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PRESENTATION AND AGENDA FOR RESTORATION ADVISORY BOARD MEETING HELD 20 MARCH 1997 NSY PORTSMOUTH ME
3/20/1997
PORTSMOUTH NAVAL SHIPYARD

RESTORATION ADVISORY BOARD AGENDA

Date	March 20, 1997
Place	Day's Inn Kittery, ME
Time	7 p.m. - 9 p.m.

Introduction

Status of work

Work Plan for Sites 10 and 29

Phase I Fate and Transport Modeling Report

Other issues as required

On-Shore/Off-Shore Contaminant Fate and Transport Modeling Phase I

Portsmouth Naval Shipyard
Installation Restoration Program
Restoration Advisory Board (RAB)
Meeting
March 20, 1997

Overview

- Problem Definition
- Modeling Objectives
  - Overall Objectives
  - Phase I Objectives
  - Phase I Non Objectives
- Phase I Modeling Approach
  - Sites Modeled
  - Contaminants of Concern (COCs) Screening
  - Conceptual Models
  - Equations
- Phase I Modeling Results and Conclusions
  - Baseline Results
  - Uncertainty Analysis

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Problem Definition

- Determine how past activities at Shipyard sites are currently impacting the off-shore environment.

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Overall Modeling Objectives

- Evaluate continuing potential of on-shore contaminants to move to off-shore
- Assist in determining remediation alternatives for on-shore sites
- Link data from previous on-shore and off-shore studies
- Evaluate potential for future contaminants levels to increase from present-day levels

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Phase I Modeling Objectives

- Establish a modeling framework that can be quickly implemented/revised once additional data is available.
  - low flow groundwater sampling data
  - seep/sediment sampling results
- Provide a very conservative estimate of contaminant levels in the off-shore environment based on existing data.

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Phase I Modeling Nonobjectives

- Not a substitute for monitoring
- Not a baseline risk assessment
- Not sole basis for remedial decisions

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Phase I Modeling Approach: Sites Modeled

- Focus on known areas of groundwater contamination
  - Operable Unit 2 (OU2)
    - Site 6 DRMO
    - Site 29 Incinerator Site
  - Operable Unit 3 (OU3)
    - Site 8 JILF
    - Site 9 MBI and MBII
    - Site 11 Former Waste Oil Tanks
  - Operable Unit 5 (OU5)
    - Site 27 Industrial Area at Berth 6

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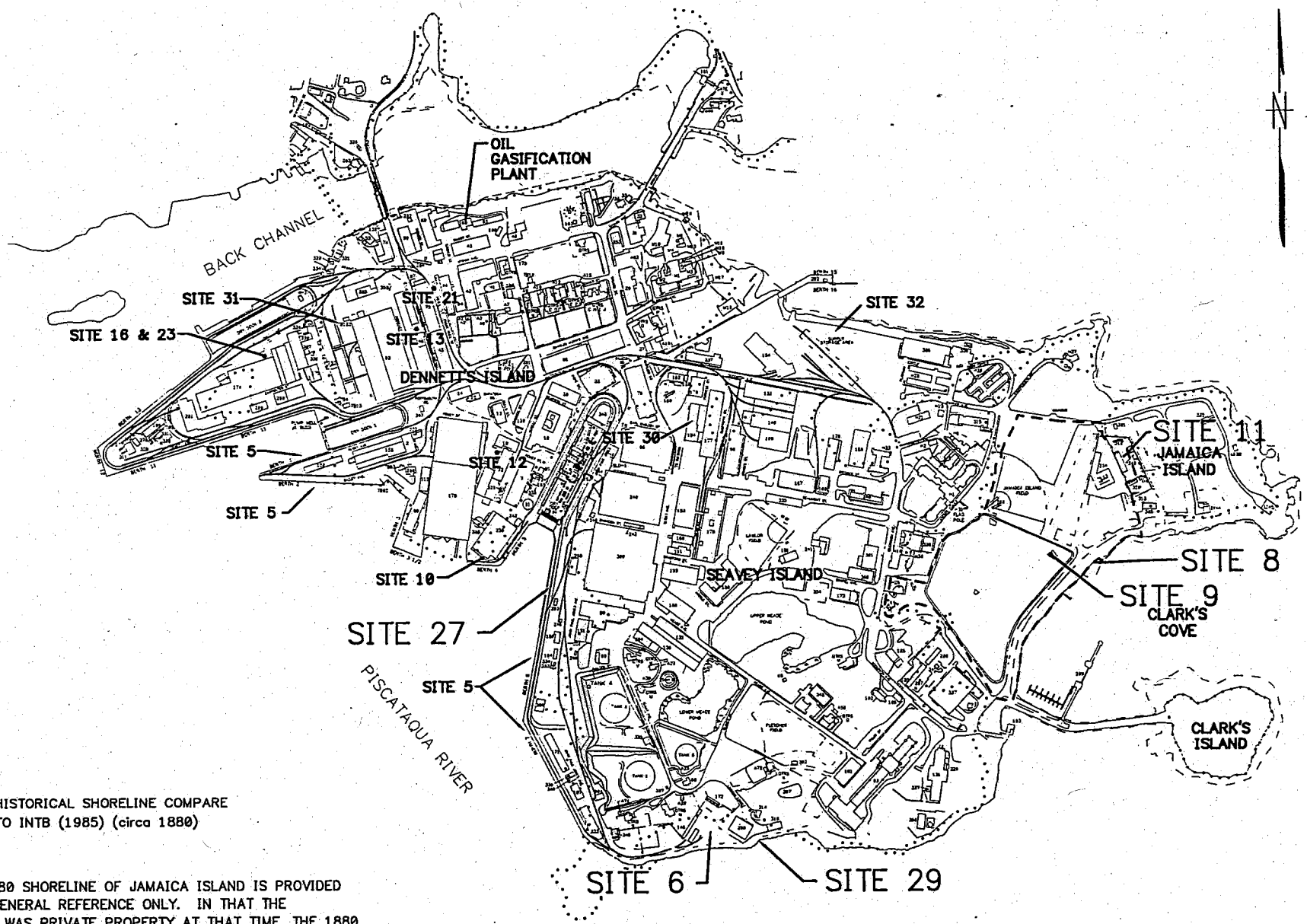

LEGEND:

..... HISTORICAL SHORELINE COMPARE TO INTB (1985) (circa 1880)

NOTES:

1. THE 1880 SHORELINE OF JAMAICA ISLAND IS PROVIDED AS A GENERAL REFERENCE ONLY. IN THAT THE ISLAND WAS PRIVATE PROPERTY AT THAT TIME, THE 1880 SHORELINE CANNOT BE DETERMINED WITH A HIGH DEGREE OF PRECISION.

