst to Shop Supt.	M 110	Refrigerator
I 98	Machinery Plant Supt.	M 111	Coal Shed
J 98	Machinery Supt.	M 112	Survey Room
K 16	Master Mechanic (PP)	M 113	Garage
L 15	Asst to Hull Supt.	M 113a	Paint Locker & Oil Storage
M 92	Production Officer		
N 98	Shop Supt.		
O 19	Public Works Officer		
P 19	Aide to Comdt		
Q 12	Comdg Off. (Nav Prison)	M 106	Main Building
R 12	Quarters (Nav Prison)	M 107	Comdg Officers Qtrs
S 09	Married CPO's Qtrs	M 108	Carpenter Shop
T 16	Foreman of Transport'n	M 109	Officers Quarters
U 16	Married CPO's Qtrs	M 110	Officers Quarters
V 16	Gardener	M 111	Garage
X 170	Radio Operators Qtrs	M 112	Emergency Ward
68	Quarters (Nav Prison)	M 113	Nurses' Quarter
73	Ch. Pharm. (Dispensary)	M 114	Garage
		M 115	Hospital Canteen
		M 116	Recreation Bldg.
		M 117	Garage
		M 118	Married Enlisted Mens Qtrs
		M 119	Married CPO's Quarters
		M 120	Garage Barrel Encl.

- References**
- Railroad Tracks
  - Crane Tracks
  - Fences
  - Elec Lights (street) on poles & standards
  - Elec Lights ( ) on buildings
  - Flood Lights (on poles)
  - Capstans
  - Fire Alarm Boxes
  - Hydrants
  - Underground Reservoirs
  - Tennis Courts
  - Paved Roads

**MAP OF  
U.S. NAVY YARD  
PORTSMOUTH, N.H.  
SHOWING CONDITIONS ON  
JUNE 30, 1940**

SCALE OF FEET  
0 100 200 300 400 500

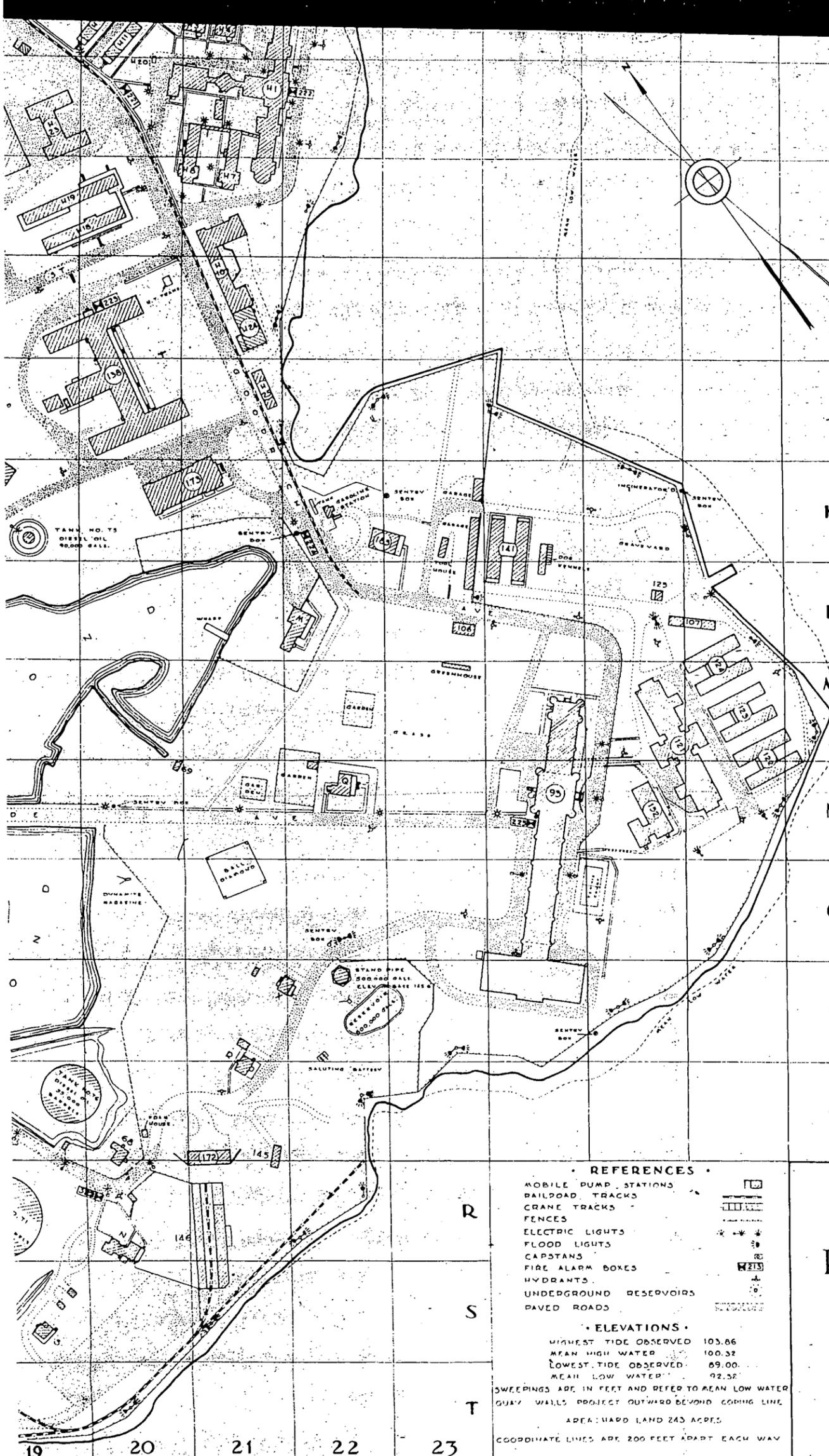
*A. J. Whisitt*  
COMMANDER (CEC) U.S. NAVY,  
PUBLIC WORKS OFFICER.

10.386  
100 32  
64 00  
12 32  
to Mean Low Water  
beyond coping line

Contour lines are  
20' apart each way

HENDERSON'S POINT  
Swept to 33'  
June 1930

RG 71, BuDocks  
Series I microfilm, Reel 2



BUILDINGS		I.D. INDUSTRIAL DEPT. S.D. SUPPLY DEPT. MIL. MILITARY DEPT. M.F.S. MEDICINE & SURGERY N.P. NAVAL PRISON			
NO.	LOC.	SHOPS, STOREHOUSES, ETC.	NO. LOC.	SHOPS, STOREHOUSES, ETC.	
2	W 8	PIPE SHOP & SUB-STATION #1	172	Q 21	S.D. COAL & COKE STORAGE
7	B 11	RIBBERS & LABORERS SHOP	173	K 21	RECREATION BUILDING
10	B 10	STOREHOUSE (POWER PLANT)	174	O 4	OUTSIDE MACH. SHOP, WS STORES
13	L 10	ADMINISTRATION BUILDING	175	N 5	FIELD SHOPS, RADIO SHOP (UTILITY)
14	L 9	APP. SCHOOL & WELDING LAB.	176	N 5	SUB-STATION #3
15	L 9	POST OFFICE & NAV. INT. OFFICE	177	N 5	TORPEDO STORAGE
18	K 11	BATTERY PLANT, ELECTRICAL	178	N 5	STOREHOUSE
20	K 11	SHOP & RESTAURANT	179	N 5	SUBMARINE ASSEMBLY SHOP
22	J 18	I.D. OFFICES, VOC. TRAINING	180	N 5	OFFICE BUS TRANSPORTATION
23	J 18	METALLURGICAL & HYGIENE LABS.	181	N 5	FIELD OFFICE & TOOL ROOM
25	J 18	OFFICERS CLUB, REC. ROOMS	182	N 5	CHapel
26	J 18	OFFICERS GARAGES	183	N 5	DRY GREEN PLANT
27	J 18	PAINT SHOP	184	N 5	LATRINE
29	J 18	FIRE STATION & S.D. STOREHOUSE	185	N 5	GALVANIZING PLANT
31	F 10	COMMISSARY STORE	186	N 5	GUARD HOUSE (N.P.)
32	L 10	STOREHOUSE	187	N 5	COMMANDANT'S GARAGE
33	L 10	SMELT HOUSE	188	N 5	CHAUFFEURS QUARTERS
34	L 9	COLD STORAGE BUILDING			
35	F 9	BARAGE			
40	H 10	PUBLIC WORKS STORAGE			
41	F 8	RASTER JOINED & SHIPY OFFICE			
42	F 7	SHIPWRIGHTS & JOINERS SHOP			
43	L 7	STOREHOUSE			
44	J 7	BUILDING TRADES SHOP			
45	L 6	INDUSTRIAL SHOP			
46	L 6	INCINERATOR			
45	J 4	I.D. ACETYLENE PLANT			
59	J 5	BOAT RECH. SHOP, LABOR BOARD			
60	L 4	BLACUWASH SHOP (PUB. WKS.)			
63	L 7	STOREHOUSE (PUB. WKS.)			
64	J 7	VARNISH ROOM			
65	L 6	SMITH SHOP			
68	Q 22	QUARTERS (PUB. WKS.)			
69	M 2	DYNAMITE'S TOOL HOUSE			
70	N 18	ICE HOUSE			
71	O 14	SCALES			
72	N 11	CENTRAL POWER PLANT			
73	N 11	DISPENSARY			
74	J 5	SWEET METAL SHOP			
75	K 7	SWEET METAL SHOP			
76	L 7	SMITH SHOP			
79	N 15	INSIDE MACH. SHOP, CENTRAL TOOL ROOM, TRAINEE SCHOOL AND BLOCK SHOP			
80	M 15	I.D. INSIDE MACHINE SHOP			
85	M 17	LATRINE			
86	J 11	I.D. INDUSTRIAL DEPT. OFFICES			
89	P 9	SUBMARINE MATERIAL ASSEMBLY			
91	P 7	PUMP WELL (DRY DOCK #2)			
92	M 8	SHIPFITTERS SHOP, HOLD LOFT.			
93	M 24	NAVAL PRISON			
95	M 15	PATTERN SHOP & TORPEDO TUBE SHOP			
96	K 14	FOUNDRY			
97	J 6	SCALE HOUSE			
98	F 16	S.D. STOREHOUSE FOR COMBUSTIBLES			
99	P 14	BACHELOR OFFICERS QTRS.			
101	L 11	WATER-METER HOUSE			
104	K 9	BAND STAND			
106	L 23	GARAGE (N.P.)			
107	L 16	FIRE EQUIPMENT STORAGE (N.P.)			
111	L 16	STOREHOUSE (PUB. WKS.)			
112	E 19	STOREHOUSE (POWER PLANT)			
115	O 9	OUTSIDE MACH. SHOP, WS STORES			
116	L 14	S.D. STOREHOUSE			
117	L 14	S.D. STOREHOUSE			
118	L 14	S.D. STOREHOUSE			
119	J 17	OIL STOREHOUSE			
120	F 14	GAS INSTRUCTION CHAMBER			
121	M 25	CLOTHING FACTORY, SHOPS (N.P.)			
122	M 26	BARRACKS (N.P.)			
123	M 26	BARRACKS (N.P.)			
124	M 26	BARRACKS (N.P.)			
125	L 25	PUMP HOUSE (N.P.)			
126	L 10	ELEC. SHOP & STORAGE, METER-READING			
129	N 10	SEAWALL			
130	J 4	GATEHOUSE #1			
131	N 17	S.D. STOREHOUSE			
132	G 16	S.D. LUMBER STOREHOUSE			
133	G 15	S.D. COKE SHED			
136	O 17	S.D. STOREHOUSE			
136	J 20	COAST GUARD BARRACKS			
141	K 24	BARRACKS (N.P.)			
143	R 15	S.D. COAL STORAGE			
143	Q 21	S.D. STONE CRUSHER			
146	Q 21	S.D. SCRAP METAL YARD			
149	H 16	S.D. LUMBER STOREHOUSE			
150	P 7	I.D. FIELD SERVICES, DEPTUS 122, SUBMARINE OFFICES			
151	P 15	S.D. STOREHOUSE			
152	M 25	MIL. DETACHMENT CLUB (N.P.)			
153	H 16	S.D. SUPPLY DEPT. OFFICES & STORAGE			
154	O 15	I.D. TRANSPORTATION EQUIP. STORAGE			
155	O 8	I.D. PIPE SHOP			
156	L 18	MIL. SUBMARINE BARRACKS			
157	M 5	I.D. NITRE STORAGE			
158	G 19	MIL. NET STORAGE			
159	H 16	S.D. STOREHOUSE			
160	L 16	S.D. STOREHOUSE			
161	A 9	MIL. GATEHOUSE #2			
162	L 15	I.P. SUB-STATION #2			
163	Q 9	I.D. VALVE HOUSE			
164	O 15	I.D. LATRINE			
165	M 12	I.D. PAINT LOCKER, TIME CLOCKS			
166	H 17	S.D. STOREHOUSE			
167	H 18	S.D. STOREHOUSE			
168	H 17	S.D. LUMBER STOREHOUSE			
169	H 18	S.D. CARBIDE STORAGE			
170	H 18	S.D. STOREHOUSE			
171	S 16	I.D. FIELD SERVICES, DEPTUS G 4 T			

REFERENCES

- MOBILE PUMP STATIONS
- RAILROAD TRACKS
- CRANE TRACKS
- FENCES
- ELECTRIC LIGHTS
- FLOOD LIGHTS
- CAPSTANS
- FIRE ALARM BOXES
- HYDRANTS
- UNDERGROUND RESERVOIRS
- PAVED ROADS

ELEVATIONS

HIGHEST TIDE OBSERVED 103.66  
 MEAN HIGH WATER 100.32  
 LOWEST TIDE OBSERVED 89.00  
 MEAN LOW WATER 92.32

SWEEPINGS ARE IN FEET AND REFER TO MEAN LOW WATER  
 QUAY WALLS PROJECT OUTWARD BEYOND CODING LINE

AREA: HARD LAND 243 ACRES

COORDINATE LINES ARE 200 FEET APART EACH WAY

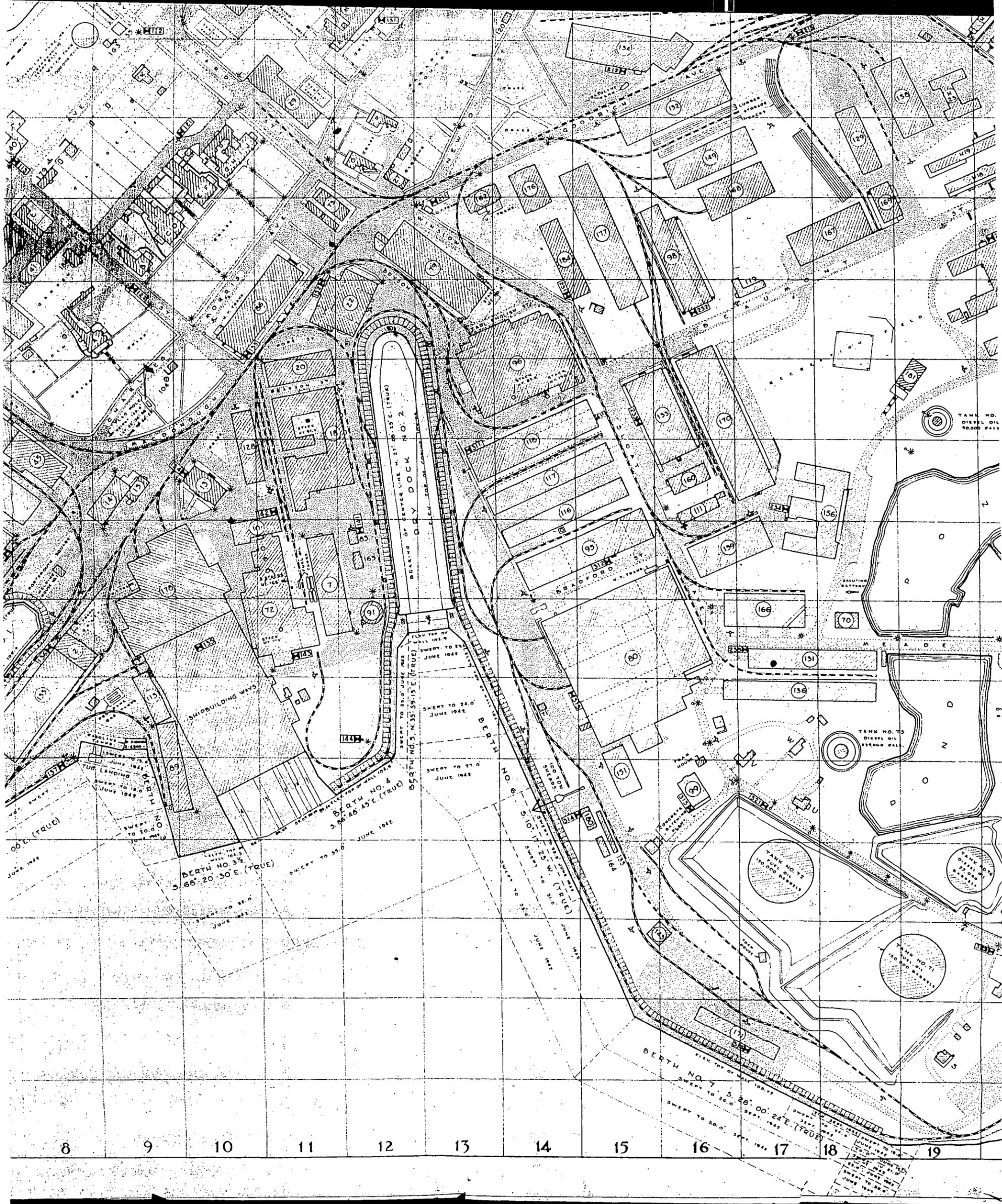
MAP OF  
 U.S. NAVY YARD  
 PORTSMOUTH, N. H.  
 SHOWING CONDITIONS ON  
 JUNE 30, 1943

SCALE OF FEET

*W. A. Spalding*  
 CAPTAIN (C-10) U.S. NAVY  
 PUBLIC

466

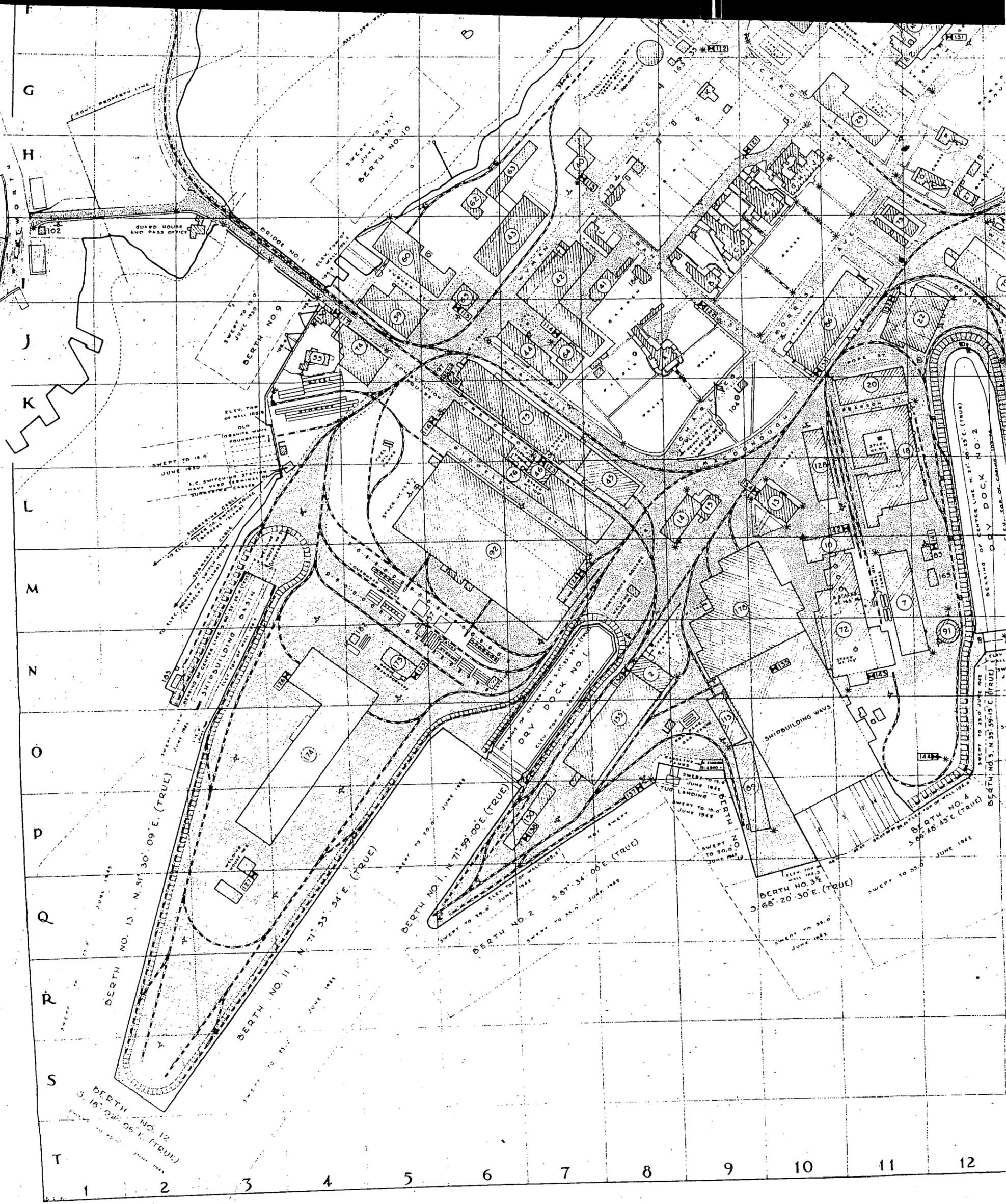
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 Series II microfilm, Reel 101

