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Final Five-Year Review Report

for

**Naval Station Newport
Newport, Rhode Island**



**Northern Division
Naval Facilities Engineering Command
Contract Number N62472-90-D-1298
Contract Task Order 0282**

December 1999



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

Superfund Records Center
SITE: _____
BREAK: _____
OTHER: _____

December 30, 1999

James Shafer, Remedial Project Manager
U.S. Department of the Navy
Naval Facilities Engineering Command
Northern Division
10 Industrial Highway
Code 1823, Mail Stop 82
Lester, PA 19113-2090

Re: Five-year review for the Naval Education and Training Center Superfund Site

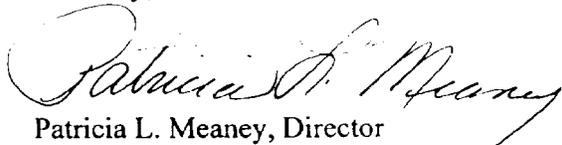
Dear Mr. Shafer:

Thank you for the opportunity to review the *Five-Year Review Report for Naval Station Newport, Newport, Rhode Island*, dated December 1999. Upon review, EPA concurs with the findings that all remedies that have been implemented are protective of human health and the environment.

EPA reviewed the document for compliance with OSWER Directive No. 9355.7-02A (July 26, 1994) and OSWER Directive No. 9344.7-03A (December 21, 1995). The report includes five-year reviews for the McAllister Point Landfill (Site 01)- Source Control Operable Unit and Tank Farm Five - Tanks 53 and 56 (Site 13) - Groundwater Containment Operable Unit. The selection of a TYPE IA review for these sites is consistent with the guidance provided in the OSWER directives. For those operable units that are still in the investigation phase, EPA is pleased to see the Navy reiterate its commitment to continuing the CERCLA process in accordance with the Federal Facilities Agreement. Access is restricted at most of the sites that have not yet been remediated to minimize potential threats to human health.

As indicated in EPA's letter dated March 10, 1999, this five-year review requirement was prompted by the remedial action start for the McAllister Point Landfill. Consistent with Section 121(c) of the CERCLA, the next five-year review must be finalized on or before December 27, 2004.

Sincerely,


Patricia L. Meaney, Director
Office of Site Remediation and Restoration

**FINAL
FIVE-YEAR REVIEW REPORT**

FOR

**NAVAL STATION NEWPORT
NEWPORT, RHODE ISLAND**

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

**Submitted to:
Northern Division
Environmental Branch, Code 1812BJH
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop No. 2
Lester, Pennsylvania 19113-2090**

**Submitted by:
Tetra Tech NUS, Inc.
600 Clark Avenue, Suite 3
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**CONTRACT NUMBER N62472-90-D-1298
"CLEAN" Contract Task Order No. 0282**

December 1999

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COPY

C-NAVY-12-99-1415W

Project Number N7538

December 23, 1999

Mr. James Shafer
Remedial Project Manager
Northern Division, Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop 82
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N62472-90-D-1298
Contract Task Order 0282

Subject: Final Five-Year Review Report
Naval Station Newport
Newport, Rhode Island

Dear Mr. Shafer:

Enclosed is one copy of the Final Five-Year Review Report for Naval Station Newport. Pursuant to your request, copies of the report have been sent overnight to EPA for delivery on December 27th, 1999 and sent U.S. mail to RIDEM, and Naval Station Newport.

Please contact me if you have any questions about this transmittal.

Sincerely,

Charles D. Race
Project Manager

CR:ms

Enclosure

c: M. Griffin, NSN (w/enc.-6)
K.Keckler, EPA (w/enc.-2)
P.Kulpa, RIDEM (w/enc.-2)
G.Glenn, TtNUS (w/enc.)
File 7538-8.0 (w/enc.) File 7538-3.2 (w/o enc.)

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1.0 INTRODUCTION

This document presents the first five-year review of the Naval Station Newport (NSN), formerly the Naval Education and Training Center (NETC), Superfund Site in Newport, Rhode Island. Tetra Tech NUS (TtNUS) has conducted this five-year review under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract Task Order (CTO) 282, as requested by the Navy. This five-year review addresses two operable units at two NSN sites which have had remedial actions implemented as of the writing of this five-year review:

- Site 01 - McAllister Point Landfill, Source Control Operable Unit; and
- Site 13 - Tank Farm Five, Interim Remedial Action for Tanks 53 and 56, to address the Groundwater Containment Operable Unit.

These two sites are included in this first five-year review of NSN, as appropriate for their progress in remediation, pursuant to the U.S. Environmental Protection Agency's (EPA) Supplemental Five-Year Review Guidance (Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-02A, July 1994). The other NSN sites and study areas (defined in the Federal Facility Agreement, FFA), are in various stages of investigation and are therefore not included in this first five-year review. It is recommended that the investigations for these sites continue as planned (see summary below). Interim measures have been implemented, or are scheduled to be implemented, to restrict access to these sites and study areas under investigation. Each of the sites and study areas are listed below with interim measures that have been or are to be implemented by the Navy, and with their respective FFA investigation schedules.

These sites and study areas include:

Study Area 04 – Coddington Cove Rubble Fill Area – Fence restricts access.

Draft SI Work Plan	June 28, 2004
Draft SI	September 7, 2005
Draft RI Work Plan	November 23, 2006
Draft RI	February 3, 2008
Draft FS	January 18, 2009
Draft Proposed Plan	November 28, 2009
Draft ROD	August 3, 2010

Study Area 07 – Tank Farm No. 1– Fence restricts access.

Draft SI Work Plan	February 13, 2004
Draft SI	April 25, 2005
Draft RI Work Plan	April 26, 2006
Draft RI	July 7, 2007

Draft FS	June 20, 2008
Draft Proposed Plan	May 3, 2009
Draft ROD	January 6, 2010

Study Area 08 – Naval Underwater Warfare Center (NUWC) Disposal Area – Posting signs and launching a public awareness campaign in early 2000.

Draft SI	March 25, 2003
Draft RI Work Plan	March 26, 2004
Draft RI	March 8, 2005
Draft FS	February 20, 2006
Draft Proposed Plan	January 9, 2007

Site 09 – Old Fire Fighting Training Area – Fence restricts access.

Draft FS	February 24, 2001
Draft Proposed Plan	September 7, 2002
Draft ROD	May 6, 2003

Study Area 10 – Tank Farm No. 2 – Fence restricts access.

Draft SI Work Plan	February 13, 2004
Draft SI	April 25, 2005
Draft RI Work Plan	April 26, 2006
Draft RI	July 7, 2007
Draft FS	June 20, 2008
Draft Proposed Plan	May 3, 2009
Draft ROD	January 6, 2010

Study Area 11 - Tank Farm No. 3 – Fence restricts access.

Draft SI Work Plan	February 13, 2004
Draft SI	April 25, 2005
Draft RI Work Plan	April 26, 2006
Draft RI	July 7, 2007
Draft FS	June 20, 2008
Draft Proposed Plan	May 3, 2009
Draft ROD	January 6, 2010

Site 12 – Tank Farm No. 4 – Fence to be installed in early 2000.

Draft RI Work Plan	March 22, 2004
Draft RI	June 2, 2005
Draft FS	May 17, 2006
Draft Proposed Plan	March 30, 2007
Draft ROD	December 3 2007

Site 13 – Tank Farm No. 5– Fence restricts access.

Draft FS	December 30, 2002
Draft Proposed Plan	September 15, 2003
Draft ROD	March 16, 2004

Study Area 17 – Gould Island Electroplating Shop– Liquid hazardous materials, asbestos, and lead-based paint to be removed in 2000. Fence restricts access.

Draft SI	August 16, 2000
Draft RI Work Plan	January 29, 2003
Draft RI	October 27, 2004
Draft FS	October 7, 2005
Draft Proposed Plan	August 20, 2006
Draft ROD	April 25, 2007

Study Area 19 – Derecktor Shipyard– Fence restricts access.

Draft Proposed Plan	January 11, 2004
Draft ROD	July 5, 2004

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121 (c) and National Oil and Hazardous Substances Contingency Plan (NCP) Section 300.400(f)(4)(ii) require a review to be conducted, at a minimum, every five (5) years after the initiation of the selected remedial action (RA) at each site. The purpose of the review is to ensure that the selected remedial action remains protective of human health and the environment and is functioning as designed. As directed by EPA, this five-year review is a "Type Ia" review. The Type Ia review emphasizes only relevant protectiveness factors, analyzed at a standard of review appropriate for sites where response is ongoing. Sites generally qualify for a Type Ia review until construction is completed and the site qualifies for listing on the Construction Completion List (CCL) (OSWER Directive 9355.7-02A, July 1994).