FACILITY MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

Phase I
Modeling Approach: COC Screening

- Start with all chemicals found on-shore and all off-shore COCs
- Evaluate whether or not off-shore COC associated with a given site
- Evaluate on-shore COC potential to move to off-shore environment
- Evaluate COC frequency of detection

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Phase I
Modeling Approach: Conceptual Models

- Represent complex natural conditions with simple, analytical equations
- Consider all significant physical and chemical processes
- Use conservative input values to overcome model uncertainties
- Consider site-specific differences
  - Overall Zones
  - OU2
  - OU3 to Clark Cove
  - OU3 to Back Channel
  - OU5

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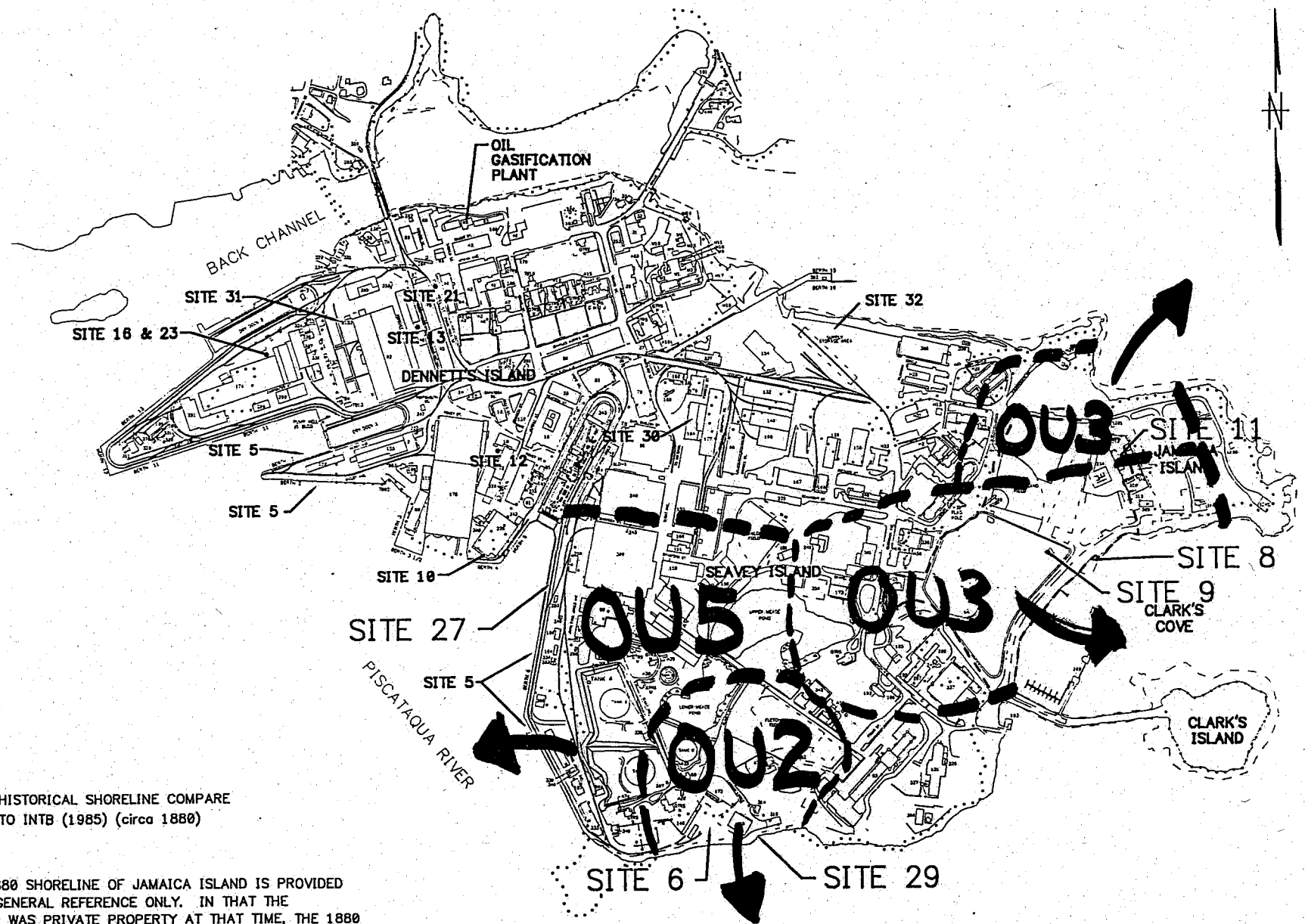

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FACILITY MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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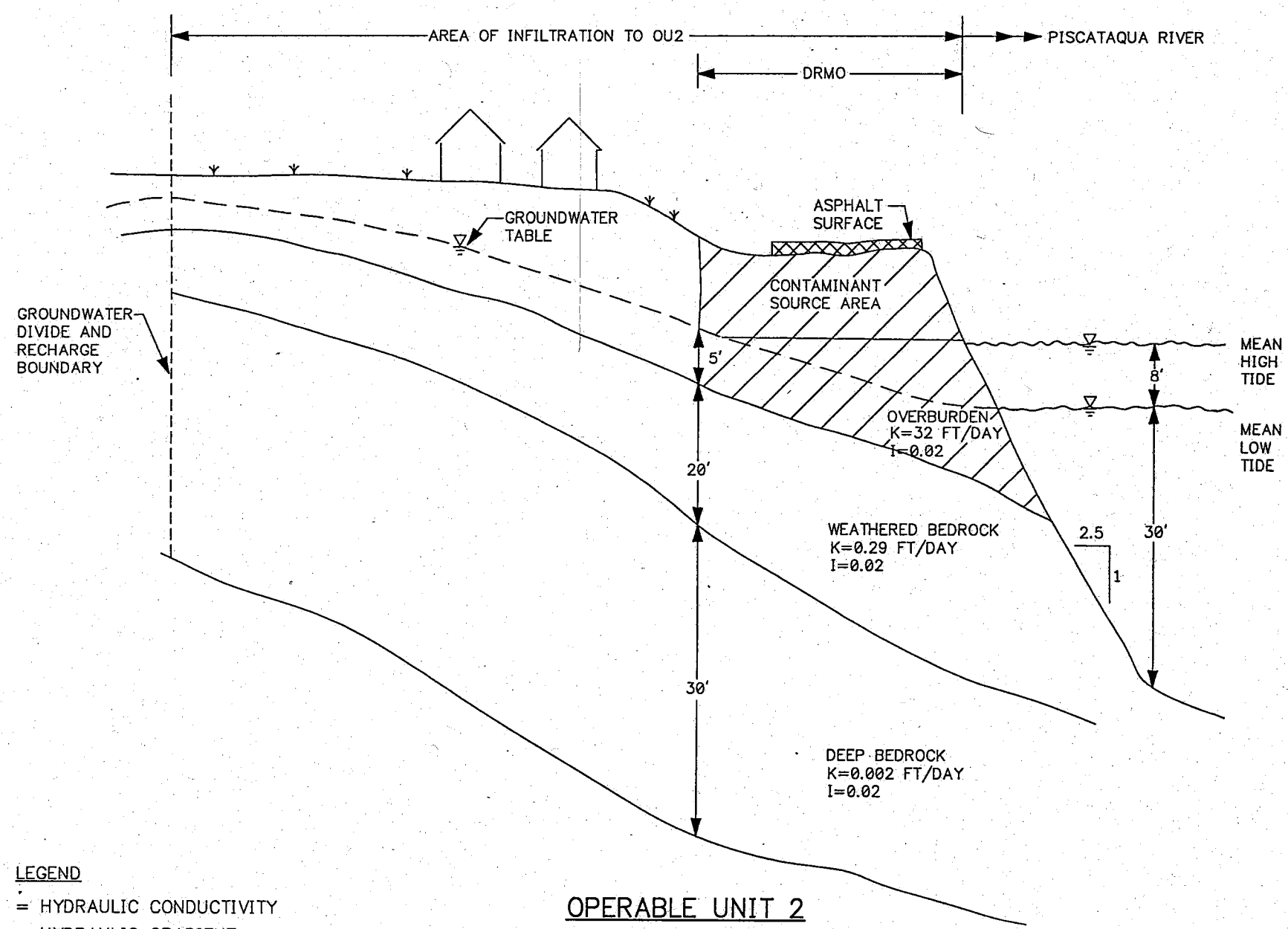