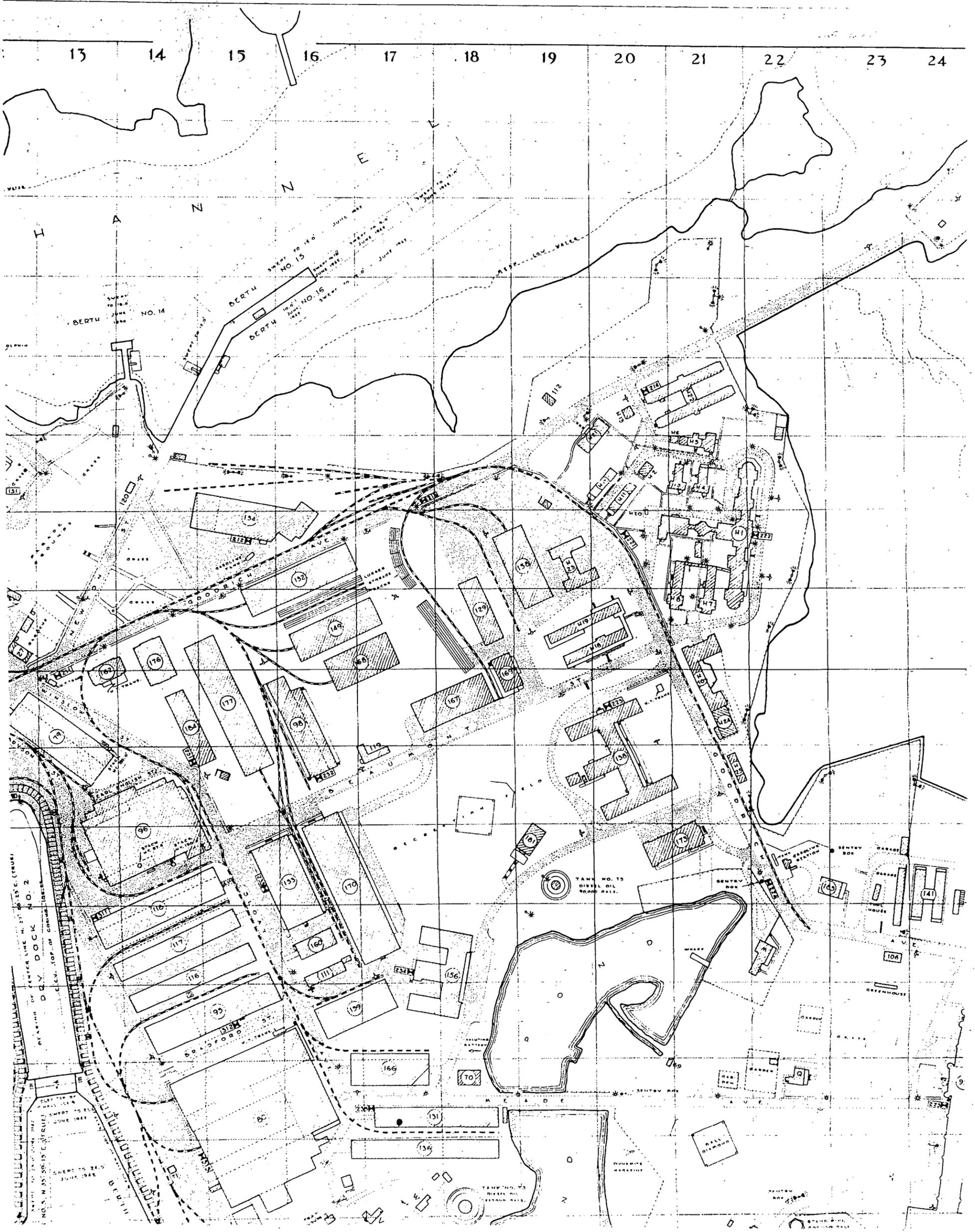




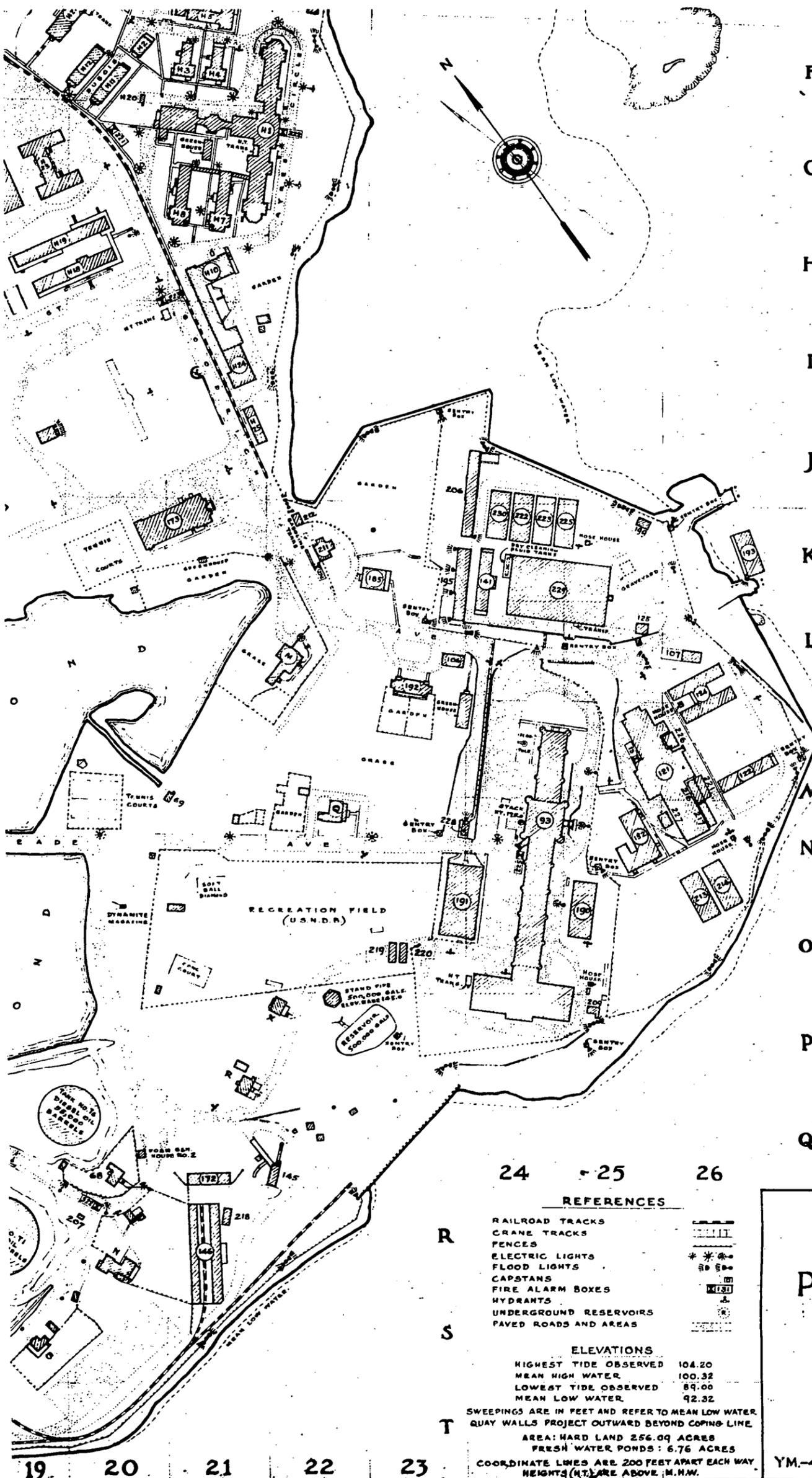












NO. LOC	U. NAVAL BASE	NO. LOC	QUARTERS
15	ADMINISTRATION BLDG.	8	COMMANDER (SHIPYARD)
31	COMMISSARY	11	ADMINISTRATIVE OFFICER
102	RADIO TRANSMITTING STA.	12	MEDICAL OFF. (SHIPYARD)
106	GARAGE & CHAUFF. QTRS.	13	WARRANT OFFICER
A	QUARTERS (COMDR. NAVAL BASE)	14	ASST. TO REPAIR SUPT.
L	QUARTERS (CHIEF STAFF)	15	DESIGN SUPT. (PLANNING)
18	QUARTERS (AIDE TO COMDR.)	16	TRAINING & EST. SUPT. (SHIPYARD)
W	QUARTERS (GARDENER)	17	ELECTRONICS OFFICER
		18	MASTER MECH. (POWER PLANT)
		19	PRODUCTION OFFICER
		20	REPAIR SUPT.
		21	PUBLIC WORKS OFFICER
		22	SUPPLY OFFICER
		23	MASTER MECH. (TRANSP.)
		24	MAINTENANCE C.F.O. QTRS.
		25	ASST. DESIGN SUPT. (PLANNING)
		26	BACHELOR OFFICERS QTRS.
		27	BACHELOR OFFICERS QTRS. ANNEX.
			U.S.N. DISCIPLINARY BARRACKS
		28	BARRACKS & CELL BLOCK
		29	GARAGE & STORAGE
		30	RAG SHOP
		31	SHOPS
		32	STORAGE
		33	STORAGE
		34	PUMP HOUSE & LATRINE
		35	OFFICES, SCHOOL & STORAGE
		36	EDUCATIONAL TRAINING
		37	RECEPTION BUILDING
		38	LAUNDRY
		39	SUPPLY & DISBURSING OFF.
		40	BARRACKS FOR ENL. PERSONNEL
		41	CLASSROOM & SHIP SERVICE
		42	CLASSROOM & SHIP SERVICE
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		44	CLASSROOM & SHIP SERVICE
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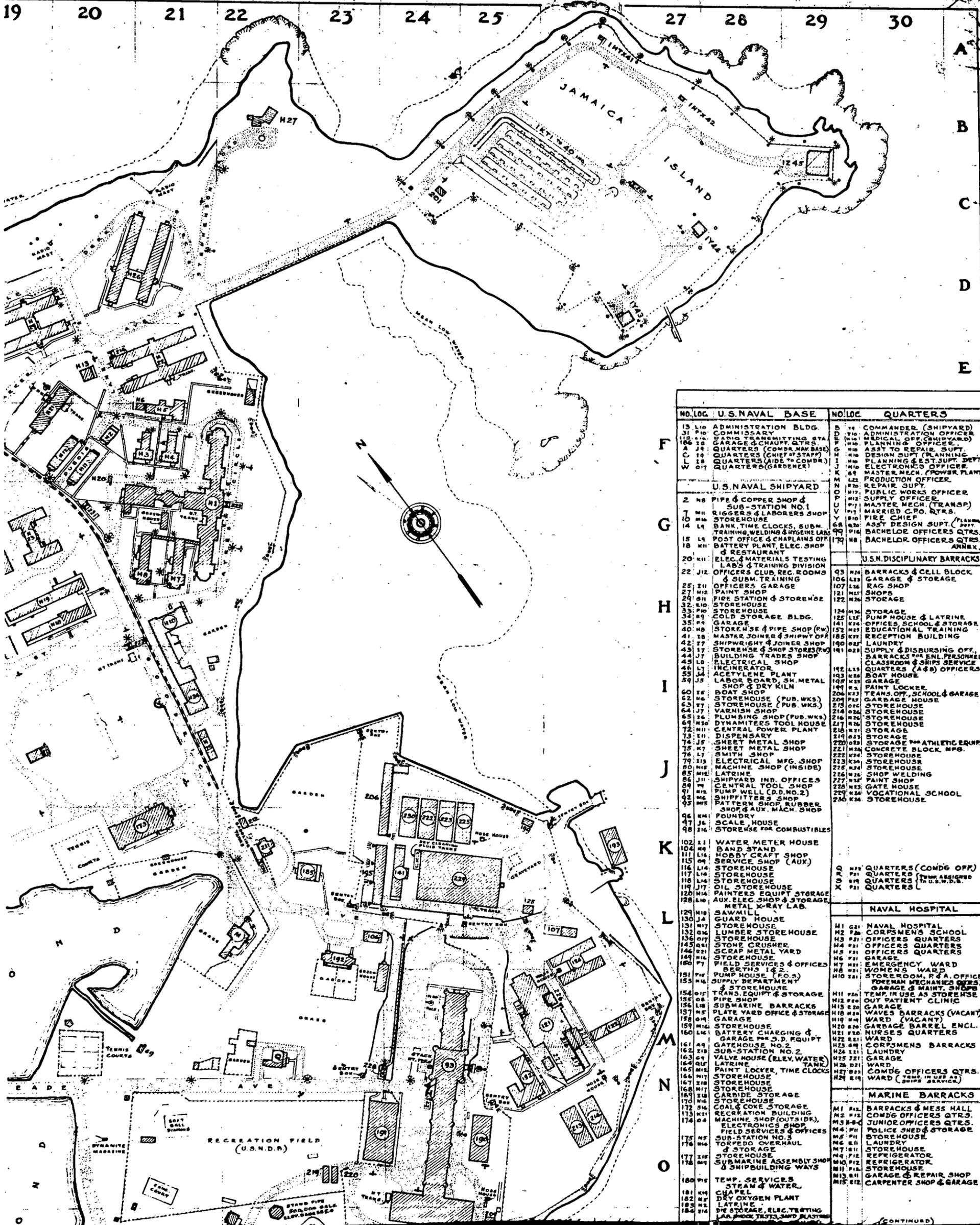
**MAP OF  
U.S. NAVAL BASE  
PORTSMOUTH, N. H.  
SHOWING CONDITIONS ON  
JUNE 30, 1949**

SCALE OF FEET  
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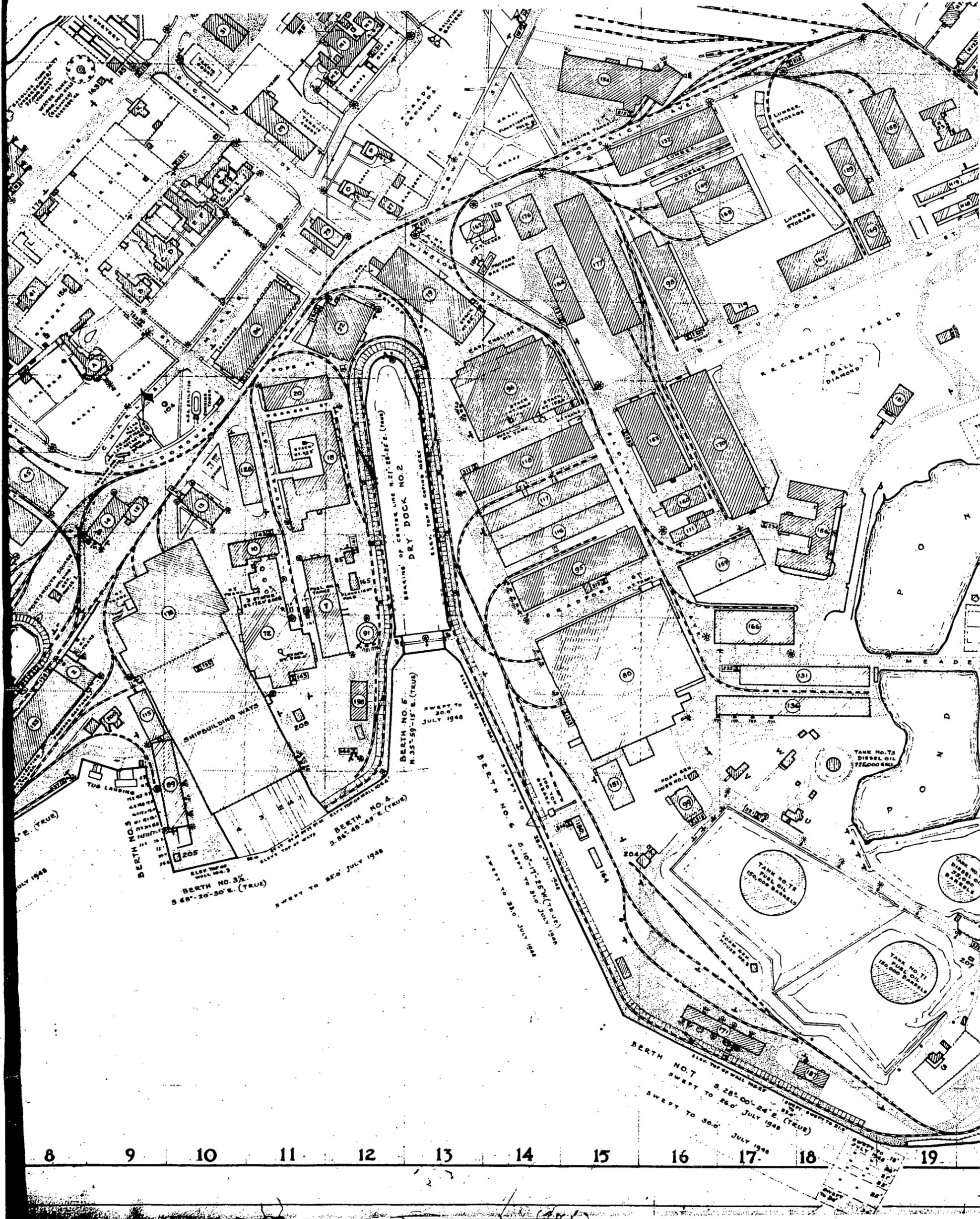
481547  
YM-49-130  
J. F. Cummins  
COMDR. (C.E.C.) U.S. NAVY  
PUBLIC WORKS OFFICER

RG 71, BuDocks  
Series II microfilm Reel 101

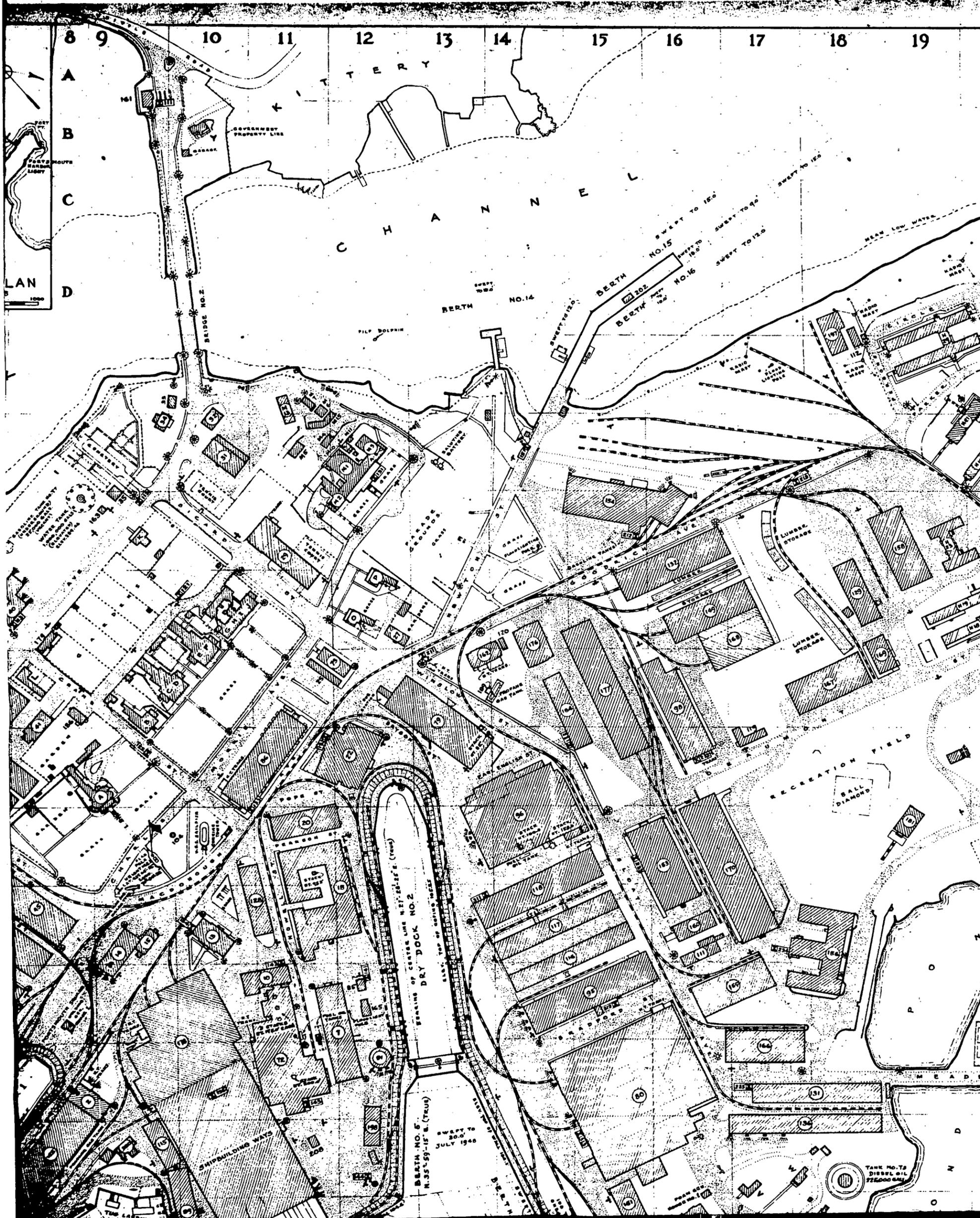
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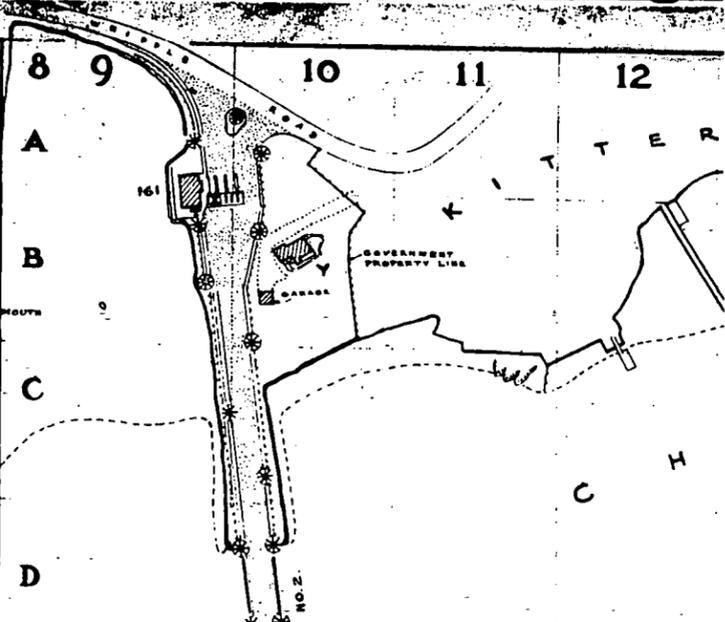
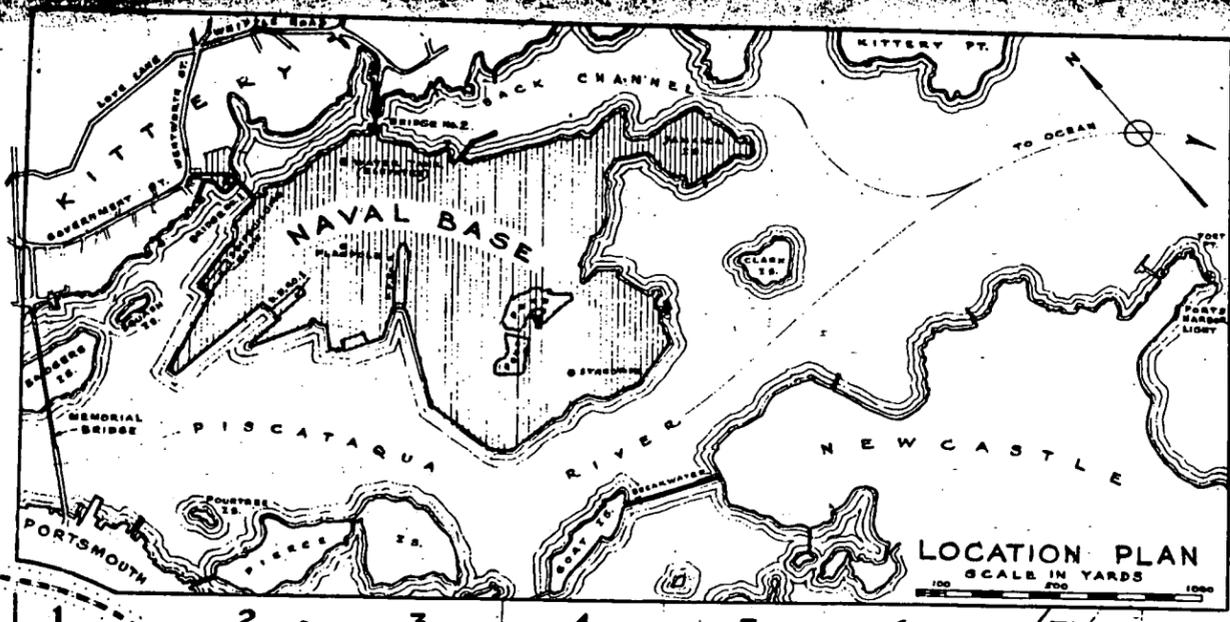


NO.	LOC.	U.S. NAVAL BASE	NO.	LOC.	QUARTERS
13	L10	ADMINISTRATION BLDG.	B	14	COMMANDER (SHIPYARD)
31	P10	COMMISSARY	D	15	ADMINISTRATION OFFICER
126	T0	GARAGE & CHAUFF. QTRS.	F	16	PLANNING OFFICER
J9		QUARTERS (COMDR. NAV. BASE)	H	17	ASST. TO REPAIR SUPT.
C	18	QUARTERS (CHIEF OF STAFF)	I	18	DESIGN SUPT. (PLANNING)
L	18	QUARTERS (AIDE TO COMDR.)	J	19	PLANNING & EST. SUPT. DEPT.
W	017	QUARTERS (GARDENER)	K	20	ELECTRONICS OFFICER
			L	21	MASTER MECH. (POWER PLANT)
			M	22	PRODUCTION OFFICER
			N	23	REPAIR SUPT.
			O	24	PUBLIC WORKS OFFICER
			P	25	SUPPLY OFFICER
			Q	26	MASTER MECH. (TRANSP.)
			R	27	MARRIED C.P.O. QTRS.
			S	28	FIRE CHIEF
			T	29	ASST. DESIGN SUPT. (PLANNING)
			U	30	BACHELOR OFFICERS QTRS.
			V	31	BACHELOR OFFICERS QTRS. ANNEX
			W	32	
			X	33	
			Y	34	
			Z	35	
			AA	36	
			AB	37	
			AC	38	
			AD	39	
			AE	40	
			AF	41	
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			AI	44	
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			CM	100	
			CN	101	
			CO	102	
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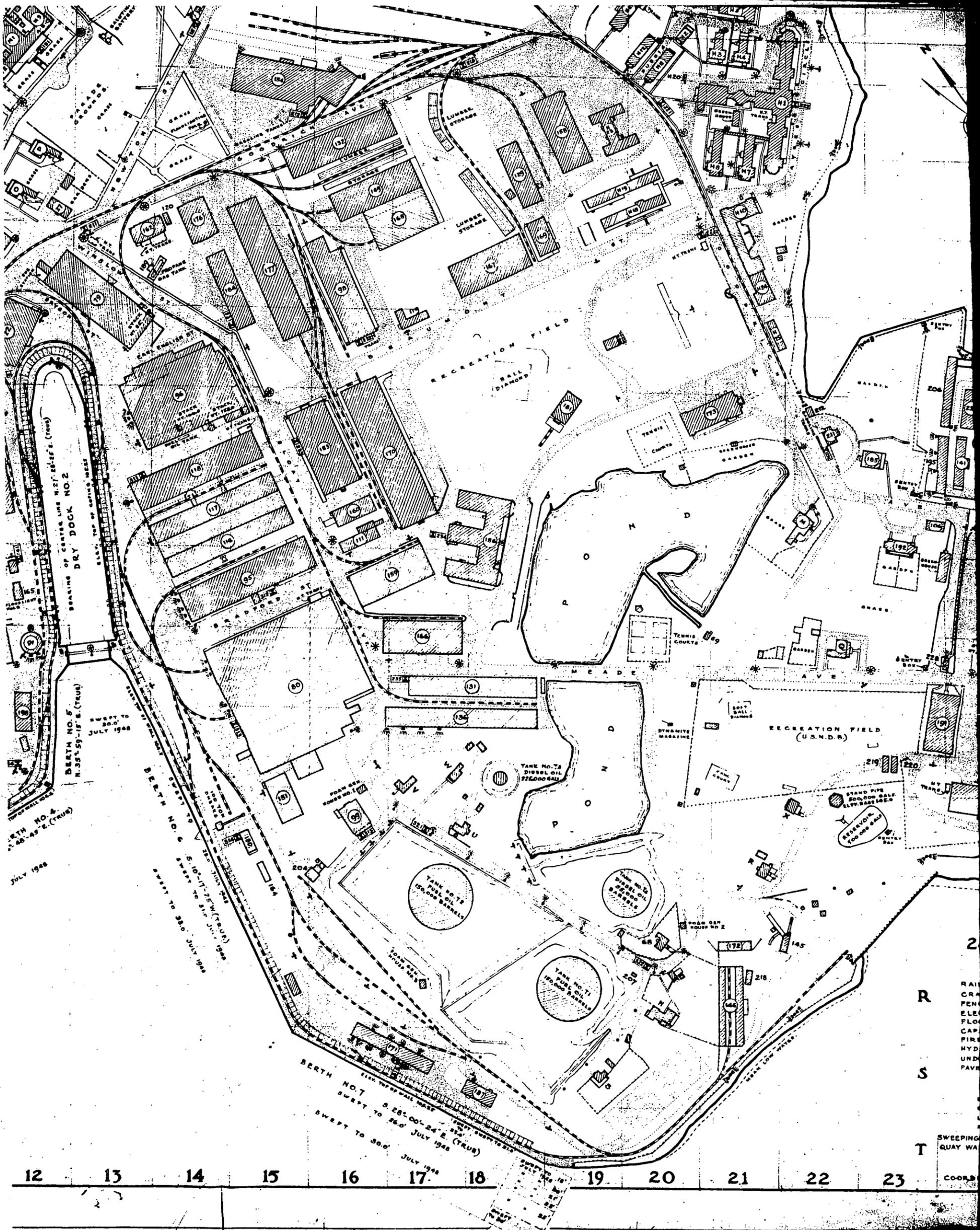