The activities conducted for the five-year review were based on EPA's Supplemental Five-Year Review Guidance (OSWER Directive 9355.7-02A, July 1994) and an EPA Region I letter to the Navy dated March 10, 1999. According to the OSWER directive referenced above, a Type Ia review is to include a document review of the ROD Summary and monitoring information. The report is to include an introduction; a discussion of remedial objectives; areas of noncompliance with those objectives; recommendations; a statement on whether the remedy remains protective; and notice of the next five-year review. This information is included in the sections which follow, for each of the two applicable sites addressed under this five-year review.

2.0 McALLISTER POINT LANDFILL (SITE 01) – SOURCE CONTROL OPERABLE UNIT

The sections below present information required for the Type Ia five-year review for the McAllister Point Landfill, as referenced in the EPA OSWER Directive 9355.7-02A, July 1994.

2.1 SITE CHARACTERISTICS

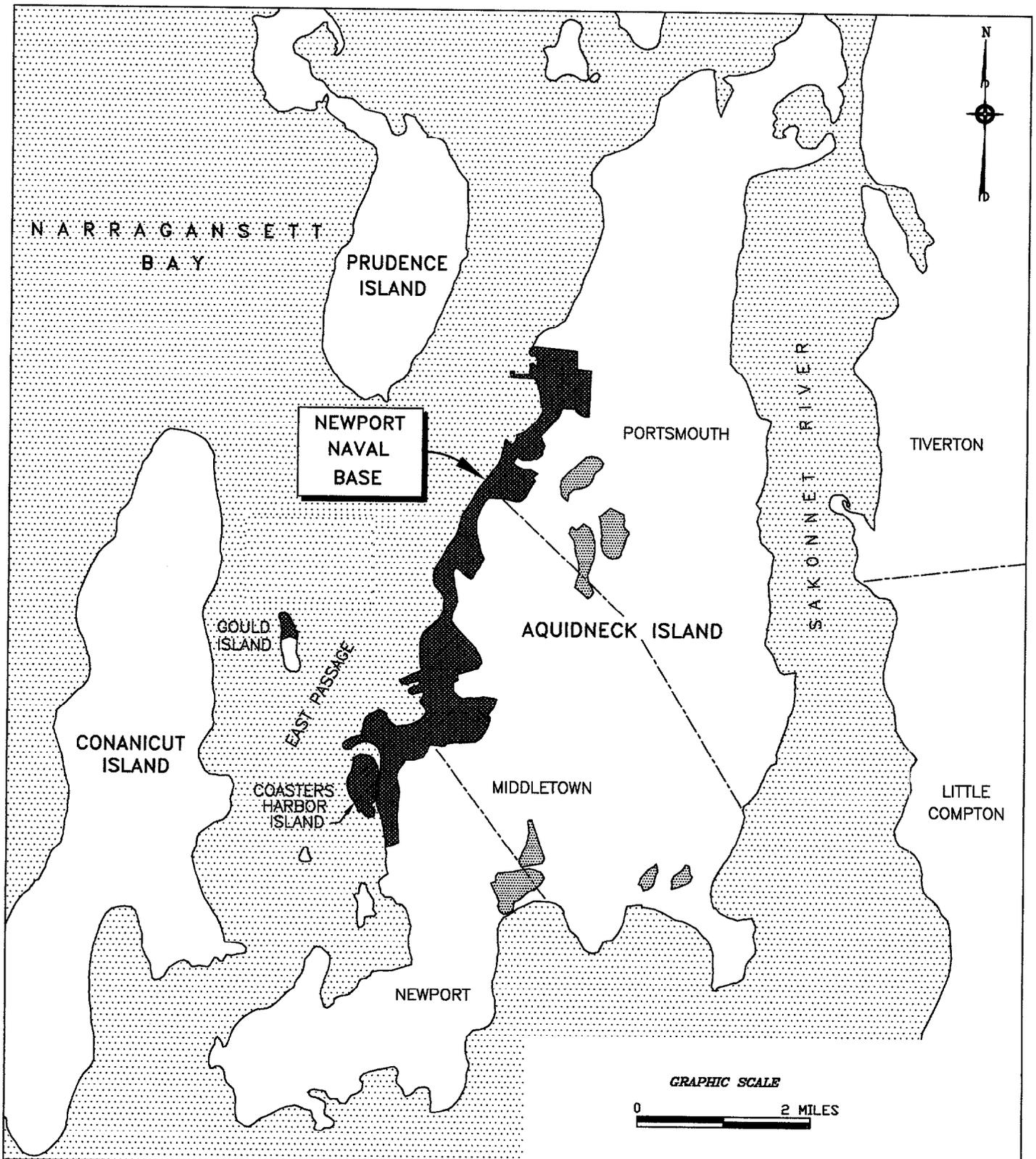
Background information including a brief site description and site history of the McAllister Point Landfill is discussed below.

Physical Characteristics

NSN is located in Middletown, Rhode Island, on the west shore of Aquidneck Island, facing the east passage of Narragansett Bay (Figure 1). McAllister Point Landfill (Site 01), part of NSN, covers approximately 11.5 acres in the central portion of the NSN facility, and is situated between the Defense Highway (to the east) and Narragansett Bay (to the north, south, and west) (Figure 2). A right-of-way for the Rhode Island Department of Transportation runs in a north-south direction along the eastern side of the site, parallel to the Defense Highway. Access to the site is via an access road off of Defense Highway, through a gate in the south-central portion of the site (Figure 3).

Currently, the landfill is covered by a multi-media low-permeability cap that prevents direct exposure to and further erosion of landfill materials. This cap was constructed in 1995 and 1996 as part of the remedial action described below in Section 2.2. The surface of the cap is vegetated and graded to promote runoff of precipitation, thus minimizing potential infiltration that could cause further leaching of landfill contaminants. The toe of the landfill slope facing Narragansett Bay is covered with a stone revetment to protect the cap from wave erosion. The capped area, excluding the revetment, is fenced. Access to the shoreline adjacent to the landfill is not entirely restricted.

A passive gas vent system was installed during construction of the cap to dissipate potential offgas buildup that could disturb the capping materials. A network of groundwater monitoring wells on site are available for use as part of the long-term monitoring program.



SITE LOCUS

FIGURE 1

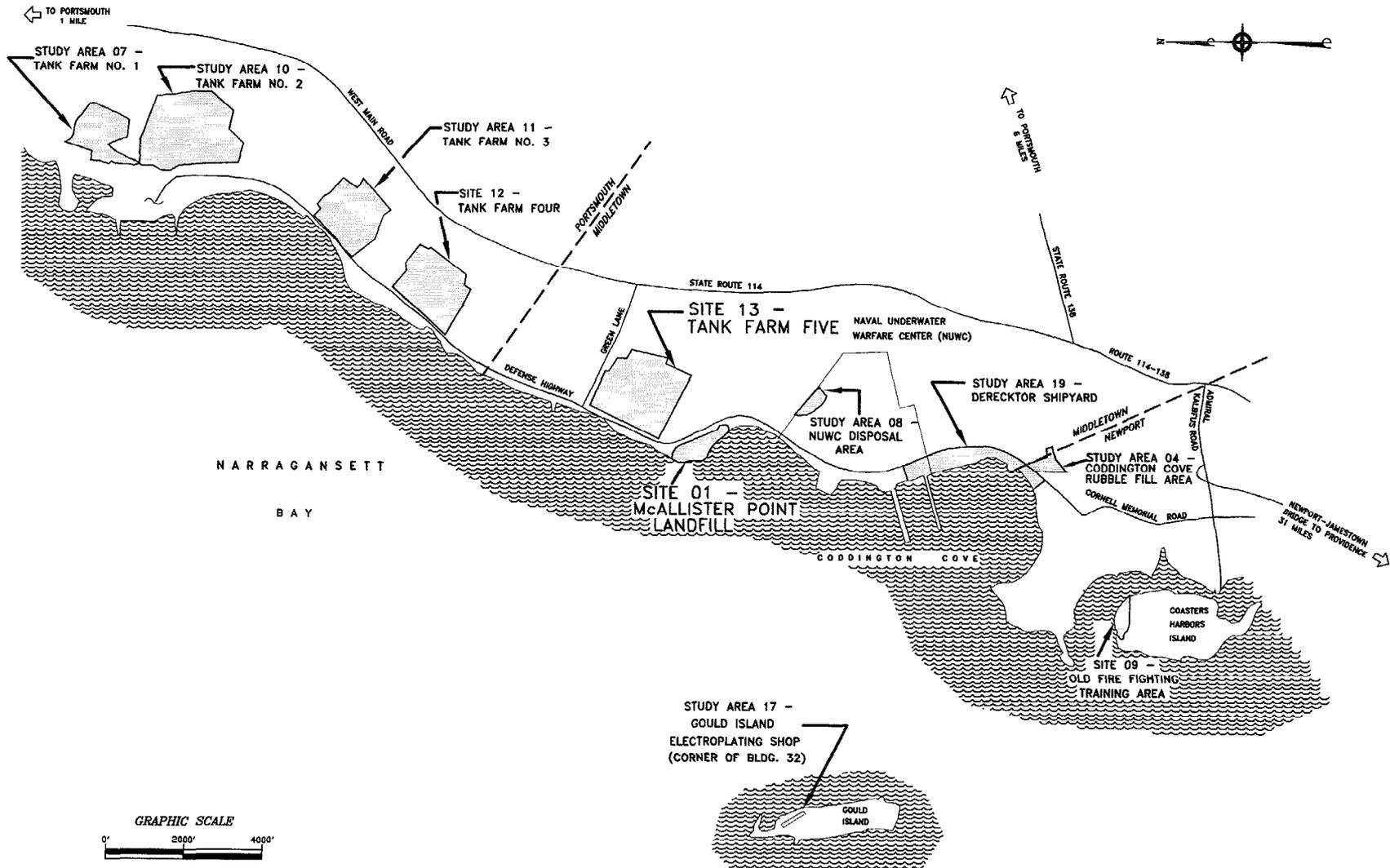
**NAVAL STATION NEWPORT
NEWPORT, RHODE ISLAND**