LEGEND

K = HYDRAULIC CONDUCTIVITY

I = HYDRAULIC GRADIENT

OPERABLE UNIT 2

NOT TO SCALE

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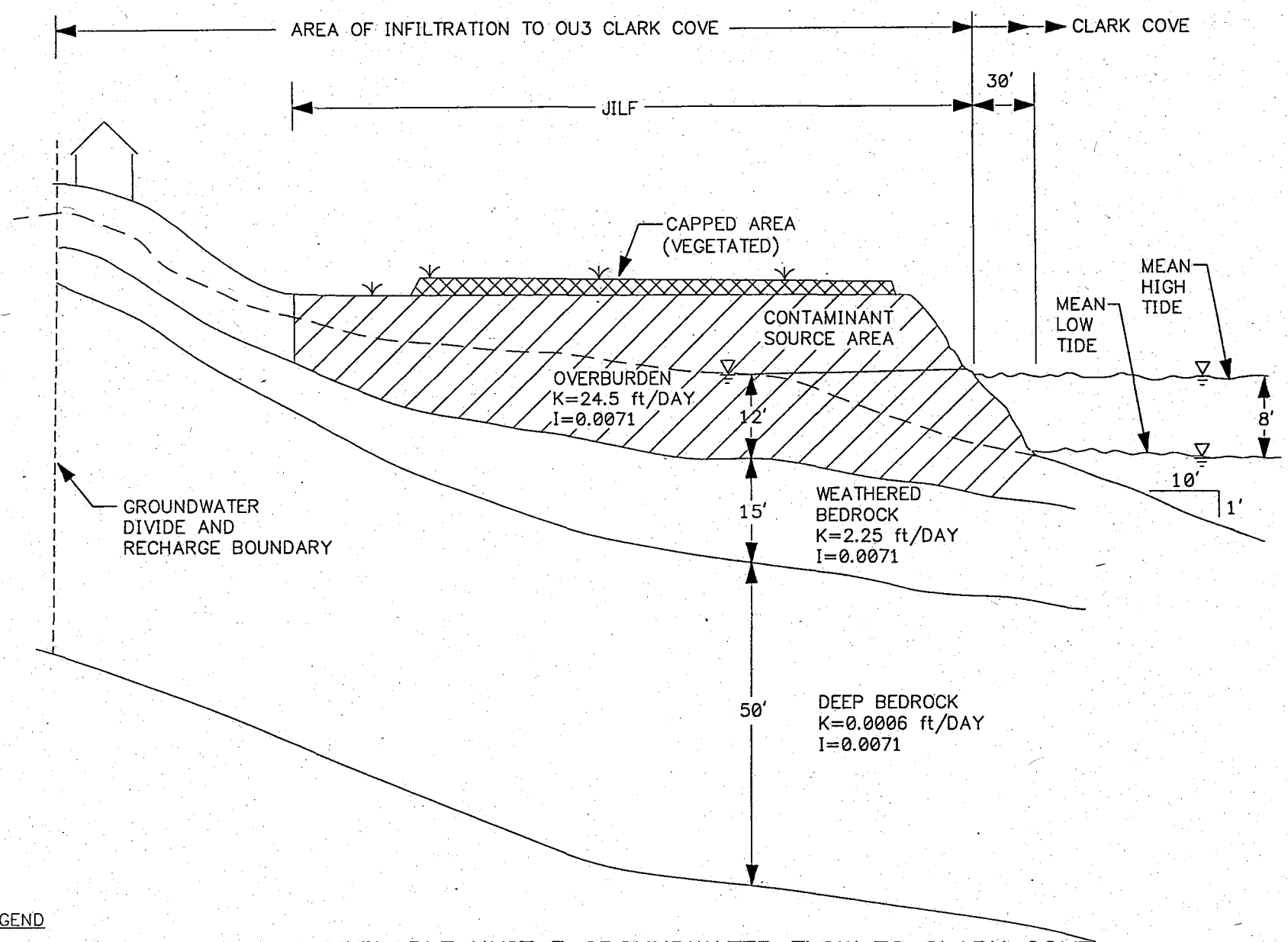

LEGEND

K = HYDRAULIC CONDUCTIVITY

I = HYDRAULIC GRADIENT

OPERABLE UNIT 3 GROUNDWATER FLOW TO CLARK COVE

NOT TO SCALE

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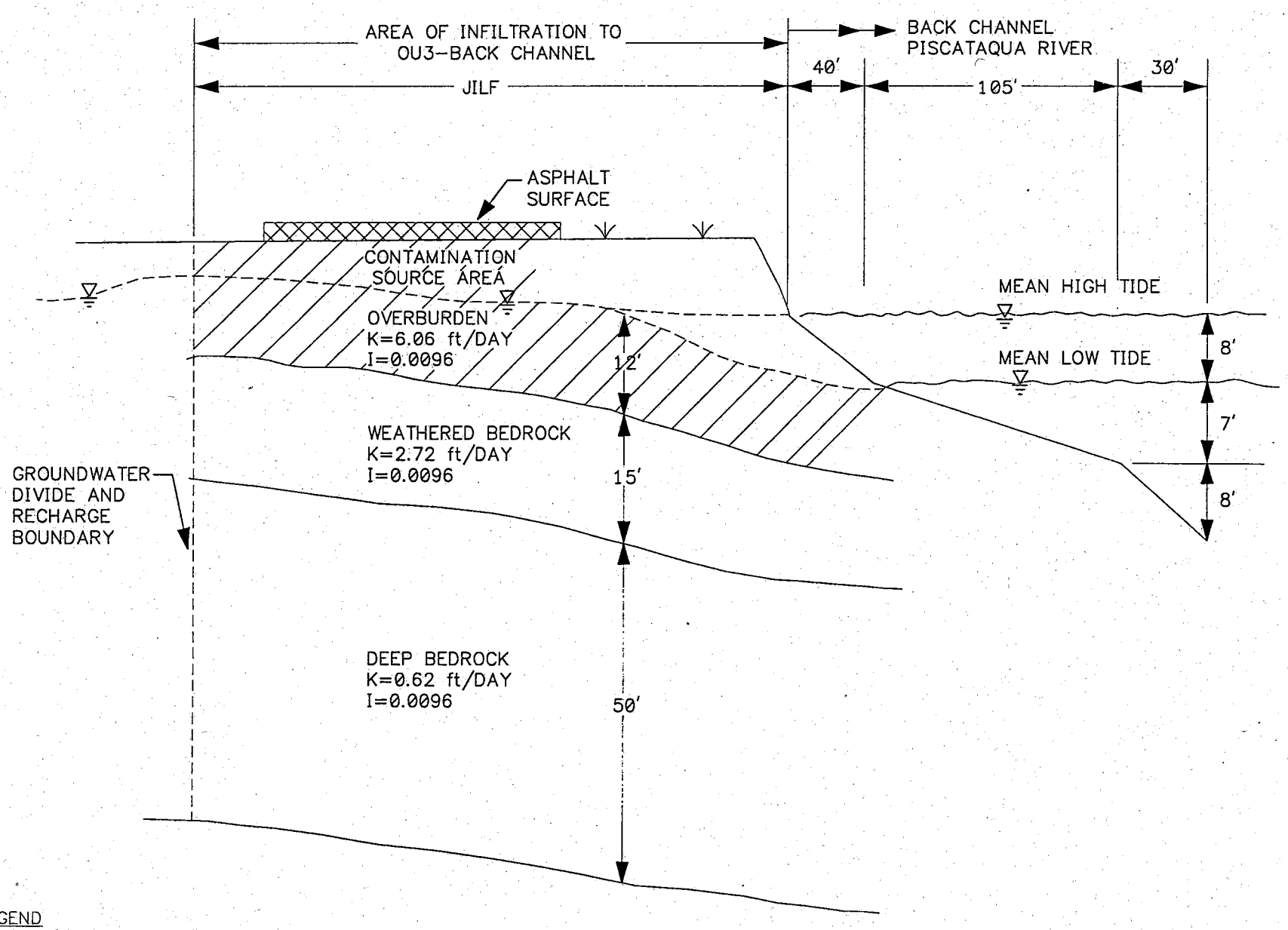