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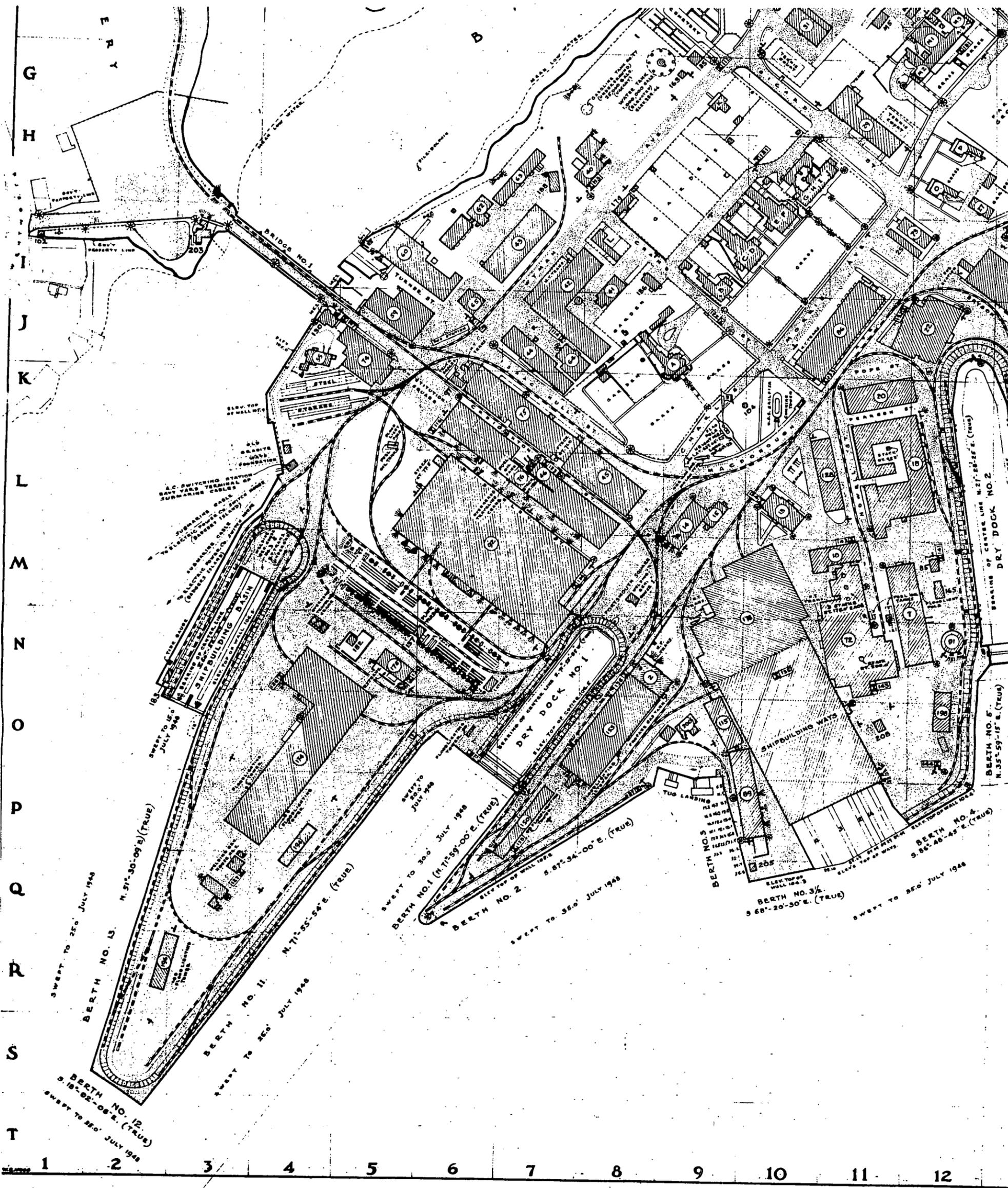


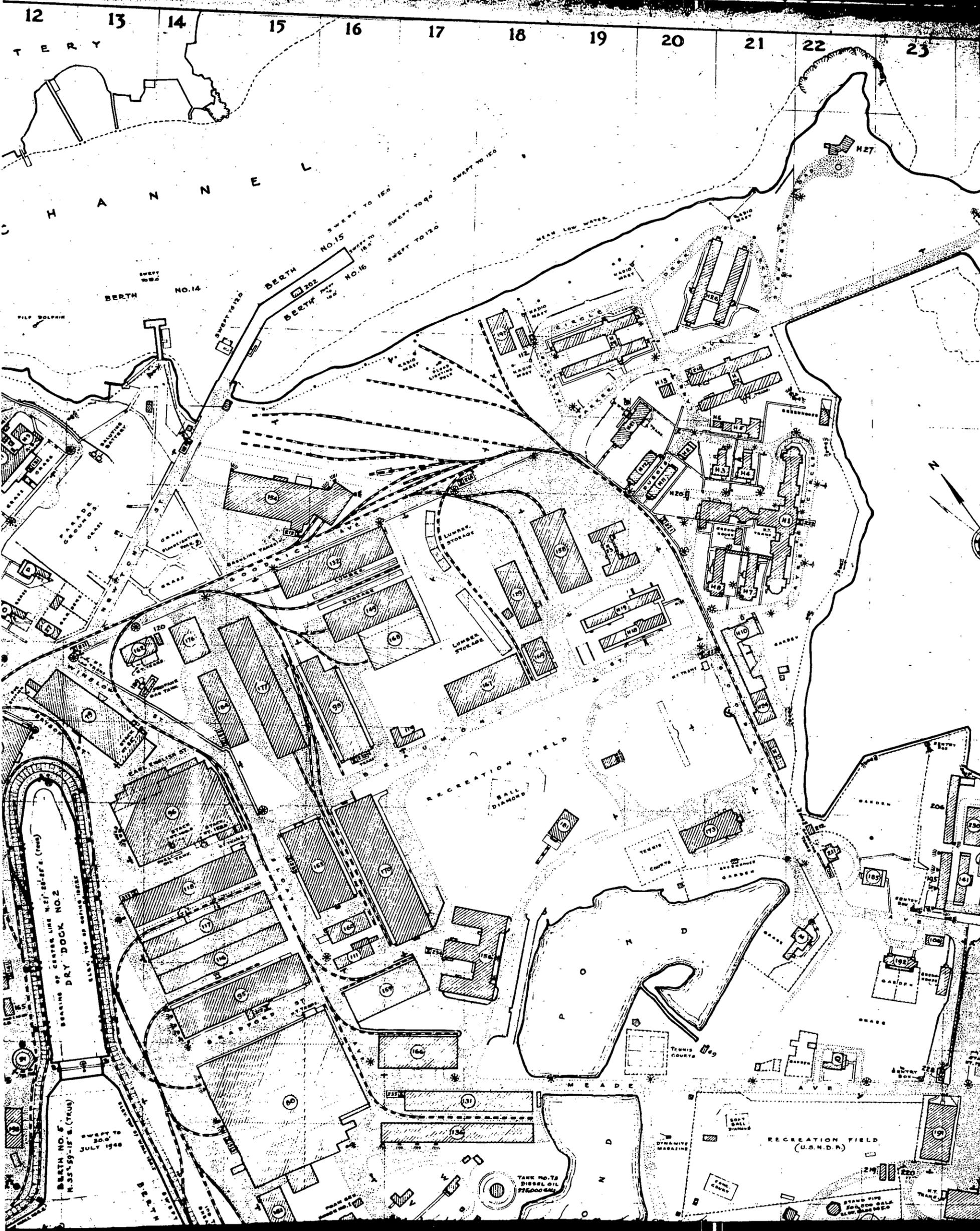


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November 6, 1961

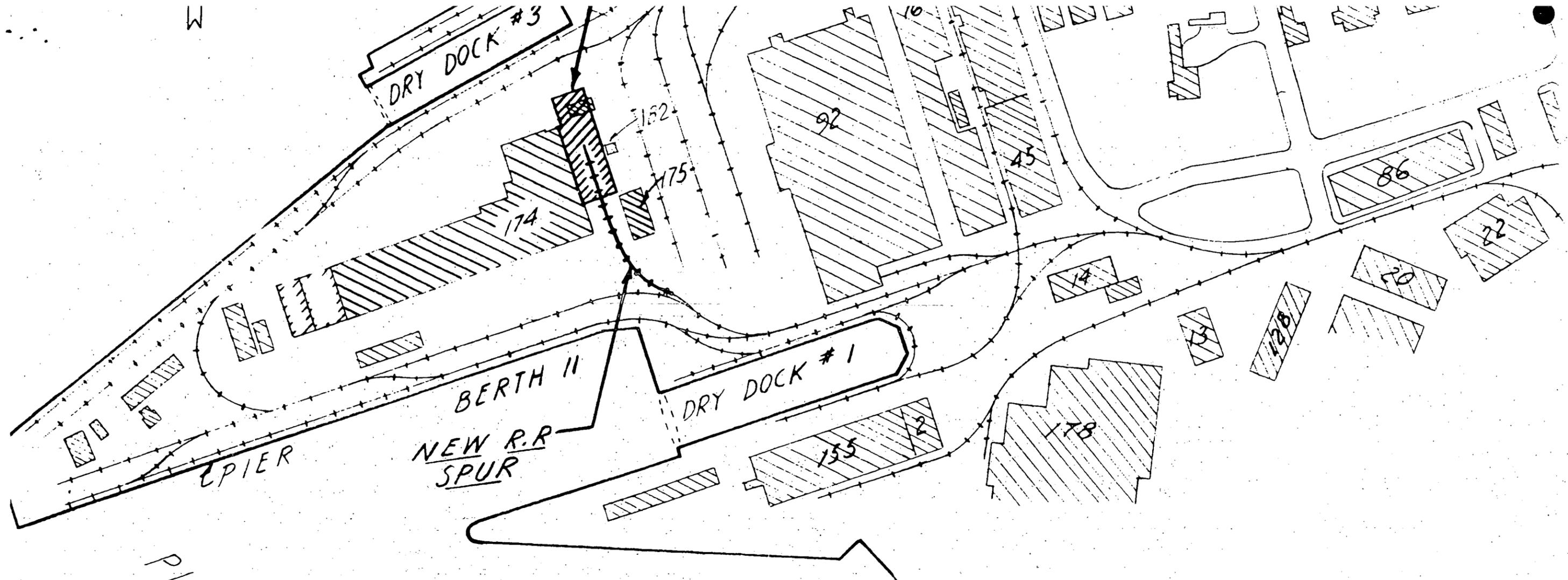
REPRODUCED AT THE NATIONAL ARCHIVES

AS BUILT

1. OTHER DRAWING NUMBER PNS-46		2. GEN. DES.	3. DEP. STD.	4. STD.	5. SHOP	6. NO. CORR.	7. OTHER	8. SHEET 1 OF 24	9. Y & D DRAWING NUMBER 924538
10. CONTRACT NUMBER NBy 37403					11. ORIGINATOR DPWO IND				
12. DATE OF DRAWING 11/6/61					13. ACTIVITY NAME PORTSMOUTH, N. H.				
14. CATEGORY CODE DESCRIPTION ADDITION FOR <u>POLARIS LAUNCH SYSTEM</u> OVERHAUL								15. BUILDING NUMBER	
								16. CATEGORY CODE	
17. TYPE OF DRAWING CIVIL					18. DRAWING DESCRIPTION LOCATION PLAN - UTILITIES				
<b>INSTRUCTIONS:</b> Box 1 - Local Drawing Number 2 - 7 - Indicate Type of Drawing by Placing an "x" in Appropriate Box. 8 - 9 - To be Completed by Contractor's Agent or DPPO. 10 - Contract Number, if Appropriate. 11 - Indicate Appropriate DPWO, APWO, Etc. 12 - Date Drawing is Completed/Approved.					13 - Name Activity where Construction is being Performed. 14 - Use Descriptions Contained in BUDDOCKSINST 11011:27 of 1 Feb. 1957. 15 - Indicate Building Number, if Applicable. 16 - Indicate Category Code. 17 - Indicate Type of Drawing; Arch., Struct., Mech., Etc. 18 - Indicate Drawing Description; Elevations, Foundations, Etc. 19 - Indicate Security Classification, if any.				
CONTRACTOR					B. L. MAKEPEACE, INC. 1266 BOYLSTON STREET BOSTON 15, MASSACHUSETTS Co7-2700				
 <b>MICRO-MASTER</b> 105 mm REPRODUCTION SYSTEM <small>REGISTERED TRADE-MARK OF THE KODAK PAPER &amp; SUPPLY CO., BOSTON, MASS.</small>									
FILMED BY					B. L. MAKEPEACE, INC. 1266 BOYLSTON STREET BOSTON, MASS.				
					19. SECURITY CLASSIFICATION				

THIS IS AN ARCHIVAL ENCLOSURE. MATERIALS USED ARE CHEMICALLY INERT, PERMITTING PROLONGED STORAGE UNDER PROPER CONDITIONS.

RG 385, NAVFEC  
 ATE Plans, Box 255

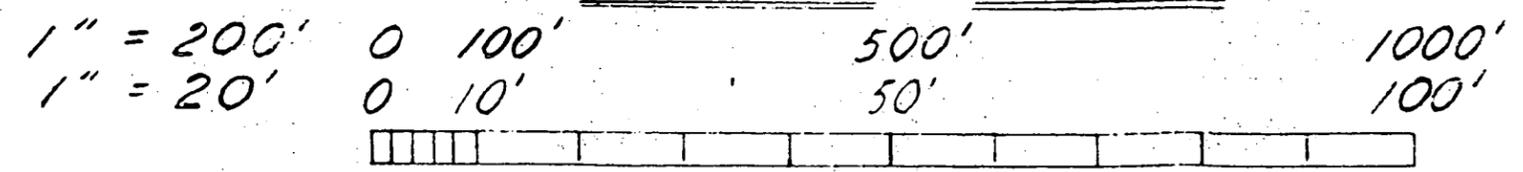


PISCATAQUA RIVER

LOCATION MAP

SCALE: 1" = 200'

GRAPHIC SCALES



REVISION	DATE		DESCRIPTION
		DPW DRAWING No.	DEPARTMENT OF THE NAVY - BUREAU
		DNS-4	DISTRICT PUBLIC WORKS
			FIRST NAVAL DISTRICT, BALTIMORE

REMOVED BY THE GOV.

WENTWICK  
TO KITL

MAIN

SHORE LINE

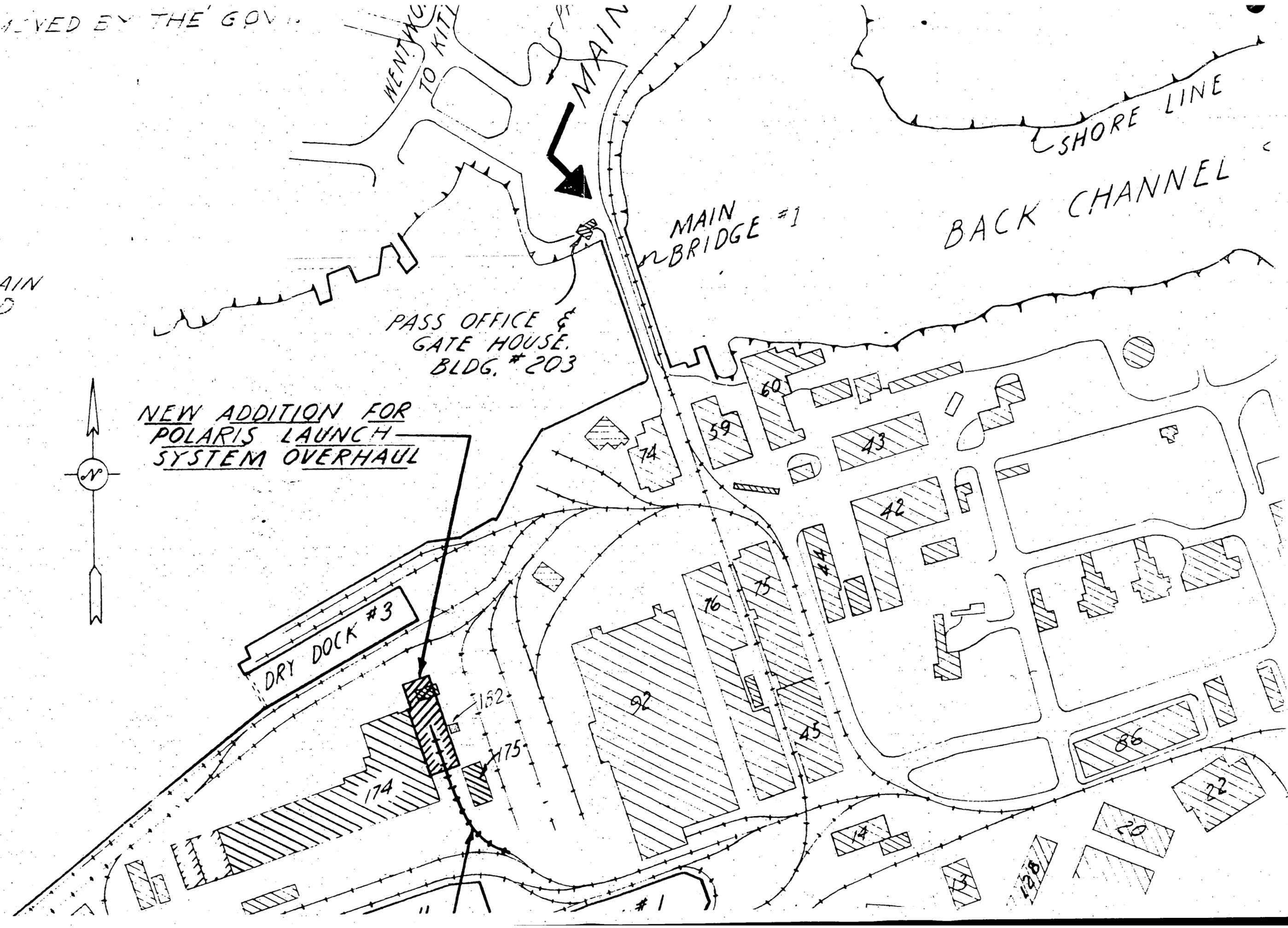
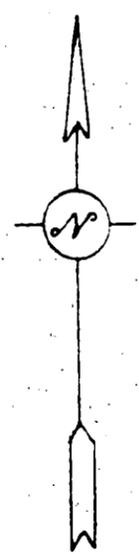
BACK CHANNEL

MAIN BRIDGE #1

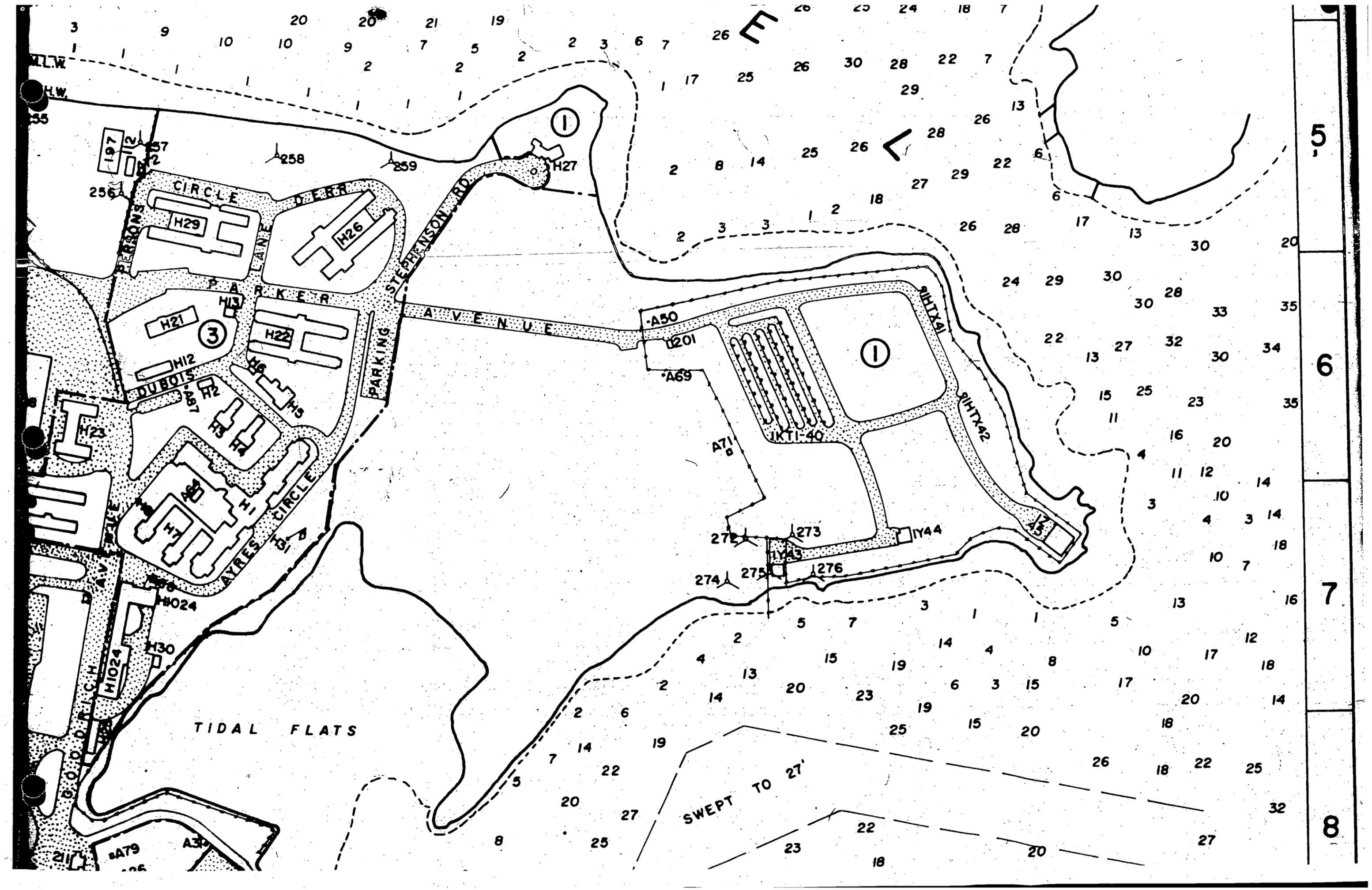
PASS OFFICE &  
GATE HOUSE.  
BLDG. #203

DRAIN  
DUG

NEW ADDITION FOR  
POLARIS LAUNCH  
SYSTEM OVERHAUL







K

L

M

N

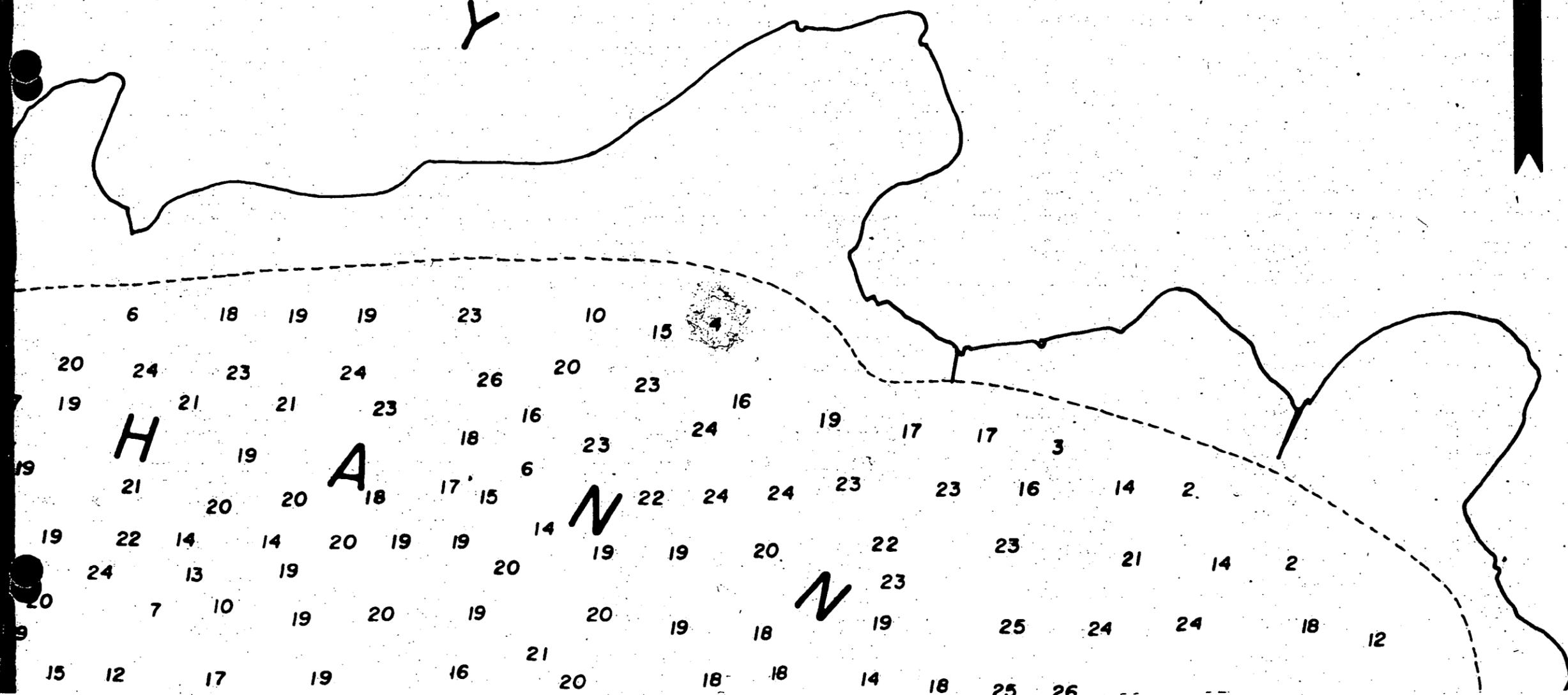
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P

### COMMAND AREAS

AREA	COMMAND	ACRES
1	PORTSMOUTH NAVAL SHIPYARD	222.29
2	U.S. NAVAL DISCIPLINARY COMMAND	27.39
3	U.S. NAVAL HOSPITAL	16.10
4	U.S. MARINE BARRACKS	5.58
5	U.S. NAVAL RESERVE TRAINING CENTER	0.85

TOTAL 271.04



R

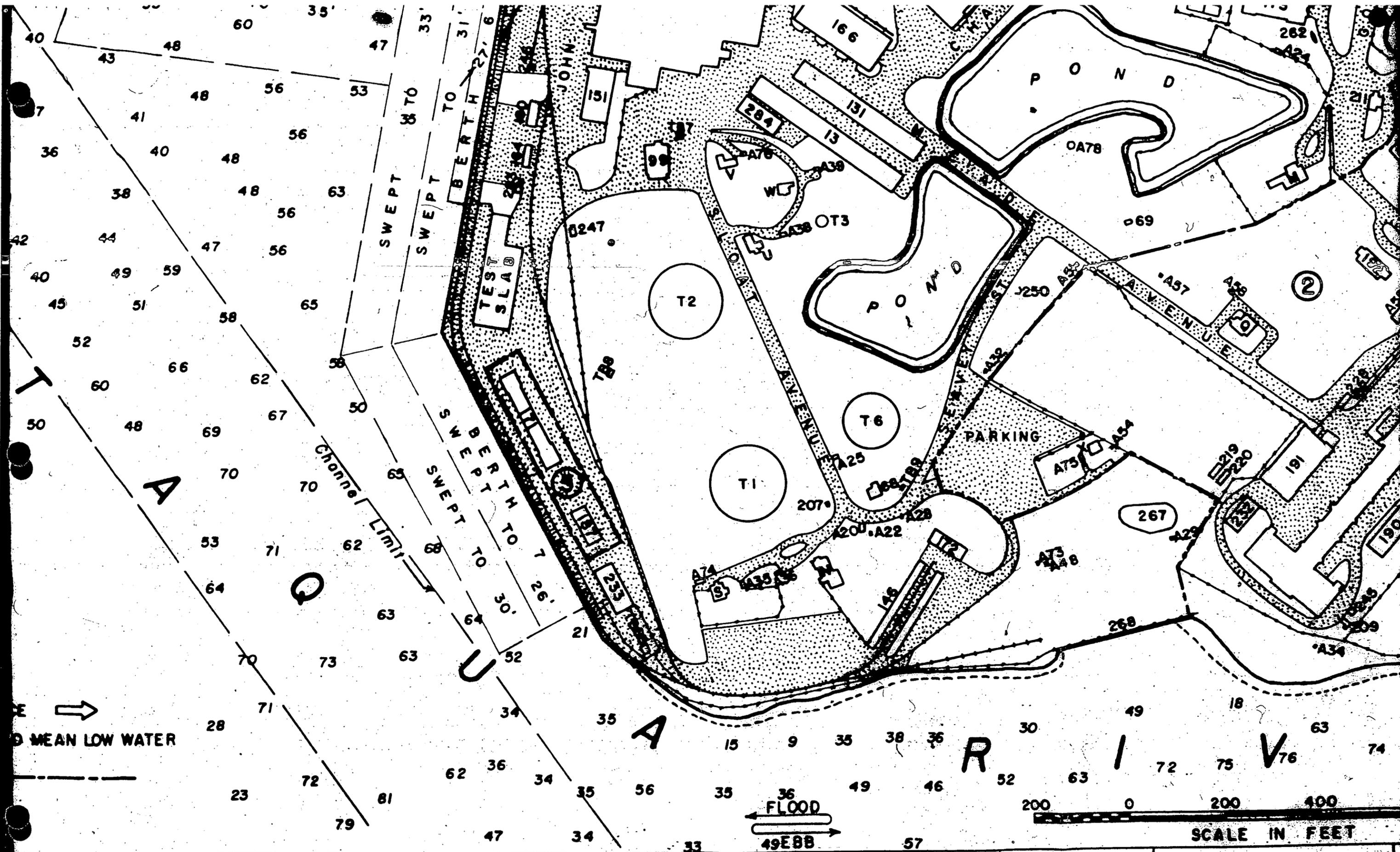
Y

1

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3

4



MEAN LOW WATER

FLOOD  
49EBB

SCALE IN FEET

E F G H I J



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BBMRR  
R/W

PRIVATE  
PROPERTY

ING

BRIDGE  
NO. 1

35

74

183

97

B

A

C

K

C

CEMETERY

PARKING

AVE.