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55 Jonspin Road
Wilmington, MA 01887
(978)658-7899



NSN SITES AND STUDY AREAS		FIGURE 2	
NAVAL STATION NEWPORT			
NEWPORT, RHODE ISLAND			
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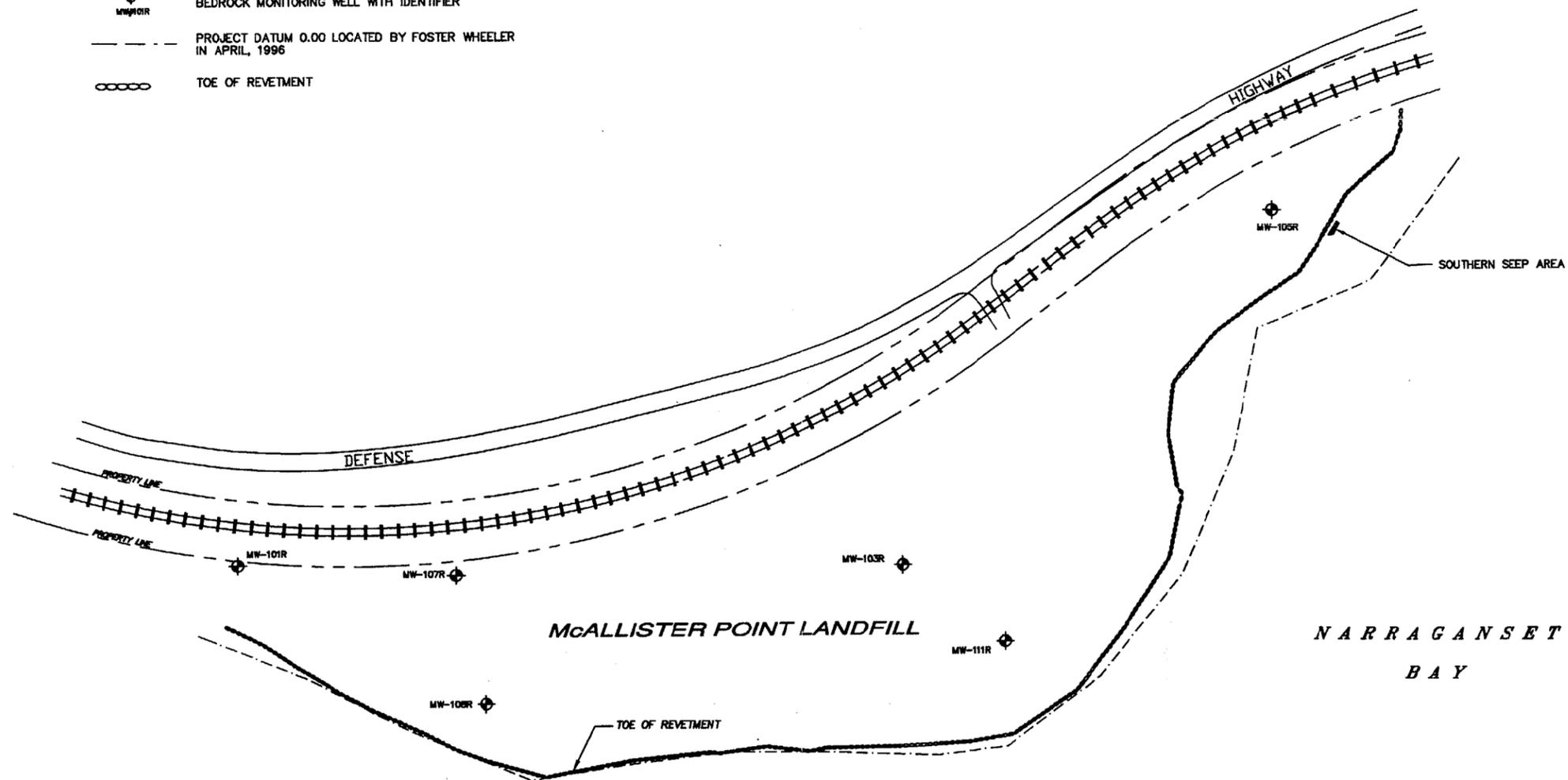
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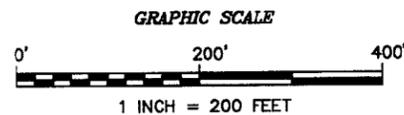


LEGEND

- BEDROCK MONITORING WELL WITH IDENTIFIER
- PROJECT DATUM 0.00 LOCATED BY FOSTER WHEELER IN APRIL, 1996
- TOE OF REVETMENT



- NOTES:**
1. PLAN NOT TO BE USED FOR DESIGN.
 2. ALL LOCATIONS TO BE CONSIDERED APPROXIMATE.
 3. SITE FEATURES COMPILED FROM A PLAN BY TRC, 1993.



McALLISTER POINT LANDFILL
NAVAL STATION NEWPORT
NEWPORT, RHODE ISLAND

FIGURE 3

TETRA TECH NUS, INC.

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Wilmington, MA 01887
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Site History

McAllister Point Landfill was the site of a sanitary landfill that operated over a 20-year period. From 1955 until the mid-1970's the site accepted all wastes generated at the Naval complex. The landfill received waste from all operational areas (machine shops, ship repair, etc.), Navy housing areas (domestic refuse), and from the 55 ships homeported at Newport prior to 1973 (approximately fourteen 40-cubic yard containers each day). The materials disposed of at the site reportedly included spent acids, paints, solvents, waste oils (diesel, lubrication, and fuel), polychlorinated biphenyl (PCB)-contaminated transformer oil; domestic refuse; and construction debris.

During the period of 1955 through 1964, wastes were trucked to the site, spread out with a bulldozer, and covered. In the late 1950's or early 1960's, an incinerator was built at the landfill. From that time through about 1970, approximately 98 percent of all the wastes were burned before being disposed of in the landfill. The incinerator was closed around 1970 due to the resultant air emissions. During the remaining years that the site was operational, all wastes were again disposed of directly into the landfill. Based on a review of aerial photographs of the site covering the period from 1965 through 1975, a change in the shape of the shoreline in the central portion of the site is evident, indicating filling of Narragansett Bay in this area. After disposal activities ceased in 1973, a three-foot thick covering of clay/silt was reportedly placed over the central portion of the landfill, and the site then remained inactive.

In November 1989, NSN, including the landfill, was listed on the EPA's National Priority List (NPL) of abandoned or uncontrolled hazardous waste sites subject to requirements of CERCLA and the Superfund Amendments and Reauthorization Act of 1986 (SARA). Following completion of the Phase I Remedial Investigation by TRC, a Record of Decision (ROD) was signed by EPA and the Navy in September 1993 that selected a multi-media, low permeability cap as a source control measure for the landfill, as discussed below in Section 2.2. Construction of the landfill cap commenced in 1995, and was completed in 1996, when the landfill was formally closed in compliance with a Consent Decree Agreement between the Navy and EPA.