LEGEND

K = HYDRAULIC CONDUCTIVITY

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OPERABLE UNIT 3 GROUNDWATER FLOW TO BACK CHANNEL

NOT TO SCALE

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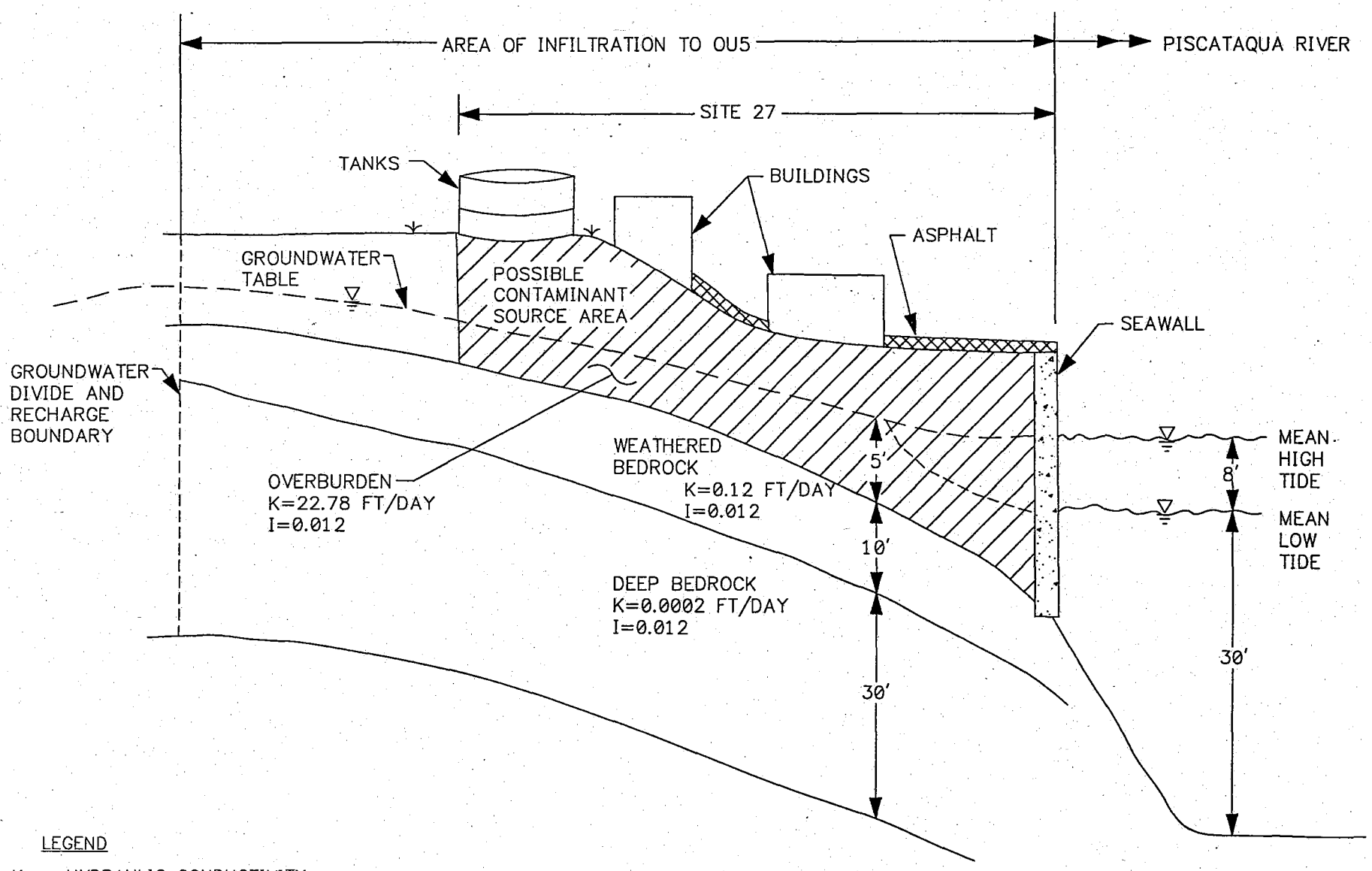

LEGEND

K = HYDRAULIC CONDUCTIVITY

I = HYDRAULIC GRADIENT

OPERABLE UNIT 5

NOT TO SCALE

Phase I Modeling Approach: Equations

- On-Shore Equations
  - Considers that contaminant mass must "add up" as it moves from one media to another
  - Considers that future contaminant levels could be higher than present-day levels (via use of OU specific soil/water partitioning coefficients)
  - Considers that specific contaminants behave differently
  - Conservative assumption that soil and groundwater contaminant levels do not decrease with time

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Phase I Modeling Approach: Equations (con't.)