W. Y. M. A. N.

PARKING

MIB

M4

M10

M11

M12

M16

M17

M18

M19

M20

M21

M22

BRIDGE  
NO. 2

LOCKS  
COVE

WHIPPLE  
ROAD

GATE NO. 2

PRIVATE  
PROPERTY

M.H.W.

M.L.W.

161

252

1444

266

183

35

34

33

32

31

DAIB

179

101

102

103

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105

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A

B

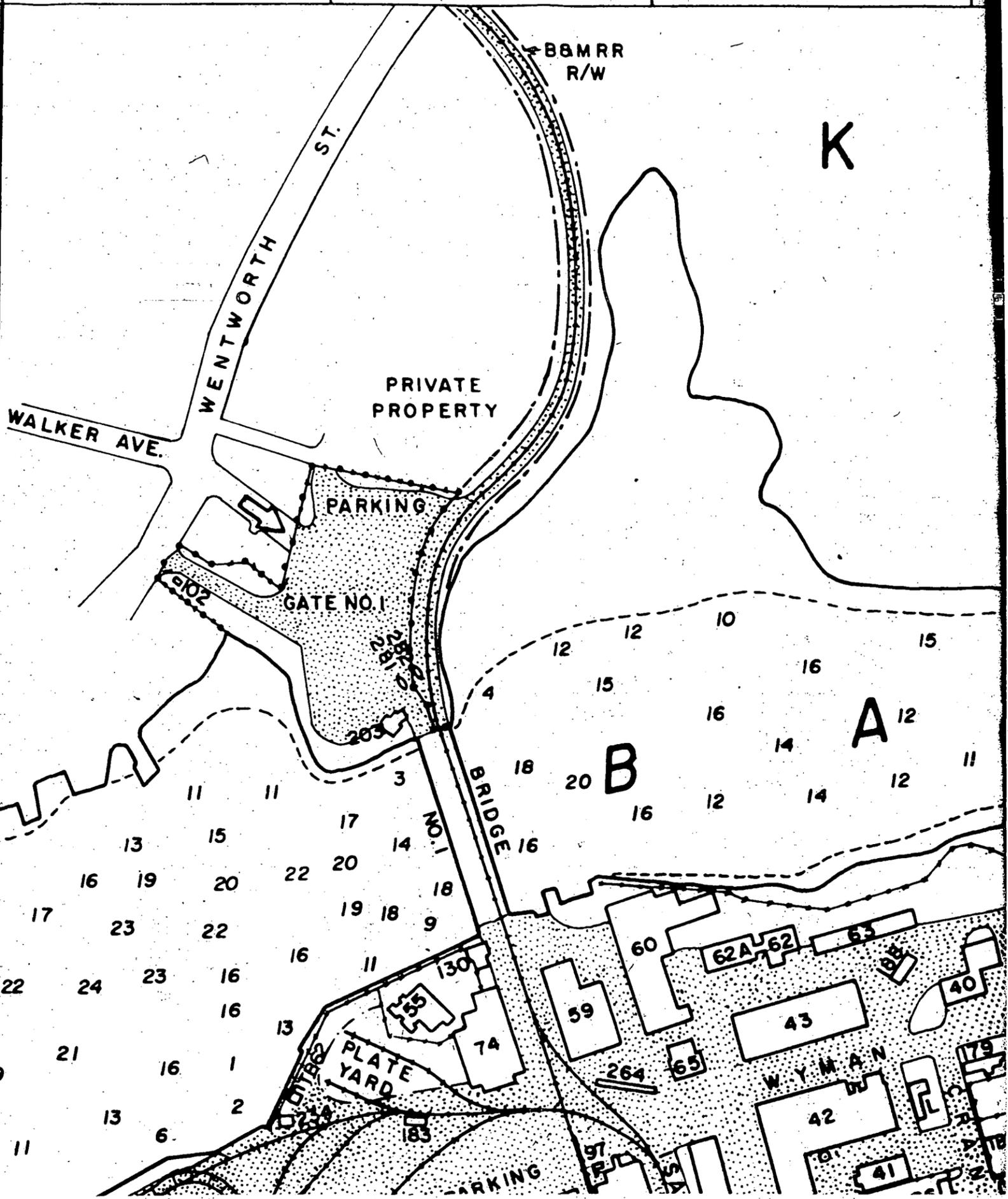
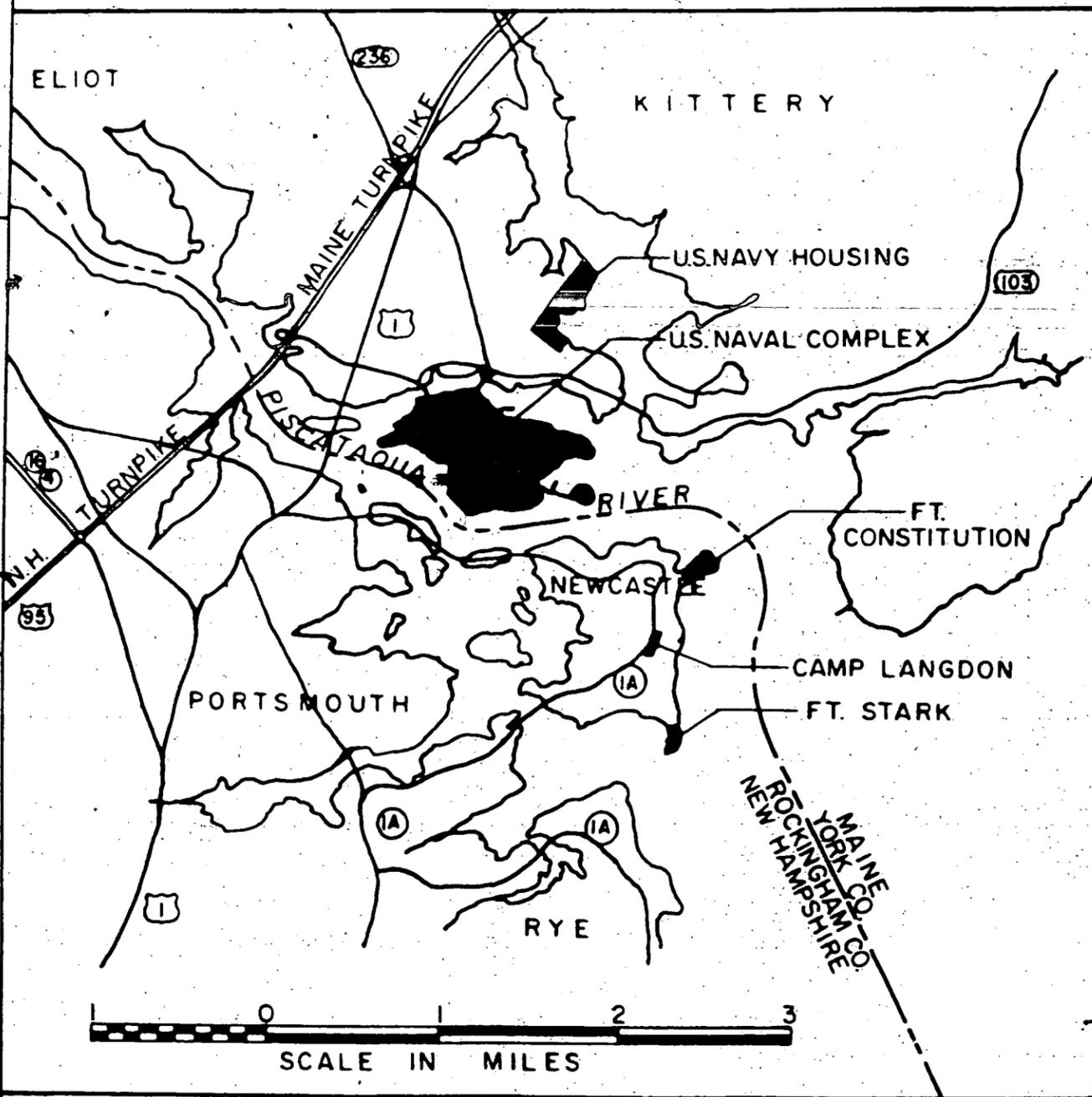
C

D

E

F

# VICINITY MAP





**REAL ESTATE DATA  
ON STATION**

LAND AREA, GOVERNMENT OWNED  
LEASED

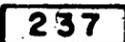
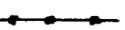
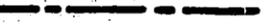
271.04 Acres  
1.54  
272.58 Acres

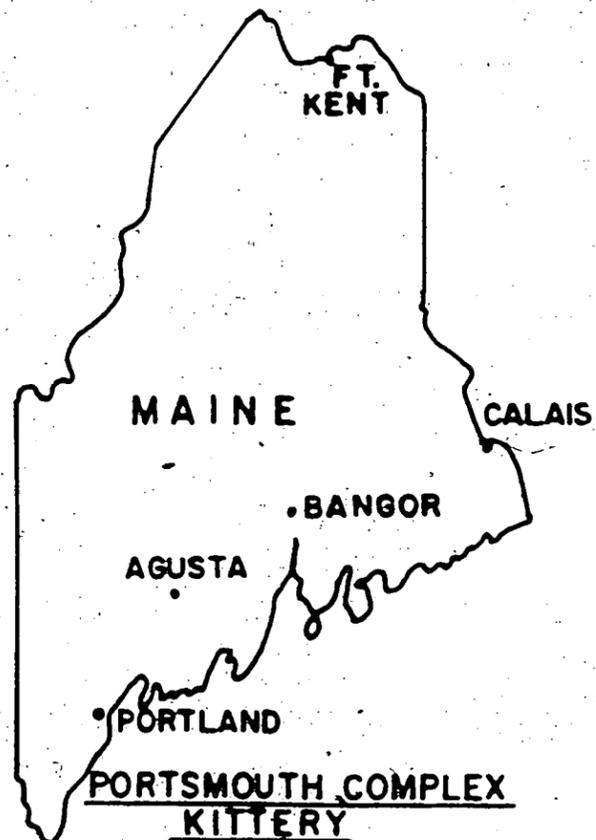
**OFF STATION**

U.S. NAVY HOUSING  
PULPIT ROCK  
FORT STARK  
FORT CONSTITUTION  
OUTLEASED

24.73 Acres  
0.44 "  
10.0 "  
4.45 "  
3.72 "  
43.34 Acres

**LEGEND**

- BUILDINGS & STRUCTURES 
- ROADS, WALKS & PAVED AREAS 
- RAILROADS 
- CRANE TRACKS 
- FENCES 
- NAVY PROPERTY BOUNDARY 
- NAVY PROPERTY BOUNDARY W/FENCE 
- SHORELINES MLW. M.H.W. PONDS 
- RIVER FLOW  SWEEPINGS & SOUNDINGS ARE IN FEET TO MEAN LOW WATER
- DATUM: M.H.W. 100.32' MLW. 92.32' MAIN STATION ENTRANCE 
- COMMAND AREA BOUNDARY 



LOCATION MAP

A

B

C

D

E

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11

SWEPT

SWEPT

SWEPT

SWEPT

Channel Limit

SWEPT

February 20, 1963

2-11 N8 10110 100000

1. OTHER DRAWING NUMBER		2. GEN. DEV.	3. DEP. STD.	4. BID	5. SHOP	6. REC. COND.	7. OTHER	8. SHEET 1 OF 4	9. Y & D DRAWING NUMBER 960243 P	
10. CONTRACT NUMBER		SPEC. NO.			11. ORIGINATOR DPWO LND					
12. DATE OF DRAWING 20 February 1963				13. ACTIVITY NAME Naval Complex, Portsmouth, N. H.						
14. TITLE OF DRAWING								15. BUILDING NUMBER		
								16. CATEGORY CODE		
17. TYPE OF DRAWING Civil				18. DRAWING DESCRIPTION Existing Conditions Map						
<b>INSTRUCTIONS:</b> Box 1 - Local Drawing Number 2 - 7 - Indicate Type of Drawing by Placing an "x" in Appropriate Box. 8 - 9 - To be Completed by Contractor's Agent or DPPO. 10 - Contract Number 11 - Indicate Appropriate DPWO, APWO, Etc. 12 - Date Drawing is Completed/Approved.					13 - Name Activity where Construction is being Performed. 14 - Use Drawing Title, Including Type and Capacity of Building 15 - Indicate Building Number 16 - Indicate Category Code. 17 - Indicate Type of Drawing; Arch., Struct., Mech., Etc. 18 - Indicate Drawing Description; Elevations, Foundations, Etc. 19 - Indicate Security Classification, if any.					
CONTRACTOR <b>COOPER-TRENT BLUEPRINT &amp; MICROFILM CORPORATION</b> 2701 WILSON BOULEVARD, ARLINGTON 1, VIRGINIA PHONE: JACKSON 5-1900 TELETYPE: WA876  <b>MICRO-MASTER, 105 mm REPRODUCTION SYSTEM</b> <small>REGISTERED TRADE-MARK OF THE KEUFFEL &amp; ESSER CO., HOBOKEN, N. J.</small>										
CONTRACT NUMBER NBγ-17794		FILMED BY COOPER - TRENT BLUEPRINT & MICROFILM CORP.				19. SECURITY CLASSIFICATION				

THIS IS AN ARCHIVAL ENCLOSURE. MATERIALS USED ARE CHEMICALLY INERT, PERMITTING PROLONGED STORAGE UNDER PROPER CONDITIONS.

REV: A 12-59

RG 385, NAVFEC  
A+E Plans, Box 253

## **Appendix C: Project Source Data – Site Specific**

## **Appendix C-1: SMALL ARMS RANGE**

**Data Collection Questionnaire**  
**U.S. Navy MMRP Ranges and Sites**

**A. Installation Information**

A1. Installation Name: Portsmouth Naval Shipyard  
A2. City, County and State: Kittery, York County, Maine  
A3. Regional Command: Naval Sea Systems Command (NAVSEA)

**B. Suspected CTT Range Area**

B1. What is the current MEC and/or MC site name? Small Arms Range  
B2. Site ID Number: N0010201  
B3. Has the MEC/MC site always been under the same name? If not, what other name(s) has it been known by? Yes

B4. MEC and/or MC site Status:                      Closed                       Transferred                       Transferring

B5. Who currently owns the MEC and/or MC site? Are there any known deed restrictions?  
DOD

B6. Range/**TYPE** Classification (check all that apply):

- |  |   |
|--|---|
| <input type="checkbox"/> 1. Explosives Training  | <input type="checkbox"/> 7. Artillery/Rocket Impact /Recoilless Rifle |
| <input type="checkbox"/> 2. RDT&E  | <input type="checkbox"/> 8. Storage/Transfer                          |
| <input checked="" type="checkbox"/> 3. Rifle / Pistol/Qualification (i.e., small arms) | <input type="checkbox"/> 9. Tactical Range                            |
| <input type="checkbox"/> 4. Burial Pit   | <input type="checkbox"/> 10. Grenade Court                            |
| <input type="checkbox"/> 5. Open Burn/ Open Detonation                                 | <input type="checkbox"/> 11. Aerial Bombing/Rockets                   |
| <input type="checkbox"/> 6. Aerial Gunnery (20mm and larger)                           | <input type="checkbox"/> 12. Other (e.g. Laser, Explosion Areas)      |

**Some of the following questions pertain only to certain range types. These are designated by the Range Type # in the table for question B5**

B7. What is the approximate size (acres) of the MEC and/or MC site? How was the boundary determined, and has it changed over time? (e.g., field evidence, photos, topography, maps, outer envelope of related ordnance items, etc.)

0.5 acres

B8. What is the approximate size of the buffer zone or area that may have been impacted by range operations?

B9. Were any operations performed outside of the range boundaries including any flying debris and shrapnel?

No

B10. When did the site open and when did the site close? approximately 1964-1988

B11. Who used the MEC and/or MC site when it was open (i.e., military, civilian, recreational, police or Government agencies including ATF, FBI etc)? Military

B12. How frequently was the range used? infrequently, according to interview with security personnel

B13. What types of ordnance and/or potential UXO exist or were used at the MEC and/or MC site during this period? Please refer to attached table. Small arms (0.22 – 0.5 caliber)

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B14. Were chemical agents or radioactive materials ever developed, tested, used or disposed of in this area? No

B15. (Range Type #3, #8, and #9) Did the range have berms or back stops? If so, what height?  
The small arms range had a backstop, height unknown

B16. (Range Type #3, #8, and #9) What type and caliber of small arms were used? \_\_\_\_\_

B17. (Range Type #3, #6, #8, and #9) Were larger weapons used (37mm and larger)? No

B18. (Range Type #4, #5, #12) What type(s) of munitions were disposed of on site (e.g., small arms, pressure/electrical/explosive actuated cartridges, etc.)? N/A

B19. (Range Type #1, #3, #9) What type(s) of training was performed (e.g., explosives, rifle and/or pistol, disposal, qualifications, steaming, washout, cryogenics, acid trepanning, EOD specific procedures, riot control, etc.)? target practice

B20. (Range Type #3, #9) What type of firing was performed (e.g., known distance range qualifications, 1,000 inch range, machine gun, tactical firing, pop up targets, moving targets)?

B21. (Range Type #3, #9) How many firing positions were there?

one

B22. (Range Type #1, 2, 8, 12) What kind of operation was performed (e.g., burn rate, reactivity, corrosion, drop, compatibility storage, long term open storage, long term igloo storage, etc.)

N/A

---

B23. (Range Type #5) What was the radius of the open burn/open detonation (OB/OD) Area? Have kick-outs been found?

N/A

---

B23. Have there ever been any recorded incidents and/or injuries associated with the site?

No

---

B23. Could reactive hazards still exist on the site? No

---

B24. How were the duds handled, both surface and subsurface? \_\_\_\_\_

---

B25. If the range is a water range, how many miles from shore is it located? N/A

---

B26. If not a water range, how close is the nearest surface water body, and was it ever impacted?

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B27. How many acres are confirmed as having UXO surface and/or subsurface? Has the UXO been identified? None

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B28. How many acres are suspected to contain UXO surface and/or subsurface? Has the UXO been identified? None

---

B29. How many acres are confirmed as not containing UXO and how was the survey performed?

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**C. MEC and/or MC Site Physical Characteristics**

C1. What is the predominant soil type associated with the MEC and/or MC site?

clay/sand with stone

C2. If the MEC and/or MC site is located in water, what is the depth of water?

N/A

C3. What is the predominant topography associated with the MEC and/or MC site?

flat

C4. What is the predominant type of vegetation associated with the MEC and/or MC site?

barren or low grass

C5. What is the average depth (in feet) to groundwater for this MEC and/or MC site?

10.00

C6. Is the MEC and/or MC site located over near an aquifer (i.e., within 1 mile) used as a drinking water source? If so, where is the nearest drinking water well?

no

C7. Are there any wetland areas associated with this MEC and/or MC site? If yes, where are they and what is the estimated acreage? no

C8. Does the MEC and/or MC site contain archaeological or cultural sites? If so, where and what? defined as low-sensitivity for historic and pre-historic archaeological sensitivity

C9. What is the distance from the MEC and/or MC site to inhabited buildings and what types of buildings? Building 357 – Hazardous Materials Storage Building – directly adjacent to location of SAR (<20 feet)

C10. Is the site/range situated in a routine air traffic control pattern?

No

C11. Are contractors able to use and store explosives on the site and are storage magazines available? No

C12. Are there any specific Electromagnetic Radiation (EMR) Hazards in the area, such as electrical/electronic testing, radar transmitters or radio transmission towers?

No

C13. Has a RCRA Subpart X permit for OB/OD operations been pursued at this MEC and/or MC site? If yes, does the permit have RCRA corrective action requirements that apply at this site/range?

No

**D. Response Activities**

D1. Have munitions response activities been initiated/conducted on the MEC and/or MC site? If yes, did any cleanup activities include subsurface work (how deep)?

no

D2. What is/was the scope of the response activities? (select all that apply):

- a.  Munitions and Explosive of Concern
- b.  Munitions Constituents
- c.  Other chemical contamination: \_\_\_\_\_
- d.  Unknown

D3. What is the status of the response activities?

- a.  Data Collection
- b.  Investigation
- c.  Response/remedial action
- d.  Operation and Maintenance
- e.  Monitoring

f.  Close out

D4. Is contamination monitoring required? no

D5. Is any environmental monitoring being conducted adjacent to the MC/MEC site? If so, where is the monitoring being conducted, and what reports are being generated? yes – Jamaica Island Landfill, groundwater monitoring conducted at four wells located around Building 357

D6. Under what authority were/are response actions conducted?

- a.  CERCLA
- b.  RCRA
- c.  Both CERCLA and RCRA
- d.  None
- e.  Other

D7. What type(s) of munitions response actions have been initiated/conducted on the MEC and/or MC site (check all that apply):

- a.  Emergency response actions
- b.  Time-critical removal actions
- c.  Non time-critical removal actions with Engineering Assessment/Cost Analysis

Explain: \_\_\_\_\_

- d.  None
- e.  Unknown
- f.  Other: \_\_\_\_\_

D8. Where are the response actions documented (i.e., title and location of documents)?

N/A

D9. Are there any military EOD units in the vicinity and did they ever respond to the site? If so, what is the contact information?

EOD units in the vicinity include: There are no records of units responding to the site

D10. Are there any civilian bomb squads that respond to the site? If so, what is the contact information?

No

D10. Have there ever been any persons injured as a result of UXO at or near the site?

No

### E. Land Use Restrictions

E1. What are the current land use restrictions? (select all that apply):

Current	Future	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	No public access authorized
<input type="checkbox"/>	<input type="checkbox"/>	Limited public access (wildlife refuge)
<input type="checkbox"/>	<input type="checkbox"/>	Limited public access (livestock grazing)
<input type="checkbox"/>	<input type="checkbox"/>	Public Access (agriculture/forestry)
<input type="checkbox"/>	<input type="checkbox"/>	Public Access (surface recreation)
<input type="checkbox"/>	<input type="checkbox"/>	Public Access (vehicle parking)
<input type="checkbox"/>	<input type="checkbox"/>	Public Access (surface supply storage)
<input type="checkbox"/>	<input type="checkbox"/>	Unrestricted (commercial, residential, utility, subsurface recreational)
<input type="checkbox"/>	<input type="checkbox"/>	Other: _____

E2. How is access currently controlled? Entrance to Shipyard is monitored – cars are inspected and individuals must have passes to access

E3. For transferred and transferring ranges/site, what was/is the nature of the transfer (i.e., leased to who, or ownership transferred to who)?

Final Navy Programmatic Work Plan for Preliminary Assessments on MMRP Ranges and Sites  
Appendix F – Data Collection Questionnaires

N/A

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E4. What is the reason for transfer? N/A

E5. List the known entities, other than a DoD component, with current ownership or control of the land or its resources, and provide a brief description of the organization with ownership/control interest:

N/A

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\*\*\*\*\*

# Interview Record

\*\*\*\*\*

**Installation/Range or Site:** Portsmouth Naval Shipyard – Small Arms Range

**Date/Time:** 08/25/03      16:45

**Person Conducting the Interview/Title/Organization:** Terri Akbas, Malcolm Pirnie, Inc.

**Person Being Interviewed/Title/Organization:** Richard E. Winslow III

**Reason for Selecting Person to Interview (i.e., Years at Installation, Position, Previous History, etc.):** author of many books on the shipyard.

---

**Interview Notes (i.e., Range History, Ordnance Types, Land Use, Historical Records/Maps Available):** Mr. Winslow is the author of many books on Portsmouth Naval Shipyard and its history. Mr. Winslow happened to be visiting the Portsmouth Public Library when we were there. He does not have any recollection of ranges on the installation – he did not come across anything pertaining to ranges in his research.