Additional information on site use and history can be found in the Draft Final Remedial Investigation Report, Revision 1(B&RE, April 1997).

2.2 DISCUSSION OF REMEDIAL OBJECTIVES

As part of the Draft Final Focused Feasibility Study (FFS), remedial action objectives were developed for the site to aid in the development and screening of response alternatives, to mitigate existing and future potential threats to human health and the environment. As summarized in the ROD, these remedial action objectives were:

- To minimize potential environmental impacts by minimizing off-site migration of potentially contaminated surface soils, and by limiting the infiltration of precipitation to the underlying waste within the landfill area, thereby minimizing leachate generation; and
- To minimize potential risk to human health associated with exposure to the landfill area.

The selected remedy (Alternative 4) for McAllister Point Landfill is a “source control” alternative, designed to provide containment and isolation of the landfill contents, control of leachate generation as a result of infiltration, protection against surface erosion and landfill gas migration, and the performance of additional site investigations, as discussed below. (It is noted that the management of contaminant migration at the site via groundwater, sediment, and landfill gas, is being addressed under a second operable unit, and through additional site investigations. Information addressing management of migration issues is presented in the “Feasibility Study (FS) for Marine Sediment/Management of Migration” (TtNUS, February 1999). The FS was developed to address marine sediment, groundwater, and landfill gas migration concerns at the landfill. The Draft Record of Decision for Marine Sediment/Management of Migration which presents the Selected Remedy was submitted to the EPA and the Rhode Island Department of Environmental Management (RIDEM) in August 1999.)

As stated in the 1993 ROD, the selected “source control” remedy is comprised of the following components:

- Capping of the site with a RCRA Subtitle C multi-layer cap;
- Establishing landfill gas controls to manage landfill gas migration;
- Constructing surface controls to minimize erosion and manage runoff;
- Fencing and institutional controls (deed restrictions) to control site access and future site use;
- Operation and maintenance and site monitoring; and
- Five-year review.

In addition, the ROD contains provisions for undertaking additional studies which include:

- Determining if additional measures, beyond capping, must be taken to reduce the amount of groundwater in contact with the contaminated materials of the landfill;
- Determining the nature and extent of groundwater contamination and whether additional measures, beyond capping, are necessary to meet federal or state groundwater standards and to reduce to acceptable levels any unacceptable risks to human health or the environment from groundwater contamination;
- Determining whether "hot spots" (isolated areas of higher concentrations of contaminants) within the landfill materials, if present, will need to be addressed by a separate remedial action or can be addressed by the landfill cap; and
- Determining the nature and extent of any near-shore sediments that have been affected by site-related contamination, and whether they will need to be addressed by a separate remedial action or whether they can be addressed through consolidation under the landfill cap.

Studies implemented to accomplish these additional objectives include the ongoing quarterly groundwater monitoring being conducted by Foster Wheeler Environmental Corporation (FWENC) as part of the Source Control Operable Unit Operation and Maintenance (O&M) activities, and the FS (TtNUS, February 1999) and Final ROD for Marine Sediment/Management of Migration (U.S. Navy, anticipated December 1999 or January 2000).

The closure activities for the McAllister Point Landfill (Source Control) were completed by FWENC in 1996, and consisted of the following:

- Construction of heavy armor stone revetment to protect the western slope of the landfill from wave erosion;
- Re-grading and reconsolidation of waste material;
- Clean-up of exposed debris within close proximity to the shoreline;
- Covering the fill area with a RCRA Subtitle C multi-layer cap;
- Installing a passive gas collection venting system;
- Installing surface controls to minimize erosion and collect runoff;
- Installing a perimeter chain-link fence and implementing land use controls to control site access;
- Revegetation planting of upland habitat; and

- Installing groundwater monitoring wells to replace the wells that were destroyed during capping of the landfill.

A discussion of applicable or relevant and appropriate federal and state requirements (ARARs) that apply to this site and this remedial action is presented in Section XI, Part B, of the ROD. (As stated in the ROD, “no chemical-specific ARARs are applicable to the selected remedial action”.)

Listed below is a summary of the major milestones and reports completed since the signing of the ROD:

- The ROD for the Source Control Operable Unit of the McAllister Point Landfill (Site 01) was signed by the NSN Commanding Officer and the Acting Administrator of EPA, Region I, in September 1993, with RIDEM concurrence.
- The source control remedial action was implemented between 1995 and 1996, when the landfill was closed in compliance with a Consent Decree Agreement between the Navy and EPA.
- The final “Certification Report for Remedial Action” (by Brown & Root Environmental, now TtNUS) was submitted to the Navy, EPA, and RIDEM in February 1997. The report documents and certifies that the methods, procedures, and inspection and testing activities conducted to close the landfill were performed in accordance with the EPA-approved 100 percent design project specifications and drawings, and the Material Quality Assurance/Construction Quality Assurance Plan. The data collected during the project was used as the basis to certify that the landfill was closed in accordance with the project specifications and drawings.
- Under contract to the Navy, FWENC prepared and submitted the “Operation and Maintenance (O&M) Plan” in March 1997.
- The required quarterly and annual reports summarizing: sampling of groundwater and stormwater, and sampling or field screening of landfill gas, as applicable; O&M activities conducted at the landfill; and any discrepancies or variances from the O&M Plan were submitted by FWENC to the Navy, EPA, and RIDEM, as listed below. The O&M program consists of inspecting and repairing system components, as necessary, and collecting and analyzing groundwater, stormwater, and landfill gas samples:
 - Second Quarter Report (April – June 1997) submitted January 1998 (first sampling performed in March 1997)

- Third Quarter Report (July – September 1997) submitted December 1997 (groundwater and landfill vent gas sampling performed in June - July 1997)
- Fourth Quarter Report (October – December 1997) submitted January 1998 (sampling performed in September 1997)
- First Annual Report – O&M Activities (summarizes activities and results from 1997, the initial year of post-closure monitoring) submitted September 1998
- Fifth Quarter Report (January - March 1998) submitted May 1998 (sampling performed in January 1998)
- Sixth Quarter Report (April – June 1998) submitted August 1998 (sampling performed in April 1998)
- Seventh Quarter Report (July – September 1998) submitted November 1998 (groundwater sampling performed in July 1998; landfill vent gas samples for laboratory analysis and field screening, collected in August 1998)
- Eighth Quarter Report (October – December 1998) submitted March 1999 (groundwater sampling and landfill vent gas field screening performed in October 1998)
- Second Annual Report – O&M Activities (summarizes activities and results from 1998, the second year of post-closure monitoring) submitted March 1999
- Ninth Quarter Report (January – March 1999) submitted June 1999 (no groundwater sampling performed this quarter; landfill vent gas field screening and laboratory samples collected between March and April 1999)

The post-closure O&M activities, begun in March 1997, have now been conducted for over two years, with required summary reports submitted to EPA and RIDEM as detailed above. The O&M activities included quarterly measurement of groundwater levels, quarterly groundwater sampling, quarterly facility inspections, and landfill gas monitoring (field screening and laboratory analysis). The results of these activities, including all analytical data, are presented in the quarterly and annual reports listed above. A brief overview of the results of the O&M activities and sampling is presented below.

Groundwater Sampling and Analysis

As stated in the 1998 Draft Annual Report – O&M Activities, groundwater samples were collected for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total and dissolved metals, and wet chemistry parameters. The report also states that groundwater data was subjected to a qualitative evaluation of changes in chemical concentrations over time. The reports generally indicate that some contaminant concentrations in groundwater have decreased over time, including xylene concentrations in several wells, and several SVOCs. For total VOCs, the results showed a high degree of variability and no trends were identified.

The reports indicate that metals groundwater results are variable. Some monitoring wells did appear to show increasing concentrations of some metals over the course of the two-year quarterly sampling program, including barium, nickel, and zinc at MW-105S, and zinc at MW-103S.

The groundwater monitoring results supporting these findings, as presented in the “Annual Report – O&M Activities – 1998,” are attached as Appendix A.

It is noted that the FS for Marine Sediment/Management of Migration concluded that no cleanup actions are recommended at this time for groundwater; however, it is recommended that additional data are needed to evaluate the trends of contaminant levels in the future. The Navy will continue environmental monitoring for a minimum of a 30 year period, as agreed to in the Source Control ROD, to assess the need for future actions.