- Off-Shore Analytical Equations
  - Considers mixing of groundwater with the Piscataqua River near shore
  - Accounts for tidal currents and mixing
  - Conservative assumption that no decay of contaminants in surface water
  - Sediment/water partitioning coefficients based on soil/water coefficients (will be revised when seep/sediment sampling results are finalized)

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Phase I Modeling Results: Baseline Results

- Comparison with surface water and sediment screening criteria
- Potential problem for OU2 and OU3 surface water
- Potential problem for OU2 and OU3 sediments (however, sediment concentrations were based on very uncertain sediment soil/water partitioning coefficients)
- Lead and copper consistent problem COCs; consistent with ecological risk assessment
- No current migration problem evident for OU 5

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Phase I Modeling Results: Uncertainty Analysis

- Deterministic Approach
  - 12 modeling runs: hand-selected input values for each area and each COC
  - Conclusion: "Baseline" results near high end of range show baseline model is very conservative
- Probabilistic Approach
  - 3000 modeling runs: computer-selected random input vales for each area and several COCs
  - Conclusion: "Baseline" results show that 95% confident that model is very conservative

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LEAD + COPPER SHOW-UP BOTH IN MODELING AND IN OFFSHORE ECO

Conclusions/ Recommendations

- Baseline Model results are very conservative
- OU2 and OU3 may potentially impact off-shore
- OU5 is not currently impacting off-shore
- Phase II modeling required to refine inputs to model
  - low-flow groundwater sampling results
  - seep/sediment sampling results

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Workplan Presentation
Building 238 (Site 10)
Teepee Incinerator (Site 29)

Portsmouth Naval Shipyard
Installation Restoration Program
Restoration Advisory Board (RAB) Meeting
March 20, 1997

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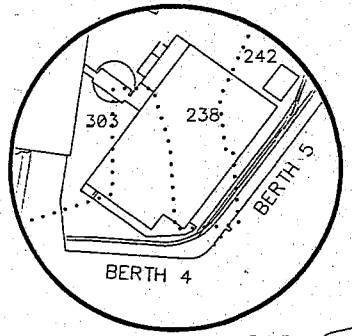

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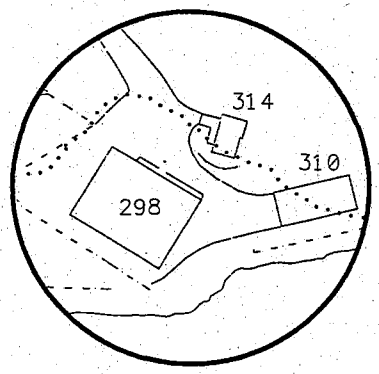

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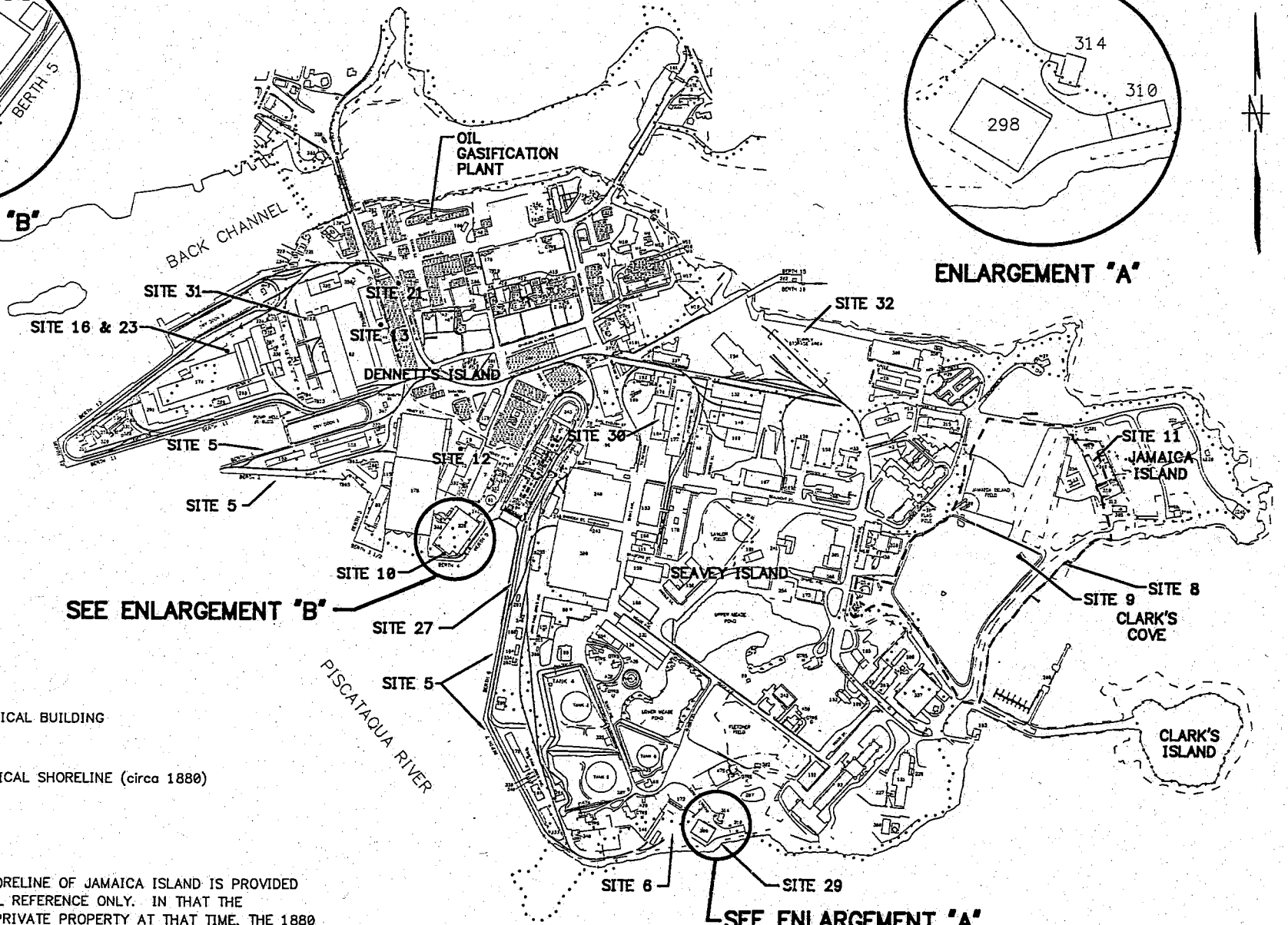

LEGEND:

HISTORICAL BUILDING

HISTORICAL SHORELINE (circa 1880)

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FACILITY MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

Sampling Objective

- Further characterize the sites to make remedial decisions

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Previous Work Summary Teepee Incinerator (Site 29)

- Site 29, although outside the fenced area of the DRMO, is being considered part of the DRMO
- Previous remedial work performed in connection with the DRMO

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Previous Work Summary (Con't.)