# Interview Record

**Installation/Range or Site:** Portsmouth Naval Shipyard – Small Arms Range

**Date/Time:** 08/25/03 14:33

**Person Conducting the Interview/Title/Organization:** Ken Kaiser, Malcolm Pirnie, Inc.

**Being Interviewed/Title/Organization:** Robert Becker, Natural Resources  
As of 06/01/03

**Reason for Selecting Person to Interview (i.e., Years at Installation, Position, Previous History, etc.):** Natural Resources – 3 years at Portsmouth

---

**Interview Notes (i.e., Range History, Ordnance Types, Land Use, Historical Records/Maps Available):**

- Only study done on Clarks Island.
- University of New Hampshire
- About 8 or 9 years ago.
- Will supply the report (received 08/25/03)

**MALCOLM  
PIRNIE**

# Interview Record

**Installation/Range or Site:** Portsmouth Naval Shipyard – Small Arms Range

**Date/Time:** 08/25/03 1600

**Person Conducting the Interview/Title/Organization:** Terri Akbas/Ken Kaiser/Al Larkins  
Malcolm Pirnie, Inc.

**Person Being Interviewed/Title/Organization:** Dennis Gagnon , Facility Manager

**Reason for Selecting Person to Interview (i.e., Years at Installation, Position, Previous History, etc.):** on base since 1979

---

## **Interview Notes (i.e., Range History, Ordnance Types, Land Use, Historical Records/Maps Available**

Bought Jamaica Island in 1941

- Bldg. 357 constructed from 1994-1996, occupancy in 1996.
- Range was located where concrete pad now sits.
- Range was closed in approximately 1981.
- Shot north through bunkers.
- Screened soil.
- Shipped screened material (lead etc.) off-site as hazardous waste.
- Ground elevation is now four feet higher than when range was operational.

# Interview Record

**Installation/Range or Site:** Portsmouth Naval Shipyard – Small Arms Range

**Date/Time:** 08/26/03 1410

**Person Conducting the Interview/Title/Organization:** Al Larkins/UXO Safety

**Person Being Interviewed/Title/Organization:** Kevin LeBoeuf  
(207) 438-1750

**Reason for Selecting Person to Interview (i.e., Years at Installation, Position, Previous History, etc.):** Explosive Safety Officer

---

**Interview Notes (i.e., Range History, Ordnance Types, Land Use, Historical Records/Maps Available):**

- Explosive Safety Officer as of 1Aug 03
- 357 is the only range.
- Class 1.2 found during dredging.
- Jim Beal DOD police office/training office.
- 1 map on wall – August 2000 Existing Condition/ Site approval.

**MALCOLM  
PIRNIE**

# Interview Record

**Installation/Range or Site:** Portsmouth Naval Shipyard – Small Arms Range

**Date/Time:** 08/26/03 0800

**Person Conducting the Interview/Title/Organization:** Al Larkins/UXO Safety

**Person Being Interviewed/Title/Organization:** Larry Strafen/Training Officer  
Naval Station Fire Department  
(207) 438-4389

**Reason for Selecting Person to Interview (i.e., Years at Installation, Position, Previous History, etc.):** representative from Base Fire Department

---

**Interview Notes (i.e., Range History, Ordnance Types, Land Use, Historical Records/Maps Available):** Fire Department has no record of any response to range or other ordnance, incident at shipyard.

# Interview Record

**Installation/Range or Site:** Portsmouth Naval Shipyard – Small Arms Range

**Date/Time:** 08/25/03 1600

**Person Conducting the Interview/Title/Organization:** Ken Kaiser/Terri Akbas  
Malcolm Pirnie, Inc.

**Person Being Interviewed/Title/Organization:** Walley Tate – Bldg 357

**Reason for Selecting Person to Interview (i.e., Years at Installation, Position, Previous History, etc.):** Person in charge of groundwater data at Bldg 357.

---

**Interview Notes (i.e., Range History, Ordnance Types, Land Use, Historical Records/Maps Available):** e-mailed excel spreadsheet with groundwater monitoring data from four wells located around Bldg. 357.

# Interview Record

**Installation/Range or Site:** Portsmouth Naval Shipyard – Small Arms Range

**Date/Time:** 08/26/03 12:30

**Person Conducting the Interview/Title/Organization:** Ken Kaiser/Terri Akbas, Malcolm Pirnie, Inc.

**Being Interviewed/Title/Organization:** Mr. James Dolph, Base Historian

**Reason for Selecting Person to Interview (i.e., Years at Installation, Position, Previous History, etc.):** Mr. Dolph is the Base Historian at Portsmouth Naval Shipyard

---

## **Interview Notes (i.e., Range History, Ordnance Types, Land Use, Historical Records/Maps Available):**

- First Naval District dumping ground – all aviation ordnance, secret ordnance
  - Mr. Dolph gave us a map illustrating the location of the “dumping grounds”
- Dangerous Ammo Dump area – specific for Portsmouth for “dangerous ammo”
  - Mr. Dolph gave us a map illustrating the location of the “dangerous ammo” disposal area
- Gun Park and Shot Park – used to store cannons and cannon balls with gunpowder stored in Bldgs. 31-34
- Fort Devons and Pease AFB – official ranges for Portsmouth training
- Fort Washington
  - fired practice/target practice
  - American Revolution to Civil War

- Cannon balls
- Fort Washington is gone – now an archaeological site - a reservoir was built over it
- Small Arms Range
  - 1964-1988 (approximate dates of use)
  - Ammunition Depot (Bldgs. 31, 32, 33, and 34) – in use until 1964
  - All magazines removed in 1980s
- Magazines
  - Marine barracks had their own magazines (2) for small arms – closed in 1974
  - Bldg. 205 – dynamite magazine – closed
- Prison
  - 1916 map – shooting range – indoor range
  - photo showing marines in open field with guns

**MALCOLM  
PIRNIE**



DEPARTMENT OF THE NAVY

PORTSMOUTH NAVAL SHIPYARD  
PORTSMOUTH, N.H. 03804-5000

IN REPLY REFER TO:

5090  
Ser 121/074

09 MAY 1994

Nancy Beardsley  
State of Maine  
Department of Environmental Protection  
Division of Oil and Hazardous Waste Facilities Regulation  
State House Station # 17  
Augusta, ME 04333

Dear Nancy Beardsley:

As you are aware, the Portsmouth Naval Shipyard is attempting to obtain a license to build and operate a new hazardous waste storage facility. The Shipyard has proposed to locate this facility on "Jamaica Island."

Until 1941 Jamaica Island was a privately held property that contained vacation homes. In 1941 the Navy purchased the island for the purpose of constructing an ammunition storage area. That year a causeway was constructed that connected Jamaica Island to the Portsmouth Naval Shipyard and the ammunition storage area was built. The Shipyard's historian, Jim Dolph, has prepared a brief history of operations at this storage area. It is attached for your reference. The storage area consisted of 40 bunkers and several small buildings. The primary use of this ammunition storage area was short term storage of munitions that were removed from ships undergoing repairs at the Yard. When the repairs were completed the ammunition was returned to the ship. Use of the ammunition bunkers declined over time. No weapons are believed to have been stored in these bunkers after 1978. In 1987, the empty bunkers were demolished. It should be noted that two of the original structures built in 1941 still exist. They are designated as A-5 and A-6 on the 1941 construction drawing provided in attached site history. Today they are designated as IZ45 and IY44. IZ45 is vacant. IY44, located on the southern edge of Jamaica Island, is still used to store small arms for the Shipyard as was explained by Jim Tayon during the windshield tour on 29 April.

Since the Shipyard began its investigation of potentially contaminated sites on the Yard, it has been extremely forthcoming about the existence of the ammunition storage area and its function. It is logical to examine munitions as an issue in a site assessment at a military installation. This, in fact, was done as part of the Initial Site Assessment of the Portsmouth Naval Shipyard that was published in 1983. Section 5.3 of this report specifically discusses ammunition handling at the Shipyard. The bunker area is referred to in particular and previous annual surveys of the area are referenced. This report uncovered no munitions disposal areas, or past munitions handling that could have contaminated any area of the Shipyard. The ammunition storage area is labelled on three separate maps and

CONTINUOUS IMPROVEMENT THROUGH TEAMWORK

shown on an aerial photograph contained in this study. This report has been provided to the EPA and the DEP as well as released to the public. Furthermore, as a result of earlier discussions with the State on the subject of soil borings, the Shipyard provided the DEP with a 1987 study which clearly shows the munitions bunkers in its project maps.

As was mentioned above, the function of this ammunition storage area was short term storage. The bunkers were inspected and found to be empty prior to demolition, as noted in the attached statement from Jim Dolph. No disposal or processing of munitions have ever occurred at this site. There is no reason to believe that munitions are still present on the site or that there are any other dangers posed by this former use of the location.

I hope that we have provided you with sufficient information to answer your concerns. We look forward to moving ahead with the field work as soon as all the arrangements can be made. Thank You.

Sincerely,



KENNETH W. PLAISTED  
Head, Environmental  
Regulatory and Operations Division  
by direction of the Commander.

Enclosure:

(1) History of Ammunition Storage Area

MEMORANDUM

4 May 94

From: 870H  
To: 121.4

Subj: JAMAICA ISLAND AMMUNITION DEPOT

Encl(1): Brief Chronological History of the Jamaica Island  
Ammunition Depot

Encl(2): Photograph, (Copy), of Ammunition Depot upon Completion  
in 1942

Encl(3): Photographs of Ammunition Depot prior to demolition in  
1987

Encl(4): Plan, Jamaica Island Naval Ammunition Depot, New Hose  
Houses and Grounds for High Explosive Magazines, year  
1945

1. The attached enclosures outline the history and layout of the Jamaica Island Ammunition Depot. Documentation indicates that ammunition was never buried aboard the facility.

2. In 1987, as Shipyard Historian, I inspected the ammunition area for items of historical value. However, the area had been abandoned as a ammunition storage area for sometime. I did not locate anything as a result of my inspection.

James Dolph

Copy to:  
file

JAMAICA ISLAND  
NAVAL AMMUNITION DEPOT  
PORTSMOUTH NAVAL SHIPYARD

- 21 Feb 41 -- Congress authorized acquisition of land to construct an ordinance facility.  
(Source #1: Department of Navy letter, 21 Feb 1942, Real Estate Files, Naval Engineering Facility Command, Lancaster, Pennsylvania)
- Oct 41 -- Construction of 40 concrete igloos began.  
(Source #2: Official History of the Portsmouth Naval Shipyard during World War II, unpublished typescript, National Archives, Waltham, Massachusetts)
- May 42 -- Igloos are at a stage of usable completion.  
(Source #2)
- 3 Aug 42 -- United States Navy acquires Jamaica Island.  
(Source #1: Deed, Real Estate files, Naval Engineering Facility Command, Lancaster, Pennsylvania)
- 30 Nov 45 -- U.S. Naval Magazine, Jamaica Island, is established as a component of the newly established U.S. Naval Base, Portsmouth, N.H.  
(Source #3: History of the U.S. Naval Base, Portsmouth, N.H., unpublished typescript, PNS Museum)
- 31 Dec 62 -- U.S. Naval Base, Portsmouth, N.H., is disestablished, reorganizing the Portsmouth Naval Shipyard.  
(Source #3)
- 21 Jul 72 -- Only second and third rows of bunkers are being used. Source #4 & #5 indicate that ammunition was removed from vessels when drydocked at the Shipyard. Once the vessel was removed from the drydock, the ammunition was re-issued to the vessel.  
(Source #4: Memorandum from Code 810 to Code 400, 6 July 72)
- 31 Aug 72 -- Normal storage in bunkers is 100 rounds of 3" saluting battery charges. These munitions are only stored for a short period of time while a vessel is drydocked.  
(Source #5: Naval Message, 401:mep, 11101, 31 Aug 1972)

- 
- 5 Feb 74 -- In response to an official inquiry by Naval Sea Systems Command, as to the location of buried ammunition and hazardous materials, the Shipyard replied that mercury had been buried. There is no mention of ammunition ever being buried aboard the facility.  
(Source #6: Letter from Commander, Portsmouth Naval Shipyard to Commander, Naval Sea Systems Command, 440:JK.mep.11011, 5 Feb 74)
- 1974 -- Guidance from Naval Sea Systems Command directs Shipyards to forward negative replies in instances when no material has been buried. A Shipyard memo from code 401, Public Works), indicates a negative response except for mercury burial.  
(Source #7: Memorandum from code 401 to code 440, Letter from Naval Sea Systems Command, page 2, 0731/RFH, 8020, Ser 695-073)
- 1978 -- It is presumed, by preliminary research, that the 40 concrete igloos were no longer being used.
- 1987 -- Concrete igloos were demolished.  
(Source #8: Public Works Contract #87-C-2199, Demolition of Various Buildings)

6/21/42

From: Code 810

To: Code 400

Subj: Distance limitations for inhabited dwellings near explosives storage

1. The type of explosive items stored by Operations in the bunkers on Jamaica Island are of two classes:  
Class I--- bulk explosives and demolition charges  
Class II --- smokeless powder bag charges, semifixed smokeless powder cartridges, and rocket motors (we only have occasion to store rocket motors)
2. The quantities of these explosive items is such that only the second and third rows of storage bunkers need be used. The safe distance for inhabited dwellings should be computed from these rows. The maximum quantities stored and corresponding distances are marked in yellow on the enclosed tables taken from OP 5 (VOL 1) (2nd REV).

Very Respectfully,

*R. W. Holzappel*  
Lt. R.W. Holzappel USN

Note: There has been one time when the distance required would be 400'. This was when the USS Preserver came in and had to be drydocked. They had a number of demolition charges that they use with salvage work that we had to off-load prior to drydocking - This was a very rare occasion -

Very Respectfully,  
*R. W. Holzappel*

Source 5

401:map  
11101

NAVAL MESSAGE

OPNAV FORM 2110-28 (REV. 3-61) S/N 0107 4000

RELEASED BY <b>B. L. HANSEN, By direction</b>		DRAFTED BY <b>J. E. CHRISTENSON</b>		PHONE EXT NR <b>401</b>	PAGE <b>1</b>	PAGES <b>OF 1</b>		
DATE <b>31 AUG 1972</b>	TOR/TOD	ROUTED BY		CHECKED BY				
MESSAGE NR	DATE/TIME GROUP (GCT) <b>R 312047Z AUG 72</b>	PRECEDENCE	FLASH	EMERGENCY	OPERATIONAL IMMEDIATE	PRIORITY	ROUTINE	DEFERRED
		ACTION					X	
		INFO					X	

FM NAVSIPYD PTSMH NH  
 TO NAVFAC WASHINGTON DC  
 INFO NORTHDIV NAVFACENCOM PHILADELPHIA PA  
 UNCLAS //11101//

PROJECT HC4-72, MOBILE BOMB PARK, PORTSMOUTH

- A. TELCON BETWEEN MR. HICKEY, CODE 20 NORTHDIV AND LCDR CHRISTENSON THIS DATE
- FOR NAVFAC CODE 20211B. IN RESPONSE TO REFERENCE A TUE QD FROM THE SECOND ROW OF ADMITTION BUNKERS IS 150 FEET. DISTANCE BETWEEN STORAGE POINT AND NEAREST PROPOSED POSITION OF MOBILE HOME IS 500 FEET.
  - QD IS BASED ON STORAGE OF CLASS 2 ITEMS FOR BRIEF PERIODS DURING DRYDOCKING OF VESSELS. NORMAL STORAGE IS APPROXIMATELY 100 ROUNDS OF 3 INCH SALUTING BATTERY CHARGES.

*back count full*

-----  
 DISTRIBUTION:  
 (PAGE ONE ONLY)

400  
 800  
 440

UNCLASSIFIED

DATE/TIME GROUP (GCT)
-----------------------

440:JK:mep  
11011

From: Commander, Portsmouth Naval Shipyard  
To: Commander, Naval Ship Systems Command

FEB -5 1974

Subj: Identification of Buried Ammunition, Explosives and Hazardous  
Material Locations

Ref: (a) NAVSHIPS spdltr 0731:RFH:das 8020 Ser 695-073 of 1 Nov 1973

Encl: (1) Existing Conditions Map

1. A marked up copy of enclosure (1) showing the location and date (May 1973) of a one time burial of hazardous mercury contaminated materials is forwarded in compliance with reference (a). The burial site is properly identified on the Shipyard's Existing Conditions Map. The exact location is also recorded in field survey notebooks. In this way, the exact position can be reestablished.

2. The mercury materials were salvaged from thermometers, electrical switches, and other electrical and mechanical instrumentation. A total of approximately 20 cu. ft. of mercury contaminated materials (gloves, brushes, pans, sawdust, instruments, etc.) required disposal. A pit was dug in the base landfill area, concrete was placed as a base, the material was dumped and covered with additional concrete to form a solid block of encased material thus neutralizing and making inert the mercury in the contaminated materials.

3. Although no additional burial of subject materials is contemplated, this Command will, as a matter of policy, comply with Federal and local environmental protection regulations if such burial becomes necessary. Planned building sites will be avoided, the materials will be made inert insofar as is possible, and sites will be shown on pertinent maps.

B. L. HANSEN  
By direction

Copy to:

400

440

800, 725

Written by John Kus, Ext. 620

Typed by M. E. Place 2/1/74

# Naval Speedletter

USE FOR URGENT LETTERS ONLY

DO NOT CLEAR THROUGH COMMUNICATIONS OFFICE

CHECK TYPE OF MAIL <input type="checkbox"/> REGULAR <input type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> AIR <input type="checkbox"/> CERTIFIED <input type="checkbox"/> SPECIAL DELIVERY		CLASSIFICATION <p style="text-align: center;">UNCLASSIFIED</p>	INSTRUCTIONS 1. Message type phraseology is permissible. 2. Both addresses must be appropriate for window envelope or bulk mailing, as intended. Include attention codes, when known. Use dots and brackets as guides for window envelope addresses. 3. Give priority to processing, routing, and action required. Avoid time-consuming controls. 4. In order to speed processing, a readily identifiable, special window envelope, OPNAV S216/145A, Speedletter Envelope, is provided for unclassified speedletters where bulk mailing is not used. Other window envelopes also may be used. In bulk mail, speedletters should be placed on top of regular correspondence.
		DATE <p style="text-align: center;">NOV 1 1973</p>	

To: Commanders, All Naval Shipyards

Fold STANDARD REFERENCES AND ENCLOSURES, IF ANY; TEXT AND SIGNATURE BLOCK

Subj: Identification of Buried Ammunition, Explosives and Hazardous Material Locations

Ref: (a) CMO ltr Ser 411F/1562 of 3 Oct 1973 (NOTAL)

Reference (a) indicated that locations of buried ammunition, explosives and hazardous chemicals are not always adequately identified on the installation master plans and that permanent records are not always available to identify the areas. The location and identity of any buried ammunition, explosives or hazardous material needs to be documented to insure that new facilities are properly sited with respect to explosives safety standards and that contaminated areas of land are not released to the public.

Therefore it is requested that addressees furnish the following information to NAVSHIPS (SHIPS 07) as soon as possible:

- A. The measures that have been taken to insure proper identification of those sites on installation master plans where such material is buried.
- B. The system that has been used to maintain permanent records of such burial sites and the availability of these records.
- C. The date of the last burial of such material.
- D. The policy guidance utilized for selection of the burial sites and methods of burial when this manner of disposal is/was required.

Fold

COPIES TO

CNM (MAT 046)

COMNAVFACENGCOM

SHIPS 13

From: Commander, Naval Ship Systems Command  
 Department of the Navy  
 Washington, D.C. 20362

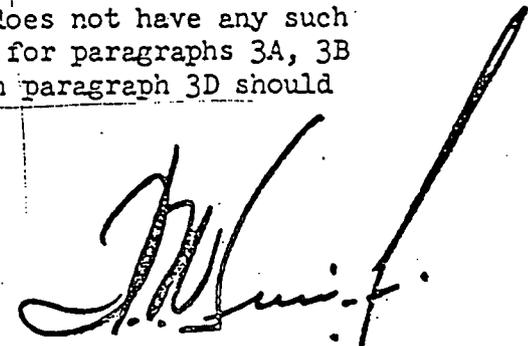
← ADDRESS  
 REPLY AS SHOWN AT LEFT;  
 OR, REPLY HEREON AND  
 RETURN

CLASSIFICATION

UNCLASSIFIED

0731/RFH  
8020  
Ser 695-073

3. In those instances where a naval shipyard does not have any such material buried, a negative reply is requested for paragraphs 3A, 3B and 3C, but the policy utilized as requested in paragraph 3D should be forwarded.



W.E. QUINN, JR., CAPT, USN  
Deputy Director for  
Shipyards Modernization/  
Director for Navy Contractor  
Operated Facilities and Equipment  
By direction of Commander  
Naval Ship Systems Command

Source #7

IND-PNS-5216/11 (NEW 9-1-6)

FROM THE DESK OF

40X

TO

440 Kms

401

DO NOT CLEAR THIS FROM COMMUNICATIONS OFFICE

INSTRUCTIONS 812 8020 (100082)

2 Jan 1974

- 1. Message type (for window envelope or bulk mailing, as intended). Include attention codes, when known. Use dots and brackets for window envelope addresses.
- 2. Give priority to procedure, routine, and when appropriate, special window envelope, OPNAV 021/7300. Special letter envelope is provided for undelivered mail.
- 3. In order to speed processing, identify items as follows: Special window envelope, OPNAV 021/7300. Special letter envelope is provided for undelivered mail.

HIPS 0731)

Explosives and Hazardous

695-073 of 1 Nov 73

73 of 12 Dec 73

Reference (b) requests

expected.

be forwarded to this

I assume we have a negative on 3A,B,C. If so, propose a single burial policy & discuss it with 810 before replying.

16

According Bellville, about a year ago, about 20 cu. ft. of mercury contaminated material was buried on Jamaica Island. The location is noted in our field books.

Show by location on shipping manifest policy

Kms 11/5/74



ZERO DEFECTS It's up to you!

COMNAVSTA

COMMUNICATIONS

NAVSTA

Commander, Naval Ship Systems Command  
Department of the Navy  
Washington, D.C. 20376

NAVSTA  
COMMUNICATIONS  
NAVSTA





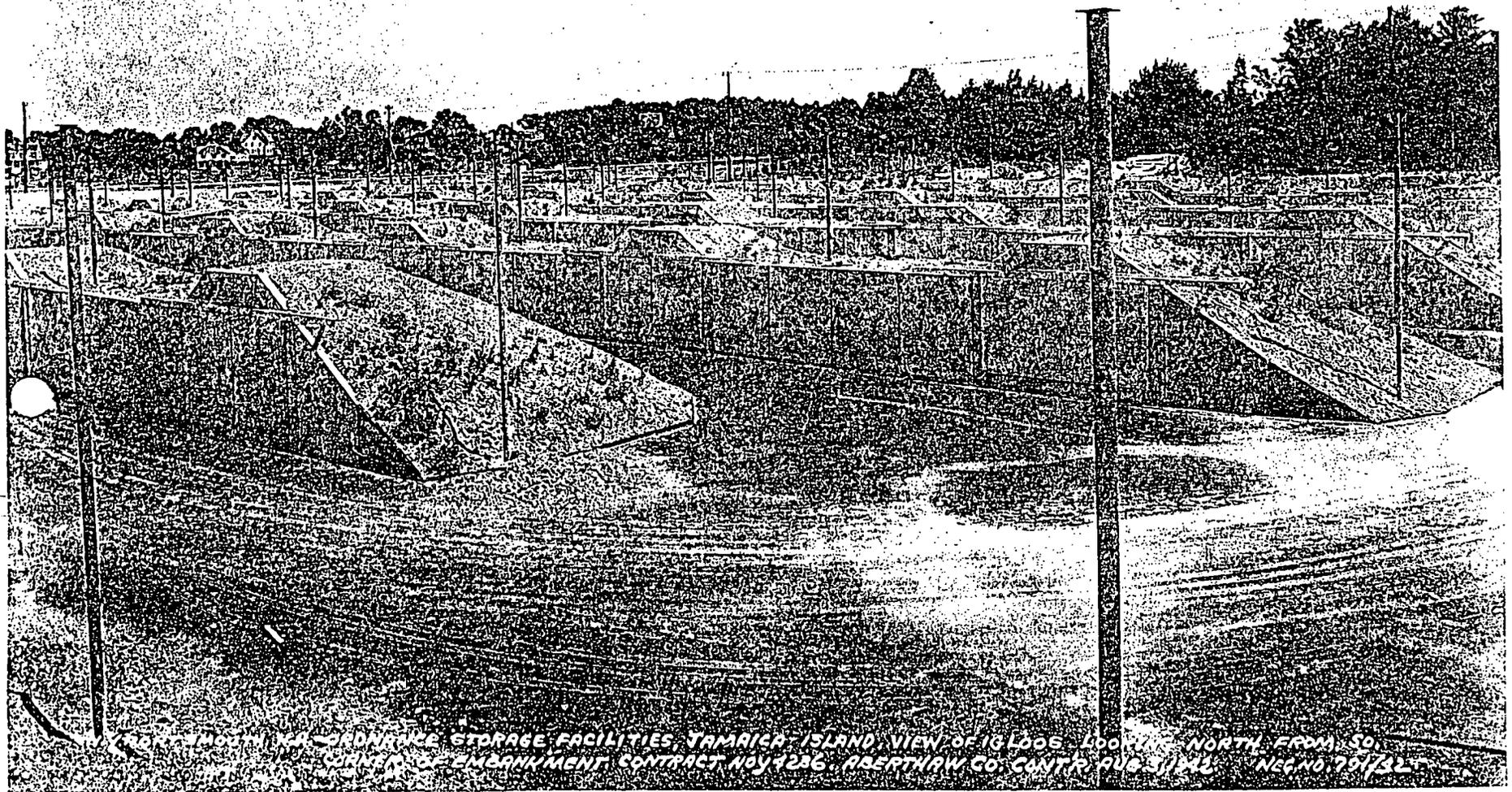
PORT KNOX, N.H., JAMAICA ISLAND, ROBINSON STORAGE FACILITIES CONTRACT NOY 4236 VIEW S. BOKIN G. N.W.  
APPROXIMATELY NOV. 1942. NEG. NO. 28/42.