Landfill Gas Monitoring and Analysis

Landfill vent gas samples and ambient air samples were collected in July 1997, August 1998 and in March-April 1999. Samples were analyzed in an off site laboratory for VOCs in July 1997, and for VOCs, SVOCs, methane, and total hydrocarbons during the other two sampling events. Vent gas samples were also collected and field-screened for percent oxygen, percent carbon dioxide, hydrogen sulfide, percent methane, and percent lower explosive limit (LEL) during these events, and in October 1998.

In general, maximum concentrations of VOCs were observed in gas vent samples collected from the center of the landfill, with lower levels of VOCs observed in the southern perimeter riser pipes and northern gas vents. Predominant VOCs included freon 12, freon 114, acetone, 2-butanone, and tetrahydrofuran. The highest concentrations of total hydrocarbons and methane were also reported primarily in the central portion of the landfill. Samples from the northern perimeter riser pipes also

contained some of the higher levels of total hydrocarbons. All analytical and field-screening results are presented in the applicable quarterly and annual monitoring reports listed above.

Although contaminants were detected in direct vent gas samples, it is noted that ambient air samples collected from the landfill perimeter indicated only trace levels of some contaminants. It is noted that the FS for Marine Sediment/Management of Migration concluded that no cleanup actions are recommended at this time for landfill gas, however, the Navy will continue monitoring, as agreed to in the Source Control ROD, to assess the need for future actions.

Stormwater Sampling

The O&M Plan requires that one set of stormwater samples be collected and analyzed from the southern culvert outlet during the two-year period following closure of the landfill (between January 1997 and December 1998). However, no precipitation events of sufficient magnitude to produce runoff at the designated surface water sampling location were observed, therefore, stormwater sampling has not yet taken place during the monitoring program. As stated in the 1998 Draft Annual Report – O&M Activities, the southern culvert was inspected during each of the quarterly sampling events and was found to be dry. As of the last quarterly report (dated June 1999), provisions had been made to allow for more continuous monitoring of stormwater runoff at the designated location, for sampling purposes.

Inspection of System Components

In addition to the sampling and analysis activities summarized above, quarterly or semiannual inspections (as specified in the O&M Plan) are conducted of the source control remedial action system components, including: the landfill cap; stormwater drainage system; stone revetment; gas monitoring wells and vents; access road and entrance ramp; perimeter fence; vegetation; and groundwater monitoring system.

One recurring problem that had been noted was erosion observed along the landfill access road at the site entrance; however, this problem was corrected in early 1998. The repairs were effective in reducing rain-related washouts. In addition, several small animal burrows have been observed in the soil covering the impermeable landfill cap, however, the burrow holes did not appear to extend through the impermeable layers of the cap.

As detailed in the O&M inspection reports listed above, all system components continue to perform satisfactorily.

2.3 AREAS OF NONCOMPLIANCE

Any substantial aspect of the remedial action that fails to conform to remedial objectives would be considered an area of noncompliance. Based on the information evaluated as part of this Type Ia five-year review, no substantial areas of noncompliance with the remedial objectives were noted.

Minor discrepancies or problem areas which have already been addressed are noted below, however, these do not constitute substantial areas of noncompliance:

- The stormwater samples to be collected from the southern culvert, per the O&M Plan, have not yet been collected, since runoff at the designated sample location has not yet been observed, according to the quarterly and annual O&M reports. Per FWENC, provisions have been made to allow for more continuous monitoring of the designated location for observations of potential runoff and sample collection.
- Previous erosion that had taken place along the access road has been repaired, and the repairs are reported to be effectively preventing additional rain-related washouts along the access road.
- "Institutional controls" (deed restrictions) were listed in the ROD as a component of the source control remedy. However, a Navy policy clarification has determined that the Navy is not authorized to implement deed restrictions, therefore, the deed itself has not been modified. The Navy can, however, enter into Land Use Control agreements with regulators regarding future use of the property while under Navy control. In addition, the Navy can request that GSA include covenants to the deed prohibiting certain uses only at the time the property leaves government ownership. In place of actual modifications to the deed, the Navy has implemented "land use controls," e.g., the property is fenced and gated, so that the Navy controls the use of, and access to, the property.

2.4 RECOMMENDATIONS

No further response actions are required at this time.

Ongoing O&M activities are continuing, and are summarized in quarterly and annual reports. Trends in groundwater contaminant levels should continue to be evaluated and reported under the O&M sampling activities. Additional data obtained from sampling of landfill vent gases and ambient air should also continue to be evaluated in future O&M activities, to assess the need for active gas collection and treatment.

In the event that the property is exccessed by the Navy in the future, the deed restrictions which are listed as a component of the source control remedy should be implemented by GSA at that time.

2.5 STATEMENT ON PROTECTIVENESS

The purpose of the five-year review is to ensure that the selected remedial action remains protective of human health and the environment and is functioning as designed. The source control remedy selected for McAllister Point Landfill has been successfully implemented, and remains protective of human health and the environment. Long-term operation and maintenance, including groundwater and landfill gas sampling, is ongoing. As stated in the Final Record of Decision for Marine Sediment/Management of Migration, McAllister Point Landfill, based on data evaluated thus far, "neither groundwater nor landfill gases at the site pose an unacceptable risk to people or the environment". Signing of the ROD is anticipated in December 1999 or early 2000.

3.0 TANK FARM FIVE, TANKS 53 AND 56 (SITE 13) – GROUNDWATER CONTAINMENT OPERABLE UNIT

The sections below present information required for the Type Ia five-year review for Tank Farm Five, Tanks 53 and 56, as referenced in the EPA OSWER Directive 9355.7-02A, July 1994.

3.1 SITE CHARACTERISTICS

Background information including a brief site description and site history of Tank Farm Five, Tanks 53 and 56, is discussed below.

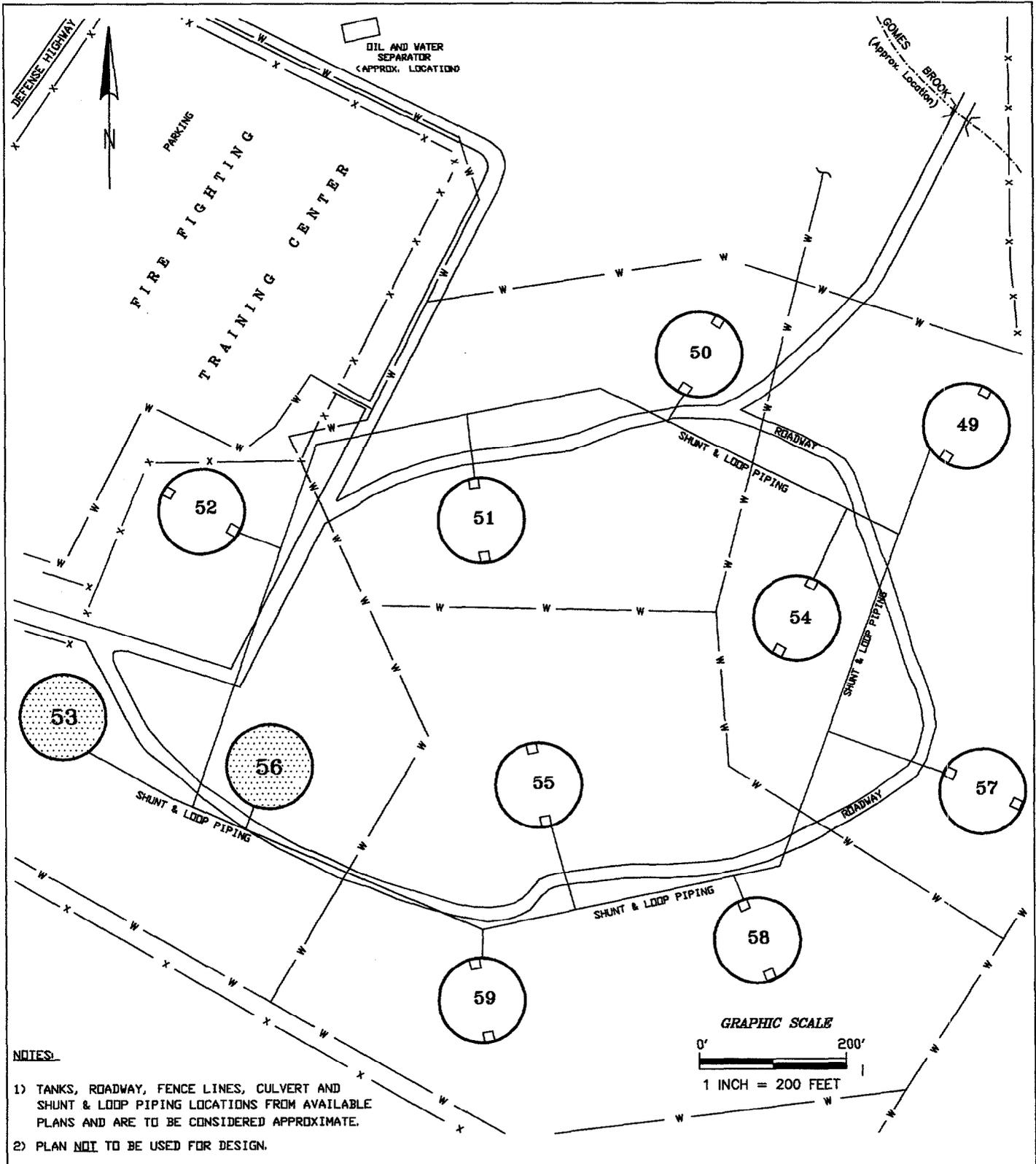
Physical Characteristics

Tank Farm Five, Tanks 53 and 56, is located in the central portion of the NSN facilities, in Middletown, Rhode Island (Figure 2). The 85-acre tank farm is the site of eleven underground storage tanks (USTs), numbered 49 through 59 (Figure 4). Tanks 53 and 56 are located in the western portion of the Tank Farm Five site. A paved road provides access to the site, passing between the tank locations in a loop. Topography generally slopes to the north. Gomes Brook is located approximately 1,200 feet north of Tanks 53 and 56, passing through the northeastern portion of the site and draining toward the west into Narragansett Bay. Tank Farm Five is bordered to the northwest by Defense Highway, to the southwest by a cemetery, to the east by residences, and to the northeast by Greene's Lane.

During 1942, the tanks were constructed of reinforced concrete and had a capacity of approximately 2.52 million gallons. The tanks were constructed in a blasted bedrock socket. The tanks are approximately 116 feet in diameter and 33 feet deep. The tanks were covered by approximately 4 feet of soil and were surrounded by a 4-foot wide, crushed-rock ring drain system. The ring drain system was installed to remove groundwater from around the tank and to prevent tank damage caused by hydraulic stresses and tank flotation.

Site History

The tanks were originally used to store fuel oils from approximately World War II through 1974. In 1975, as part of an oil recovery program, the Navy began using the tanks to store used oil for alternate use as a heating fuel oil (TRC, 1993a). In 1982, RIDEM adopted hazardous waste regulations that were applicable to the waste oils stored in Tanks 53 and 56. Subsequent sampling of the waste oils in 1983 indicated that the oil and sludge layers were considered hazardous due to elevated concentrations of lead. Also, the water phase was found to contain dissolved hydrocarbon compounds.



NOTES:

- 1) TANKS, ROADWAY, FENCE LINES, CULVERT AND SHUNT & LOOP PIPING LOCATIONS FROM AVAILABLE PLANS AND ARE TO BE CONSIDERED APPROXIMATE.
- 2) PLAN NO. 1 TO BE USED FOR DESIGN.

TANK FARM 5 – TANKS 53 & 56 LOCATION

FIGURE 4

NAVAL STATION NEWPORT

NEWPORT, RI



TETRA TECH NUS, INC.

DRAWN BY: R.G. DEWSNAP

REV.: 0

CHECKED BY: B. O'NEILL

DATE: SEPTEMBER 29, 1998

SCALE: 1" = 200'

ACAD NAME: DWG\NETC\CT0143\WLP_ADD\FIG_3.DWG

55 Jonspin Road

Wilmington, MA 01887

(978)658-7899

In 1984, the Navy decided to discontinue use of the tanks. In 1985, results of a groundwater sampling round from monitoring wells located within the Tank 53 ring drain indicated the presence of chlorinated and aromatic hydrocarbon compounds. In September 1985, RIDEM issued NSN a Hazardous Waste Facility Permit for Tanks 53 and 56, which included a stipulation for removing the contents and closing the tanks in accordance with federal hazardous waste regulations and in accordance with RIDEM requirements for USTs used for oil and hazardous substance storage.

Further investigations conducted in 1986 confirmed the presence of VOCs in the Tank 53 ring drain. Lower concentrations of VOCs were detected in groundwater up to 150 feet downgradient of Tank 53. In January 1990, oil was observed overflowing from the tank gauging chamber and onto the ground as a result of surface water entering the tank through cracks in the tank roof. The Navy took immediate action to lower the level in the tank to prevent further overflow. RIDEM issued an Immediate Compliance Order, which required that the Navy remove the contents of the tank, begin remediation of contaminated groundwater and soils surrounding the tank, and initiate an investigation to determine the extent of oil contamination in the vicinity of Tank 53.

In 1992, pursuant to the Immediate Compliance Order, the Navy completed the removal of sludge, oil, and water from the tank, and cleaned the interior surfaces of the tank. Also in 1992, an Interim Action ROD was signed by EPA and the Navy that selected a management of migration alternative consisting of groundwater extraction, treatment and discharge as an interim remedial action for the Tanks 53 and 56 site. Additional pertinent site activity since implementation of the Interim Action ROD is included below in Section 3.2.

Additional information on site use and history can also be found in the Remedial Investigation Report (TRC, 1992) and the Soil Investigation Report – Tank Farm Five – Tanks 53 and 56 (TRC, 1993c).

3.2 DISCUSSION OF REMEDIAL OBJECTIVES

Remedial action objectives were developed for the site to mitigate existing and future potential threats to human health and the environment. As summarized in the Interim Action ROD, these remedial action objectives were:

- To minimize further migration of the contaminated groundwater;
- To minimize any future negative impact to Gomes Brook and Narragansett Bay resulting from discharge of contaminated groundwater;
- To reduce the potential risk associated with the future ingestion of contaminated groundwater; and
- To reduce the time required for restoration of the aquifer.

The selected management of migration remedy is comprised of the following components:

- Groundwater extraction to contain contaminated groundwater and prevent its migration and potential discharge to surface water bodies;
- Groundwater treatment using coagulation/filtration and UV oxidation to treat organic and inorganic contaminants;
- Discharge of treated groundwater to the local wastewater treatment facility;
- Continued groundwater monitoring to confirm the capture of contaminated groundwater.

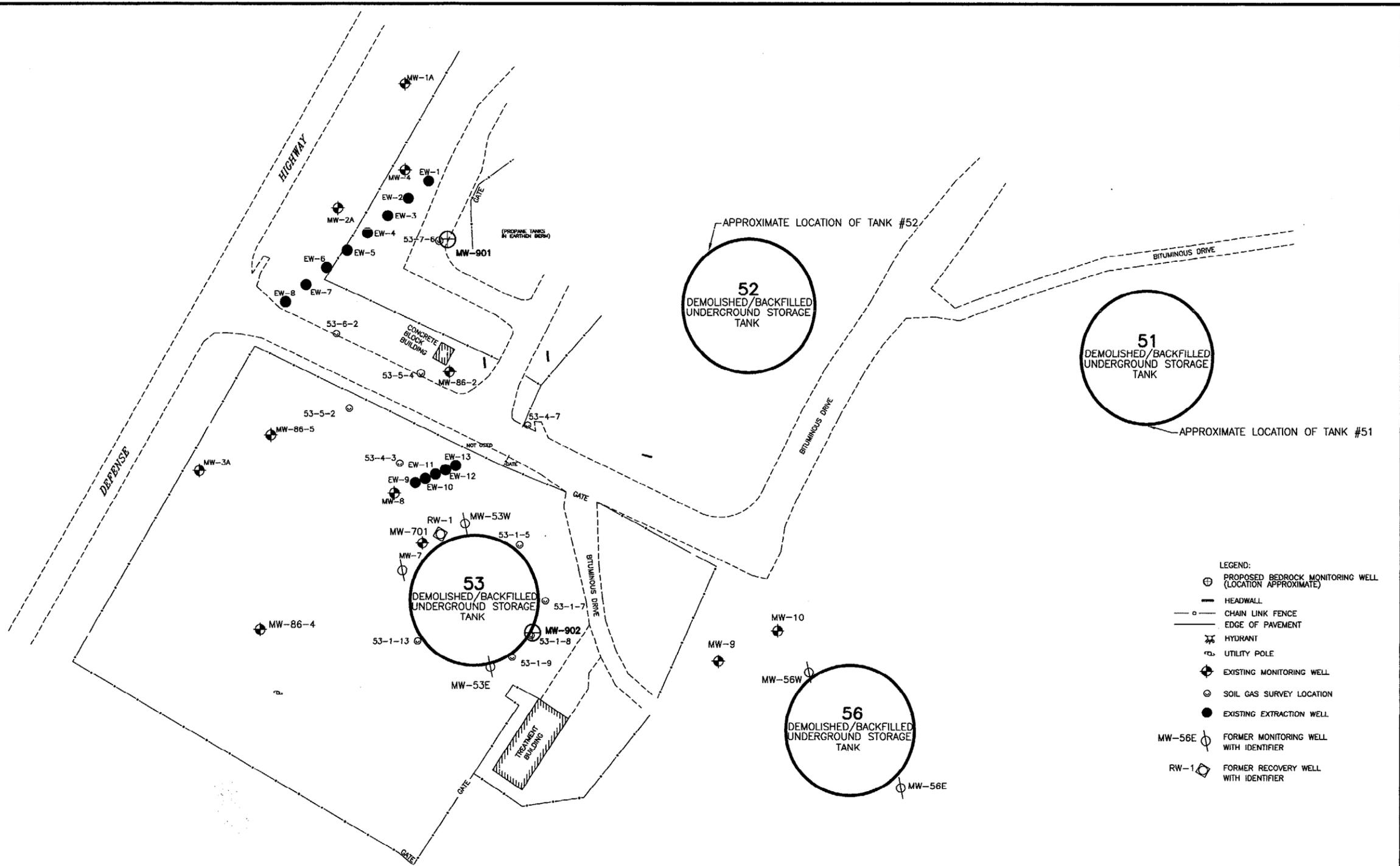
A more detailed description of the remedial components is provided in the Interim Action ROD.

In 1993, the design for the groundwater extraction and treatment/containment system was completed, and construction of the system was completed in December 1994. The system was designed to contain groundwater in the vicinity of Tank 53 and to prevent it from migrating further toward Narragansett Bay. The system consists of two sets of extraction wells and a treatment system. The first set of extraction wells (EW-9 through EW-13) is located approximately 60 to 70 feet northwest of Tank 53 and a second set (EW-1 through EW-8) is located approximately 280 feet northwest of Tank 53. In addition to the extraction wells, groundwater monitoring wells MW-1A, MW-2A, and MW-3A were installed downgradient of the second set of extraction wells (Figure 5).

The groundwater extraction and treatment system operated during the period from December 1994 to December 1996 when the system was shut down because analytical results for influent samples were below the cleanup levels established in the Interim Action ROD (cleanup levels from the ROD are presented in Table 1). Also within this time period (1995 to 1996) the Navy conducted a source removal action at Tank 53, as discussed below, which likely contributed to meeting the established cleanup levels in groundwater.

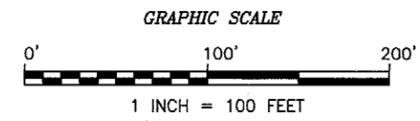
While the selected interim remedial action for the Tanks 53 and 56 site is a groundwater management of migration remedy, and does not have a "source control" component as part of the Interim Action ROD implemented under CERCLA, the Navy elected to also implement a separate source removal action. As stated in the Interim Action ROD, the soil contamination in the vicinity of Tanks 53 and 56, and soil cleanup strategies were to be evaluated separately: investigation and remediation of soil contamination at Tanks 53 and 56 are subject to RIDEM UST regulations, while the investigation and remediation of groundwater contamination is addressed under CERCLA, and by the Interim Action ROD signed by EPA and the Navy in September 1992.

Soil conditions at the tanks were investigated and reported separately, as summarized in "Soil Investigation, Tank Farm Five, Tanks 53 and 56" (TRC, 1993c). The report presented the Navy's



NOTES AND REFERENCES:

1. U.S. NAVAL BASE NEWPORT, RI, MELVILLE AREAS 2, 3, 4, 8, 5, LOCATION OF ESTABLISHED BENCH MARKS, DEPARTMENT OF THE NAVY BUREAU OF YARDS & DOCKS, DRAWING NO. 638,210, SHEET 1 OF 1, SKETCH NO. C-52-65. BM NO. 5 (TANK FARM NO. 5) IS A SQUARE CUT ON N.W. COR. OF R.R. BRIDGE ABUT'MT 83.5'W. OF INTERSECTION. BM ELEV. ARE REFERRED TO THE DATUM OF M.L.W.=0.00.
2. VERTICAL DATUM IS BASED ON LOCAL MEAN LOW WATER (SEE NOTE #2).
3. HORIZONTAL DATUM IS BASED ON THE STATE OF RHODE ISLAND GRID COORDINATE SYSTEM (NAD 1983).
4. PLAN NOT TO BE USED FOR DESIGN.
5. ALL LOCATIONS TO BE CONSIDERED APPROXIMATE.
6. SELECTED SOIL GAS AND MONITORING WELL LOCATIONS ARE SHOWN.
7. MW-701 MAY HAVE BEEN DAMAGED DURING TANK 53 DEMOLITION AND BACKFILLING.



TANKS 53 & 56 - WELL LOCATIONS	
TANK FARM FIVE	
NAVAL STATION NEWPORT, NEWPORT, RI	
DRAWN BY: R.G. DEWSNAP	REV.: 0
CHECKED BY: C. RACE	DATE: OCTOBER 14, 1999
SCALE: 1" = 100'	FILE NO.: \DWG\NETC\TANKFRM5\PROPBED_A_1A

FIGURE 5

Tt TETRA TECH NUS, INC.

55 Jonspin Road Wilmington, MA 01887
(978)658-7899

**TABLE 1
GROUNDWATER CLEANUP LEVELS
TANKS 53 AND 56, TANK FARM FIVE
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND**

Carcinogenic Contaminants of Concern	Cleanup Level (ppb)	Basis	Level of Risk
VOLATILE ORGANICS			
Benzene	5	MCL	2×10^{-06}
Tetrachloroethene	5	MCL	4×10^{-06}
Trichloroethene	5	MCL	6×10^{-07}
Vinyl Chloride	2	MCL	4×10^{-05}
INORGANICS			
Arsenic	50	MCL	*
Beryllium	1	MCL	5×10^{-05}
Lead	15	AL	NA
			SUM 1×10^{-04}

Non-carcinogenic Contaminants of Concern	Cleanup Level (ppb)	Basis	Target Endpoint of Toxicity	Hazard Index
VOLATILE ORGANICS				
1,2-Dichloroethene (cis-)	70	MCLG	Decreased hematocrit and hemoglobin	8×10^{-02}
1,2-Dichloroethene (trans-)	100	MCLG	Decreased hematocrit and hemoglobin	6×10^{-02}
1,1,1-Trichloroethane	200	MCLG	Liver	2×10^{-02}
INORGANICS				
Cadmium	5	MCLG	Proteinuria	1×10^{-01}
Chromium (Total)	100	MCLG	None observed	2×10^{-01}
Manganese	3650	Risk	CNS	1
Thallium	0.5	MCLG	Increased SGOT and LDH levels, alopecia	9×10^{-02}
				SUM 1

Note: The Hazard Index is summed for only those indicator compounds with the same or similar target endpoints.

MCL - Maximum Contaminant Level, National Primary Drinking Water Regulations, Final Rule Amendments to Safe Drinking Water Act (SDWA), U.S. EPA, Effective July 1992.

MCLG - Maximum Contaminant Level Goal, based on health considerations only, Final Rule Amendments to SDWA, U.S. EPA, Effective July 1992.

AL - Action Level representative of drinking water quality at the tap, U.S. EPA, May 7, 1991.

* The cleanup level for arsenic has been set at the MCL of 50 ppb. The carcinogenic risk posed by arsenic at 50 ppb in groundwater will be approximately 1 in 1,000. However, in light of recent studies indicating that many skin tumors arising from oral exposure to arsenic are non-lethal and in light of the possibility that the dose-response curve for the skin cancers may be sublinear (in which case the cancer potency factor used to generate risk estimates will be overstated), it is EPA policy to manage these risks downward by as much as a factor of ten. As a result, the carcinogenic risks for arsenic at this Site have been managed as if they were 1 in 10,000. (See EPA memorandum, "Recommended Agency Policy on the Carcinogenic Risk Associated with the Ingestion of Inorganic Arsenic" dated June 21, 1988).

Reference: This table is "Table 3" taken in its entirety, without revision, from the "Record of Decision for an Interim Remedial Action at Tank Farm 5, Tanks 53 and 56, Groundwater Operable Unit, Naval Education and Training Center, Newport, Rhode Island, September 1992".

selected remedial alternative for soil at Tanks 53 and 56, and from 1995 through 1996 contaminated soils surrounding Tank 53 were removed and disposed of off site under a RCRA action. It is noted that remediation of soil near Tank 56 was determined not necessary, based on sampling and analytical data. The ring drain at Tank 53 was re-constructed with clean stone/soils. However, the ring drain pumping system was not placed back into operation, rather, the tank was ballasted with clean water to address concerns about flotation.

Analytical results from 11 wells (monitoring and extraction wells) sampled during three events conducted between December 1996 and August 1997, following implementation of the interim remedial action, are summarized in the "Technical Memorandum – Summary of Analytical Results – Sample Round 3 for Tank 53 – Tank Farm 5" (B&R Environmental, 1997). Sample results are included for wells MW-2A, MW-3A, MW-4, MW-8, MW-86-1, MW-86-2, MW-86-4, MW-86-5, EW-7, EW-13, MW-701. Groundwater samples were analyzed for VOCs, SVOCs, metals, pesticides/PCBs, and petroleum hydrocarbons. Analytical results identify near detection limit concentrations of analytes in the first row of extraction wells (EW-9 to EW-13); no analytes have been detected in the perimeter extraction wells (EW-1 to EW-8) (B&R Environmental, 1997). The report states that results for potential contaminants of concern do not exceed current (August 1996) RIDEM Class GA groundwater quality standards. The report concludes that based on the analytical results from these events and from previous investigations "it appears that the removal action that the Navy conducted in the ring drain has effectively removed the source of contamination and concentrations of potential contaminants of concern have attenuated. Consequently, the extraction and treatment system should remain shut down."

The groundwater monitoring results supporting these findings, as presented in the "Technical Memorandum – Summary of Analytical Results – Sample Round 3 for Tank 53 – Tank Farm 5" (B&R Environmental, 1997), are attached as Appendix B.

A discussion of applicable or relevant and appropriate federal and state requirements (ARARs) that apply to this site and this remedial action is presented in Section XI, Part B, of the ROD. The groundwater cleanup levels established in the ROD are presented in Table 1.

Listed below is a summary of the major milestones and reports completed since the signing of the ROD:

- The ROD for the Interim Remedial Action – Groundwater Operable Unit – Tank Farm Five, Tanks 53 and 56, (Site 13) was signed by the NSN Commanding Officer and the Regional Administrator of EPA Region I in September 1992, with RIDEM concurrence.

- Construction of the groundwater and extraction treatment system was completed in December 1994, and the system was operated between 1994 and 1996, when the system was shut down because analytical results for influent samples were below the cleanup levels established in the Interim Action ROD.
- Post-remedial action groundwater sampling events conducted: December 1996, March 1997, and August 1997.
- Technical Memorandum – Summary of Analytical Results – Sample Round 1 for Tank 53 – Tank Farm 5 (B&R Environmental, March 1997). Summarizes results of first groundwater sampling event (post-remedial action).
- Technical Memorandum – Summary of Analytical Results – Sample Round 2 for Tank 53 – Tank Farm 5 (B&R Environmental, June 1997). Summarizes results of second groundwater sampling event (post-remedial action).
- Technical Memorandum – Summary of Analytical Results – Sample Round 3 for Tank 53 – Tank Farm 5 (B&R Environmental, 1997). Summarizes results of three groundwater sampling events, and recommends that the groundwater extraction and treatment system should remain shut down.
- February 17, 1998 letter from RIDEM to Navy approving demolition of six tanks at Tank Farm 5, and requesting the installation of two additional bedrock wells downgradient of Tank 53 in conjunction with the Tanks 53 and 56 groundwater investigation operable unit, and requesting the performance of a soil gas survey to assist in locating the wells in optimal locations.
- Final Work Plan Addendum 8, Passive Soil Gas Survey, Tanks 53 and 56, Tank Farm 5 (TtNUS, August 1998). Work Plan to scope the passive soil gas survey in order to assist in locating the RIDEM-requested bedrock monitoring wells at Tanks 53 and 56.
- Demolition of the tanks at Tank Farm 5 was completed in 1998. The tanks were imploded individually, with the demolition objective being to collapse and separate the tank roof from the tank walls while maintaining the basic structural integrity of the tank floor and side walls. A 15-foot layer of sand was placed into the tank to absorb the shock from the collapsing tank roof and to fill voids between the tank floor and roof. The ballast waters were removed from the tanks and pump rooms prior to sand placement. Following tank demolition, each tank site was backfilled with certified clean fill.

- Passive Soil Gas Investigation Report, Tanks 53 and 56, Tank Farm 5 (TtNUS, August 1999). Presents results of soil gas investigation and recommends proposed locations for two bedrock monitoring wells downgradient of Tank 53, per RIDEM request. (It is noted that the associated bedrock groundwater investigation is anticipated to be completed by January 2000.)

3.3 AREAS OF NONCOMPLIANCE

Any substantial aspect of the remedial action that fails to conform to remedial objectives would be considered an area of noncompliance. Based on the information evaluated as part of this Type Ia five-year review, no areas of noncompliance with the remedial objectives were noted.

3.4 RECOMMENDATIONS

No further response actions are required at this time. (Evaluation of additional groundwater sampling results will be conducted by the Navy following completion of the additional bedrock monitoring well installations and sampling requested by RIDEM.)

3.5 STATEMENT ON PROTECTIVENESS

The purpose of the five-year review is to ensure that the selected remedial action remains protective of human health and the environment and is functioning as designed. The groundwater management of migration remedy selected for Tank Farm 5, Tanks 53 and 56, has been successfully implemented. The system was shut down in December 1996 because analytical results for influent samples were below the cleanup levels established in the Interim Action ROD. Groundwater monitoring data indicates that contaminants do not remain on site at levels that pose an unacceptable risk to human health or the environment.

4.0 NEXT FIVE-YEAR REVIEW

Consistent with CERCLA and the NCP, a five-year review is to be performed five (5) years after the initiation of the selected remedial action at each site. Given that this first five-year review of NSN is occurring in 1999, the next five-year review will be due in 2004. Pursuant to EPA's Supplemental Five-Year Review Guidance (OSWER Directive 9355.7-02A, July 1994), any additional sites or operable units at NSN which initiate remedies under CERCLA subsequent to the two sites covered in this first five-year review should be incorporated into future reviews, as appropriate.

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Brown & Root Environmental, Certification Report for Remedial Action, McAllister Point Landfill Cap Construction, Naval Education and Training Center, Newport, Rhode Island, February 1997.

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Brown & Root Environmental, Remedial Investigation Report, McAllister Point Landfill, Naval Education and Training Center, Newport, Rhode Island, April 1997.

Brown & Root Environmental, Technical Memorandum, Summary of Analytical Results - Sample Round 2 for Tank 53, Tank Farm 5, Naval Education and Training Center, Newport, Rhode Island, June 1997.

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Tetra Tech NUS, Inc. (TtNUS), Feasibility Study for Marine Sediment/Management of Migration, McAllister Point Landfill, Naval Station Newport, Newport, Rhode Island, February 1999.

TRC, Final Report - Remedial Investigation (Technical Report and Risk Assessment Technical Report), Naval Education and Training Center, Newport, Rhode Island, Contract No. N62472-86-C-1282, January 1992.

TRC, Remedial Design Work Plan, Ground Water Treatment Interim Action near Tanks 53 and 56 at Tank Farm 5, Naval Education and Training Center, Newport, Rhode Island, January 1993a.

TRC, (Draft Final) Focused Feasibility Study Report, Site 01 - McAllister Point Landfill, Naval Education and Training Center, Newport, Rhode Island, January 1993b.

TRC, Soil Investigation, Tank Farm Five - Tanks 53 and 56, Naval Education and Training Center, Newport, Rhode Island, December 1993c.

U.S. Navy, Record of Decision for an Interim Remedial Action at Tank Farm 5, Tanks 53 and 56, Groundwater Operable Unit Naval Education and Training Center, Newport, Rhode Island, September 1992.

U.S. Navy, Record of Decision - Source Control Operable Unit - Site 01 - McAllister Point Landfill, Naval Education and Training Center, Newport, Rhode Island, September 1993.

U.S. Navy, Final Record of Decision for Marine Sediment/Management of Migration, McAllister Point Landfill Site, Naval Station Newport, Newport, Rhode Island, anticipated December 1999 or January 2000.

U.S. EPA, Supplemental Five-Year Review Guidance, OSWER Directive 9355.7-02A, July 1994.