- July/September 1991
  - 5 monitoring wells installed near the incinerator
  - 8 surface soil samples collected near the incinerator
- December 1996
  - Monitoring wells sampled

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Previous Work Summary Building 238 (Site 10)

- July/September 1991
  - UST removal activity
  - 3 soil borings around excavation
  - Potentially leaking pipe lines not removed beneath building 238

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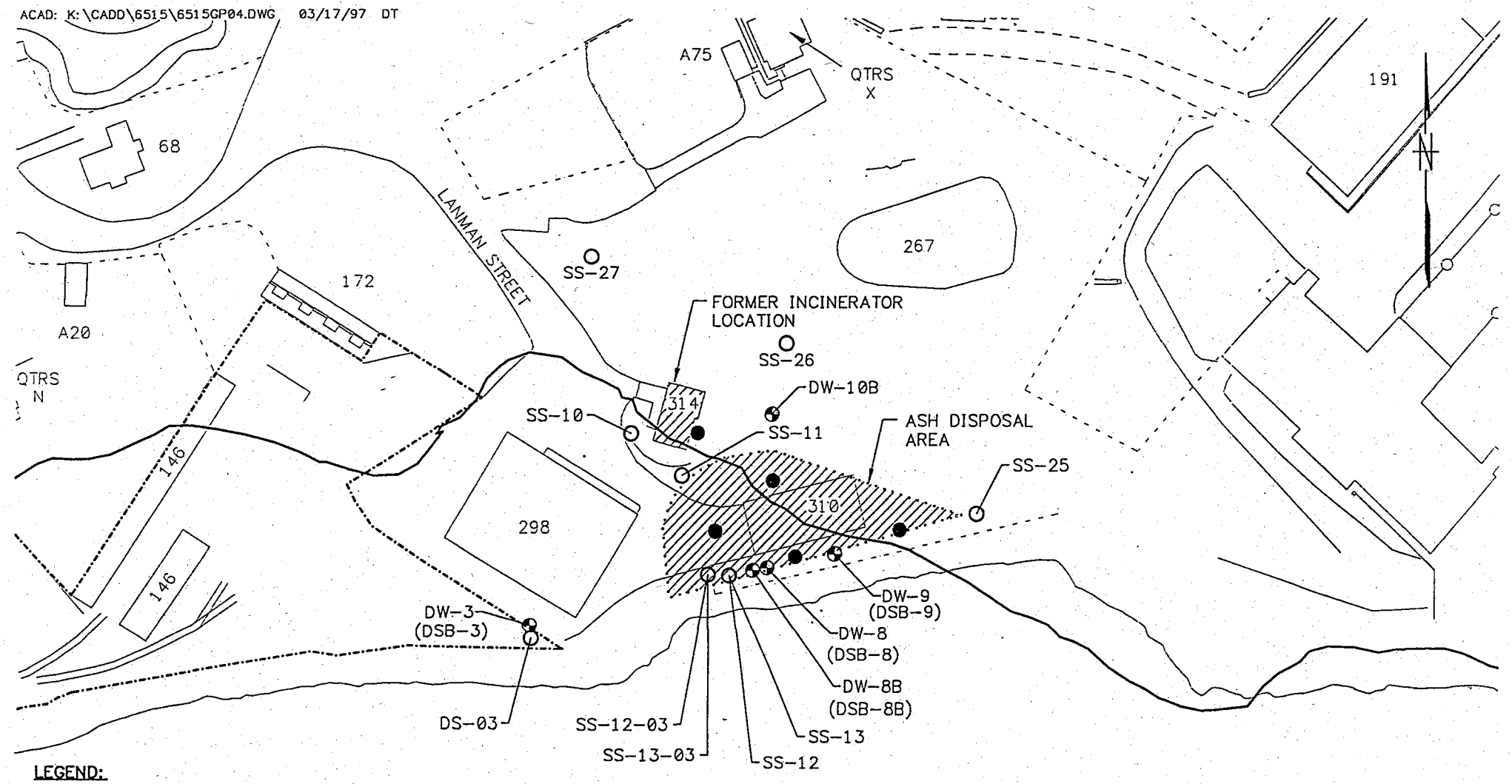

LEGEND:

- EXISTING MONITORING WELL
- EXISTING SURFACE-SUBSURFACE SOIL SAMPLE LOCATION
- PROPOSED SURFACE-SUBSURFACE SOIL SAMPLE LOCATION
- HISTORICAL SHORELINE (CIRCA 1880)
- APPROXIMATE BOUNDARY OF DUMP
- DRMO FENCE LINE
- FENCE

PROPOSED SAMPLING LOCATIONS
TEEPEE INCINERATOR/SITE 29
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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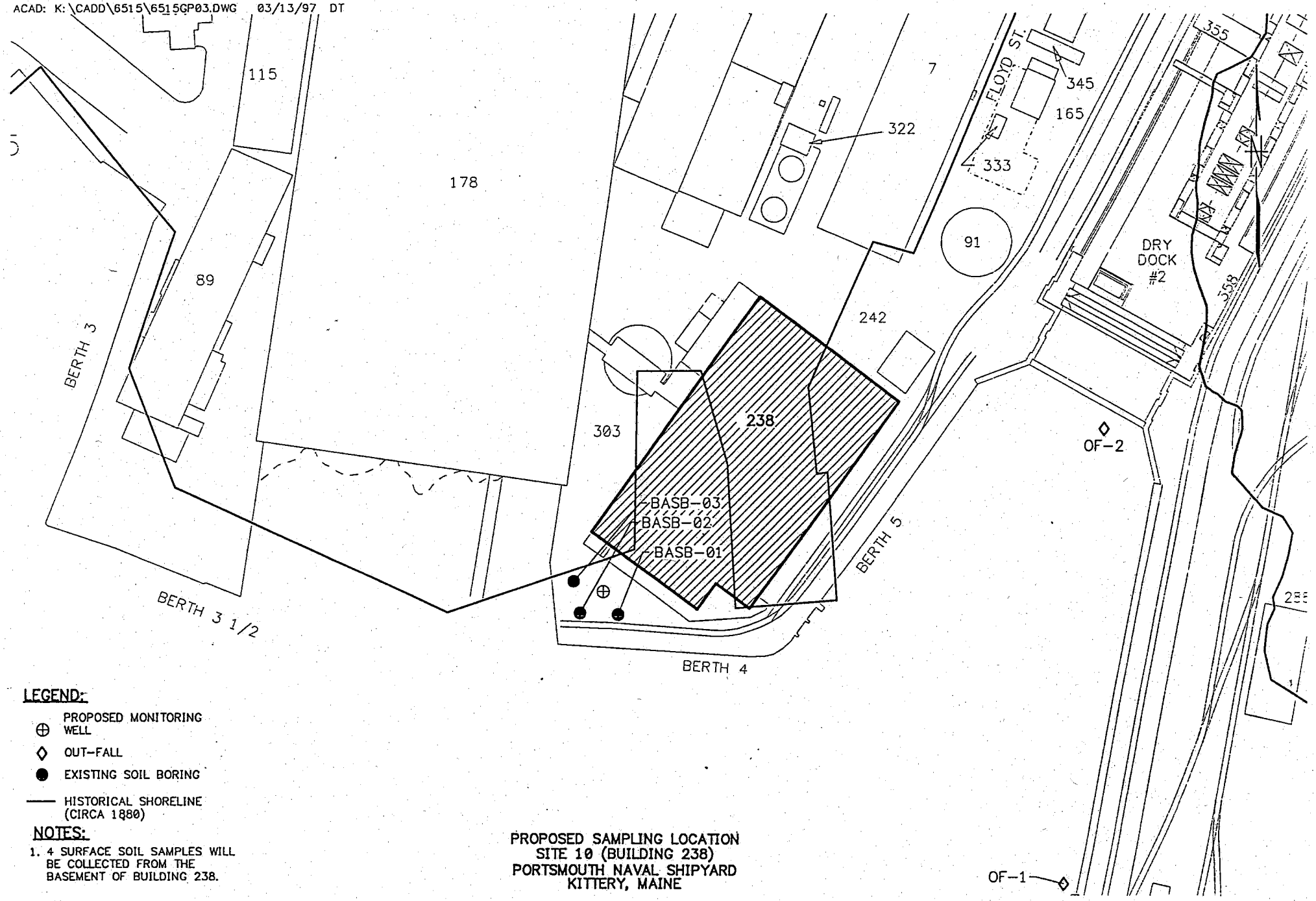

LEGEND:

- ⊕ PROPOSED MONITORING WELL
- ◇ OUT-FALL
- ● EXISTING SOIL BORING
- —— HISTORICAL SHORELINE (CIRCA 1880)

NOTES:

1. 4 SURFACE SOIL SAMPLES WILL BE COLLECTED FROM THE BASEMENT OF BUILDING 238.