PORTSMOUTH, N.H. JAMAICA ISLAND ORGANIC STORAGE FACILITIES CONTRACT NO. NOV 4236  
VIEW LOOKING NW WEST PHOTOGRAPHED BY W. H. FREDERICK FEB. 11, 1942 NEG. NO. 152/10



NY PORT AUTHORITY - STORAGE FACILITIES, JAMAICA, ISLAND - VIEW OF BLOCK COOKING NORTH  
DEC 1936 - HEERMAN CO. CONTRACTOR - APRIL 3, 1942  
NEG NO. 276/42



ORDNANCE STORAGE FACILITIES, YAMAICA ISLAND, VIEW OF IGLOOS, LOOKING NORTH FROM SO. CORNER OF EMBANKMENT, CONTRACT NO. Y286, BERTHAW CO. CONTR. AUG 31/42. NEG. NO. 751/32.



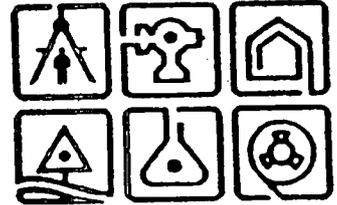




**C.T. MALE ASSOCIATES, P.C.**

50 Century Hill Drive  
P.O. Box 727  
Latham, New York 12110  
(518) 786-7400  
FAX (518) 786-7299

Engineering  
Land Surveying  
Architecture  
Landscape Architecture  
Environmental Services  
Computer Services



**REPORT ON THE  
SUBSURFACE INVESTIGATION OF THE  
PROPOSED HAZARDOUS WASTE  
CONSOLIDATION AND STORAGE FACILITY  
PORTSMOUTH NAVAL SHIPYARD  
KITTERY, MAINE**

**JULY 1, 1994**

Prepared by:

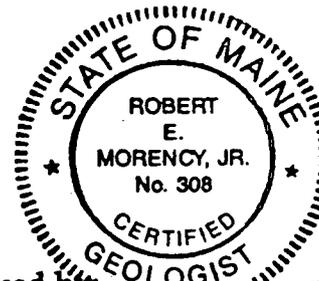
**C.T. MALE ASSOCIATES, P.C.**  
50 Century Hill Drive  
P.O. Box 727  
Latham, New York 12110  
(518) 786-7400  
CTMA Project No.: 94.4462



Submitted by:

*Elizabeth W. Rovers*

**Elizabeth W. Rovers, P.E.**  
Managing Engineer  
C.T. Male Associates, P.C.



Reviewed by:

*Robert E. Morency, Jr.*

**Robert E. Morency, Jr., CG**  
R.E. Morency & Associates, Inc.

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REPORT ON THE  
SUBSURFACE INVESTIGATION OF THE  
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AND STORAGE FACILITY  
PORTSMOUTH NAVAL SHIPYARD  
KITTERY, MAINE

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REPORT ON THE  
SUBSURFACE INVESTIGATION OF THE  
PROPOSED HAZARDOUS WASTE CONSOLIDATION  
AND STORAGE FACILITY  
PORTSMOUTH NAVAL SHIPYARD  
KITTERY, MAINE

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C.T. MALE ASSOCIATES, P.C.

REPORT ON THE  
SUBSURFACE INVESTIGATION OF THE  
PROPOSED HAZARDOUS WASTE CONSOLIDATION  
AND STORAGE FACILITY  
PORTSMOUTH NAVAL SHIPYARD  
KITTERY, MAINE

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DOCUMENTS ATTACHED UNDER SEPARATE COVER

Data deliverable package for soil samples entitled:

Sample Data Package (1,373 pages) for PNS HWC&S Facility, SDG No. Z0511, Lab ID 3095-0511, prepared by IEA, Inc. for C.T. Male Associates, P.C.

# C.T. MALE ASSOCIATES, P.C.

## 1.0 INTRODUCTION

### 1.1 General

This document is the Report On The Subsurface Investigation of the Proposed Hazardous Waste Consolidation and Storage (HWC&S) Facility located at the Portsmouth Naval Shipyard in Kittery, Maine. The purpose of the subsurface investigation was to determine the presence of soil contamination and document existing site conditions in the area of the proposed HWC&S facility.

The report presents the results and findings of the subsurface investigation field activities conducted by C.T. Male Associates, P.C. (C.T. Male) on June 1 and 2, 1994. All work performed as part of the subsurface investigation was done in accordance with the Maine Department of Environmental Protection (MEDEP) approved Work Plan entitled: "Work Plan, Subsurface Investigation of the Proposed Hazardous Waste Consolidation and Storage Facility, Portsmouth Naval Shipyard," dated May 23, 1994, except as noted in Section 2.2.

This document has been prepared by C.T. Male on behalf of the Portsmouth Naval Shipyard and the Northern Division Naval Facilities Engineering Command.

### 1.2 Report Organization

Section 1.0 describes this report's organization and presents a description of the site. Section 2.0 presents the scope and methodology of the subsurface investigation, including: a discussion of the objective, modifications to the Work Plan, and summaries of the test pitting program, field analyses, and soil sampling conducted. Section 2.0 also presents the health and safety monitoring performed, the decontamination of equipment and disposition of generated wastes.

Section 3.0 provides a brief discussion of regional geology and site geology as it relates to the work performed.

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Section 4.0 presents the results of the investigation including: field analysis results, laboratory analysis results and evaluation of data. Also included in this section is a discussion of the quality assurance program implemented during field and laboratory analyses and a subsection on data validation and data usability.

Section 5.0 summarizes the findings and presents conclusions.

Tables and figures prepared for presentation of and evaluation of the data are included within the text of the report. Appendices contain field logs including field reports, test pit logs and field headspace analysis logs; tables of the raw and validated data and associated laboratory analysis reports and chain of custody records; and the data validator's reports.

### **1.3 Site Location and Description**

The Portsmouth Naval Shipyard (PNS) is located within the Town of Kittery, York County, Maine on Seavey Island on the north shore of the Piscataqua River. Seavey Island is located at the mouth of the Great Bay Estuary approximately two miles from the Atlantic Ocean.

The PNS originally consisted of four separate islands; Fernald's, Seavey, Pumpkin and Jamaica. Development of PNS facilities necessitated the filling of low lying tidal flats subsequently connecting the islands to form one contiguous land mass. The present Shipyard consists of 376 buildings on 278 acres of land known as Seavey Island.

The proposed HWC&S facility is located on the Jamaica Island area of the PNS, and is partially on "filled lands". The proposed location is northeast of and adjacent to the existing Hazardous Waste Storage Facility (HWSF). A Site Location Map is presented as Figure 1.

The proposed facility is also located approximately 200 feet east of previous waste oil storage tanks. Waste oil used to be stored in two 7,500 gallon underground railroad tanker cars. The two 7,500 gallon buried railroad tanker cars and approximately 600 cubic yards of oil contaminated soil were removed by PNS in

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1989. PNS representatives indicated that the soils removed from the site also contained slightly elevated levels of heavy metals, solvents and freon, and that PCBs were also detected.

The site is generally flat and at an elevation of approximately 9 to 10 feet above mean sea level. The site is currently used for the storage of snow in the winter and for the storage of miscellaneous equipment.



MAP REFERENCE:  
 U.S.G.S. QUADRANGLE, 7.5 MIN. SERIES  
 KITTERY, MAINE AND PORTSMOUTH,  
 NEW HAMPSHIRE.



SAT TO	DATE
DEPARTMENT OF THE NAVY	APPROVED
NAVAL FACILITIES ENGINEERING COMMAND	DATE 5/23/94
NORTHERN DIVISION	NORTHDIV FOR COMMANDER, NAVFAC
LESTER	
PORTSMOUTH NAVAL SHIPYARD	
PENNSYLVANIA	
KITTERY, ME	
CODE I.D. NO.	
SCALE : 1" = 2000'	
SPEC. NO. 04 -	
CONSTRN. CONTR. NO.	
NAVFAC DRAWING NO.	
SHEET 1 OF 2	
SIZE: DIS. SH. NO.	
FIGURE 1	

**FIGURE 1: SITE LOCATION MAP**  
**PROPOSED HAZARDOUS WASTE CONSOLIDATION AND STORAGE FACILITY**

## **C.T. MALE ASSOCIATES, P.C.**

### **2.0 STUDY AREA INVESTIGATION**

Section 2.0 presents the objective of the subsurface investigation of the proposed HWC&S facility and the scope of work as implemented. All work was done substantially in accordance with the MEDEP approved Work Plan and Site Specific Health and Safety Plan dated May 23, 1994 except as noted in Section 2.2. Refer to these documents as necessary for a more detailed description of methodologies employed. Summaries of the investigations as performed are discussed in the subsections that follow.

#### **2.1 Objective and Scope of Work**

The objective of the subsurface investigation was to:

- facilitate the collection of soil samples and to perform field screening and laboratory analyses of soil samples to determine the presence or absence of soil contamination in the area of the proposed Hazardous Waste Consolidation and Storage facility either attributable to the previous waste oil tanks located west of the site or other source(s),
- to perform quality assurance and quality control checks during field sampling and laboratory analyses to monitor and document the integrity and quality of the data obtained, and
- to provide data to document existing site soil conditions.

The subsurface investigation consisted of the following activities:

- excavation of 8 test pits;
- collection of 20 subsurface soil samples;
- field headspace screening of soil samples with a portable photoionization detector (PID) meter and flame ionization detection (FID) meter;

## C.T. MALE ASSOCIATES, P.C.

- laboratory analysis of 7 soil samples, one replicate soil sample, two equipment blanks and one field blank for TCL volatiles and freon, TCL semi-volatiles, TCL pesticides/PCBs, TAL inorganics and total petroleum hydrocarbon (TPH), analysis of one soil sample for the above parameters excluding TCL pesticides/PCBs, and analysis of two transport/trip blanks for TCL volatiles; and
- health and safety monitoring of the work zone during investigative activities.

### 2.2 Modifications to the Work Plan

Several modifications to the Work Plan For The Subsurface Investigation Of The Proposed Hazardous Waste Consolidation and Storage Facility prepared by C.T. Male and dated May 23, 1994, were made prior to the implementation of the subsurface investigation. Modifications to the Work Plan were made under the direction of representatives of the Maine Department of Environmental Protection (MEDEP) in communication with the Portsmouth Naval Shipyard Environmental Affairs representative. A summary of those modifications are as follows:

- Number and Location of Test Pits:

The Work Plan specified 15 test pit locations for sampling. A total of 8 test pits were completed based on MEDEP modifications to the Work Plan and conditions encountered during the course of the investigation.

- Headspace Analysis:

The Work Plan specified a Photovac Microtip photoionization detector (PID) meter would be utilized to screen soil samples in the field for total volatile organic compounds (VOCs) contamination. The PID utilizes a 10.6 eV lamp to ionize volatile organic compounds with ionization potentials at or below 10.6 eV. Freon 113 ionizes above the 10.6 eV threshold. In addition to the Photovac Microtip PID meter, a Foxboro Organic Vapor Analyzer (OVA) flame ionization detection (FID) meter was utilized for soil headspace analysis. The OVA FID is

## C.T. MALE ASSOCIATES, P.C.

capable of ionizing all volatile organic compounds with a hydrogen flame; including Freon 113.

- Sampling Containers:

The soil samples for TPH analysis were collected in 2-ounce septum glass jars instead of 12-ounce jars specified in the Work Plan. Also the water samples for TPH analysis were collected in one liter amber glass jars.

- Laboratory Analyses:

Modifications were made to the type of soil sample (i.e., grab, composite) and the frequency of laboratory analyses performed. One soil sample per test pit location was submitted for laboratory analysis for; TCL volatiles and Freon 113, TCL semi-volatiles, TCL pesticides/PCBs, TAL inorganics and cyanide, and total petroleum hydrocarbons (TPH). No compositing of soil samples was performed. TPH analysis was performed by MEDEP Method 4.1.2 (i.e., Modified EPA Method 8015) instead of EPA Method 418.1 as specified in the Work Plan.

Additionally, as the result of conditions encountered during the implementation of the subsurface investigation, an additional soil sample from test pit TP-1 was submitted for analysis for full TCL parameters (except TCL pesticides/PCBs was not performed due to insufficient sample), Freon 113 and TPH. A total of two samples were analyzed from test pit TP-1.

- Health and Safety Monitoring:

Breathing zone air monitoring was performed as part of the project health and safety with both the Photovac Microtip PID meter and the Foxboro OVA FID meter. Modifications to the Work Plan health and safety monitoring also included radiation monitoring. Monitoring was performed with a Victoreen 450 or Eberline RO-2 radiation survey meter.

## C.T. MALE ASSOCIATES, P.C.

- Data Validation:

MEDEP reduced the number of analytical sample results required to be validated. Three soil sample results were submitted for data validation as well as the replicate sample and transport blanks.

### 2.3 Subsurface Investigations

#### 2.3.1 TEST PITTING AND SOIL SAMPLING

Eight test pits, identified as TP-1 to TP-8, were completed on June 1 and 2, 1994 along the building and loading dock foot prints and in the area of the proposed HWC&S facility. Clean Harbors Environmental Services, Inc. of Portsmouth, New Hampshire performed the excavation work under the full time observation of a C.T. Male geologist. Test pit locations are shown on Figure 2, "Site Plan Map of Test Pit Locations". Test pit locations were established in the field from scaled distances to existing structures shown on the Site Plan Map of Proposed Test Pit Locations, Figure 2 in the Work Plan. These measurements were used in "swing tying" the test pit locations.

Table 2-1 provides a summary of the test pitting program including test pit identification, total depth of the test pits, and sampling data.

TABLE 2-1  
SUMMARY OF TEST PITTING PROGRAM

Test Pit Identification	Total Depth	Thickness of Fill Material	Depth to Bedrock	Depth to Ground-water	No. of Samples Collected	Sample Intervals Submitted for Analysis
TP-1	9.5'	4.0'	>9.5'	4.0'	5	4-6', 8'-10'
TP-2	4.5'	4.0'	4.0'	4.0'	2	2'-4'
TP-3	3.7'	3.7'	3.7'	3.0'	2	none
TP-4	6.0'	0.75'	>6.0'	4.0'	3	4-6'
TP-5	4.0'	3.5'	3.5'	3.0'	2	0-2'
TP-6	4.0'	4.0'	4.0'	unknown	2	0-2'
TP-7	4.0'	3.5'	3.5'	unknown	2	0-2'
TP-8	4.0'	1.0'	4.0'	unknown	2	2-4'

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The C.T. Male geologist was responsible for collection of soil samples, field screening of soil samples, recording of test pitting and sampling data, and observation of all field work performed as part of the subsurface investigation. Site activities were documented through preparation of field reports. Completed field reports are presented in Appendix A.1.

Soil was excavated at the designated locations with a backhoe on an incremental basis. Soil samples were collected at each location at two foot intervals for the following analytical parameters:

- TCL Volatiles & Freon 113
- TCL Semi-Volatiles
- TAL Inorganics and Cyanide
- TCL Pesticides/PCB's
- Total Petroleum Hydrocarbons (TPH)
- Field Analyses (Total VOCs Headspace Analysis)

Additional soil samples were collected as necessary for laboratory quality control sample requirements (matrix spike/matrix spike duplicates).

Analytical samples were collected in the appropriate containers (as detailed in the Work Plan except as noted in Section 2.2), labeled and stored in coolers with ice packs pending submittal to the analytical laboratory. Test pit logs were completed with observations on soils/conditions encountered. Completed logs are presented in Appendix A.2. A discussion of site geology is presented in Section 3.2 of this report.

The test pit excavations were backfilled with the excavated material at completion of each test pit.

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### 2.3.2 FIELD ANALYSES

Soil samples were screened in the field for total VOCs contamination with a Photovac Microtip photoionization detector (PID) meter with a 10.6 eV lamp and with a Foxboro Organic Vapor Analyzer (OVA) flame ionization detection (FID) meter. Results of the field analyses were utilized in the determination of which soil samples were submitted to the laboratory for analysis. The PID meter was calibrated prior to use each day and after every four hours of use. The FID was factory calibrated and adjusted in accordance with manufacturer's specifications.

Soil samples were collected from each test pit and interval sampled for soil headspace analysis. Eight-ounce glass containers were filled approximately one-half full and the top of the container was sealed with aluminum foil. The soil sample was allowed to equilibrate to ambient air temperature; the jar was shaken for 30 seconds; and allowed to equilibrate. The foil was then pierced with the FID and subsequently the PID sampling tube. The readings were observed and recorded on a Headspace Analysis Log form. Completed copies of the headspace analysis forms are presented in Appendix A.3. Headspace analysis results are discussed in Section 4.2.

### 2.3.3 SOIL SAMPLE SELECTION AND HANDLING

Field analysis results were reviewed at the end of each day's sampling and samples were selected for laboratory analysis in consultation with MEDEP and PNS Environmental Affairs representatives. Soil samples displaying the highest field screening detections were selected for submission to the analytical laboratory. The following soil samples were submitted for chemical analytical characterization for the parameters previously stated:

SOIL SAMPLES SUBMITTED FOR LABORATORY ANALYSIS

TP-1	4' - 6'
TP-1	8' - 10'(1)
TP-2	2' - 4'
TP-4	4' - 6'
TP-5	0' - 2'
TP-6	0' - 2'
TP-7	0' - 2'
TP-8	2' - 4'

(1) Inadequate sample volume was collected for TCL Pesticides/PCBs analysis.

A chain of custody was completed with the detailed sampling information and the soil samples were placed in a cooler with ice packs and the signed chain of custody. The cooler(s) was then sealed with tape and a completed custody seal.

The C.T. Male geologist retained custody of all analytical samples prior to releasing them for shipment via Federal Express to the analytical laboratory, IEA, Inc., located at 200 Monroe Turnpike, Monroe, Connecticut for analysis.

The laboratory analyses results are discussed in Section 4.3.

#### 2.4 Health and Safety Monitoring

Health and Safety Monitoring consisted of breathing zone air monitoring with the PID and FID meters and radiation monitoring with a Victoreen 450 or Eberline RO-2 radiation survey meter. Monitoring was performed continuously during the execution of the subsurface investigation by the on-site geologist. No upgrading of the Level D personal protection was necessitated as a result of the air monitoring. No VOCs were detected on the PID and FID meters in the breathing zone during air monitoring. No radiation levels above background were observed.

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### **2.5 Decontamination Procedures**

The backhoe bucket was cleaned with a high temperature, high pressure washer prior to the start of work, in between each test pit, and prior to leaving the site. Decontamination was performed at the northwest corner of the site. The soil sampling equipment (stainless steel trowel) was cleaned prior to use, in between each use at each sample interval, and at completion of the project either using a high temperature, high pressure washer followed by a distilled water rinse or following the procedures specified in the Work Plan consisting of non-phosphate detergent cleaning followed by rinses with copious amounts of distilled water. Decontamination liquids were captured within a polyethylene lined decontamination pad and transferred via pump into 55 gallon DOT drums at the end of each day.

### **2.6 Disposition of Generated Wastes**

Liquids generated during the decontamination of excavation and sampling equipment were collected and stored in 55 gallon DOT drums. Soiled personal protective equipment (PPE) and excess soil generated from decontamination procedures were also collected in 55 gallon DOT drums. All waste drums were sealed, labeled and stored on a pallet on the project site and then transferred by PNS representatives to the existing HWSF for storage until the laboratory analyses results indicated the proper method of disposal. A total of one drum of liquid, one drum of soil, and one drum of PPE were generated.

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### 3.0 PHYSICAL CHARACTERISTICS OF THE SITE

#### 3.1 Regional Geology and Hydrogeology

The Portsmouth area is located in the Seaboard Lowland Section of the New England physiographic province. Characterized as an embayed coastline typical of the Maine coastal area, the area is the result of the submergence of a glacially eroded landmass.

Thin surficial deposits of glacial till and outwash and recent alluvium overlay volcanic and metamorphosed sedimentary bedrock. Bedrock has been subjected to several deformation sequences and contains a rather complex fracture pattern. Swanson and Carrigan (1984) mapped the Portsmouth Fault Zone as being present immediately south of Seavey Island. These authors considered this fault zone as a major ductile fault at the contact between the Rye Formation to the south, and the Kittery Formation to the north. The ductile fault predates the brittle faulting also seen in the area.

#### 3.2 Site Geology

The site geology is described from soils encountered during the completion of the eight test pits. Test pit logs prepared from observations collected by the on-site geologist are attached in Appendix A.2.

Overburden materials encountered in the area of the HWC&S facility generally consisted of brown to tan, fine to coarse, subangular to subrounded sands and gravel, varying from less than 1 foot to four feet in thickness. This material was interpreted as fill material on the basis of observations made during the excavations and the site history. Six of the test pits were completed to the bedrock surface/backhoe refusal which was encountered at 3.5 feet to 4 feet below ground surface.

Test pit TP-1 was excavated to a depth of 9.5 feet when the test pit collapsed. Test pit TP-4 was abandoned upon encountering and damaging a water line. Natural overburden consisting of recent beach and/or alluvial deposits was encountered

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at TP-1, TP-4 and TP-8 below the fill material. A gray, silty sandy clay was encountered at TP-1 from 4 feet to 9.5 feet and at TP-8 from 3 feet to 4 feet. Tan to yellow fine to coarse sand, possibly a beach deposit was encountered at TP-4 from 0.75 feet to 1.5 feet. A summary of the test pitting results is presented as Table 2-1 in Section 2.3.1.

Bedrock was encountered at 3.5 to 4.0 feet below the ground surface at test pits TP-2, 3, 5, 6, 7 and 8. The backhoe was able to scrape the uppermost six inches of the weathered bedrock surface. Bedrock was interpreted as gray brown, moderately weathered, moderately fractured phyllite, mapped as belonging to the Kittery Formation (Osberg, et.al., 1985).

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## 4.0 SOIL SAMPLING ANALYTICAL RESULTS

### 4.1 General

This section of the report discusses the results of field screening of soil samples, presents the analytical program and discusses the results of the laboratory analysis of soil samples. This section also contains a discussion of the QA/QC program including; field sampling quality control, laboratory quality control and data validation and data usability.

Soil sample collection methodologies are summarized in Section 2.3.1. Sample locations are identified on Figure 2, Site Plan Map of Test Pit Locations. The rationale for the selection of soil samples for analytical characterization is discussed in Section 2.3.3

### 4.2 Field Analysis Results

Field screening of soil samples consisted of PID meter and FID meter headspace analyses of soil samples. A discussion of methodologies employed is presented in Section 2.3.2. Results of the field analyses are presented in Appendix A.3.

Volatile organic compounds (VOCs) were detected in three locations with the FID; TP-1, TP-4 and TP-7 at concentrations ranging from non-detect to 120 ppm. Headspace analysis with the PID meter indicated the presence of total VOCs at five of the eight test pit locations; TP-1, and TP-4 through TP-8 at concentrations ranging from non-detect to 84 ppm. No VOCs were detected at test pits TP-2 and TP-3 with either meter.

### 4.3 Analytical Program

The laboratory analyses were performed by IEA, Inc. of Monroe, Connecticut, an EPA CLP certified laboratory. The laboratory analysis protocols that were followed by IEA are those specified in the EPA document CLP SOW OLM01.8 dated August 1991.

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Table 4-1 presents a summary of the laboratory analyses performed and the associated sample analysis methods.

**TABLE 4-1  
SUMMARY OF ANALYTICAL PROGRAM**

<b>Analytical Parameter</b>	<b>Sample Analysis Method</b>
TCL Volatiles	USEPA CLP SOW OLM01.8
TCL Semi-Volatiles	USEPA CLP SOW OLM01.8
TCL Pesticides/PCBs	USEPA CLP SOW OLM01.8
Total Petroleum Hydrocarbons (TPH)	MEDEP Method 4.1.2(1)
TAL Inorganics	EPA Method 200.7 CLP-M(2)

- (1) This method is similar to Modified EPA Method 8015.  
(2) The analysis method for inorganics was 200.7 CLP-M except for the metals listed below, the method was that given:

Arsenic	206.2 CLP-M
Lead	239.2 CLP-M
Thallium	279.2 CLP-M
Selenium	270.2 CLP-M
Cadmium	213.2 CLP-M
Mercury	245.2 CLP-M
Cyanide	335.2 CLP-M

The laboratory developed a data deliverable package including analytical results and quality control data deliverables as set forth in the EPA CLP SOW OLM01.8 document dated August 1991. The data deliverable package is referenced in the table of contents and attached under separate cover.

Complete laboratory analytical data including tabulated data, sample data summary package and chain of custody records are included in Appendix B.

#### **4.4 Laboratory Analysis Results and Evaluation of Data**

Table 4-2 presents a summary of parameter detections from laboratory analysis results.

The identification of contaminants in soil was established taking the following into consideration:

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- whether levels detected above the contract required quantitation limit (CRQL) or practical quantitation limit (PQL) were above measured or published background concentrations (where available); and
- elimination of parameters detected in quality assurance/quality control samples (i.e., equipment blanks, transport/trip blanks, field blank, laboratory method blanks, etc.) which would indicate contamination of sample during transport and/or in the laboratory and not in the environmental sample.

Parameters detected were compared to EPA soil ingestion criteria (EPA-HEAST, 1990). The worst case TCLP values were calculated by assuming that all the concentration of contaminant detected on a total basis would leach out of the sample. The TCLP values were calculated to determine if the contaminants could potentially leach out above groundwater standards and/or guidance values. TCLP values were compared to EPA maximum contaminant levels (MCLs) and Maine maximum exposure guidelines (MEGs). The level of inorganics detected were also compared to concentrations typically found in Eastern United States (Shacklette, Hanford T., 1984) to establish if the levels were typical background levels.

Evaluation of detections is divided into a discussion on TCL volatiles, TCL semi-volatiles, TCL pesticides/PCBs, TAL inorganics, and total petroleum hydrocarbons.

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**TABLE 4-2  
SUMMARY OF SOIL SAMPLE DETECTIONS AND REGULATORY STANDARDS  
SUBSURFACE INVESTIGATION OF THE PROPOSED HWC & S FACILITY  
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE**

TCL VOLATILES	EPA Soil Ingestion Criteria (2)	LOCATION AND CONCENTRATION, ug/kg(1)						
		TP-1 (4' - 6')	TP-1 (8' - 10')	TP-2 (2' - 4')	TP-4 (4' - 6')	TP-5 (0' - 2')	TP-6 (0' - 2')	TP-9 Blind Replicate of TP-6 (0'-2')
Methylene Chloride	9.3x10 <sup>-1</sup>	18B(U)	18B	17B(U)	4JB	4JB	3JB (10U)	
Acetone	6.0x10 <sup>6</sup>	93B(U)	65B	37B(U)	12B	15B		5JB (10U)
2-Butanone	4.0x10 <sup>4</sup>	12J						
<b>TCL SEMI VOLATILES</b>								
Naphthalene	3.0x10 <sup>5</sup>							
Acenaphthene	6.0x10 <sup>6</sup>							
Dibenzofuran	None							
Diethylphthalate	6.0x10 <sup>7</sup>			11J	8J		9J (330U)	
Fluorene	None							
Pentachlorophenol								
Phenanthrene	None	23J				54J		
Anthracene	2.0x10 <sup>7</sup>				12J	24J	25J	32J
Carbazole	8.3x10 <sup>3</sup>							
Di-n-butylphthalate	8.0x10 <sup>6</sup>	33JB (330U)	18JB	37JB	18JB	23JB	14JB (330U)	20JB (330U)
Fluoranthene	3.0x10 <sup>6</sup>	40J						
Pyrene	2.0x10 <sup>6</sup>	35J			32J	35J	34J	47J
Butylbenzylphthalate	2.0x10 <sup>7</sup>				28J	38J	43J	50J
Benzo (a) anthracene	2.2x10 <sup>8</sup>							
Chrysene	None							21J
Bis (2-Ethylhexyl) phthalate	5.0x10 <sup>4</sup>	65JB (330U)	100JB	37JB	16J	24J	23J	31J
Benzo (b) fluoranthene	2.2x10 <sup>2</sup>				48JB	58JB	30JB (330U)	30JB (330U)
Benzo (k) fluoranthene	2.2x10 <sup>2</sup>							29J
Benzo (a) pyrene	6.1x10 <sup>1</sup>							28J
<b>TCL PESTICIDE/PCBs</b>								34J
4,4'-DDE	2.1x10 <sup>3</sup>	3.2J		2.2J	7.6	4.4	25	30P(J)
Endrin	2.0x10 <sup>5</sup>	0.38JP			0.24JP			0.78JP
4,4'-DDD	2.9x10 <sup>3</sup>	5.6		0.25JP	11	1.9JP	0.95JP	0.78JP
4,4'-DDT	2.1x10 <sup>3</sup>	5.4B		13B	6.8B	13B	4.6P	7.0P(J)
Methoxychlor	8.0x10 <sup>4</sup>					0.72 JPB	67B	120B(J)

NOTES:

- (1) Concentrations given in ug/kg unless otherwise noted.
- (2) Taken from U.S. Environmental Protection Agency Health Effects Assessment Summary Table (HEAST) of 12/90.

CRVsg

Qualifiers for Organic Data:

- J = Indicates an Estimated Value.
- B = Indicates that the analyte was found in the associated blank as well as in the sample.
- U = Not detected.
- P = This flag is used for a pesticide/aroclor target analyte when there is a greater than 25 percent difference for detected concentrations between the two GC columns.

Note: The qualifier in parenthesis is the data validator's qualifier (U = Not Detected, J = Estimated Value)

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**TABLE 4-2  
SUMMARY OF SOIL SAMPLE DETECTIONS AND REGULATORY STANDARDS  
SUBSURFACE INVESTIGATION OF THE PROPOSED HWC & S FACILITY  
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE  
(continued)**

**LOCATION AND CONCENTRATION, mg/kg**

<b>TAL INORGANICS</b>	<b>EPA Soil Ingestion Criteria (1)</b>	<b>TP-1 (4' - 6')</b>	<b>TP-1 (8' - 10')</b>	<b>TP-2 (2' - 4')</b>	<b>TP-4 (4' - 6')</b>	<b>TP-5 (0' - 2')</b>	<b>TP-6 (0' - 2')</b>	<b>TP-9 Blind Replicate of TP-6 (0'-2')</b>
Aluminum	None	27900 (J)	24000	11000	6340	14600	10100 (J)	7920 (J)
Arsenic	$8.0 \times 10^{-1}$	6.9B	11.1B	15.2	6.2	13	12.2	11.6
Barium	$4.0 \times 10^3$	55.2	73.3	47.0	25.4B	43.1	41.6	27.8B
Beryllium	$1.6 \times 10^{-1}$	1.6 (J)	1.4	0.30B		0.42B	0.28B (J)	0.28B (J)
Calcium	None	1170* (J)	1220*	1530*	909*	1230*	1590* (J)	956* (J)
Chromium	None	45.3	39.3	33.8	16.8	41.6	30.0 (J)	17.3 (J)
Cobalt	None	8.5B	9.0B	8.4B	3.3B	9.2B	7.2B	4.4B
Copper	None	19.5	24.3	16.8	8.4	25.1	18.5	16.5
Iron	None	24700	30000	18100	9520	20200	16300	10900
Lead	$2.5 \times 10^{-2}$	14.7N* (J)	9.6N*	6.7N*	9.8N*	27.6N*	22.8N* (J)	11.2N* (J)
Magnesium	None	7340 (J)	7090	6460	3190	6700	5010 (J)	2600 (J)
Manganese	$2.0 \times 10^{-1}$	235	234	280	110	271	284	165
Nickel	$2.0 \times 10^{-3}$	29.3 (J)	30.8	25.7	12.8	29.7	24.5 (J)	13.2 (J)
Potassium	None	3890 (J)	5840	2420	1620	1390	1750 (J)	1040 (J)
Selenium	None	1.1BN (J)			0.32BNW	0.25BN		
Sodium	None	1110	1160	151.8	136.8	188.8	258 (J)	200.8 (J)
Thallium	6.0	0.34B	0.43B	0.21U			0.42B	0.22B
Vandarium	$6.0 \times 10^{-2}$	49.7	48.0	29.7	14.7	31.6	24.7	18.0
Zinc	$2.0 \times 10^4$	68.2	65.6	34.6	24.0	44.6	55.9	41.6

**NOTES:**

(1) Taken from U.S. Environmental Protection Agency Health Effects Assessment Summary Table (HEAST) of 12/90.

**Qualifiers for Inorganic Data:**

- N = Spiked sample recovery not within control limits.
  - B = Indicates a value greater than or equal to the instrument detection limit but less than the contract required detection limit.
  - U = Not detected.
  - \* = Duplicate analysis not within control limits.
  - E = Reported value is estimated because of the presence of interference.
  - W = Post-digest spike recovery furnace analysis was out of 85 - 115 percent control limit, while sample absorbance was less than 50 percent of spike absorbance.
  - S = The reported value was determined by method of standard additions.
- Note: The qualifier in parenthesis is the data validator's qualifier (U = Not Detected, J = Estimated Value)

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**TABLE 4-2**  
**SUMMARY OF SOIL SAMPLE DETECTIONS AND REGULATORY STANDARDS**  
**SUBSURFACE INVESTIGATION OF THE PROPOSED HWC & S FACILITY**  
**PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE**  
 (continued)

TCL VOLATILES	EPA Soil Ingestion Criteria (2)	TP-7 (0'-2')	TP-8 (2'-4')	LOCATION AND CONCENTRATION, ug/kg(1)				
				Transport Blank 6/2/94 Lab ID 0511007 (ug/l)	Transport Blank 6/2/94 Lab ID 0511014 (ug/l)	Equipment Blank 6/1/94 Before TP-1 (0' - 2') (ug/l)	Equipment Blank 6/2/94 Before TP-4 (4' - 6') (ug/l)	Field Blank (Decontamination Water) (ug/l)
Methylene Chloride	9.3x10 <sup>4</sup>	4JB		14B	11B	1JB		
Acetone	6.0x10 <sup>4</sup>	13B	13B (U)					
<b>TCL SEMI VOLATILES</b>	4x10 <sup>6</sup>							
Naphthalene	3.0x10 <sup>5</sup>		11J					
Acenaphthene	5.0x10 <sup>5</sup>		12J					
Dibenzofuran	None		10J					
Diethylphthalate	6.0x10 <sup>7</sup>							
Fluorene	None		18J			0.8JB	0.3JB	2JB
Phenanthrene	None		120J					
Anthracene	2.0x10 <sup>7</sup>		17J					
Carbazole	8.0x10 <sup>3</sup>		14J					
Di-n-butylphthalate	8.0x10 <sup>6</sup>	12JB	20JB (330U)					
Fluoranthene	3.0x10 <sup>6</sup>	14J	110J			0.9JB	0.8JB	0.8JB
Pyrene	2.0x10 <sup>6</sup>	16J	100J					
Butylbenzylphthalate	2.0x10 <sup>7</sup>	23J						
Benzo (a) anthracene	2.2x10 <sup>2</sup>		41J					
Chrysene	None		51J					
Bis (2-Ethylhexyl) phthalate	5.0x10 <sup>4</sup>	32JB	69JB (330U)					
Benzo (b) fluoranthene	2.2x10 <sup>-2</sup>					15	4J	2J
Benzo (k) fluoranthene	2.2x10 <sup>-2</sup>							
Benzo (a) pyrene	6.1x10 <sup>1</sup>							
<b>TCL PESTICIDE/PCBs</b>								
4,4'-DDE	2.1x10 <sup>3</sup>	31P	2.5JP					
Endrin	2.0x10 <sup>5</sup>	1.8JP	0.47JP					
4,4'-DDD	2.9x10 <sup>3</sup>	26P	2.5J					
4,4'-DDT	2.1x10 <sup>3</sup>	170PB	10B					
Methoxychlor	8.0x10 <sup>4</sup>							

NOTES:

- (1) Concentrations given in ug/kg unless otherwise noted.
- (2) Taken from U.S. Environmental Protection Agency Health Effects Assessment Summary Table (HEAST) of 12/90.

CR/sg

Qualifiers for Organic Data:

- J = Indicates an Estimated Value.
- B = Indicates that the analyte was found in the associated blank as well as in the sample.
- U = Not detected.
- P = This flag is used for a pesticide/aroclor target analyte when there is a greater than 25 percent difference for detected concentrations between the two GC columns.

Note: The qualifier in parenthesis is the data validator's qualifier (U = Not Detected, J = Estimated Value)

**TABLE 4-2**  
**SUMMARY OF SOIL SAMPLE DETECTIONS AND REGULATORY STANDARDS**  
**SUBSURFACE INVESTIGATION OF THE PROPOSED HWC & S FACILITY**  
**PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE**  
 (continued)

LOCATION AND CONCENTRATION, mg/kg

TAL INORGANICS	EPA Soil Ingestion Criteria (1)	TP-7 (0'-2')	TP-8 (2'-4')	Transport Blank 6-1-94 (ug/l)	Transport Blank 6-2-94 (ug/l)	Equipment Blank 6-1-94 Before TP-1 (0' - 2') (ug/l)	Equipment Blank 6-2-94 Before TP-4 (4' - 6') (ug/l)	Field Blank (Decontamination Water) (ug/l)
Aluminum	None	11500	13600 (J)					
Arsenic	8.0x10 <sup>1</sup>	12.4	14.7 (J)			23.3B		
Barium	4.0x10 <sup>3</sup>	48.1	54.6					
Beryllium	1.6x10 <sup>-1</sup>	0.47B	0.47B (J)					
Calcium	None	1990*	1970* (J)					
Chromium	None	33.0	38.6 (J)			87.5B (J)	83.4B (J)	83.4B (J)
Cobalt	None	9.7B	7.4B					
Copper	None	22.6	29.1					
Iron	None	18800	18100					
Lead	2.5x10 <sup>2</sup>	25.7N*	28.8* (J)					
Magnesium	None	5740	5360 (J)					
Manganese	2.0x10 <sup>4</sup>	307	219			20.8B (J)		18.4B (J)
Nickel	2.0x10 <sup>3</sup>	30.4	26.4 (J)			1.2B		
Potassium	None	2190	1870 (J)					
Selenium	None	378	358 (J)					
Sodium	None	0.60BWN (J)						
Thallium	6	0.31B	0.26B			139.8 (J)	46.0B (J)	93.3B (J)
Vandadium	6.0x10 <sup>2</sup>	31.7	30.1					
Zinc	2.0x10 <sup>4</sup>	53.8	55.9			8.1B	6.6B	6.2B

NOTES:  
 (1) Taken from U.S. Environmental Protection Agency Health Effects Assessment Summary Table (HEAST) of 12/90.

Qualifiers for Inorganic Data:  
 N = Spiked sample recovery not within control limits.  
 B = Indicates a value greater than or equal to the instrument detection limit but less than the contract required detection limit.  
 U = Not detected.  
 \* = Duplicate analysis not within control limits.  
 E = Reported value is estimated because of the presence of interference.  
 W = Post-digest spike recovery furnace analysis was out of 85 - 115 percent control limit, while sample absorbance was less than 50 percent of spike absorbance.  
 S = The reported value was determined by method of standard additions.  
 Note: The qualifier in parenthesis is the data validator's qualifier (U = Not Detected, J = Estimated Value)

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- Volatiles Organic Compounds:

No 1,1,2 trichlorotrifluoromethane (Freon 113) was detected. Methylene chloride and acetone were detected in some of the samples but these compounds were also detected in laboratory method blanks and are common laboratory artifacts. The methylene chloride and acetone are not considered site contaminants. 2-butanone was detected at an estimated concentration of 12 ug/kg in soil sample TP-1, 4 to 6 feet, but not in the 8 to 10 foot sample. The detected concentration is several orders of magnitude below the EPA health based criteria for soil ingestion. The calculated worst case TCLP value of 0.6 ug/l is also below the Maine MEG of 170 ug/l. The results indicate that the level of 2-butanone detected in the soil is at a level that is protective of human health and the environment.

- Semi-Volatile Organic Compounds:

Low levels of polynuclear aromatic hydrocarbons (PNAs) and phthalate esters were detected in site soils, but at levels below the CRQLs. Diethylphthalate, di-n-butylphthalate, and bis(2-ethylhexyl)phthalate detections were also found in laboratory blanks and are common laboratory contaminants. These compounds therefore are not considered to be present in the environmental samples or site contaminants, but rather laboratory introduced contamination. Semi-volatile organic compound detections were generally several orders of magnitude below EPA health based criteria for soil ingestion. The calculated worst case TCLP value of the highest concentration of PNA detected (i.e., 6 ug/l for phenanthrene) is above the Maine MEG of 0.03 ug/l for the class of PNA compounds. (The Maine MEG of 0.03 ug/l is not compound specific.) This however assumes that all of the concentration detected would leach out which is conservative. Taking into consideration attenuation/dilution the potential for the PNAs to be present in groundwater above Maine MEGs appears low. Qualitative concentrations of semi-volatile parameters were detected in the background soils samples on the PNS as part of the RCRA Facility Investigation conducted by McClaren and Hart in 1991 and reported in the RCRA Facility Investigation Report dated July 17, 1992. PNAs are typical components of fuel oil and motor oil and also result from the incomplete combustion of fossil fuels (oil, coal, wood).

## C.T. MALE ASSOCIATES, P.C.

The low levels detected in the soil samples, and their presence in background soils on the PNS suggest that the levels detected are at background levels. The levels detected are below EPA soil ingestion criteria and therefore protective of human health with respect to ingestion/contact.

- Pesticides/PCBs:

No TCL PCBs were detected in any of the soil samples. Four TCL pesticides were consistently detected at low levels in soil samples including 4,4'-DDT, 4,4'-DDE, 4,4'-DDD and endrin. Six locations reported detections of these analytes above the CRQL. The 4,4'-DDT was consistently detected in the method blanks and therefore is felt to be laboratory contamination and not present in the environmental samples. The other three pesticides ranged in concentrations from non-detect to 31 ug/kg. Methoxychlor was detected at TP-5 at 0.72 ug/kg; a value below the CRQL. TCL pesticide detections reported were several orders of magnitude below EPA health based criteria for soil ingestion. Pesticides were detected in the background soils sampled during the RCRA Facility Investigation conducted by McClaren and Hart in 1991 and reported in the RCRA Facility Investigation Report, dated July 17, 1992. The low levels of pesticides detected in the soil samples, below EPA soil ingestion criteria, and the presence of pesticides in background soils on the PNS indicate that the pesticides detected in the soil samples are protective of human health and the environment and appear to be at background levels.

- TAL Inorganics:

Eighteen metals were detected in the soil samples. No metals were detected in exceedance of the EPA health based criteria for soil ingestion. Table 4-3 presents typical range of metal concentrations found in soil in Eastern United States. No metals were detected outside these typical ranges. Cyanide was not detected in any of the soil samples. The results indicate that metals are not contaminants in the soil and that the levels detected are at background levels and protective of human health and the environment.

**C.T. MALE ASSOCIATES, P.C.**

- Tentatively Identified Compounds:

The laboratory mistakenly did not report tentatively identified compounds (TICs). This data has been requested from and will be provided by the laboratory. An addendum to this report and an addendum to the data deliverable package referenced in the table of contents will be prepared on the TIC results.

- Total Petroleum Hydrocarbons (TPH):

No detections were reported from the petroleum hydrocarbon scan.

TABLE 4-3  
TYPICAL RANGE OF METAL CONCENTRATIONS FOUND IN SOIL

Element/Metal	Eastern United States <sup>(1)</sup> (mg/kg)
Aluminum	5,000 -> 100,000
Antimony	NA
Arsenic	<0.1 - 73
Barium	10 - 1,500
Beryllium	<1 - 7(2)
Cadmium	0.01 - 7(2)
Calcium	100 - 280,000
Chromium	1 - 1,000
Cobalt	<0.3 - 70
Copper	<1 - 700
Iron	100 - >100,000
Lead	<10 - 300
Magnesium	50 - 50,000
Manganese	<2 - 7,000
Mercury	0.01 - 3.4
Nickel	<5 - 700
Potassium	50 - 37,000
Selenium	<0.1 - 3.9
Silver	NA
Sodium	500 - 50,000
Thallium	2.2 - 23
Vanadium	<7 - 300
Zinc	<5 - 2,900

## References:

- (1) Shacklette, Hanford, T. and J. Boerngen, 1984.  
 (2) Dragun, James. The Soil Chemistry of Hazardous Materials; Hazardous Materials Control Research Institute; Silver Spring, Maryland.  
 NA = Not available.

#### 4.4 Quality Assurance/Quality Control Program (QA/QC)

The Quality Assurance/Quality Control (QA/QC) Program was implemented as detailed in the Work Plan. Field and laboratory quality control checks were performed to monitor and document the integrity and quality of the data. The measurement parameters used to determine the quality of the data are precision, accuracy, completeness, representative and comparability. Complete analytical results of the QA/QC program are included in the tabulated data in Appendix B.1. A summary of the detected parameters is presented in Table 4-2.

##### 4.4.1 FIELD SAMPLING QUALITY CONTROL

The field sampling quality control checks included taking a replicate sample to monitor analytical precision/reproducibility and sampling technique; taking equipment blanks after the sampling equipment was decontaminated to check for cross contamination and equipment cleanliness; taking a field blank of the decontamination water to check for contaminants that could result in cross-contamination; and having transport blanks transported with the sample containers for volatile analyses to monitor sample handling.

Field sampling quality control performed for this project consisted of the collection of, a replicate soil sample (TP-9; replicate of TP-6), an equipment blank for each day of sampling; a field blank of distilled water utilized for decontamination of equipment, and transport/trip blanks accompanying sample shipments. Table 4-4 presents a summary of QA/QC samples collected and analyses performed.

TABLE 4-4  
QUALITY ASSURANCE/QUALITY CONTROL SAMPLING SUMMARY

Type of QA/QC Sample	Sample ID and Date	Location/Description	Analytical Parameters
Replicate Sample	TP-9 (0'-2') 6-2-94	TP-6 (0'-2')	TCL Volatiles and Freon 113, TCL Semi-Volatiles, TAL Inorganics and Cyanide, TCL Pesticides/PCB's, TPH
Equipment Blanks	Equipment Blank 6-1-94	Before TP-1 (0' - 2')	TCL Volatiles and Freon 113, TCL Semi-Volatiles, TAL Inorganics and Cyanide, TCL Pesticides/PCB's, TPH
	Equipment Blank 6-2-94	Before TP-4 (4' - 6')	TCL Volatiles and Freon 113, TCL Semi-Volatiles, TAL Inorganics and Cyanide, TCL Pesticides/PCB's, TPH
Field Blank	Field Blank 6-2-94	Distilled Water Utilized in Sample Equipment Decontamination	TCL Volatiles and Freon 113, TCL Semi-Volatiles, TAL Inorganics and Cyanide, TCL Pesticides/PCB's, TPH
Transport Blanks	Transport Blank 6-1-94-1	With Soil Samples: TP-1 (4'-6'), TP-1 (8'-10'), and TP-2 (2'-4')	TCL Volatiles and Freon 113
	Trip Blank 6-2-94-2	With Soil Samples: TP-4, TP-5, TP-6, TP-7, TP-8, TP-9	TCL Volatiles and Freon 113

#### 4.4.2 LABORATORY QUALITY CONTROL

Quality control samples were run in accordance with the protocols and specified frequencies of the EPA document CLP SOW OLM01.8 dated August 1991, except that QA/QC for TPH was performed in accordance with Modified EPA Method 8015 requirements. The laboratory quality control checks performed by the analytical laboratory included method blanks, initial and continuing calibration, control samples, matrix spike/matrix spike duplicates, matrix spike blanks, surrogate spikes and duplicates. Documentation of the quality assurance/quality control (QA/QC) performed by IEA, Inc. is presented in the data deliverables package referenced in the table of contents and presented under separate cover. The Sample Data Summary Package of the analytical results and QA/QC results prepared by IEA is attached in Appendix B.2. The laboratory's data qualifiers based on the QA/QC results are included in the Sample Data Summary Package and are included in the tabulated data in Appendix B.1.

#### 4.4.3 EVALUATION OF QUALITY CONTROL RESULTS

The quality control results were reviewed and evaluated to determine which analytical detections were actually present in the soil samples and which were a result of laboratory or sampling contamination, or contaminated during transport.

Where a parameter was detected in the laboratory blank, the parameter was considered a laboratory contaminant and not considered to be present in the associated environmental sample. This was generally the case for detections of methylene chloride, acetone, diethylphthalate, di-n-butylphthalate, bis(2-ethylhexyl) phthalate, 4,4'-DDT.

Some low detections of methylene chloride did occur in the transport blanks that accompanied samples for volatile analyses. The detections were also noted as being in the laboratory blank, indicating laboratory contamination, not contamination during transport, and the results were not affected.

## C.T. MALE ASSOCIATES, P.C.

The two equipment blanks taken during sampling showed low detections below the CRQL for methylene chloride (in 6/1/94 sample only), diethylphthalate, and di-n-butylphthalate which were also detected in the laboratory blank, indicating laboratory contamination and not cross-contamination from sampling equipment. Metals including cobalt, manganese, nickel, sodium and zinc were also detected at levels above the instrument detection limit but below the CRQL. Bis (2-ethylhexyl) phthalate was detected in the June 1, 1994 equipment blank above the CRQL (15 ug/l) but it is a common laboratory artifact and it was detected in some of the laboratory method blanks. These same parameters were also detected in the field blank sample (distilled water utilized in decontamination of equipment) at similar concentrations indicating that the detections in the equipment blank are not from cross contamination. Results of the field blanks did not indicate the presence of any of the analytes above the CRQL.

A replicate sample of TP-6 (0' - 2') was collected and identified as TP-9 (0' - 2'). Replicate sampling results generally indicated the same components were detected within the same order of magnitude, indicating good laboratory reproducibility. The exception was that a greater degree of variability between the two samples was observed in the TAL inorganic detections. This variability though can be attributed to matrix variability and the condition that metal concentrations can vary within a sample due to their natural presence in soil.

#### 4.4.4 DATA VALIDATION/DATA USABILITY

The data deliverable package, prepared by IEA, Inc. was externally validated by ECHEM, Inc. The samples that were validated are listed below:

Lab Sample ID0511001:	TP-1, 4-6 FT
Lab Sample ID 0511010:	TP-6, 0-2 FT
Lab Sample ID 0511012:	TP-8, 2-4 FT
Lab Sample ID 0511013:	TP-9, 0-2 FT (Replicate of TP-6, 0-2 FT)
Lab Sample ID 0511007:	Trip Blank 6/2/94
Lab Sample ID 0511014:	Trip Blank 6/2/94

## C.T. MALE ASSOCIATES, P.C.

Validation of laboratory data was performed in accordance with the following documents:

- Requirements for Quality Control of Analytical Data, Hazardous Waste Remedial Actions Program, Martin Marietta Energy Systems, Inc., DOE/HWP-69/R1, July 1990.
- USEPA Region 1 Functional Guidelines for Evaluating Organic Analyses, February 1, 1988 as modified by Deborah Szaro November 1, 1988.
- USEPA Region 1 Functional Guidelines for Evaluating Inorganic Analyses, June 13, 1988, modified February 1989.

The narrative portion of the data validator's reports are included in Appendix C. The data validator's qualifiers have been inserted on the laboratory's Sample Data Summary Package (in red ink on the original). C.T. male has included the validator's qualifiers in parenthesis on the tables of results including Table 4-2 and Table B.1 in Appendix B.1.

In general there was agreement between the laboratory's qualifiers and the data validator's qualifiers. The qualifiers present the quality control (QC) conditions of the data. The qualifiers do not imply that the data is unusable. Only rejected results, the "R" qualifier, are considered unusable. Most of the qualifiers identified in the data deliverable packages for the subsurface investigation represent minor QC problems that do not affect the usability of the data or the results.

In a few instances the validator changed a result. When the parameter was detected in the laboratory blank the result was generally changed to "U", undetected qualifier. If some of the QC protocols presented in the CLP SOW were not met, then the result was flagged by the validator as "J", estimated value qualifier.

**C.T. MALE ASSOCIATES, P.C.**

The only instance where data was rejected was in the case of 2-butanone for samples identified as transport blank 6/2/94-1, equipment blank 6/1/94, equipment blank 6/2/94, and field blank 6/2/94. The validator rejected the detection limit values due to the instrument calibration not meeting the minimum relative response factor for the analytical equipment. This change does not effect the results since no detections were reported.

## 5.0 SUMMARY AND CONCLUSIONS

A subsurface investigation of the proposed HWC&S facility at the PNS was implemented by C.T. Male and C.T. Male's excavating subcontractor, Clean Harbors Environmental Services, Inc. and laboratory subcontractor, IEA, Inc.

The subsurface investigation included test pit excavations, soil sampling, field screening of soil samples, laboratory analysis of soil samples, field and laboratory quality control checks and data validation.

The findings of the subsurface investigation indicate the presence of some target compound list parameters at low levels in the soil samples analyzed. 2-butanone was the only volatile compound detected in one sample at insignificant levels and at levels protective of human health and the environment.

Several semi-volatile polynuclear aromatic (PNAs) hydrocarbons were detected at low levels. PNAs are typical components of fuel oil and motor oil and also result from the incomplete combustion of fossil fuels (oil, coal, wood). The low levels of PNAs detected in the soil samples, and their presence in background soils on the PNS suggest that the levels detected are at background levels and the result of incomplete combustion residues. All of the PNA detections were below the CRQLs and do not appear to be the result of migration of contamination from the previous waste oil tanks 200± feet west of the area investigated. The levels detected are below EPA soil ingestion criteria and therefore protective of human health with respect to ingestion/contact.

No TCL PCBs were detected. Low levels of four TCL pesticides were detected. Pesticides were detected in background soil samples collected on the PNS during the RCRA Facility Investigation in 1991 and therefore the levels detected are felt to be at background levels. The levels detected are also protective of human health being below EPA soil ingestion criteria.

**C.T. MALE ASSOCIATES, P.C.**

Several TAL inorganics were detected in the soil samples analyzed but at concentrations below EPA soil ingestion criteria and at concentrations typically found in soil in Eastern United States. Metals therefore are felt to be at background levels in the soil.

No petroleum products (No. 1, 2, 4 or 6 oil) were identified by total petroleum hydrocarbon analysis.

Based on the extent of investigations conducted and described in this report, the levels of constituents in the soil in the area of the proposed HWC&S facility appear to be protective of human health and the environment and at background levels. It does not appear that the previous underground waste oil storage tanks, 200± feet west of the area investigated, have had an impact on soil in the area of the proposed HWC&S facility.

REFERENCES

C.T. Male Associates, P.C., 1994. "Site Specific Health and Safety Plan for the Subsurface Investigation of the Proposed Hazardous Waste Consolidation and Storage Facility," Portsmouth Naval Shipyard, May 23, 1994.

C.T. Male Associates, P.C., 1994. "Work Plan Subsurface Investigation of Proposed Hazardous Waste Consolidation and Storage Facility, Portsmouth Naval Shipyard, Kittery, Maine," May 23, 1994.

Dragun, James. "The Soil Chemistry of Hazardous Materials, Hazardous Materials Control Research Institute," Silver Springs, Maryland.

EPA - HEAST, 1990. "Health Effects Assessment Summary Tables (HEAST)," U.S. Department of Environmental Protection Agency, December 1990.

Maine Department of Human Services, "Summary of State and Federal Drinking Water Guidelines," Bureau of Health, September 1992.

McLaren and Hart, 1992. "RCRA Facility Investigation Report," prepared for the Portsmouth Naval Shipyard, July 17, 1992.

Osberg, P.H., Hussey, A.M. and Boone, G.M., 1985, Bedrock Geologic Map of Maine: Maine Geological Survey, Augusta, Maine.

Shacklette, Hanford, T. and J. Boerngan, 1984. "Elemental Concentrations in Soils and Other Surficial Materials of the Conterminous United States," U.S. Geological Survey Professional Paper 1270, Washington, D.C.

Sittig, Marshal, 1985. "Handbook of Toxic and Hazardous Chemicals," Noyes Publication, Park Ridge, New Jersey.

Swanson, M.T. and Carrigan, J.A., 1984, "Duchle and Brittle Structures Within The Rye Formations of Southern Coastal Maine and New Hampshire," In Geology of the Coastal Lowlands, Boston, Massachusetts to Kennebunk, Maine, Hanson, L.S. ed., New England Intercollegiate Geological Conference, 76th Annual Meeting, Salem State College, Salem, Massachusetts, pp 165 - 185.

CR/sg  
CTMA #94.4462

## FINAL PRELIMINARY ASSESSMENT

Electronic copies of reference materials for Appendix C are provided on the CD-ROM in folder:

Reference\_Documents\Source\_Data\Appendix\_C

**Links to all reference documents are provided in Appendix A**

## **Appendix D: Ordnance Technical Data Sheets**

# Ordnance Technical Data Sheet

## SMALL-ARMS AMMUNITION

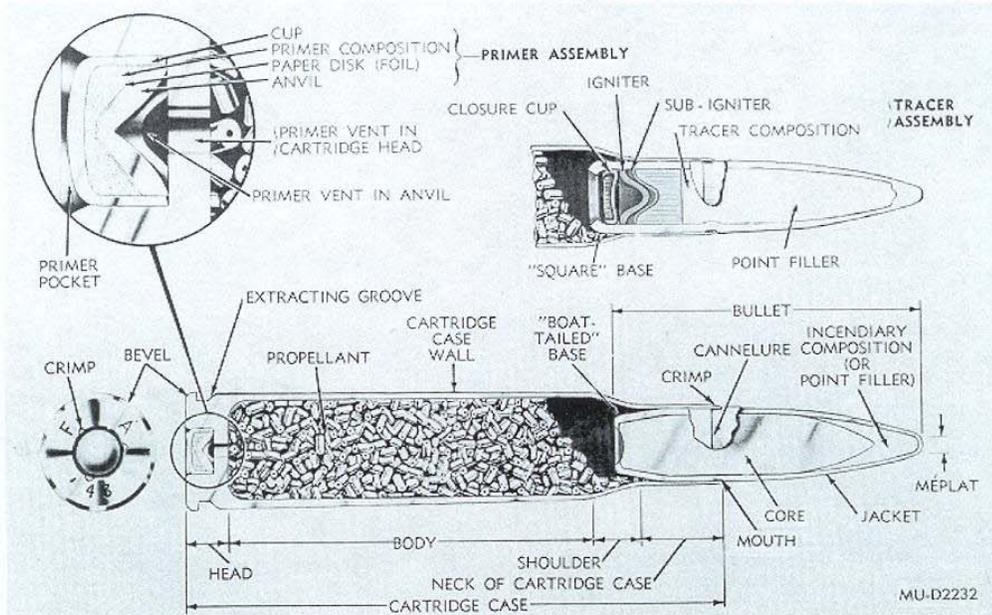


Figure 1. Typical cartridge (sectional)

**General.** Small-arms ammunition, as used herein, describes a cartridge or families of cartridges intended for use in various types of hand-held or mounted weapons through 30 millimeter. Within a caliber designation, these weapons may include one or more of the following: rifles (except recoilless), carbines, pistols, revolvers, machineguns and shotguns. For purposes of this publication, small-arms ammunition may be grouped as cartridges intended primarily for combat or training purposes (API, HEI, tracer or ball); for training purposes only (blank or dummy); or for special purposes (rifle grenade or spotter-tracer). Refer to TM 9-1306-200 for more detailed information on small-arms ammunition.

**Cartridges.** In general, a small-arms cartridge is identified as an assembly of a cartridge case, primer, a quantity of propellant within the cartridge case, and a bullet or projectile. Blank and rifle grenade cartridges are sealed with paper closure disks in lieu of bullets. Dummy cartridges are composed of a cartridge case and a bullet. Some dummy cartridges contain inert granular materials to simulate the weight and balance of live cartridges. A typical cartridge and the terminology of its components are shown in figure 1.

**Case.** Although steel, aluminum, zinc and plastic materials have been used experimentally, brass, a composition of 70 percent copper and 30 percent zinc, is the most commonly used material for cartridge cases. Steel, as well as brass, is an approved material for caliber .45 cartridge cases. Brass, paper and plastic are used for 12 gage shotshell bodies. Aluminum is used for military-type .410 gage shotshell bodies. Configurations of cartridges and bullets are illustrated in figures 2 through 11.

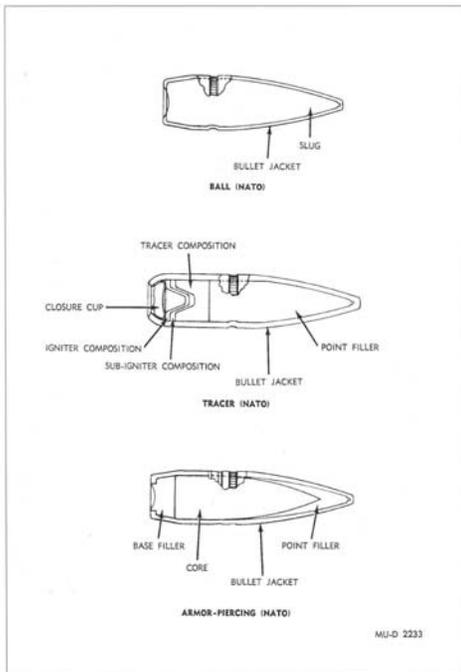


Figure 2. 7.62 mm bullets (sectional)

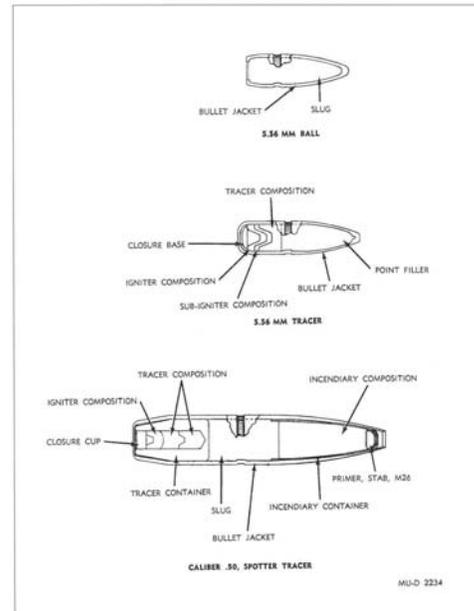


Figure 3. 5.56mm and caliber .50 spotter tracer bullets (sectioned)

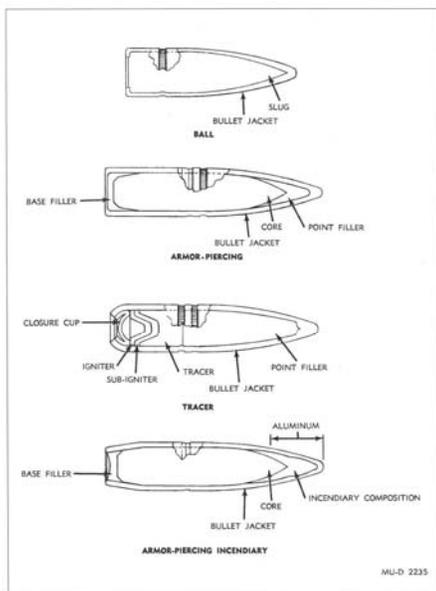


Figure 4. Caliber .30 bullets (sectional)

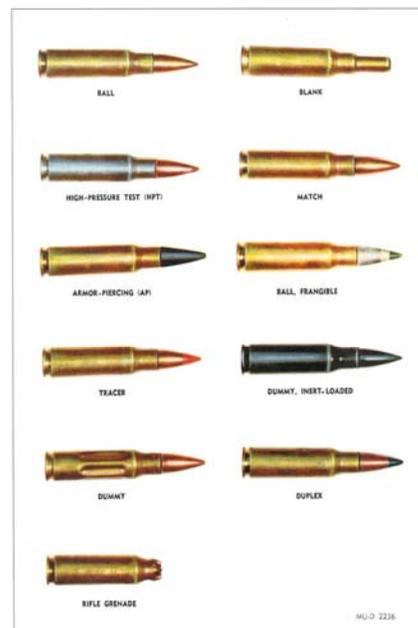


Figure 5. 7.62mm cartridges

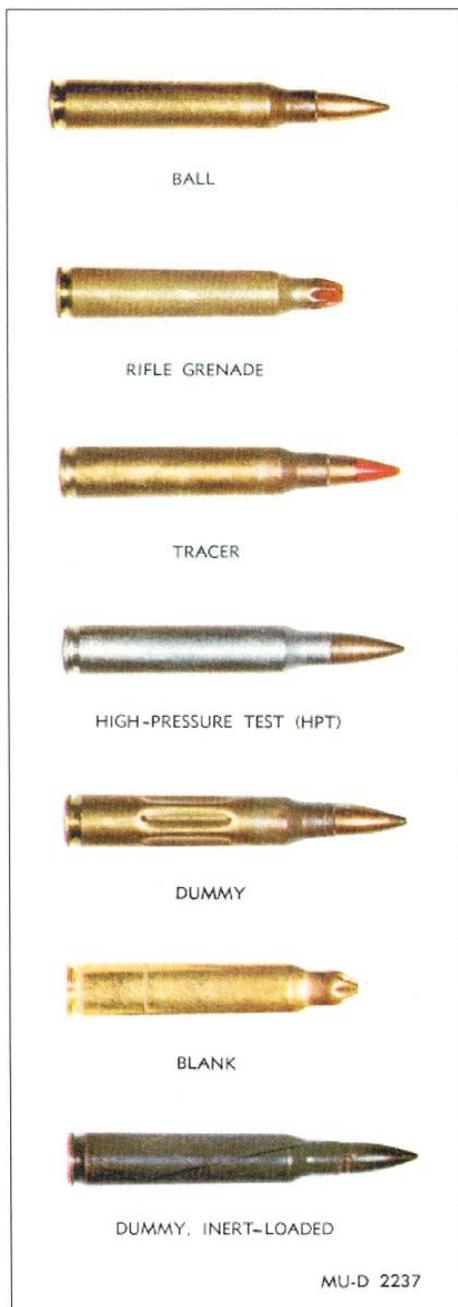


Figure 6. 5.56mm cartridges

*Propellant.* Cartridges are loaded with varying weights of propellant. This is to impart sufficient velocity (within safe pressures) to the projectile to obtain the required ballistic performance. These propellants are either of the single-base (nitrocellulose) or double-base (nitrocellulose and nitroglycerine) type. The propellant grain configuration may be cylindrical with a single, lengthwise perforation, spheroid (ball) or flake. Most propellants are coated with a deterrent (to assist in controlling the rate of combustion) and with a final coating of graphite (to facilitate flow of propellant and eliminate static electricity in loading cartridges).

*Primer.* Small-arms cartridges contain either a percussion or electric primer. The percussion primer consists of a brass or gilding metal cup that contains a pellet of sensitive explosive material secured by a paper disk and a brass anvil. The electric primer consists of an electrode button in contact with the priming composition, a primer cup assembly and insulator. A blow from the firing pin of the weapon on the center of the percussion primer cup base compresses the primer composition between the cup and the anvil. This causes the composition to explode. The function of the electric primer is accomplished by a firing pin with electrical potential, which contacts the electrode button. This allows current to flow through the energy-sensitive priming composition to the grounded primer cup and cartridge case, exploding the priming composition. Holes or vents in the anvil or closure cup allow the flame to pass through the primer vent in the cartridge case and ignite the propellant. Rimfire ammunition, such as the caliber .22 cartridge, does not contain a primer assembly. Instead, the primer composition is spun into the rim of the cartridge case and the propellant is in intimate contact with the composition. On firing, the firing pin strikes the rim of the cartridge case, compressing the primer composition and initiating its explosion.



Figure 7. Caliber .30 cartridges

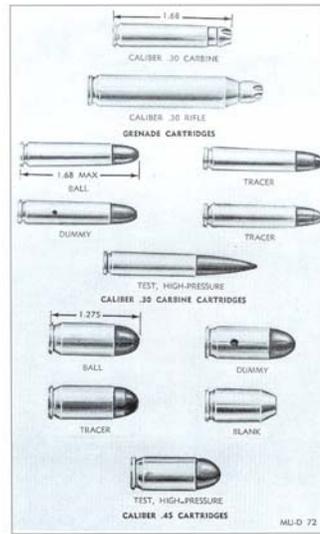


Figure 8. Caliber .30 carbine and caliber .45 cartridges

**Bullet.** With few exceptions, bullets through caliber .50 are assemblies of a jacket and a lead or steel core. They may contain other components or chemicals which provide the terminal ballistic characteristics of the bullet type. The bullet jacket may be either gliding metal, gliding-metal clad steel, or copper plated steel. Caliber .30 and 7.62mm frangible bullets are molded of powdered lead and a friable plastic which pulverizes into dust upon impact with the target. The pellets used in the shotgun shells are spheres of lead alloys varying from 0.08 inch to 0.33 inch in diameter.



Figure 9. Caliber .50 cartridges

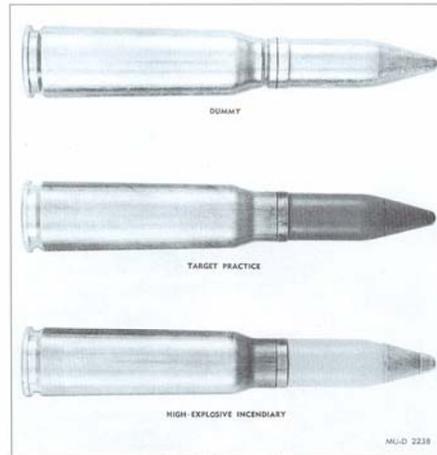


Figure 10. 20mm cartridges

**Ball Cartridge.** The ball cartridge is intended for use in rifles, carbines, pistols, revolvers and/or machineguns against personnel and unarmored targets. The bullet, as designed for general purpose combat and training requirements, normally consists of a metal jacket and a lead slug. Caliber .50 ball bullet and 7.62-mm, Ball M59 bullet contain soft steel cores.

**Tracer Cartridge.** By means of a trail of flame and smoke, the tracer cartridge is intended to permit visible observation of the bullet's in-flight path or trajectory and the point of impact. It is used primarily to observe the line of fire. It may also be used to pinpoint enemy targets to ignite flammable materials and for signaling purposes. The tracer element consists of a compressed, flammable, pyrotechnic composition in the base of the bullet. This composition is ignited by the propellant when the cartridge is fired. In flight, the bullet emits a bright flame which is visible to the gunner. Trace burnout occurs at a range between 400 and 1,600 yards, depending upon the caliber of ammunition.

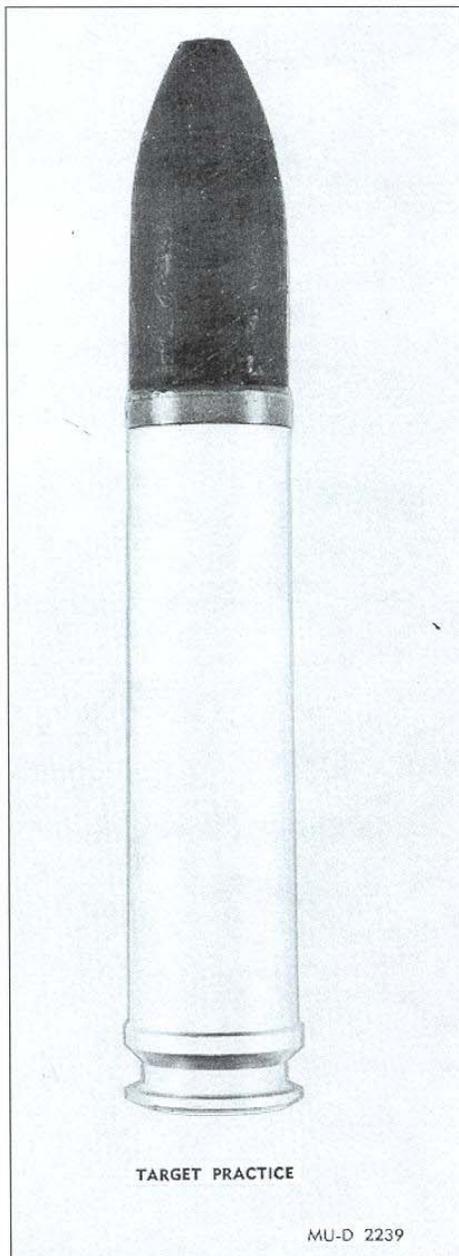


Figure 11. Typical 30mm projectile

*Match Cartridge.* The match cartridge is used in National and International Match Shooting competitions. The bullet consists of a gliding-metal jacket over a lead slug.

The cartridges are identified on the head face with the designation NM (National Match) or Match.

*Armor-Piercing Cartridges.* The armor-piercing cartridge is intended for use in machine-guns or rifles against personnel and light armored and unarmored targets, concrete shelters, and similar bullet-resisting targets. The bullet consists of a metal jacket and a hardened steel-alloy core. In addition, it may have a base filler and/or a point filler of lead.

*Armor-Piercing-Incendiary Cartridge.* The armor-piercing-incendiary cartridge is used in rifles or machineguns as a single combination cartridge in lieu of separate armor-piercing and incendiary cartridges. The bullet is similar to the armor-piercing bullet, except that the point filler is incendiary mixture instead of lead. Upon impact with the target, the incendiary mixture burst into flame and ignites flammable material.

*Armor-Piercing-Incendiary Tracer Cartridge.* The bullet of the armor-piercing-incendiary-tracer cartridge combines the features of the armor-piercing, incendiary, and tracer bullets and may be used to replace those cartridges. The bullet consists of a hard steel core with compressed pyrotechnic mixture in the cavity in the base of the core. The core is covered by a gilding-metal jacket with incendiary mixture between the core point and jacket. This cartridge is for use in caliber .50 weapons only.

*Duplex Cartridge.* The duplex cartridge contains two special ball type bullets in tandem. The front bullet is positioned partially in the case neck, similarly to a standard ball bullet. The rear bullet, positioned completely within the case, is held in position by a compressed propellant charge. The base of the rear bullet is angled so that in flight, it follows a path slightly dispersed from that of the front bullet.

## **Appendix E: Response to Comments**

**RESPONSES TO MEDEP COMMENTS DATED DECEMBER 6, 2004  
DRAFT PRELIMINARY ASSESSMENT FOR SMALL ARMS RANGE, OCTOBER 2004  
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE**

1. **Comment:** In Section 2.3 Munitions Related Training/Storage/Usage, p. 2-5, the report indicates that a 1916 map of the prison shows an indoor shooting range. We note that additional historical material from the 1940s discusses acquisitions of firearms for use in the Yard's "Rehabilitation and Restoration Program for general courts-martial prisoners who are scheduled to return to duty."

Since it seems likely such a range did exist are there any records that may indicate what happened to the lead from the firing range? Would it have been disposed of with the general trash?

**Response:** No records are available which indicates what happened to the lead from the firing range.

2. **Comment:** In addition, the Interview Record for the 8/26/03 interview with Jim Dolph states, "Mr. Dolph gave us a map illustrating the location of the 'dangerous ammo' disposal area."

Please provide details regarding the "dangerous ammo" disposal area. Where was it located and how much use did it receive?

**Response:** The "dangerous ammo" disposal area is located within a 2.5 mile radius whose center is Latitude 43°13'30" North, Longitude 70°09'30" West. The location is approximately 18.5 miles East of York Beach, Maine. The Navy is currently developing guidance to address underwater presence of discarded military munitions.



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
NEW ENGLAND - REGION I  
1 CONGRESS STREET, SUITE 1100 (HBT)  
BOSTON, MASSACHUSETTS 02114-2023

May 10, 2005

Mr. Frederick J. Evans, P.E.  
Remedial Project Manager  
Engineering Field Activity Northeast  
10 Industrial Hwy., Mail Stop #82  
Lester, PA 19113-2090

Re: ***Preliminary Assessment, Small Arms Range, Portsmouth Naval Shipyard, Kittery, Maine***

Dear Mr. Evans:

I have reviewed the subject document submitted by the Navy. The Agency has no comments.

If you have any questions, please feel free to contact me at [audet.matthew@epa.gov](mailto:audet.matthew@epa.gov) or 617.918.1449.

Sincerely,

**Matthew R. Audet** · (signed)

Matthew R. Audet, P.G.  
Remedial Project Manager  
Office of Site Remediation and Restoration

cc. Iver McLeod/ME DEP  
Marty Raymond/PNS  
Deb Cohen/Tetra Tech NUS  
Carolyn Lepage/Lepage Environmental (email)  
RAB Members (email)

December 6, 2004

Mr. Fred Evans  
Department of the Navy  
Northern Division  
Naval Facilities Engineering Command  
10 Industrial Highway, Mailstop 82  
Lester, PA 19113-2090

re: Preliminary Assessment, Portsmouth Naval Shipyard, Small Arms Range, October 2004, Malcolm Pirnie.

Dear Fred:

The Maine Department of Environmental Protection has reviewed the document referenced above. The MEDEP agrees with the report's conclusion that no further remedial actions related to contamination resulting from the Small Arms Range are necessary. Since soils at the range were excavated and screened as part of the process for constructing the Hazardous Waste Transfer Facility, with screenings transported off-site, it is unlikely that any additional source of lead contamination is present.

However, as part of its background material the report included items of interest.

In Section 2.3 Munitions Related Training/Storage/Usage, p. 2-5, the report indicates that a 1916 map of the prison shows an indoor shooting range. We note that additional historical material from the 1940s discusses acquisitions of firearms for use in the Yard's "Rehabilitation and Restoration Program for general courts-martial prisoners who are scheduled to return to duty."

Since it seems likely such a range did exist are there any records that may indicate what happened to the lead from the firing range? Would it have been disposed of with the general trash?

In addition, the Interview Record for the 8/26/03 interview with Jim Dolph states, "Mr. Dolph gave us a map illustrating the location of the 'dangerous ammo' disposal area."

Please provide details regarding the "dangerous ammo" disposal area. Where was it located and how much use did it receive?

Please feel free to contact me at (207) 287-8010 if you have any questions.

Sincerely,

Iver McLeod  
Project Manager  
Bureau of Remediation and Waste Management

pc:

Denise Messier, MEDEP  
Larry Dearborn, MEDEP  
Matt Audet, USEPA  
Marty Raymond, PNS  
Debbie Cohen, TtNUS  
Peter Britz, RAB  
Doug Bogen, RAB  
Don Card, RAB  
Alan Davis, RAB  
Michele Dionne, RAB

Mary Marshall, RAB  
Jack McKenna, RAB  
Diana McNabb, RAB  
Onil Roy, RAB  
Roger Wells, RAB  
James Horrigan, SAPL  
Carolyn Lepage, TAG Advisor  
Claire McBane, NH F&W  
File



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
NEW ENGLAND - REGION I  
1 CONGRESS STREET, SUITE 1100 (HBT)  
BOSTON, MASSACHUSETTS 02114-2023

April 5, 2005

Mr. Frederick J. Evans, P.E.  
Remedial Project Manager  
Engineering Field Activity Northeast  
10 Industrial Hwy., Mail Stop #82  
Lester, PA 19113-2090

Re: ***Preliminary Assessment, Small Arms Range, Portsmouth Naval Shipyard, Kittery, Maine***

Dear Mr. Evans:

I have reviewed the subject document submitted by the Navy. The Agency has no comments.

If you have any questions, please feel free to contact me at [audet.matthew@epa.gov](mailto:audet.matthew@epa.gov) or 617.918.1449.

Sincerely,

**Matthew R. Audet** (signed)

Matthew R. Audet, P.G.  
Remedial Project Manager  
Office of Site Remediation and Restoration

cc. Iver McLeod/ME DEP  
Marty Raymond/PNS  
Deb Cohen/Tetra Tech NUS  
Carolyn Lepage/Lepage Environmental (email)  
RAB Members (email)