PROPOSED SAMPLING LOCATION
SITE 10 (BUILDING 238)
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

Proposed Sampling

Site	Description of Activities	Analysis
Teepee Incinerator (Site 29)	5 Subsurface soil borings	TCL PCB/Pesticides TAL Metals Dioxin pH
	3 Background soil Samples	Dioxin pH
Building 238 (Site 10)	1 Groundwater samples	TCL volatiles TCL Semivolatiles TAL Metals Cyanide Total Organic Carbon (TOC) Salinity pH
	1 Monitoring well soil boring	TCL Volatiles TCL Semivolatiles TAL Metals pH
	4 Surface soil samples	TAL Metals pH

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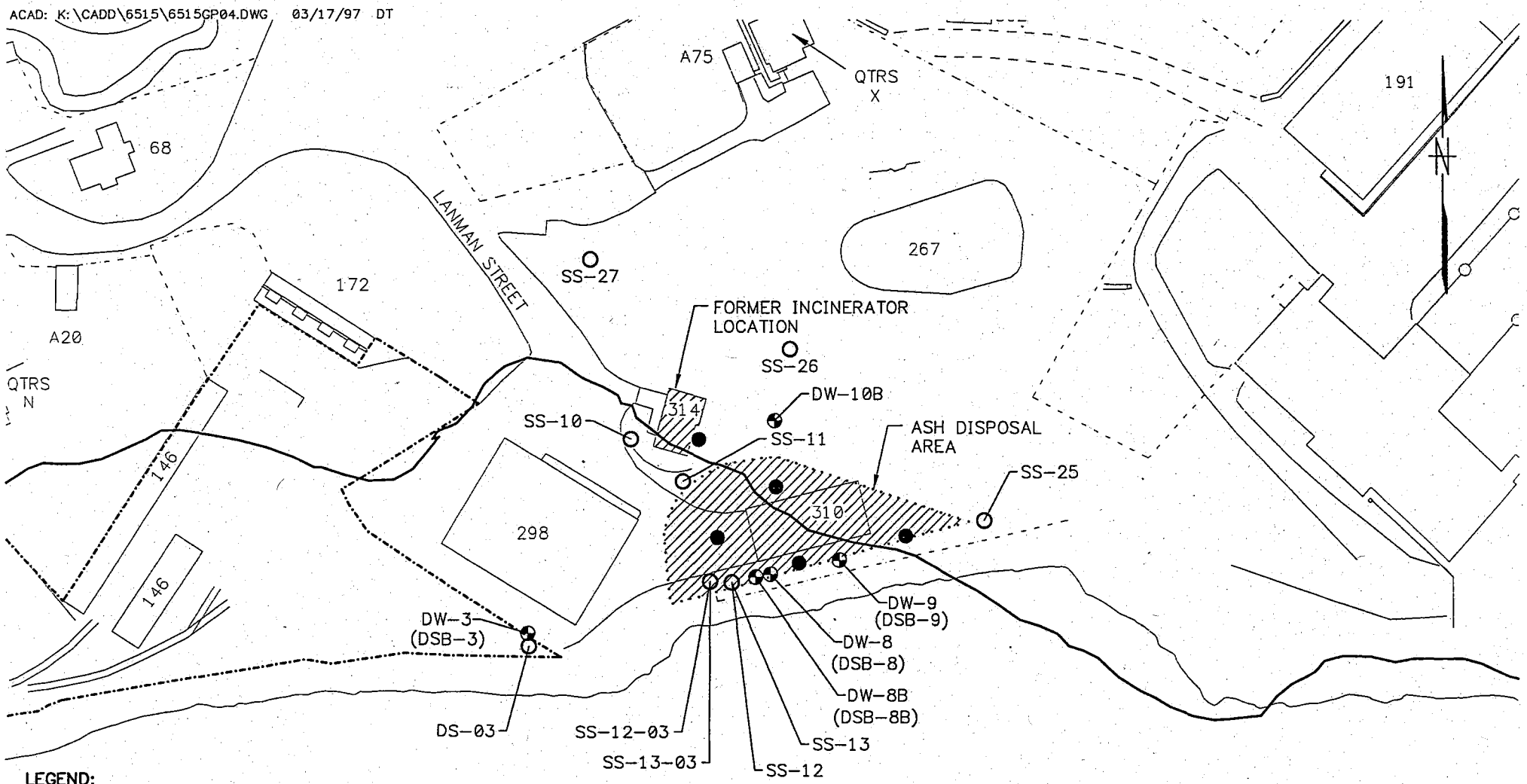

LEGEND:

- EXISTING MONITORING WELL
- EXISTING SURFACE-SUBSURFACE SOIL SAMPLE LOCATION
- PROPOSED SURFACE-SUBSURFACE SOIL SAMPLE LOCATION
- HISTORICAL SHORELINE (CIRCA 1880)
- APPROXIMATE BOUNDARY OF DUMP
- DRMO FENCE LINE
- FENCE

PROPOSED SAMPLING LOCATIONS
TEEPEE INCINERATOR/SITE 29
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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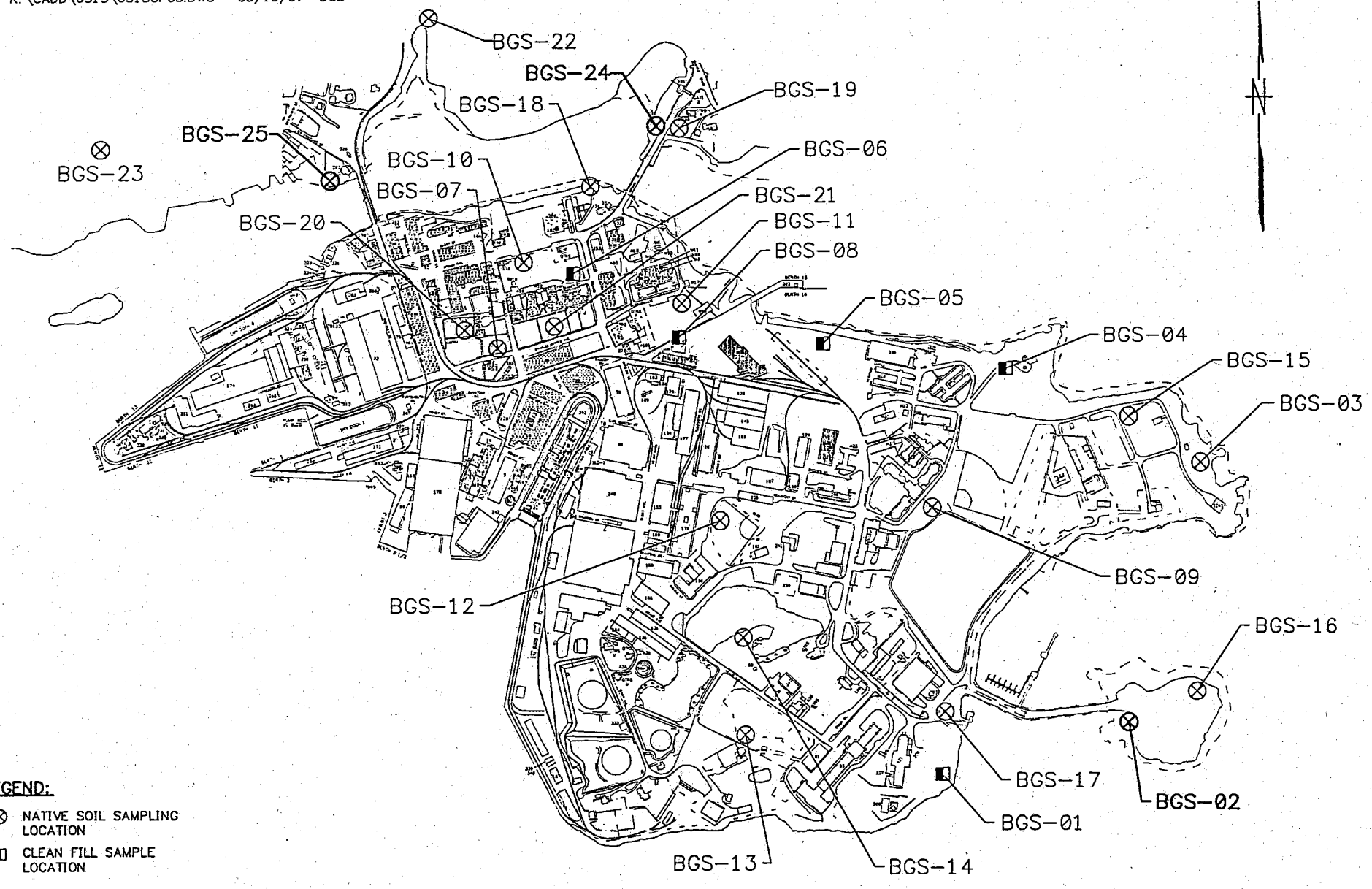

LEGEND:

- ⊗ NATIVE SOIL SAMPLING LOCATION
- ◧ CLEAN FILL SAMPLE LOCATION

NOTE:

BACKGROUND DIOXIN SAMPLES WILL BE COLLECTED FROM BGS-02, BGS-24 AND BGS-25

BACKGROUND SOIL LOCATIONS
EXCEEDANCES OF MEDIA PROTECTION STANDARDS
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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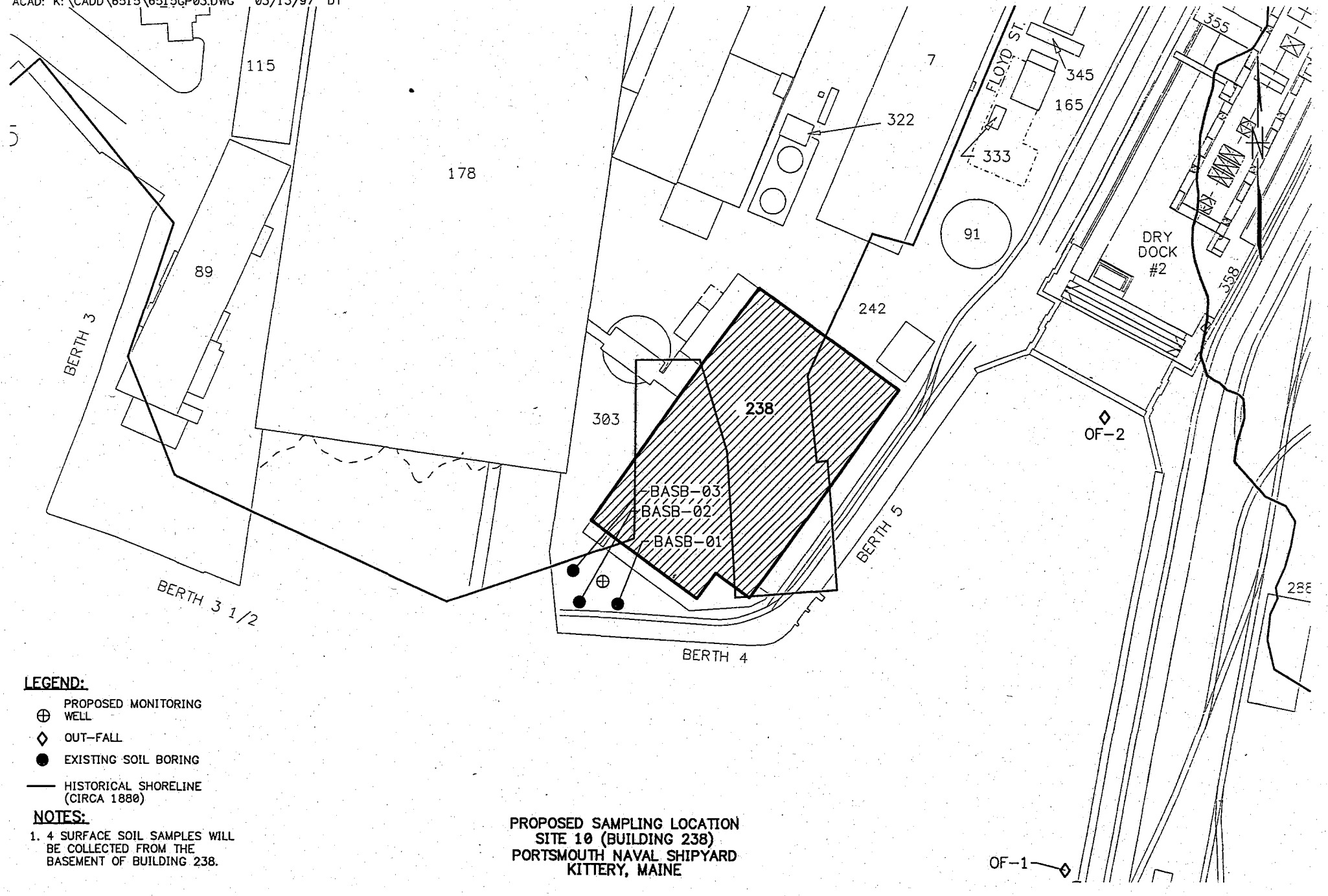

LEGEND:

- ⊕ PROPOSED MONITORING WELL
- ◇ OUT-FALL
- ● EXISTING SOIL BORING
- —— HISTORICAL SHORELINE (CIRCA 1880)

NOTES:

1. 4 SURFACE SOIL SAMPLES WILL BE COLLECTED FROM THE BASEMENT OF BUILDING 238.

PROPOSED SAMPLING LOCATION
SITE 10 (BUILDING 238)
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE