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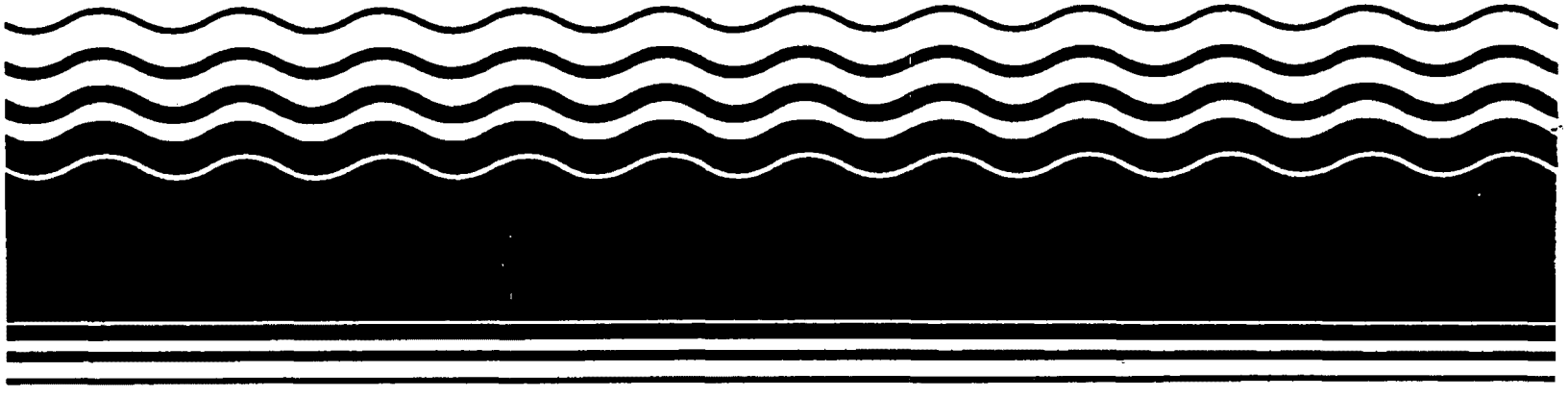
EPA

Superfund Record of Decision:

Newport Naval Education/ Training Center, RI



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16. Abstract (Limit: 200 words)

The 11.5-acre Newport Naval Education/Training Center site is an inactive landfill located in Middletown, Rhode Island. Land use in the area is predominantly rural, with onsite grasslands and woodlands. The site borders Narragansett Bay, and the shoreline of the site lies within the 100-year coastal floodplain. From 1955 to the mid-1970s, McAllister Point Landfill, located in the central portion of the facility, accepted all waste generated at the Newport Naval complex, including spent acids, paints, solvents, oil, and PCB-contaminated transformer oil. From 1955 to 1964, the waste was brought onsite, spread out with a bulldozer, and covered. In 1965, an incinerator was built onsite and operated until 1970 or 1971, when it was closed due to resultant air emissions. During the remaining years that the site was operational, all wastes were disposed of directly into the landfill. After closure of the landfill, a three-foot thick clay/silt cover was placed over several portions of the site. As part of the Department of Defense's Installation Restoration Program, environmental sampling and analysis was conducted in 1983 to determine the presence of contamination at the site. These studies revealed low levels of inorganic and phenol contamination in the existing cap, and leachate containing metals, cyanide, phenol, and other organics seeping from

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - Newport Naval Education/Training Center, RI
Second Remedial Action
Contaminated Media: soil, debris
Key Contaminants: VOCs (benzene, PCE, TCE, toluene, xylenes), other organics (PAHs, PCBs, pesticides, phenols), metals (arsenic, chromium, lead)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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Abstract (Continued)

the western edge of the landfill. In 1992, the U.S. Navy, EPA, and the State entered into an agreement to cleanup the onsite hazardous substances. This ROD addresses a source remedy for the landfill contents and control of leachate generation as a result of infiltration, as OU1. A future ROD will address management of contaminant migration at the landfill, as OU2. The primary contaminants of concern affecting the soil and debris are VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PAHs, PCBs, pesticides, and phenols; and metals, including arsenic, chromium, and lead.

The selected remedial action for this site includes placing a RCRA Subtitle C multi-layer cap over the 10.5 acres of the landfill; consolidating contaminated "hot spot" materials and/or sediment in the landfill prior to cap construction, if determined appropriate based on additional studies; implementing a gas vent layer below the lower barrier layer of the cap to manage landfill gas, if determined appropriate during an evaluation; conducting vapor pilot testing on wells located within the landfill area; conducting additional site investigations to determine if additional measures need to be taken with respect to ground water contamination, leachate generation, landfill gas extraction and treatment, and remediation of "hot spot" areas and contaminated sediment; monitoring ground water and storm water discharge quality; implementing site surface controls, including grading, revegetation, and slope protection to prevent precipitation from infiltrating into the landfill; and implementing institutional controls, including deed restrictions, and site access restrictions. The estimated present worth cost for this remedial action is $8,000,000, which includes an estimated present worth O&M cost of $2,300,000.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil and debris cleanup goals have not been established for the site, but ground water, leachate, landfill gas, and sediment cleanup goals will be established, if appropriate, for OU2.

RECORD OF DECISION

SOURCE CONTROL OPERABLE UNIT

Site 01 - McAllister Point Landfill
Naval Education and Training Center
Newport, Rhode Island

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DECISION SUMMARY

I. SITE NAME, LOCATION AND DESCRIPTION

The U.S. Naval Education and Training Center (NETC) Newport is a National Priorities List (NPL) site. There are currently four areas of contamination (AOC) and six study areas (SAs) within NETC Newport that are under investigation. This Record of Decision (ROD) relates to the presence of the existing landfill area at McAllister Point as a source of contamination.

Portions of the NETC facility are located in Newport, Middletown, and Portsmouth, Rhode Island. The facility layout is long and narrow, following the shoreline of Aquidneck Island for nearly 6 miles bordering Narragansett Bay. A facility location map is provided on Figure 1. McAllister Point Landfill is located in the central portion of the facility, in the town of Middletown, Rhode Island, as shown in Figure 2.

The McAllister Point Landfill site covers approximately 11.5 acres and is situated between Defense Highway and Narragansett Bay. Penn Central Railroad tracks run in a north-south direction along the eastern side of the site, parallel to Defense Highway. Access to the site is from Defense Highway in the south-central portion of the site. The layout of the site is depicted in Figure 3.

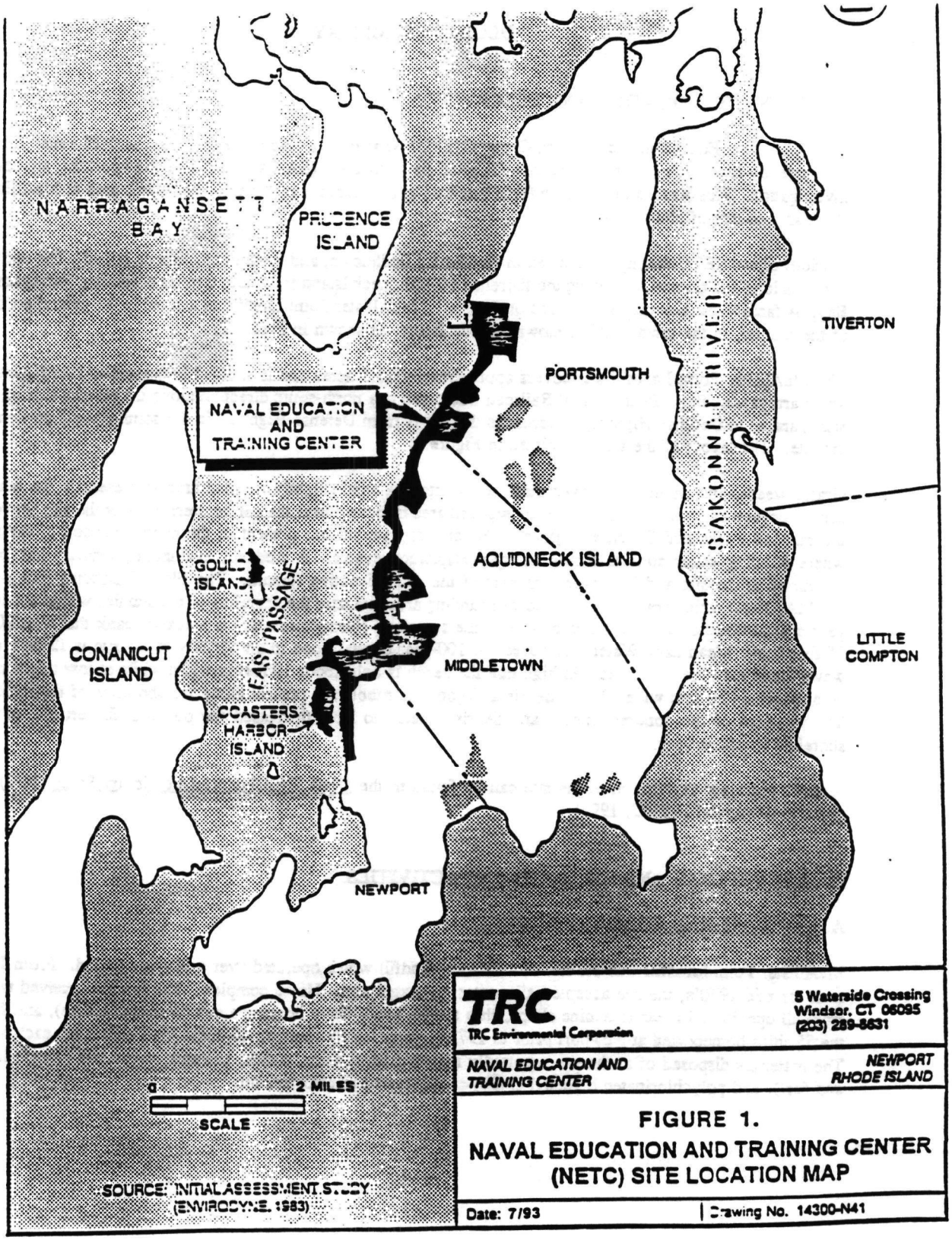
Grass, weeds, and small trees cover most of the site. A small, lightly wooded area is present in the north-central portion of the site. A more mature wooded area is located near the northeastern edge of the site between the railroad tracks and Defense Highway. Several depressions are present in the central portion of the site where standing water collects during heavy precipitation events. A wetlands evaluation summary has been conducted at the site and is available as part of the Administrative Record. The Flood Insurance Rate Map (FEMA, 1984) which covers the site and surrounding area indicates the shoreline of the site lies within the 100-year coastal flood area. The western edge of the site along Narragansett Bay is a coastal bank that rises 10 to 15 feet above Mean Low Water. The areas of 100-year coastal flood in the vicinity of the site is 12 feet, and wave action may reach 17 feet. At high tide the beach is only about 10 feet in width while at low tide it may be as much as 50 feet wide. Metal debris and concrete rubble are present along the shoreline of the landfill. The presence of the concrete rubble and debris appears to have decreased the potential for erosion of the shoreline landfill slopes.

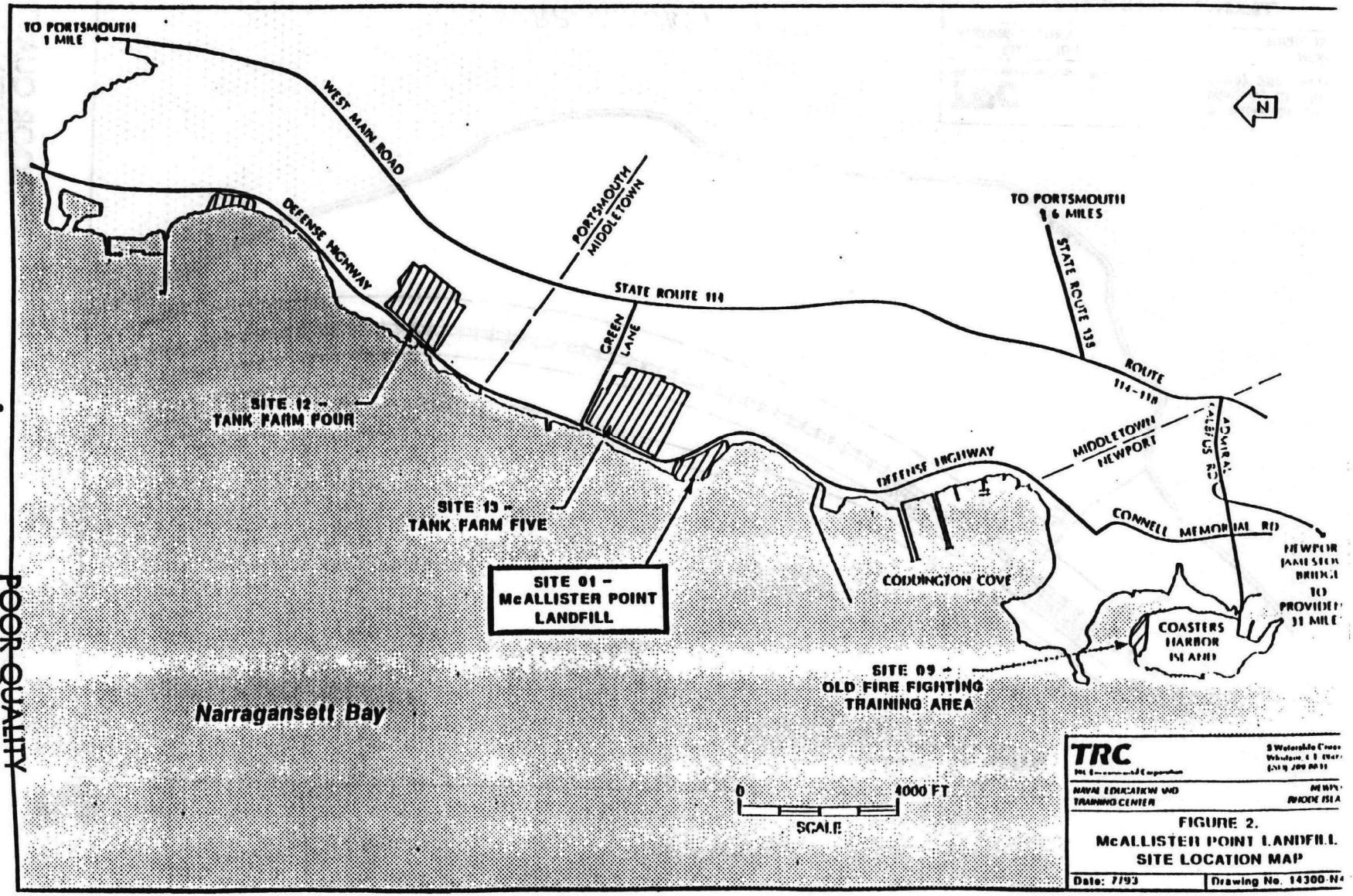
A more complete description of the site can be found in the Draft Final Focused Feasibility Study (FFS) on pages 1-10 and 1-11 (TRC, 1993).

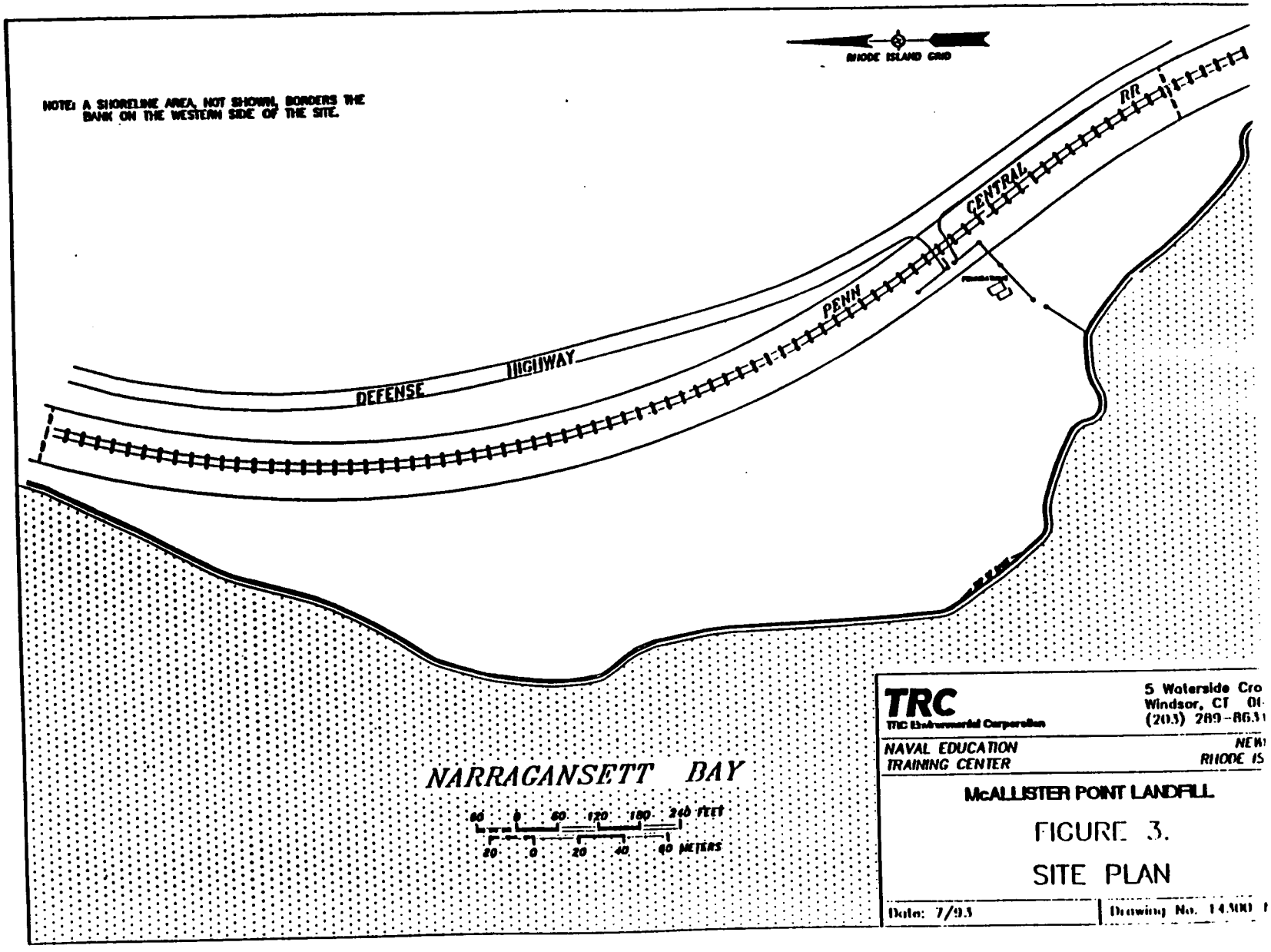
II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. LAND USE AND RESPONSE HISTORY

McAllister Point Landfill was the site of a sanitary landfill which 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, lube, and fuel), and polychlorinated biphenyl (PCB)-contaminated transformer oil.







During the period of 1955 through 1964, wastes were trucked to the site, spread out with a bulldozer, and covered. In 1965, an incinerator was built at the landfill. From 1965 through 1970 to 1971, 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.

Following the closure of the landfill at McAllister Point, a three-foot thick covering of clay/silt was reportedly placed over the site. Current observations confirm the presence of a clay/silt material over portions of the landfill, although it is not continuous over the entire landfill area. Since the closure of the landfill, the site has remained inactive.

A more detailed description of site use and history for Site 01 can be found in the FFS Report at pages 1-10 and 1-11 (TRC, 1993).

B. ENFORCEMENT HISTORY

In response to the environmental contamination which has occurred as a result of the use, handling, storage, or disposal of hazardous materials at numerous military installations across the United States, the Department of Defense (DOD) has initiated investigations and cleanup activities under the Installation Restoration (IR) Program. The IR Program parallels the Superfund program and is conducted in several stages, including:

1. Identification of potential hazardous waste sites;
2. Confirmation of the presence of hazardous materials at the site;
3. Determination of the type and extent of contamination;
4. Evaluation of alternatives for cleanup of the site;
5. Proposal of a cleanup remedy;
6. Selection of a remedy; and
7. Implementation of the remedy for the cleanup of the site.

An Initial Assessment Study (IAS) was completed in March 1983, detailing historical hazardous material usage and waste disposal practices at NETC Newport. Following the IAS, a Confirmation Study (CS) was conducted and included environmental sampling and analysis to verify the presence of contamination at the site.

On November 21, 1989, NETC Newport was placed on the USEPA's National Priorities List. The investigation and cleanup of Site 01 is funded through the Defense Environmental Restoration Account (DERA).

In March 1992, a Federal Facility Agreement (FFA) was entered into by the U.S. Navy, the U.S. Environmental Protection Agency (USEPA) and the Rhode Island Department of Environmental Management (RIDEM) for the cleanup of hazardous substances pursuant to CERCLA. The FFA sets forth the roles and responsibilities of each agency, contains deadlines for investigation and cleanup of the hazardous waste sites, and establishes a mechanism to resolve disputes between the agencies.

III. COMMUNITY PARTICIPATION

Throughout the facility's history, community concern and involvement has been fairly low. The Navy has kept the community and other interested parties apprised of site activities through informational meetings, press releases, public meetings and Technical Review Committee (TRC) meetings.

In July 1990, the Navy released a community relations plan which outlined a program to address community concerns and to keep citizens informed about and involved during remedial activities.

The TRC meetings have been an important vehicle for community participation. The TRC meeting group was established in 1988 and is comprised of the Navy, USEPA, RIDEM, and various community representatives. The community members of the TRC include representatives from Newport, Middletown and Portsmouth. The TRC meets every two to three months, reviews the technical aspects of the facility investigation and remediation program, and provides community input to the program.

The Administrative Record, a file which is maintained and contains all information considered and relied upon by the Navy to make its decision on the selection of a response action under CERCLA, is available for public review at the Naval Education and Training Center in Newport, Rhode Island. Information Repositories, which contain files available for public review which include current information on technical reports and reference documents regarding the site, are maintained at the following locations: the Newport Public Library, the Middletown Free Library and the Portsmouth Free Public Library Association. The Navy published a notice and brief analysis of the Proposed Plan in the Newport Daily News on August 3 and August 4, 1993 and in the Providence Journal Bulletin on August 4, 1993 and made the plan available to the public at the previously listed public libraries. Notices of a change in location of the public hearing and public meeting were printed in the Newport Daily News on August 23 and August 24, 1993 and in the Providence Journal Bulletin on August 25, 1993.

On August 25, 1993, the Navy held an informational meeting to discuss the results of the field investigation activities, as described in the Remedial Investigation Technical Report, and the cleanup alternatives presented in the Draft Final Focused Feasibility Study, and to present the Navy's Proposed Plan. Also during this meeting, representatives from the Navy, TRC Environmental Corporation, USEPA, and RIDEM were available to answer questions from the public about McAllister Point Landfill and the proposed remedial alternative. From August 4, 1993 to September 3, 1993, the Navy held a 30-day public comment period to accept public comment on the alternatives presented in the Draft Final Focused Feasibility Study and the Proposed Plan and on any other documents addressing the McAllister Point Landfill site previously released to the public. Immediately following the informational meeting on August 25, 1993, the Navy held a public hearing to accept formal comments on the Proposed Plan. A transcript of this hearing is included in the attached responsiveness summary. Both verbal and written comments were received regarding the Proposed Plan. These comments and the Navy's responses to these comments are presented in the Responsiveness Summary attached as Appendix B.

IV. SCOPE AND ROLE OF RESPONSE ACTION

The selected remedy described herein is a source control alternative. In summary, the remedy provides containment and isolation of the landfill contents, the control of leachate generation as a result of infiltration, protection against surface erosion and landfill gas migration, and the performance of additional site investigations. It addresses the principal threats to human health and the environment posed by the site and is intended to be the permanent source control remedy for the site. Management of contaminant migration at the McAllister Point Landfill site will be addressed within a second operable unit. Management of migration

remedial alternatives will be developed and evaluated following the completion of additional field investigations at the McAllister Point Landfill site. The Record of Decision for the management of migration operable unit will be issued prior to the commencement of the source control operable unit.

V. SUMMARY OF SITE CHARACTERISTICS

Section 1.5 of the Draft Final FFS Report (TRC, 1993) contains an overview of the site investigations conducted at the McAllister Point Landfill site. The significant findings of the site investigations are summarized below.

A Confirmation Study (CS) including environmental sampling and analysis was conducted from 1984 to 1985 to verify the presence of contamination at the McAllister Point Landfill site. The CS included the collection of soil, leachate and ground water samples from the site as well as sediment and mussel samples from Narragansett Bay. The analysis of a composite surface soil sample collected from the landfill cover material indicated that low levels of contamination (inorganics and phenols) may be associated with the existing landfill cap. Samples of leachate seeping from the western edge of the landfill exhibited metals, cyanide, phenol, and some other organic constituents. Sediment and blue mussel samples were collected along the landfill shore and at two background locations several miles north and south of the site, respectively. The presence of inorganic contaminants was detected in sediment samples collected adjacent to the site, especially near the southern end of the landfill, with levels decreasing with distance from the site. Inorganics were also present in mussel samples. PCBs were detected in mussel samples but appeared to be attributable to bay-wide contamination, on the basis of similar levels detected in the background mussel samples. Site ground water samples exhibited elevated levels of metals. While the CS results indicated that the presence of the landfill had resulted in apparent impacts to ground water and sediment quality, the study did not define whether the landfill was continuing to contribute contaminants into Narragansett Bay and, if it was, the potential migration pathways by which the contamination was reaching the bay.

Additional sediment and mussel sampling was conducted by the U.S. Army Corps of Engineers in the portion of Narragansett Bay adjacent to McAllister Point Landfill in January 1988. Mussel and sediment samples were collected and analyzed for metals. The sediment samples were also analyzed for PCBs and total petroleum hydrocarbons (TPH). All three chemical types were detected in the sediment samples, with concentrations in sediment samples collected adjacent to the landfill consistently at least one order of magnitude greater than those detected in the control sample. Copper, chromium, zinc and PCBs were detected in some of the mussel samples at concentrations greater than were detected in the control sample.

A Phase I RI was conducted at McAllister Point Landfill from 1989 to 1990. The general purposes of the overall investigation were to:

- determine the presence, nature and extent of contamination resulting from historic site activities, including on-site and off-site impacts to soils, ground water, surface water, sediment and biota;
- identify potential contaminant migration routes;
- identify potential receptors of site contaminants; and
- characterize related environmental impacts and potential human health risks.

For a detailed assessment of the Phase I RI investigation refer to the Final RI Technical Report, which is included in the Administrative Record. A Phase II RI is planned to further investigate the site.

The Navy implemented a field sampling program to evaluate the site which included site geophysical surveys, and the collection and chemical analysis of surface soil, subsurface soil, leachate, and ground water samples.

Volatile organic compounds (VOCs), base neutral/acid extractable organic compounds (BNAs) (including polynuclear aromatic hydrocarbons (PAHs)), pesticides, PCBs, and inorganics were all detected in on-site soils. The major areas of the site where contaminants were detected in the soil at elevated levels include the following:

- Northern area - Carcinogenic PAHs;
- North-central area - BNAs, carcinogenic PAHs, and inorganics;
- Central landfill area - VOCs, BNAs, PCBs and inorganics;
- South of access road - BNAs, carcinogenic PAHs, and inorganics; and
- Shoreline - BNAs, carcinogenic PAHs, and inorganics.

The overburden at the site consists of fill and glacial till deposits. The fill material generally consists of three broad categories of waste: domestic-type refuse, industrial/construction (demolition) waste, and incinerator ash. The central, mounded portion of the landfill may be characterized by the presence of domestic-type refuse (e.g., plastic, paper, garbage). The remainder of the site generally consists of waste typical of building demolition debris (e.g., wood, metal, brick, concrete, etc.). Incinerator ash is present within the northwestern portion of the site and a single location in the southern part of the site.

Under the ground water investigation, samples were collected from eight new monitoring wells and three existing monitoring wells. Two of the new wells were screened in bedrock while the remaining wells were screened in the overburden. VOCs, BNAs, PCBs and inorganics were all detected in ground water samples. A thin oil layer was observed floating on the ground water surface in one monitoring well located in the southern portion of the site. The major areas of the site where contaminants were detected at levels exceeding drinking water standards include the following:

- Northern area - inorganics;
- North-central area - inorganics;
- Central landfill area - VOCs, and inorganics; and
- South of access road - VOCs, PCBs, and inorganics.

The presence of VOCs in ground water samples and soil samples collected at the depth of the water table over the north-central to southern portions of the site indicates the potential for ground water contamination throughout this area. The ground water samples collected from the deep bedrock wells generally indicated that deep ground water quality has not been impacted, with the exception of the detection of benzene at a concentration of 1 part per billion (ppb) in one deep well.

VI. SUMMARY OF SITE RISKS

In November 1991, a risk assessment was prepared on the basis of Phase I Remedial Investigation results for the McAllister Point Landfill site to estimate the probability and magnitude of potential adverse human health effects from exposure to constituents associated with site use. The risk assessment followed a four-step process: 1) constituent identification, which identified those constituents, which given the specifics of the site, were of potential concern; 2) exposure assessment, which identified current or potential future land uses, receptor populations, and exposure pathways, and determined the extent of potential exposures; 3) toxicity assessment, which considered the types and magnitude of adverse health effects associated with each constituent of potential concern, and 4) risk characterization, which integrated the three earlier steps to summarize the potential and

actual risks posed by constituents at the site, including carcinogenic and non-carcinogenic risks. The results of the risk assessment for the McAllister Point Landfill site are summarized below.

The constituents of potential concern selected for evaluation in the risk assessment for the McAllister Point Landfill site are listed in Table A-1 found in Appendix A of this Record of Decision. These constituents of potential concern were identified through an evaluation of the data for all three media at the site (i.e., surface soils, subsurface soils and ground water) and constitute a representative subset of the 150 constituents identified at the site during the Phase I Remedial Investigation. The constituents of potential concern were selected to represent potential site-related hazards based on constituent type, toxicity, concentration, frequency of detection, and mobility and persistence in the environment. A summary of the range of concentrations in each media is provided in Table A-2 of this Record of Decision. while a summary of the health effects associated with each of the constituents of potential concern can be found in Appendix F of the Phase I RI Risk Assessment Report.

Potential risks associated with exposure to the constituents of potential concern were estimated quantitatively or qualitatively through the development of several hypothetical exposure scenarios. These scenarios were developed to reflect the potential for exposure to site constituents based on current or potential future land uses and on the location of the site. Since the site is not presently in active use, trespassing was the only current land use scenario evaluated in the risk assessment. Future land uses which were considered plausible during the development of the risk assessment include recreational use of the site, on-site construction activities, commercial/industrial use of the site, and residential site use. The following is a brief summary of the exposure scenarios evaluated in the risk assessment. A more thorough description of these scenarios can be found in Section 2.3 of the Phase I RI Risk Assessment Report.

Under the current trespassing scenario, referred to as Scenario 1, it was assumed that children aged 9 to 18 years and living within the immediate vicinity of the site may be exposed to constituents while trespassing on the site. Exposure was assumed to occur through incidental ingestion of and dermal contact with surface soil at a frequency of 21 days per year (i.e., approximately one day per week during the summer and less frequently during the school year). A soil ingestion rate of 100 mg of soil per day and a dermal contact rate of 500 mg of soil/day were used to evaluate these two pathways, respectively.

Under the future recreational use scenario (Scenario 2), it was assumed that ball fields were constructed on-site for public recreational use. As a result, children from ages 6 to 18 years old were assumed to receive dermal and ingestion exposures to constituents in surface soil. It was assumed that children would visit the ball fields 104 days/year (five days per week in the summer and less frequently during the spring and fall). It was further assumed that the children would ingest 100 mg soil/day and dermally contact soil at a rate of 500 mg soil/day.

Under the future construction use scenario (Scenario 3), it was assumed that construction workers involved in site development would be exposed to site constituents through incidental ingestion of and dermal contact with soil (to a depth of 12 feet), and inhalation of fugitive dust. Exposure was assumed to occur for 250 days over a one year period. Specific assumptions for each exposure pathway included a soil ingestion rate of 480 mg soil/day, a dermal contact rate of 500 mg soil/day, and an inhalation rate of 20 m^3 of air/workday which assumes moderate exertion.

Under the future commercial/industrial use scenario (Scenario 4), it was assumed that adult employees of a commercial/industrial business established on the site would be exposed to surface soil contamination through incidental ingestion (50 mg soil/day) and dermal exposure (500 mg soil/day) and to contaminated ground water through ingestion (1 liter water/day). Employees were assumed to be exposed for 250 days per year for 25 years.

Under the future residential use scenario (Scenario 5), risks to children and adults were evaluated separately. Children (aged 0 to 6 years) and adults (over a period of 30 years) were assumed to receive exposures to constituents in surface soil through incidental ingestion, dermal contact, and inhalation of airborne particulates. Child and adult residents were also assumed to ingest ground water and to inhale volatile organic constituents released into bathroom air during showering. These exposures were assumed to occur 350 days year for 6 years for children and over a 30-year period for adults. Children were assumed to ingest 0.75 liters water/day and 200 mg soil/house dust per day, while for adults these values were 2 liters water/day and 100 mg soil/house dust per day. Other exposure assumptions for children and adults included a dermal contact rate of 500 mg soil/day, an inhalation rate of 20 m^3 air/day for fugitive dust, and an inhalation rate of 0.6 m^3 air/hour for inhalation of constituents while showering. The length of a shower was assumed to be 12 minutes.

For each exposure pathway and land use evaluated, an average and a reasonable maximum exposure estimate (RME) was generated for each constituent of potential concern corresponding to exposure to the average and the maximum concentrations detected in the relevant medium.

Excess lifetime cancer risks were determined for each exposure pathway by multiplying the exposure level by the constituent-specific cancer slope factor. Cancer slope factors have been developed by EPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic constituents. That is, the true risk is unlikely to be greater than the risk predicted. The resulting risk estimates are expressed in scientific notation as a probability (e.g. 1×10^{-6} for 1/1,000,000) and indicate (using this example), that an average individual is not likely to have greater than a one in a million chance of developing cancer over 70 years as a result of site-related exposure as defined to the constituent at the stated concentration. Current EPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of constituents.

The hazard index (HI) was also calculated for each pathway as EPA's measure of the potential for non-carcinogenic health effects. The HI is a sum of the constituent-specific hazard quotients (HQs) which are calculated by dividing the exposure level by the reference dose (RfD) or other suitable benchmark for non-carcinogenic health effects for an individual constituent. RfDs have been developed by EPA to protect sensitive individuals over the course of a lifetime and they reflect a daily exposure level that is likely to be without an appreciable risk of an adverse health effect. RfDs are derived from epidemiological or animal studies and incorporate uncertainty factors to provide margins of safety between the RfD and the observed effect level. The hazard quotient is often expressed as a single value (e.g. 0.3) indicating the ratio of the stated exposure as defined to the reference dose value (in this example, the exposure as characterized is approximately one third of the target exposure level for the given constituent). The hazard quotient should only be considered additive for constituents that have the same or similar toxic endpoint (for example, the hazard quotient for a constituent known to produce liver damage should not be added to a second constituent whose toxic endpoint is kidney damage).

Risk estimates were evaluated using EPA's established target risk range for Superfund cleanups (i.e., cancer risk range of 1×10^{-6} to 1×10^{-4}) and target HI value (i.e., HI less than or equal to 1). A conservative approach was taken where risks from all exposure pathways and all constituents were summed to yield the total site risk for a given receptor.

Table A-3 depicts the carcinogenic and non-carcinogenic risk summary for exposures to constituents of potential concern in soil under current (and potential future) trespassing at the site (Scenario 1). Both the average and RME estimates of total risk fell below or within the target cancer risk range for Superfund cleanups established by EPA (i.e., 1×10^{-6} to 1×10^{-4}) and below EPA's target HI value of 1.0.

Table A-4 depicts the carcinogenic and non-carcinogenic risk summary for exposures to constituents of potential concern in soil under future recreational use of the site (Scenario 2). Both the average and RME estimates of total non-carcinogenic risk fell below 1.0. While the average total cancer risk fell within the 1×10^{-6} to 1×10^{-4} range, the RME estimate exceeded 1×10^{-4}. Incidental ingestion of carcinogenic polynuclear aromatic hydrocarbons (PAHs) in soil accounted for most of the elevated RME cancer risk estimate.

Table A-5 depicts the carcinogenic and non-carcinogenic risk summary for exposures to constituents of potential concern in soil under future construction activities at the site (Scenario 3). With the exception of the RME estimate of total non-carcinogenic risk, the estimated total HIs and cancer risks fell within target levels. The RME estimate of total non-carcinogenic risk exceeded 1.0 as a result of incidental ingestion of antimony in soil.

Table A-6 depicts the carcinogenic and non-carcinogenic risk summary for exposures to constituents of potential concern in soil and ground water under future commercial/industrial use of the site (Scenario 4). With the exception of the RME estimate of total carcinogenic risk, the estimated total HIs and cancer risks for soil fell within target levels. The RME estimate of total carcinogenic risk exceeded 1×10^{-4} as a result of incidental ingestion of carcinogenic PAHs in soil. Both the average and RME estimates of total non-carcinogenic and carcinogenic risk for ground water exceeded target levels. The ground water HIs were elevated as a result of ingestion of antimony and manganese in drinking water, while ingestion of arsenic, beryllium, and carcinogenic PAHs contributed the most to the estimated cancer risks for this medium.

Table A-7 depicts the carcinogenic and non-carcinogenic risk summary for exposures to constituents of potential concern in soil and ground water under future residential development of the site (Scenario 5). For soil, the average total HI and cancer risk estimates fell within target levels, while most of the RME estimates of total risk exceeded the target levels. Incidental ingestion of antimony, copper, and zinc in soil accounted for the majority of the elevated RME estimates of non-carcinogenic risk for children. The elevated RME cancer risks for children and adults occurred as a result of incidental ingestion of carcinogenic PAHs in soil. For ground water, both the average and RME estimates of total non-carcinogenic and carcinogenic risk exceeded target levels. As shown in Table A-8, the ground water HIs were elevated as a result of ingestion of antimony, arsenic, cadmium, chromium, copper, manganese, and zinc in drinking water, while ingestion of arsenic, beryllium, vinyl chloride, 3,3'-dichlorobenzidine, and carcinogenic PAHs contributed the most to the estimated cancer risks for this medium.

Since EPA toxicity values for lead were not available, an alternative approach called the Integrated Lead Uptake/Biokinetic Model was used to evaluate potential risks from childhood lead exposures. As described in Section 2.5 of the Phase I RI Risk Assessment Report, a criterion of greater than or equal to five percent of the child population with blood lead concentrations above 10 μg lead per deciliter of blood was used. The model was run using two sets of surface soil data; one comprising all locations across the site and one limited to a zone along the Narragansett Bay shoreline where the concentrations of lead in soil were higher relative to the rest of the site. As shown in Table A-9, less than one percent of the modeled population of children were predicted to have blood lead concentrations above 10 μg/dl when the mean concentration of lead in soil across the site was used. Using either the mean or maximum soil lead concentration for the "impacted" zone, greater than five percent of the child population was estimated to have blood lead concentrations above 10 μg/dl.

Uncertainties are associated with each component of the risk assessment process. In the exposure assessment, for example, uncertainties in the selection of current and potential future land uses, exposure pathways, and exposure parameter values contribute to the overall uncertainty associated with the risk estimates. Given the uncertainty associated with the site being developed for future residential use, the uncertainty in the risk estimates for this scenario is quite large. Overall, assumptions or uncertainties incorporated into this or other components of the risk assessment are expected to contribute to an overestimation of risk associated with site

use. This overestimation of risks results in a conservative approach to the evaluation of site remedial requirements, since actual risks posed by the site may be less than those calculated.

Significant uncertainties also exist for the data used in the risk assessment. These uncertainties include the following:

- Constituents detected infrequently in all media were assumed to occur across the site at an average or maximum detected concentration;
- "UJ" data (i.e., resulting from matrix effects) were included as the sample quantitation limit (SQL) in calculations of the average concentration, and considered as potential locations of contamination. As stated in EPA's comments on the risk assessment, data qualified with "UJ" indicate constituents which were analyzed for but not detected, and the associated values are estimated SQLs;
- "U" data (non-detect values) were included as one-half the SQL, used in calculation of the average concentration, and considered as potential locations of contamination; and
- Uncertainties in background sampling locations, particularly with regard to inorganic constituents, disallowed exclusion of constituents which may occur naturally at the site.

In most cases, uncertainties associated with the data (e.g., inclusion of chemicals for which only "UJ" qualified data were available) are likely to overestimate rather than underestimate the risk.

With respect to cancer risk estimates, a major uncertainty is the degree of exposure possible to vinyl chloride, 3,3'-dichlorobenzidine, and carcinogenic PAHs in drinking water. These constituents were not actually detected in ground water, but were included in the quantitative assessment on the basis of "UJ" qualified data. Cross-assignment of the slope factors for benzo(a)pyrene to the other carcinogenic PAHs likely overestimated the risks associated with exposures to these constituents in ground water and soil. Interactions between carcinogens may lead both to enhanced and diminished carcinogenic responses which also lend a degree of uncertainty to the risk estimates.

With respect to non-cancer risk estimates, the HQs for all constituents were summed to estimate the total risk for a given receptor. The elevated HIs (i.e., above 1.0) at this site were generally not caused by adding individual HQs for different constituents. Therefore, consideration of whether it is appropriate to sum HQs stemming from non-cancer effects that occur in different tissues for different constituents does not greatly increase the uncertainty in this analysis.

No environmental assessment was conducted as part of the Phase I Remedial Investigation. Previous Confirmation Studies indicated that sediments and mussels in the adjacent portion of Narragansett Bay may be impacted by the migration of constituents from the site. An off-shore sampling program will be conducted at the site and a full environmental assessment will be conducted to further define site-related impacts on the environment.

Actual or threatened releases of constituents from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment. The objective of the selected remedial action is to provide containment and isolation of the landfill contents and the control of leachate generation as a result of infiltration. Through this action, exposures to the landfill area will be limited and continued migration of contamination leached from the waste materials located within the unsaturated zone into the ground water will be minimized.

VII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

A. STATUTORY REQUIREMENTS/RESPONSE OBJECTIVES

The Navy is responsible for addressing environmental contamination at the McAllister Point Landfill site pursuant to Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Federal Facility Agreement entered into by the Navy, the USEPA and RIDEM. The Navy's primary responsibility under these legal authorities is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including: a requirement that the remedial action, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria or limitations, unless a waiver is invoked; a requirement that a remedial action be selected that is cost-effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment which permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances is a principal element over remedies not involving such treatment. Response alternatives were developed to be consistent with these Congressional mandates.

Based on preliminary information relating to types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives were developed to aid in the development and screening of alternatives. These remedial action objectives were developed to mitigate existing and future potential threats to human health and the environment. 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.

B. TECHNOLOGY AND ALTERNATIVE DEVELOPMENT AND SCREENING

CERCLA and the NCP set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, a focused range of source control remedial alternatives was developed for the McAllister Point Landfill site in which institutional and engineering controls were utilized to reduce the threat posed by the presence of the landfill at the site. This range also included a no action alternative. Other alternatives which address management of contaminant migration will be evaluated in a separate operable unit, upon completion of additional site investigations. The Record of Decision for the management of migration operable unit will be completed prior to the construction of the source control operable unit remedy. Because a focused feasibility study approach was used, no initial screening of alternatives was conducted. Chapter 2 of the FFS presents the remedial alternatives which were developed by combining the technologies identified in the technology and process option screening. Table 1 identifies the four alternatives which were developed for the site and which underwent detailed analysis.

TABLE 1
REMEDIAL ALTERNATIVES
SITE 01 - McALLISTER POINT LANDFILL SITE

ALTERNATIVE 1	NO ACTION
ALTERNATIVE 2	LIMITED ACTION (Fencing, Surface Controls and Deed Restrictions)
ALTERNATIVE 3	RCRA SUBTITLE D SOIL CAP WITH SURFACE AND INSTITUTIONAL CONTROLS
ALTERNATIVE 4	RCRA SUBTITLE C MULTI-LAYER CAP WITH SURFACE AND INSTITUTIONAL

VIII. DESCRIPTION OF ALTERNATIVES

This section describes the selected alternative and the other alternatives the Navy developed for detailed analysis. The numbering system used in the FFS report to distinguish between the various alternatives is referenced here. The source control alternatives analyzed for the McAllister Point Landfill site include a No-Action Alternative (Alternative 1); a Fencing, Surface Controls and Deed Restrictions Alternative (Alternative 2); a RCRA Subtitle D Soil Cap with Surface and Institutional Controls Alternative (Alternative 3); and a RCRA Subtitle C Soil Cap with Surface and Institutional Controls Alternative (Alternative 4). Detailed alternative descriptions are provided on pages 3-4, 3-6, 3-9 through 3-14 and 3-17 through 3-24 of the Draft Final FFS.

Alternative 1: No Action: This alternative was developed and evaluated in the FFS to serve as a baseline for comparison with the other remedial alternatives under consideration. Under the No Action Alternative, no active measures would be taken to reduce or to contain contamination emanating from the landfill. The alternative would not meet remedial objectives.

Alternative 2: Limited Action (Fencing, Surface Controls and Deed Restrictions): This alternative would consist of the following components:

- Fencing of the site to restrict site access;
- Improvements in site drainage and revegetation to restrict surficial erosion;
- Deed restrictions to limit future site use and development; and
- Five-year review.

Under the Limited Action Alternative, minimal active measures would be taken to reduce contamination emanating from the landfill. Surface controls in the form of drainage improvements and revegetation of bare areas of the site would be used to enhance site drainage and minimize erosion from the surface of the landfill. Institutional controls in the form of fencing and the posting of warning signs would be implemented to restrict site access. Restrictions to future site development would be incorporated to restrict future land use.

Based on the improvements to site drainage which are incorporated into this alternative, long-term storm water discharge monitoring is included. The monitoring program would be developed to meet federal and state Pollution Discharge Elimination System regulations regarding storm water discharge from a landfill site. The monitoring program would be conducted for a period of 30 years. The Navy would also review the remedial action, to the extent required by law, to assure that it continued to protect human health and the environment.

Estimated Time for Design and Construction: 3 months
Estimated Period for Operation: 30 years
Estimated Capital Cost: $190,000
Estimated Operation and Maintenance Cost (net present worth): $290,000
Estimated Total Cost (net present worth): $580,000

Alternative 3: RCRA Subtitle D Soil Cap with Surface and Institutional Controls: This alternative consists of the following components:

- RCRA Subtitle D (municipal waste landfill) cap;
- Regrading of the site and drainage improvements;
- Landfill gas management;
- Reduction in grade and provision of slope protection along Narragansett Bay;
- Fencing and deed restrictions;
- Additional site investigations;
- Long-term monitoring of ground water and storm water discharge quality; and
- Five-year review.

The landfill area would be covered with a soil cap constructed in accordance with federal municipal solid waste landfill closure requirements. The cap provides a physical barrier to potential exposures to or erosion of surficial contaminants and provides some restriction of infiltration. The alternative also includes regrading of the site, improvement of drainage features, a landfill gas management system, and a reduction in grade and provision of slope protection along Narragansett Bay. Fencing and deed restrictions would be included to limit site access and future site use and development. Supplemental site investigations would be required to determine if additional measures need to be taken with respect to ground water contamination, leachate generation, landfill gas treatment, and remediation of hot spot areas and contamination sediments. If determined to be appropriate based on these additional studies, contaminated hot spot materials and/or sediments could potentially be consolidated beneath the landfill cap prior to cap construction. Ground water and storm water discharge monitoring would be conducted for a period of 30 years in accordance with federal and state regulations. The Navy would also review the remedial action, to the extent required by law, to assure that it continued to protect human health and the environment.

Estimated Time for Design and Construction: 1 to 2 years
Estimated Period for Operation: 30 years
Estimated Capital Cost: $2,500,000
Estimated Operation and Maintenance Cost (net present worth): $2,300,000
Estimated Total Cost (net present worth): $5,800,000,

Alternative 4: RCRA Subtitle C Multi-Layer Cap with Surface and Institutional Controls: This alternative consists of the following components:

- RCRA Subtitle C (hazardous waste landfill) cap;
- Regrading of the site and drainage improvements;
- Landfill gas management;
- Reduction in grade and provision of slope protection along Narragansett Bay;
- Fencing and deed restrictions;
- Additional site investigations;
- Long-term monitoring of ground water and storm water discharge quality; and
- Five-year review.

The landfill area would be covered with a multi-layer cap constructed in accordance with federal and state hazardous waste landfill closure requirements. The cap provides a physical barrier to potential exposures to or erosion of surficial contaminants and restricts infiltration and the subsequent leaching of contaminants from wastes within the unsaturated zone. The alternative also includes regrading of the site, improvement of drainage features, a landfill gas management system, and a reduction in grade and provision of slope protection along Narragansett Bay. Fencing and deed restrictions would be included to limit site access and futures site use and development. Additional site investigations would be required to determine if additional measures need to be taken with respect to ground water contamination, leachate generation, landfill gas treatment, and remediation of hot spot areas and contaminated sediments. If determined to be appropriate based on these additional studies, contaminated hot spot materials and/or sediments could potentially be consolidated beneath the landfill cap prior to cap construction. Ground water and storm water discharge monitoring would be conducted for a period of 30 years in accordance with federal and state regulations. The Navy would also review the remedial action, to the extent required by law, to assure that it continued to protect human health and the environment.

Estimated Time for Design and Construction: 2 years
Estimated Time of Operation: 30 years
Estimated Capital Cost: $4,300,000
Estimated Operations and Maintenance Costs (net present worth): $2,300,000
Estimated Total Cost (net present worth): $8,000,000

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

Section 121(b)(1) of CERCLA presents several factors that, at a minimum, must be considered in the assessment of remedial alternatives. Building upon these specific statutory mandates, the National Contingency Plan (NCP) articulates nine evaluation criteria to be used in assessing the individual remedial alternatives.

A detailed analysis was performed on the alternatives using the nine evaluation criteria in order to select a site remedy. These criteria and their definitions are as follows:

Threshold Criteria

The two threshold criteria described below must be met in order for the alternatives to be eligible for selection in accordance with the NCP.

1. **Overall protection of human health and the environment** addresses whether or not a remedy protects human health and the environment both in the long-term and the short-term

from unacceptable risks posed by hazardous substances, pollutants, or contaminants present at the site by eliminating, reducing, or controlling exposures to the hazardous substances.

2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** addresses whether or not a remedy will meet all of the ARARs of other Federal environmental laws and state environmental or facilities siting laws or whether grounds for invoking a waiver are applicable.

Primary Balancing Criteria

The following five criteria are utilized to compare and evaluate the elements of those alternatives which meet the threshold criteria.

3. **Long-term effectiveness and permanence** addresses the criteria that are utilized to assess alternatives for the long-term effectiveness and permanence they afford, along with the degree of certainty that they will prove successful.

4. **Reduction of toxicity, mobility, or volume through treatment** addresses the degree to which alternatives employ recycling or treatment that reduces toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the site.

5. **Short term effectiveness** addresses the period of time needed to achieve protection and any short-term risks to human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.

6. **Implementability** addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. **Cost** includes estimated capital and operation and maintenance (O&M) costs, calculated as present-worth costs for comparison purposes.

Modifying Criteria

The modifying criteria are used in the final evaluation of the remedial alternatives, generally after public comment on the FFS Report and the Proposed Plan has been received.

8. **State acceptance** addresses the State's position and key concerns related to the preferred alternative and other alternatives, and the state's comments on ARARs or the proposed use of waivers.

9. **Community acceptance** addresses the public's general response to the alternatives described in the Proposed Plan and FFS report and requires a determination of which components of the alternatives interested persons in the community support, have reservations about or oppose.

Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of the alternatives against the nine criteria, was conducted. This comparative analysis can be found in Tables 3-14 through 3-20 of the FFS. The section below presents the nine criteria and a brief narrative summary of the alternatives and the strengths and weaknesses according to the detailed and comparative analysis.

Overall Protection of Human Health and the Environment

Alternative 4 (the selected alternative) would provide overall protection against exposures to the landfill area as well as minimize contaminant migration from the landfill area due to erosion and infiltration of precipitation. Alternative 3, which utilizes a soil cap, would also provide a degree of overall protection, although it would not be as effective in reducing infiltration of precipitation as Alternative 4. Alternative 2 utilizes only institutional controls and minor drainage improvements and revegetation to provide protection of human health and the environment. Alternative 1, the no action alternative, would not meet this criterion.

Compliance with ARARs

The proposed remedial action would meet all ARARs. Specifically, the selected alternative would comply with location-specific ARARs, including wetlands and water resources requirements, coastal zone requirements, and endangered species and cultural resource requirements, as applicable. If the landfill cap and shoreward protection features cannot be constructed within the existing extent of the landfill, mitigation actions will be taken to replace any wetlands destroyed by the remedial action, in accordance with the requirements of Section 404 of the Clean Water Act and other federal wetlands regulations. With respect to action-specific ARARs, federal and state landfill closure requirements, ARARs applicable to the venting of landfill gases, and storm water discharge requirements will be met by the selected alternative.

The remaining alternatives do not meet all ARARs. Alternative 3 would not meet hazardous waste landfill closure requirements. Alternatives 1 and 2 would permit continued impacts to wetlands and waters to occur and therefore, would not meet the requirements of the Clean Water Act.

Long-Term Effectiveness and Permanence

Alternative 4 provides the greatest degree of long-term effectiveness and permanence because the multi-layer cap design provides the greatest degree of protection against infiltration of precipitation and subsequent leachate generation. Alternative 3 is not considered as effective in the long-term because the soil cap will not be as effective a barrier to infiltration. Alternative 2, fencing, surface controls and deed restrictions, provides only minor improvements to site drainage and would have minimal impact on leachate generation. The no action alternative, Alternative 1, is not considered permanent or effective in the long term.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Due to the nature of this source control operable unit, none of the alternatives developed provide a reduction in toxicity, mobility or volume of contamination through treatment. The management of migration operable unit will consider cleanup levels and remedial options for ground water, leachate, landfill gas, hot spot areas and sediments, as appropriate.

Alternative 4 would provide the greatest reduction in the mobility of contamination through containment. This alternative includes a multi-layer cap which would provide the greatest protection against infiltration of precipitation and the subsequent generation of leachate as the precipitation would percolate through the unsaturated waste materials.

Alternative 3 provides a reduction in the mobility of contamination through the capping of the site with a soil cap, although it would not provide as much protection against infiltration of precipitation as Alternative 4. Alternative 2 provides minimal reduction in contaminant mobility through improved site drainage and

revegetation. Alternative 1, the no action alternative provides no reduction in the toxicity, mobility or volume of contaminated material.

Short-Term Effectiveness

Alternative 4 and Alternative 3 would be comparable in terms of short-term effectiveness, with similar potential short-term risks and environmental impacts associated with the construction of the landfill caps. Alternative 2 would result in fewer potential short-term human health or environmental risks during the implementation period but would not provide the same degree of protection upon completion. Alternative 1 requires no implementation and therefore results in no increase in short-term risks. However, it does not achieve remedial response objectives.

Implementability

None of the alternatives have significant barriers to implementation although the implementation considerations become more complex with the increasing complexity of the remedial action. Alternative 2 is most easily implemented from a technical standpoint, involving implementation of only minor surface controls and institutional controls. Both Alternative 3 and Alternative 4 require removal of existing vegetation, site regrading and slope protection along the western side of the site. The soil cap of Alternative 3 would be more easily constructed than the multi-layer cap of Alternative 4, which requires specialized construction methods and handling for the installation of the synthetic geomembrane.

Cost

The capital, operation and maintenance, and total costs for each alternative are provided as part of the preceding section entitled "Description of Alternatives". Alternative 1, no action, is the lowest cost alternative followed by the limited action alternative, Alternative 2. Alternatives 3 and 4 are significantly more expensive than Alternatives 1 and 2, with Alternative 4 being the highest cost alternative.

State Acceptance

As a party to the FFA, the State has reviewed and commented on the FFS and Proposed Plan and the Navy has taken the State's comments into account. The State has documented its concurrence with the selected remedial action, as presented in Section XIII of this ROD. The State's comments and outstanding concerns regarding the Phase II site investigations, Focused Feasibility Study and Proposed Plan were presented verbally at the formal public hearing for the Proposed Plan and in a subsequent comment letter. Responses to the State comments are presented in the Responsiveness Summary in Appendix B. A transcript of the public hearing is included as Attachment A to the Responsiveness Summary. A copy of the State's letter of concurrence is presented in Appendix E.

Community Acceptance

Community acceptance of the Proposed Plan was evaluated based on verbal comments received at the public hearing and on the basis of written comments received during the public comment period. This is documented in the Responsiveness Summary presented in Appendix B.

X. THE SELECTED REMEDY

For Site 01 - McAllister Point Landfill, the selected remedy is Alternative 4, consisting of a RCRA Subtitle C cap, and surface and institutional controls. The remedial action addresses source control and will be combined with a management of migration remedial action, as appropriate, to provide a comprehensive approach to site remediation.

A. CLEANUP LEVELS

A 10^{-6} excess cancer risk level for carcinogenic effects or a concentration corresponding to a Hazard Index of 1.0 for compounds with non-carcinogenic effects is typically used to set cleanup levels. No contaminant-specific cleanup levels have been developed for this source control remedial alternative since the alternative addresses the landfill area as the source of contamination and landfill wastes were not sampled. Although soils/waste will not be removed or treated under the selected alternative, containment technologies are generally considered appropriate for landfills where treatment is impracticable because of the volume and heterogeneity of the waste. Therefore, no Target Cleanup Levels have been set for soils at the site. Cleanup levels and remedial alternatives applicable to ground water/leachate, landfill gas, hot spot areas and contaminated sediments will be developed, as appropriate, within the management of migration operable unit for the site.

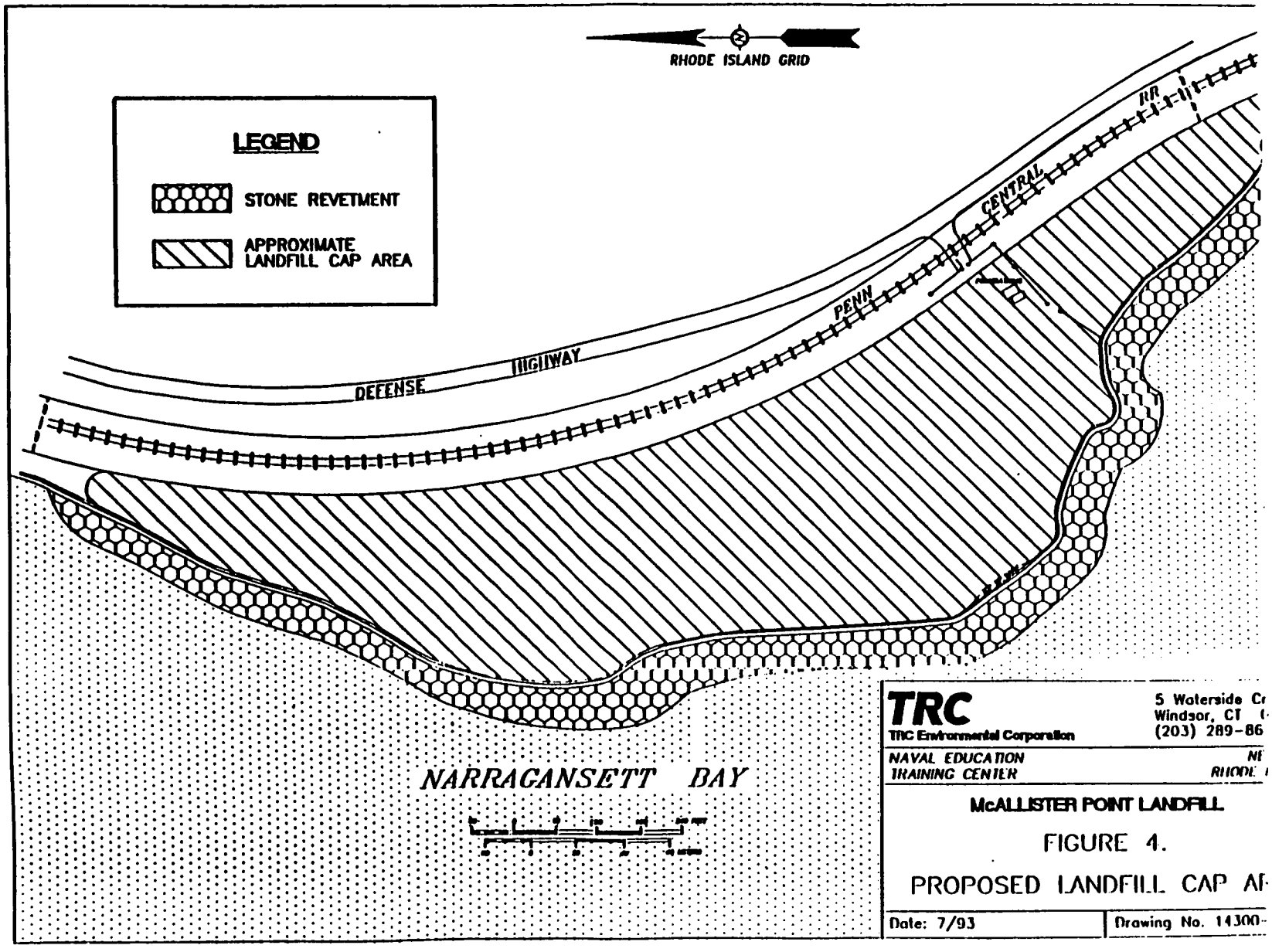
B. DESCRIPTION OF THE REMEDIAL COMPONENTS

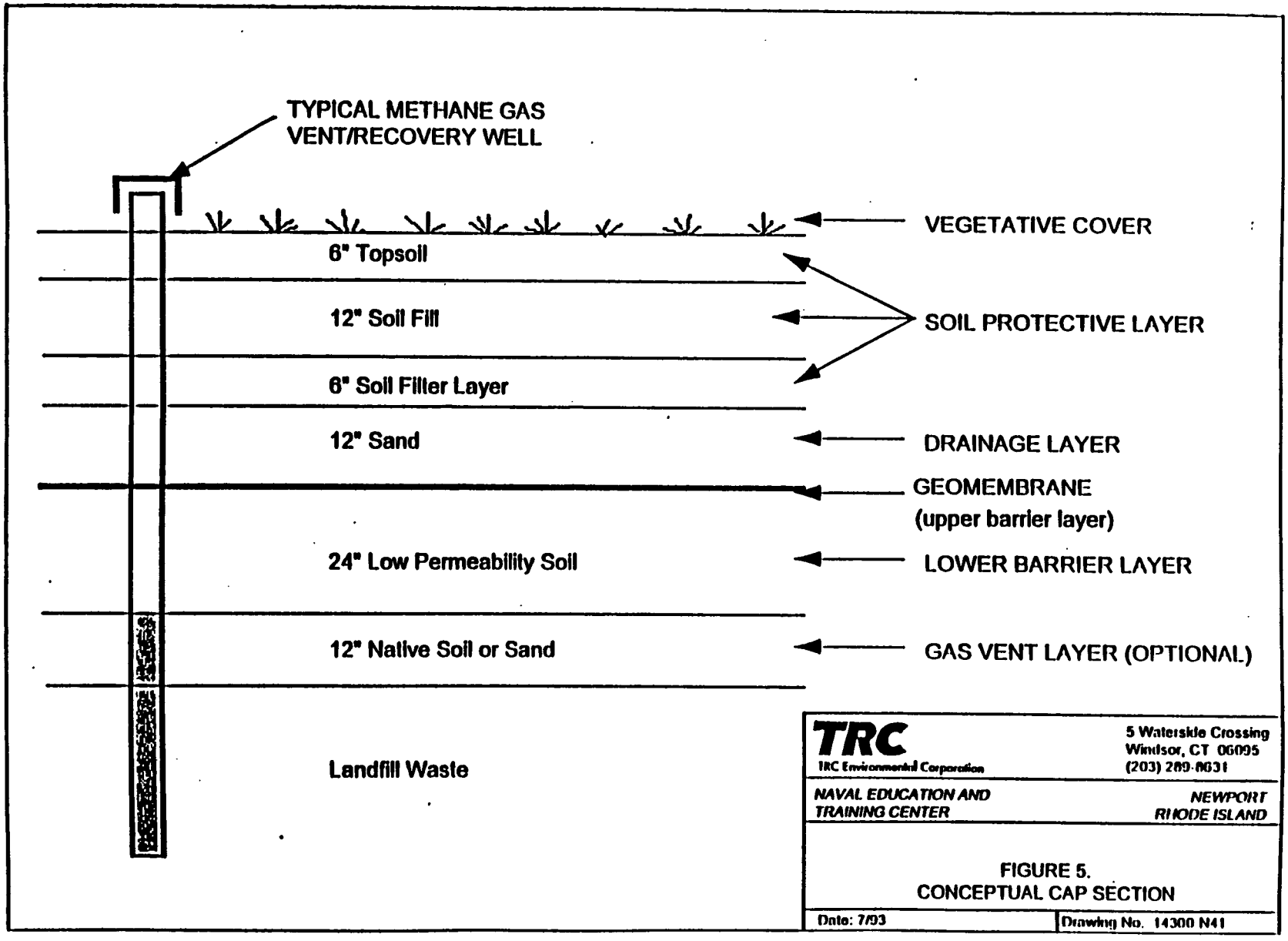
The selected alternative is designed to contain the landfill area and minimize the infiltration of precipitation through the waste materials. The alternative includes the following components:

- RCRA Subtitle C multi-layer cap;
- Landfill gas management;
- Surface controls;
- Fencing and institutional controls;
- Additional site investigations;
- Operation and maintenance and site monitoring; and
- Five-year review.

RCRA Subtitle C Multi-layer Cap

A multi-layer cap will be placed over the landfill area, as indicated in Figure 4, to limit the amount of infiltration and thereby minimize leachate production. The cap will cover approximately 10.5 acres, encompassing the landfill area at McAllister Point, including identified areas of ash, construction debris and domestic waste disposal. The cap will be designed to meet or exceed Resource Conservation and Recovery Act (RCRA) guidance as described in the USEPA documents, Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments (USEPA, 1989) and Design and Construction of RCRA/CERCLA Final Covers (USEPA, 1991), and in accordance with accepted engineering design practices. The cap will be designed to comply with the performance standard set forth in Section 14.12 of the Rhode Island Solid Waste Management Regulations which requires that the cap have a remolded coefficient of permeability of 1×10^{-7} centimeters per second. Site-specific factors will be evaluated in determining an effective cap design. A typical cover system is composed of a vegetative and protective layer, a drainage layer, an upper barrier layer consisting of a synthetic membrane, and a lower barrier layer consisting of a low permeability soil barrier. An optional gas vent layer may be placed below the lower barrier layer, if determined to be appropriate during the landfill gas management system evaluation. A conceptual cap cross-section is provided in Figure 5.




TYPICAL METHANE GAS
VENT/RECOVERY WELL
VEGETATIVE COVER
6" Topsoil
12" Soil Fill
SOIL PROTECTIVE LAYER
6" Soil Filter Layer
12" Sand
DRAINAGE LAYER
GEOMEMBRANE
(upper barrier layer)
24" Low Permeability Soil
LOWER BARRIER LAYER
12" Native Soil or Sand
GAS VENT LAYER (OPTIONAL)
Landfill Waste
TRC
TRC Environmental Corporation
5 Waterside Crossing
Windsor, CT 06095
(203) 289-8631
NAVAL EDUCATION AND
TRAINING CENTER
NEWPORT
RHODE ISLAND
FIGURE 5.
CONCEPTUAL CAP SECTION
Date: 7/93
Drawing No. 14300 N41

Landfill Gas Management

A landfill gas management system will be incorporated into the cap design. As part of the design phase, a landfill gas study will be conducted. A vapor pilot test will be conducted on wells located within the landfill area, with vapor samples collected and analyzed to determine the composition of the landfill gas. The field data will be evaluated and landfill gas extraction will be modeled to evaluate potential landfill gas extraction alternatives. The design of a landfill gas venting or extraction system will be developed based on the results of these analyses. If an active landfill gas extraction system is required, landfill gas extraction well locations will be located where possible in areas suspected to be potential "hot spot" areas.

Surface Controls

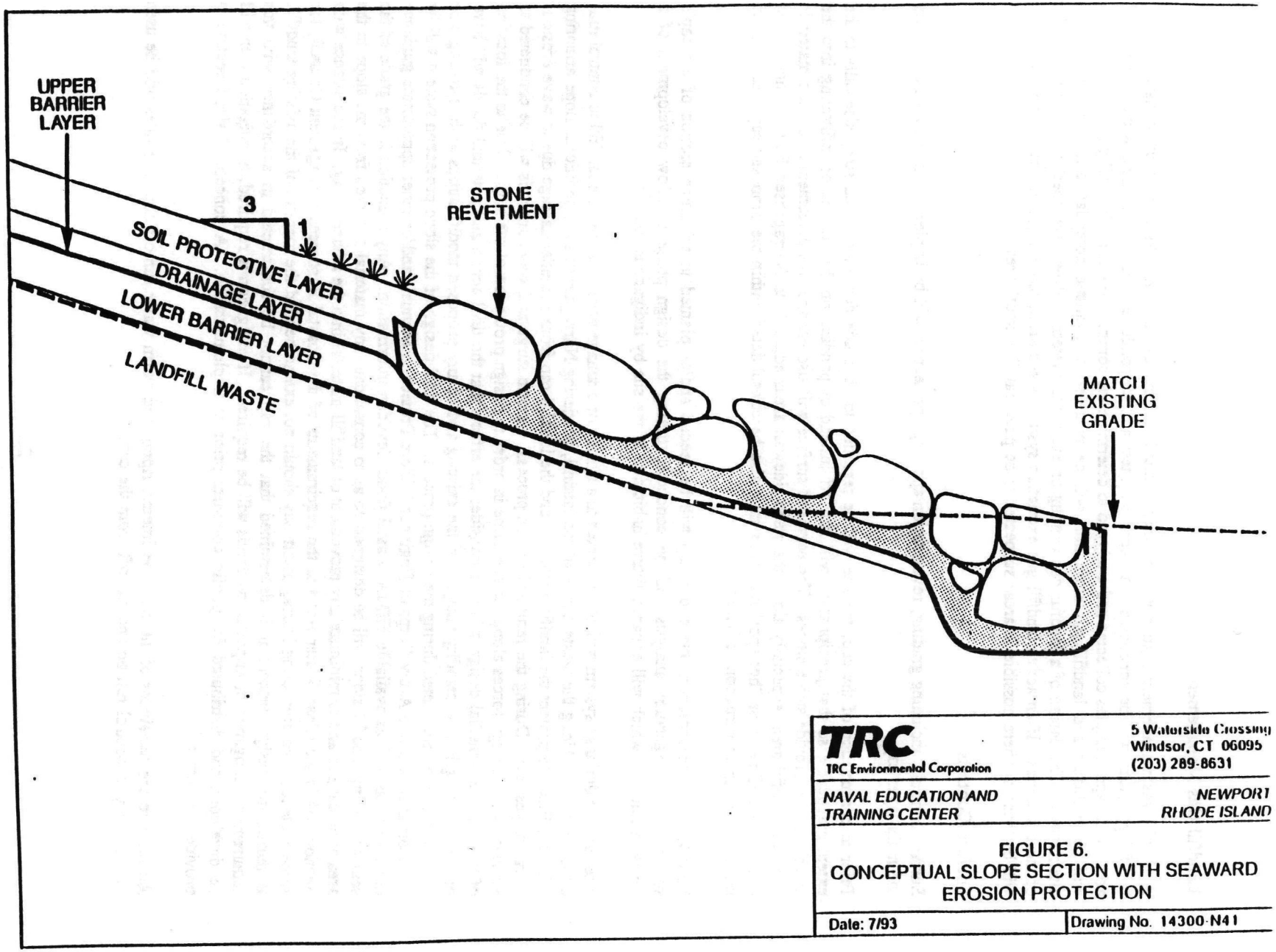
Surface controls, including grading, revegetation and slope protection will be implemented in conjunction with the multi-layer cap.

Prior to construction of the cap, the site will be regraded to eliminate depressions and steep sidewalls to the extent practicable so that precipitation will run off instead of ponding on the surface or infiltrating into the landfill and to provide stable slopes. The regraded surface will also enhance the placement of the cap materials over the landfill area, especially along the steep sidewall areas adjacent to Narragansett Bay. Contaminated near-shore sediments or "hot spot" materials may also be consolidated within the proposed cap area prior to initiation of cap construction activities.

Following cap construction, the entire cap will be seeded and/or planted to minimize erosion of the cap's surface. A revegetation analysis will be conducted during the design phase to allow development of a revegetation plan which will enhance future habitation of the site by indigenous species.

The cap and drainage system will be connected to a system of drainage swales around the landfill to control run-on and run-off. Along the western side of the landfill, bordering Narragansett Bay, additional slope armoring will be utilized to protect the landfill materials and the landfill cap from potential damage due to wave erosion, storm surges, etc. During the remedial design process, a storm surge and wave analysis will be conducted to evaluate wave energy forces along the shoreline in order to design protection of the slope. Due to the location of the site, the remedial design will also consider the effects that the tidal action and potential floods will have on the cap integrity. A stability analysis of the existing and/or any proposed modifications to the existing side slope will also be conducted during the design process. The final design of the slope protection system will be in accordance with the Army Corps of Engineers' Shore Protection Manual, and/or other appropriate guidance documents, as well as available FEMA coastal flood elevation information. Any reduction in the grade of the seaward-facing landfill slope will be designed so as to consolidate any material removed from the slope in the area to be capped and to minimize any movement of landfill material into the adjacent bay. In accordance with Section 404 of the Clean Water Act and the requirements of the Coastal Resources Management Council, the slope protection features along Narragansett Bay should not extend beyond the toeprint of the existing landfill. If during the design process it is determined that the cap cannot be constructed in accordance with this requirement, mitigation of impacted wetlands will be required. If mitigation is required, a mitigation plan will be developed and distributed for public comment prior to implementation. A conceptual slope section is provided in Figure 6.

Adjacent to the remainder of the cap's perimeter, riprap and storm water run-off control swales will be used as necessary to control run-on and run-off from the cap.



TRC
TRC Environmental Corporation

5 Waterside Crossing
Windsor, CT 06095
(203) 289-8631

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FIGURE 6.
CONCEPTUAL SLOPE SECTION WITH SEAWARD EROSION PROTECTION

Date: 7/93

Drawing No. 14300-N41

Fencing and Institutional Controls

Fencing will be placed around the perimeter of the site to limit site access. Fencing will be combined with institutional controls to also limit future site use and development. Restrictions on land use will be implemented by NETC to prevent future use of the site.

Additional Site Investigations

Additional site investigations which will support the evaluation and determination of management of migration remedial action(s) at the site will be conducted as part of the source control remedial action. These additional studies will be designed to determine the following:

- If additional measures, beyond capping the landfill, must be taken to reduce the amount of ground water in contact with the contaminated materials of the landfill (these studies will evaluate the potential for leachate generation due to contact between the landfill materials and ground water, including the potential effects of daily, monthly, and seasonal tidal fluctuations as well as flooding events associated with the storms);

- The nature and extent of ground water contamination and whether additional measures, beyond capping the landfill, are necessary to meet federal or state ground water standards and to reduce to acceptable levels any unacceptable risks to human health or the environment from ground water contamination;

- If the vented landfill gases require treatment to protect human health and/or the environment and if the landfill gas extraction system can also be used to treat potential "hot spots" at the site;

- Whether "hot spots", including Non-Aqueous Phase Liquids (NAPLs), are present within the landfill and whether they will be addressed by a separate remedial action or by the landfill cap; and

- The nature, extent and location of near-shore sediments which may have been affected by site-related contamination and whether they will be addressed by a separate remedial action or excavated and consolidated under the landfill cap.

Such studies would be conducted in association with Phase II Remedial Investigation activities or would be included in landfill cap design studies. Based upon the results of these studies, the management of migration operable unit would include the following, as necessary:

- the treatment standards and remedial alternative(s) for vented landfill gases;

- the cleanup standards and remedial alternative(s) for hot spots within the landfill materials, if present;

- the cleanup standards and remedial alternatives(s) for contaminated ground water; and

- the cleanup standards and remedial alternative(s) for contaminated sediments.

Operation and Maintenance and Site Monitoring

Post-closure care would be conducted for thirty years, and would consist of the following components, in accordance with RCRA requirements (40 CFR Part 264, Subparts G and N):

- Maintaining the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;

- Maintaining and monitoring the ground water monitoring system and complying with other applicable requirements of 40 CFR 264 Subpart F;

- Maintaining and operating the gas control and monitoring system;

- Preventing run-on and run-off from eroding or otherwise damaging the final cover; and

- Protecting and maintaining surveyed benchmarks used in complying with 40 CFR 264.309.

Long-term ground water monitoring and storm water discharge monitoring would be conducted following capping of the landfill. The design of the monitoring systems would be defined following completion of additional ground water studies and site drainage design. The environmental monitoring program would be submitted for regulatory review and would identify the sampling locations and sampling frequencies. At a minimum the environmental monitoring program would be conducted for a period of thirty years.

The Navy will review the remedial action, to the extent required by law, to assure that it continues to protect human health and the environment. During these periodic reviews, the Navy will consider requirements that are newly promulgated if determined to be applicable or relevant and appropriate and necessary to assure that the remedy is still protective of human health and the environment.

XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at the McAllister Point Landfill site is consistent with CERCLA and with the requirements of the NCP. The selected remedy is protective of human health and the environment, attains ARARs and is cost effective. The selected remedy uses permanent solutions and alternate treatment technologies or resource recovery technologies to the maximum extent practicable for this site. However, it does not satisfy the statutory preference for treatment which permanently and significantly reduces the mobility, toxicity or volume of hazardous substances as a principal element.

A. THE SELECTED REMEDY IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT

The remedy at the McAllister Point Landfill site will permanently reduce the risks posed to human health and the environment by eliminating, reducing or controlling exposures to human and environmental receptors through engineering controls and institutional controls. The placement of a cap will eliminate direct contact and incidental ingestion exposure to surficial soil or waste contaminants and the implementation of institutional controls will prevent exposure to contaminated soil or ground water under future site use. The cap will effectively reduce the infiltration of precipitation through unsaturated waste materials and the resultant generation of leachate. The selected remedy will comply with ARARs and to-be-considered criteria. Finally, the implementation of the selected remedy will not pose unacceptable short-term risks or cross-media impacts.

B. THE SELECTED REMEDY ATTAINS ARARS

This remedy will attain all Applicable or Relevant and Appropriate federal and state requirements (ARARs) that apply to the McAllister Point Landfill site and this remedial action. Environmental laws from which ARARs for the selected source control remedial action are derived, and the specific ARARs are presented in tabular form in Appendix C and are summarized below.

Chemical-Specific ARARs

No chemical-specific ARARs are applicable to the selected remedial action.

Location-Specific ARARs

- Executive Order 11988 and 11990; Statement on Proceedings of Floodplain Management and Wetlands Protection (40 CFR 6, Appendix A)
- Clean Water Act Section 404 (40 CFR 230.10) Requirements for Discharge of Dredge or Fill Material
- Rivers and Harbors Act (Section 10) Prohibition of Filling a Navigable Water
- Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661) Protection of Wildlife Habitats
- Endangered Species Act of 1973 (16 U.S.C. 1531) Protection of Endangered Species
- National Historic Preservation Act of 1966 (16 U.S.C. 470, et seq.) Protection of Historic Lands and Structures
- Archaeological and Historic Preservation Act of 1974 (132 CFR 229 & 229.4, 43 CFR 7 & 7.4); Historic Sites, Building and Antiquities Act
- Rhode Island Wetlands Laws (RIGL 2-1-18 et seq.); Rhode Island Department of Environmental Management Rules Governing the Enforcement of the Freshwater Wetlands Act - as amended Dec. 21, 1986
- Rhode Island Coastal Resources Management Law (RIGL, Title 46, Chapter 23) and Regulations

Action-Specific ARARs

- RCRA (40 CFR 264) Subtitle C Requirements:
  - 40 CFR 264.10-264.18 Subpart B - General Facility Standards
  - 40 CFR 264.30-264.37 Subpart C - Preparedness and Prevention
  - 40 CFR 264.50-264.56 Subpart D - Contingency Plan and Emergency Procedures
  - 40 CFR 264.90-254.101 Subpart F - Ground Water Protection
  - 40 CFR 264.110-118 Subpart G - Closure/Post Closure Requirements
  - 40 CFR 264.301-264.310 Subpart N - Landfill Requirements
- Migratory Bird Treaty Act (16 U.S.C. 703-712)
- Clean Water Act Section 404 (40 CFR 230.10) Requirements for Discharge of Dredged or Fill Material
- Rivers and Harbors Act (Section 10) Prohibition of Wetland Filling

- Clean Air Act:
  - Section 5-171 through 178, 42 USC §§ 7471-7478 (Requirements for Non-Attainment Areas)
  - Section 5-160 through 169A - Prevention of Significant Deterioration Provisions

- Clean Water Act (40 CFR 122-125) National Pollutant Discharge Elimination System (NPDES) Permit Requirements

- RI Hazardous Waste Management Act of 1978 (RIGL 23-19.1 et seq.) Hazardous Waste Management Rules and Regulations and Proposed Amendments:

  - Section 7
  - Section 8
  - Section 9
  - Section 10

- RI Rules and Regulations for Solid Waste Management Facilities

  - Section 14.12 (relating to landfill cover permeability standards)

- RI Clean Air Act (RIGL, Title 23, Chapter 23) General Air Quality and Air Emissions Requirements
  - RI Air Pollution Control Regulations, RI Dept. of Health, Div. of Air Pollution Control, effective 8/2/67, amended 5/20/91
    - Regulation No. 1 - Visible Emissions
    - Regulation No. 5 - Fugitive Dust
    - Regulation No. 7 - Emissions Detrimental to Person or Property
    - Regulation No. 15 - Control of Organic Solvent Emissions
    - Regulation No. 17 - Odors
    - Regulation No. 22 - Air Toxics

- RI Water Pollution Control Act
  - RI Water Quality Regulations for Water Pollution Control (RIGL 46-12 et seq.)
  - RI Regulations for the Pollutant Discharge Elimination System (RIPDES) (RIGL 46-12 et seq.)

The following action-specific policies, criteria and guidelines were also considered:

- RCRA Proposed Rule 52 FR 8712 - Proposed Amendments for Landfill Closures

- EPA Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments (EPA 530-SW-89-047)

- Clean Air Act (40 CFR 50) New Source Performance Standards (NSPS) Proposed Subpart WWW 56 FR 24468-24528 (5/30/91)

- Clean Air Act (40 CFR 61) National Emissions Standards for Hazardous Pollutants (NESHAPS)

Federal Location-Specific Regulations - The federal location-specific regulations that apply to the selected remedy are mainly based on the site's location adjacent to Narragansett Bay. Executive Orders 11988 and 11990 require the avoidance of long- and short-term impacts associated with the destruction of wetlands and the occupancy and modifications of floodplains and wetlands whenever there is a practicable alternative. Similarly,

Section 404 of the Clean Water Act prohibits the discharge of dredged or fill material to a water of the United States if there is a practicable alternative which poses less of an adverse impact or if it causes significant degradation of the water. The Rivers and Harbors Act prevents filling of a navigable water. The Fish and Wildlife Coordination Act of 1958 requires consultation with federal and state conservation agencies during planning and the decision-making process for any action which may impact water bodies, including wetlands, as well as consideration of prevention, mitigation or compensation measures. These standards are applicable to cap construction and slope protection activities which impact wetland, floodplain or coastal areas. Remedial designs will be developed to minimize adverse impacts to these areas. If adverse impacts to wetland areas cannot be avoided as part of the selected remedy, appropriate mitigating actions will be taken.

The Endangered Species Act of 1973 is a potential ARAR for activities which could impact endangered or threatened wildlife species. Information provided by the RIDEM Natural Heritage Program, Division of Planning and Development, indicates that no rare plants, rare animals, or ecologically significant natural communities have been identified in the vicinity of McAllister Point Landfill. An environmental assessment to be conducted during the Phase II RI, prior to cap construction, will also include a consultation of U.S. Fish and Wildlife Service information to further evaluate the potential presence of endangered species in the vicinity of the site. The National Historic Preservation Act of 1966 and the Archaeological and Historic Preservation Act of 1974 govern the preservation of historic, scientific and archaeological sites. Remedial actions must be coordinated with preservation agencies and societies to minimize loss of significant scientific, prehistoric, historic or archaeological data.

State Location-Specific Requirements - The state location-specific regulations that apply to the selected remedy are based on the site's location adjacent to Narragansett Bay. The Rhode Island Wetlands Laws define and establish provisions for the protection of swamps, marshes and other freshwater wetlands. The Rhode Island Coastal Resources Management Law and Regulations set standards and regulations for the management and protection of coastal resources. These standards are applicable to cap construction and slope protection activities which impact wetland and coastal areas. Remedial designs will be developed to minimize adverse impacts to these areas. If adverse impacts to wetland areas cannot be avoided as part of the selected remedy, appropriate mitigating actions will be taken.

Federal and State Action-Specific Requirements - Many portions of RCRA and Rhode Island Hazardous Waste Management Regulations are relevant and appropriate to site closure, since the wastes reportedly disposed of at the site are sufficiently similar to known, listed RCRA wastes.

The substantive requirements of RCRA General Facility Standards, Preparedness and Prevention, and Contingency Plan and Emergency Procedures will be attained during remedial construction activities. RCRA Subpart F - Ground Water Protection stipulates ground water monitoring and corrective action requirements and establishes points of compliance. A ground water monitoring program will be implemented which will adhere to these requirements. Sections of Subpart G (Closure and Post-Closure Requirements) and Subpart N (Landfills) which define landfill closure requirements are relevant and appropriate to the capping and long-term monitoring of the site. RCRA Proposed Amendments for Landfill Closures and EPA Technical Guidance on Final Covers on Hazardous Waste Landfills and Surface Impoundments will be considered in the final design of the cap and development of the post-closure monitoring plan. The cap will also be designed in accordance with the permeability standards set forth in Section 14.12 of the Rhode Island Solid Waste Management Regulations. Section 404 of the Clean Water Act will affect the design of the final cover, as discussed previously under the Location-Specific requirements.

Landfill cap construction and closure monitoring will be conducted in accordance with the applicable portions of Sections 7, 8, 9 and 10 of the Rhode Island Hazardous Waste Management Rules and Regulations and Proposed Amendments.

Portions of Section 5 of the Clean Air Act may be applicable or relevant and appropriate to the venting of landfill gas from the site. Monitoring and modeling would be required to determine if these requirements are applicable or relevant and appropriate. Venting of landfill gases will also be conducted in accordance with Regulations 1, 5, 7, 15, 17 and 22 of the Rhode Island Air Pollution Control Regulations.

Clean Water Act NPDES requirements and Rhode Island Water Quality Regulations for Water Pollution Control and RIPDES requirements will be applicable to the discharge of storm water from the site. A storm water monitoring program will be developed to meet these requirements.

It is also noted that, although the requirements, standards and regulations of the Occupational Safety and Health Act of 1970 are not ARARs, they will be complied with in connection with McAllister Point remedial activities, where applicable.

C. THE SELECTED REMEDIAL ACTION IS COST-EFFECTIVE

In the Navy's judgement, the selected remedy is cost effective (i.e., the remedy affords overall effectiveness proportional to its costs). In selecting this remedy, once the Navy identified alternatives that are protective of human health and the environment and that attain ARARs, the Navy evaluated the overall effectiveness of each alternative by assessing the relevant three criteria -- long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness -- in combination. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs. The costs of this remedial action are:

- Estimated Capital Cost: $4,200,000
- Estimated Operation and Maintenance Costs (net present worth): $2,300,000*
- Estimated Total Cost (net present worth): $8,000,000*

* The net present worth is based on a 5% discount factor and 30 years of operation; the estimated total cost includes a 20% contingency factor.

The selection of this alternative represents a reasonable value in regard to the degree of protectiveness offered by the alternative in comparison with the other alternatives evaluated. While the selected alternative is the most expensive alternative, it will be the most effective alternative in limiting future leachate generation as a result of infiltration of precipitation. While the need for remediation of ground water contamination will be evaluated on the basis of additional site investigations within the management of migration operable unit for the site, it is anticipated that if a remedial action is required under that operable unit, the overall effort and expense associated with that action will be reduced if infiltration is effectively removed as a source of leachate generation. Therefore, the increased capital cost associated with this alternative may be offset later by a decrease in the overall operation and maintenance cost of a management of migration remedial action.

D. THE SELECTED REMEDY UTILIZES PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

Once the Navy identified those alternatives that attain ARARs and that are protective of human health and the environment, the Navy identified that alternative which utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. This determination was made by deciding which one of the identified source control alternatives provides the best balance of trade-offs among alternatives in terms of: 1) long-term effectiveness and permanence; 2) reduction of toxicity, mobility or volume through treatment; 3) short-term effectiveness: 4) implementability; and 5) cost. The balancing test emphasized long-term effectiveness and permanence and the reduction of toxicity, mobility and volume through treatment; and considered the preference for treatment as a principal element, the bias against off-site land disposal of untreated waste, and community and state acceptance. The selected alternative provides the best balance of trade-offs among the alternatives.

The selected alternative offers the greatest degree of long-term effectiveness and permanence based on its use of a multi-layer barrier to prevent infiltration of precipitation. Due to the nature of the site (i.e., the implementability problems and prohibitive costs which would be associated with treatment of the entire landfill area), treatment was not found to be a practicable source control option at the site. Therefore, none of the source control alternatives evaluated in the FFS included a treatment component to reduce mobility, toxicity or volume. The selected alternative is comparable to the other alternatives in terms of short-term effectiveness, and although it is slightly more difficult to implement and is slightly more costly than the soil cap alternative, it was found to provide the best balance of trade-offs among the alternatives considered, with long-term effectiveness and permanence being the major determining factor in the selection process.

E. THE SELECTED REMEDY DOES NOT SATISFY THE PREFERENCE FOR TREATMENT WHICH PERMANENTLY AND SIGNIFICANTLY REDUCES THE TOXICITY, MOBILITY OR VOLUME OF THE HAZARDOUS SUBSTANCES AS A PRINCIPAL ELEMENT

The selected remedy does not satisfy the statutory preference for treatment as a principal element due to the impracticability of treating the landfill area (i.e., the implementability problems and prohibitive costs which would be associated with treatment of the entire landfill). The selected remedy includes the provision for conducting additional site investigations which will provide the basis for determining if treatment of principal threats (e.g., hot spot areas or contaminated sediments), landfill gas or ground water is required.

XII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

On August 4, 1993, the Navy released the Proposed Plan for the source control remedial action at the McAllister Point Landfill site. The preferred alternative included the capping of the landfill area with a RCRA Subtitle C multi-layer cap, landfill gas management, surface controls, fencing and institutional controls, additional site investigations, and operation and maintenance and site monitoring. Since the remedial action is identical to the remedy proposed in the Proposed Plan, no significant changes need to be addressed.

XIII. STATE ROLE

The Rhode Island Department of Environmental Management (RIDEM) has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the Remedial Investigation Technical Report and the Focused Feasibility Study to determine if the selected remedial action is in compliance with applicable or relevant and appropriate state environmental laws and regulations. In response to State

comments on the Proposed Plan, the permeability standards of Section 14.12 of the Rhode Island Solid Waste Management Regulations have been incorporated herein as an ARAR. As a party to the FFA, Rhode Island concurs with the selected remedy for the source control action at the McAllister Point Landfill site. A copy of the letter of concurrence is attached as Appendix E.

APPENDIX A
RISK ASSESSMENT TABLES
Site 01 - McAllister Point Landfill
NETC - Newport, Rhode Island

INORGANICS	VOLATILES	SEMIVOLATILES	PESTICIDES	PCBs
Antimony	Benzene	Acenaphthene	Aldrin	Aroclor-1016
Arsenic	Bromodichloromethane	Acenaphthylene	BHC, alpha-	Aroclor-1221
Beryllium	Bromoform	Anthracene	BHC, beta-	Aroclor-1232
Cadmium	Carbon Tetrachloride	Benzo(a)anthracene	BHC, delta-	Aroclor-1242
Chromium	Chlorobenzene	Benzo(a)pyrene	BHC, gamma-	Aroclor-1248
Cobalt	Chloroform	Benzo(b)fluoranthene	Chlordane, alpha-	Aroclor-1254
Copper	Chloromethane	Benzo(ghi)perylene	Chlordane, gamma-	Aroclor-1260
Lead	Dibromochloromethane	Benzo(k)fluoranthene	DDD, 4,4'-	
Manganese	Dichloroethane, 1,2-	Bis(2ethylhexyl)phthalate	DDE, 4,4'-	
Mercury	Dichloroethene, 1,1-	Butylbenzylphthalate	DDT, 4,4'-	
Nickel	Dichloroethene, 1,2-	Chrysene	Deildrin	
Selenium	Dichloropropane, 1,2-	Dibenzofuran	Endosulfan I	
Zinc	Ethylbenzene	Dibenzo(a,h)anthracene	Endosulfan II	
	Hexanone, 2-	Dichlorobenzene, 1,4-	Endosulfan Sulfate	
	Styrene	Dichlorobenzidine, 3,3'-	Endrin	
	Tetrachloroethane, 1,1,2,2-	Dichlorophenol, 2,4-	Endrin ketone	
	Tetrachloroethene	Diethylphthalate	Heptachlor	
	Toluene	Dimethylphthalate	Heptachlor epoxide	
	Trichloroethane, 1,1,1-	Di-n-butylphthalate	Methoxychlor	
	Trichloroethane, 1,1,2-	Di-n-octylphthalate	Toxaphene	
	Trichloroethene	Fluoranthene		
	Vinyl chloride	Fluorene		
	Xylenes	Indeno(123cd)pyrene		
		Methylnapthalene, 2-		
		Naphthalene		
		Phenanthrene		
		Phenol		
		Pyrene		
		Trichlorophenol, 2,4,5-		

	RANGE OF SURFACE SOIL CONCENTRATIONS (mg/kg)		RANGE OF SUBSURFACE SOIL CONCENTRATIONS (mg/kg)		RANGE OF GROUND WATER CONCENTRATIONS (mg/l)	
INORGANICS						
Antimony		4.0-91		3.5-167		0.022-0.25
Arsenic		1.9-20		2-23		0.0021-0.089
Beryllium		0.16-1.7		0.33-2.0		0.002-0.013
Cadmium		0.8-2.0		0.57-8.6		0.003-0.057
Chromium		5.2-59		4.7-78		0.017-0.25
Cobalt		3.6-20		1.5-28		0.022-0.74
Copper		13-6070		11-1760		0.057-3.2
Lead		7.3-1980		2.1-886		0.003-4.8
Manganese		217-678		45-1300		0.058-21
Mercury		0.14-1.6		0.11-2.9		0.00032-0.0084
Nickel		3.4-105		2.7-68		0.017-0.68
Selenium		0.35-2.0		0.33-4.2		0.0025
Zinc		38-19200		18-2090		0.17-12
VOLATILES						
Benzene	X	0.008-0.009		0.004-0.006		0.001-0.006
Bromodichloromethane	X	0.008-0.009	X	0.006	X	0.005
Bromoform	X	0.008-0.009	X	0.005-0.012	X	0.005
Carbon Tetrachloride	X	0.008-0.009	X	0.006	X	0.005
Chlorobenzene		0.002-0.012		0.001-0.032		0.005-0.011
Chloroform	X	0.009		0.003-0.006	X	0.005
Chloromethane	X	0.01-0.017	X	0.012-1.7	X	0.01
Dibromochloromethane	X	0.008-0.009	X	0.006-0.012	X	0.005
Dichloroethane, 1,2-	X	0.009	X	0.006	X	0.005
Dichloroethene, 1,1-	X	0.009	X	0.006	X	0.005
Dichloroethene, 1,2-	X	0.009		0.006-0.34	X	0.005
Dichloropropane, 1,2-	X	0.008-0.009	X	0.006	X	0.005
Ethylbenzene	X	0.006-0.012		0.002-0.38		0.002-0.012
Hexanone, 2-	X	0.014-0.025		0.011-0.023	X	0.01
Styrene	X	0.006-0.012	X	0.006	X	0.005
Tetrachloroethane, 1,1,2,2-	X	0.006-0.012	X	0.006	X	0.005
Tetrachloroethene		0.002-0.012		0.002-0.38	X	0.005
Toluene		0.002-0.012		0.001-0.68		0.001-0.005
Trichloroethane, 1,1,1-		0.0035-0.009		0.003-0.010	X	0.005
Trichloroethane, 1,1,2-	X	0.008-0.009	X	0.006	X	0.005
Trichloroethene	X	0.008-0.009		0.001-0.240	X	0.005
Vinyl chloride	X	0.015-0.017	X	0.012-0.013	X	0.01
Xylenes	X	0.006-0.012		0.003-0.73		0.002-0.16

X : Values reflect "UJ" qualified data only

		RANGE OF SURFACE SOIL CONCENTRATIONS (mg/kg)		RANGE OF SUBSURFACE SOIL CONCENTRATIONS (mg/kg)		RANGE OF GROUND WATER CONCENTRATIONS (mg/l)
SEMIVOLATILES						
Acenaphthene		0.11-3.8		0.057-5.8		0.003-0.045
Acenaphthylene		0.44-0.052		0.068-2.7	X	0.01
Anthracene		0.044-6.8		0.057-2.7		0.003-0.01
Benzo(a)anthracene		0.052-19		0.044-3.7	X	0.01
Benzo(a)pyrene		0.44-16		0.073-3.2	X	0.01
Benzo(b)fluoranthene		0.12-15		0.05-2.7	X	0.01
Benzo(ghi)perylene		0.2-8.4		0.067-2.7	X	0.01
Benzo(k)fluoranthene		0.12-14.0		0.052-2.9	X	0.01
Bis(2ethylhexyl)phthalate		0.44-7.9		0.11-12	X	0.01
Butylbenzylphthalate		0.44-7.9		0.31-2.7	X	0.01
Chrysene		0.072-18		0.05-3.6	X	0.01
Dibenzofuran		0.05-2.8		0.043-4.0		0.01-0.019
Dibenzo(a,h)anthracene		0.074-7.9		0.3-2.7	X	0.01
Dichlorobenzene, 1,4-	X	0.44		0.05-2.2		0.01
Dichlorobenzidine, 3,3'-	X	0.87-16.0	X	0.78-5.4	X	0.02
Dichlorophenol, 2,4-	X	0.44		0.054-2.7		ND
Diethylphthalate		0.27		0.045-2.7		0.001-0.01
Dimethylphthalate	X	0.44	X	0.39-2.7	X	0.01
Di-n-butylphthalate		0.44		0.046-6.7	X	0.01
Di-n-octylphthalate	X	0.87-7.9	X	0.096-2.7	X	0.01
Fluoranthene		0.17-46		0.047-5.9		0.002-0.01
Fluorene		0.09-4.7		0.044-4.4		0.003-0.025
Indeno(123cd)pyrene		0.16-8.9		0.21-2.7	X	0.01
Methylnapthalene, 2-		0.099-1.1		0.05-4.5		0.001-0.043
Napthalene		0.044-3.0		0.047-3.0		0.003-0.24
Phenanthrene		0.060-26		0.06-6.2		0.003-0.021
Phenol	X	0.44		0.15-2.7		ND
Pyrene		0.098-27		0.045-4.4		0.001-0.01
Trichlorophenol, 2,4,5-	X	2.2		0.11-14.0		ND
PESTICIDES						
Aldrin	X	0.0095	X	0.0085-0.1		ND
Alpha-BHC	X	0.0095	X	0.0085-0.1		ND
Alpha-chlordane	X	0.095	X	0.084-1.0		ND
Beta-BHC	X	0.0095	X	0.0085-0.1		ND
DDD, 4,4'-		0.019-0.19		0.0033-0.2		ND
DDE, 4,4'-		0.011-0.024		0.0023-0.2		ND
DDT, 4,4'-		0.007-1.8		0.0044-0.3		ND
Deildrin	X	0.019	X	0.017-0.2		ND
Delta-BHC	X	0.0095	X	0.0085-0.1		ND
Endosulfan I	X	0.0095	X	0.0085-0.1		ND
Endosulfan II	X	0.019	X	0.017-0.2		ND
Endosulfan Sulfate	X	0.019	X	0.017-0.2		ND
Endrin	X	0.019	X	0.017-0.2		ND
Endrin ketone	X	0.019	X	0.017-0.2		ND
Gamma-BHC	X	0.0095	X	0.0085-0.1		ND
Gamma-chlordane	X	0.095	X	0.084-1.0		ND
Heptachlor	X	0.0095	X	0.0085-0.1		ND
Heptachlor epoxide	X	0.0095	X	0.0085-0.1		ND
Methoxychlor	X	0.095	X	0.084-1.0		ND
Toxaphene	X	0.19	X	0.087-2.0		ND
PCBs						
Aroclor-1016	X	0.095	X	0.084-1.0		ND
Aroclor-1221	X	0.095	X	0.084-1.0		ND
Aroclor-1232	X	0.095	X	0.084-1.0		ND
Aroclor-1242		0.095		0.044-1.0		ND
Aroclor-1248	X	0.095		0.084-1.0		ND
Aroclor-1254		0.13-0.61		0.025-2.0		ND
Aroclor-1260	X	0.19	X	0.17-2.0		ND

X : Values reflect "UJ" qualified data only
ND : Not detected; "U" qualified data only

SCENARIO 1 - TRESPASSING (CURRENT) - YOUTH AGES 9 TO 16 YEARS
MCALLISTER POINT LANDFILL

	Averace		RME	
	Total HI	Total Cancer Risk	Total HI	Total Cancer Risk
SOIL (a)	0.0043	1.2×10^{-6}	0.064	1.8×10^{-5}
Incidental Ingestion of Soil	0.0042	1.1×10^{-6}	0.064	1.8×10^{-5}
Dermal Contact with Soil	0.00017	3.2×10^{-8}	0.00039	7.3×10^{-8}

(a) Surface soil

	Average		RME	
	Total HI	Total Cancer Risk	Total HI	Total Cancer Risk
SOIL (a)	**0.025**	**8.7×10^{-6}**	**0.36**	**1.3×10^{-4}**
Incidental Ingestion of Soil	0.024	8.4×10^{-6}	0.36	1.3×10^{-4} (b)
Dermal Contact with Soil	0.00098	2.4×10^{-7}	0.0022	5.5×10^{-7}

(a) Surface soil

= Cancer Risk $\geq 1 \times 10^{-4}$

(b) Benzo(a)anthracene: 2.5×10^{-5}
Benzo(a)pyrene: 2.1×10^{-5}
Benzo(b)fluoranthene: 2.0×10^{-5}
Benzo(k)fluoranthene: 1.8×10^{-5}
Chrysene: 2.3×10^{-5}
Dibenz(a,h)anthracene: 1.0×10^{-5}
Indeno(1,2,3-cd)pyrene: 1.2×10^{-5}

	Average		RME	
	Total HI	Total Cancer Risk	Total HI	Total Cancer Risk
SOIL (a)	**0.13**	**3.7×10^{-6}**	**2.5**	**2.3×10^{-5}**
Incidental Ingestion of Soil	0.13	3.7×10^{-6}	2.5 (b)	2.2×10^{-5}
Dermal Contact with Soil	0.0014	1.6×10^{-7}	0.011	1.2×10^{-6}
Inhalation of Fugitive Dust	0.00067	1.7×10^{-10}	0.0026	1.1×10^{-9}

(a) Soil to a depth of 12 feet
(b) Antimony: 2.0

= HI > 1.0

SCENARIO 4 - COMMERCIAL/INDUSTRIAL (FUTURE) - ADULT
MCALLISTER POINT LANDFILL

	Average		RME	
	Total HI	Total Cancer Risk	Total HI	Total Cancer Risk
SOIL (a)	**0.019**	**1.4×10^{-5}**	**0.27**	**2.1×10^{-4}**
Incidental Ingestion of Soil	0.018	1.3×10^{-5}	0.27	2.1×10^{-4} (b)
Dermal Contact with Soil	0.0014	7.4×10^{-7}	0.0032	1.7×10^{-6}
GROUND WATER	**1.8**	**1.8×10^{-3}**	**13**	**3.7×10^{-3}**
Ingestion of Drinking Water	1.8 (c)	1.8×10^{-3} (d)	13 (c)	3.7×10^{-3} (d)

(a) Surface soil

= Cancer Risk > 1×10^{-4} or HI > 1.0

(b) Benzo(a)anthracene: 3.8×10^{-5}
Benzo(a)pyrene: 3.2×10^{-5}
Benzo(b)fluoranthene: 3.0×10^{-5}
Benzo(k)fluoranthene: 2.8×10^{-5}
Chrysene: 3.6×10^{-5}
Dibenzo(a,h)anthracene: 1.6×10^{-5}
Indeno(1,2,3-cd)pyrene: 1.8×10^{-5}

(c) Antimony: 0.91 (average) to 6.3 (maximum)
Manganese: 0.31 (average) to 2.1 (maximum)

(d) Arsenic: 1.7×10^{-4} (average) to 5.5×10^{-4} (maximum)
Beryllium: 3.4×10^{-5} (average) to 1.9×10^{-4} (maximum)
Benzo(a)anthracene: 2.2×10^{-4} (average) to 4.0×10^{-4} (maximum)
Benzo(a)pyrene: 2.2×10^{-4} (average) to 4.0×10^{-4} (maximum)
Benzo(b)fluoranthene: 2.2×10^{-4} (average) to 4.0×10^{-4} (maximum)
Benzo(k)fluoranthene: 2.2×10^{-4} (average) to 4.0×10^{-4} (maximum)

SCENARIO 3 - RESIDENTIAL (FUTURE, - CHILD & ADULT
MCALLISTER POINT LANDFILL

	Average				RME			
	Total HI		Total Cancer Risk		Total HI		Total Cancer Risk	
	Child	Adult	Child	Adult	Child	Adult	Child	Adult
SOIL (a)	**0.52**	**0.056**	**8.6×10^{-5}**	**4.5×10^{-5}**	**7.7**	**0.82**	**1.3×10^{-3}**	**7.0×10^{-4}**
Incidental Ingestion of Soil	0.51	0.053	8.5×10^{-5}	4.4×10^{-5}	7.7 (b)	0.80	1.3×10^{-3} (c)	7.0×10^{-4} (c)
Dermal Contact with Soil	0.013	0.0027	1.2×10^{-6}	1.2×10^{-6}	0.079	0.016	2.7×10^{-6}	2.8×10^{-6}
Inhalation of Fugitive Dust	0.0013	0.00026	2.5×10^{-8}	2.6×10^{-8}	0.0024	0.00051	1.1×10^{-7}	1.2×10^{-7}
GROUND WATER	**9.1**	**5.0**	**2.2×10^{-3}**	**6.0×10^{-3}**	**64**	**36**	**4.5×10^{-3}**	**1.2×10^{-2}**
Ingestion of Drinking Water	9.1 (d)	5.0 (d)	2.2×10^{-3} (d)	6.0×10^{-3} (d)	64 (d)	36 (d)	4.5×10^{-3} (d)	1.2×10^{-2} (d)
Inhalation of Volatiles	0.018	0.0037	9.3×10^{-6}	9.6×10^{-6}	0.10	0.021	1.6×10^{-5}	1.6×10^{-5}

= Cancer Risk > 1×10^{-4} or HI > 1.0

(a) Surface soil

(b) Antimony: 3.0
Copper: 2.0
Zinc: 1.3

(c) Benzo(a)anthracene: Child: 2.5×10^{-4} and Adult: 1.3×10^{-4}
Benzo(a)pyrene: Child: 2.1×10^{-4} and Adult: 1.1×10^{-4}
Benzo(b)fluoranthene: Child: 2.0×10^{-4} and Adult: 1.0×10^{-4}
Benzo(k)fluoranthene: Child: 1.8×10^{-4} and Adult: 9.5×10^{-5}
Chrysene: Child: 2.3×10^{-4} and Adult: 1.2×10^{-4}
Dibenzo(a,h)anthracene: Child: 1.0×10^{-4} and Adult: 5.3×10^{-5}
Indeno(1,2,3-cd)pyrene: Child: 1.2×10^{-4} and Adult: 6.0×10^{-5}

(d) See Table A-8

SCENARIO 5 – RESIDENTIAL (FUTURE) – CHILD & ADULT
MCALLISTER POINT LANDFILL

	Average				RME			
	Total HI		Total Cancer Risk		Total HI		Total Cancer Risk	
	Child	Adult	Child	Adult	Child	Adult	Child	Adult
INGESTION OF GROUND WATER	**9.1**	**5.0**	2.2×10^{-3}	6.0×10^{-3}	**64**	**36**	4.5×10^{-3}	1.2×10^{-2}
Antimony	4.6	2.5			32	18		
Arsenic	1.4	0.78			4.4	2.4		
Cadmium	0.25	0.14			2.8	1.6		
Chromium	0.30	0.17			2.5	1.4		
Copper	0.18	0.099			3.9	2.2		
Manganese	1.6	0.88			10	5.8		
Zinc	0.14	0.077			3.0	1.7		
Arsenic			2.1×10^{-4}	5.9×10^{-4}			6.7×10^{-4}	1.8×10^{-3}
Beryllium			4.1×10^{-5}	1.1×10^{-4}			2.3×10^{-4}	6.5×10^{-4}
Vinyl chloride			4.3×10^{-5}	1.2×10^{-4}			8.1×10^{-5}	2.2×10^{-4}
Dichlorobenzidine, 3,3–			2.1×10^{-5}	5.7×10^{-5}			3.8×10^{-5}	1.1×10^{-4}
Benzo(a)anthracene			2.6×10^{-4}	4.9×10^{-4}			7.2×10^{-4}	1.4×10^{-3}
Benzo(a)pyrene			2.6×10^{-4}	4.9×10^{-4}			7.2×10^{-4}	1.4×10^{-3}
Benzo(b)fluoranthene			2.6×10^{-4}	4.9×10^{-4}			7.2×10^{-4}	1.4×10^{-3}
Benzo(k)fluoranthene			2.6×10^{-4}	4.9×10^{-4}			7.2×10^{-4}	1.4×10^{-3}
Chrysene			2.6×10^{-4}	4.9×10^{-4}			7.2×10^{-4}	1.4×10^{-3}
Dibenzo(a,h)anthracene			2.6×10^{-4}	4.9×10^{-4}			7.2×10^{-4}	1.4×10^{-3}
Indeno(1,2,3–cd)pyrene			2.6×10^{-4}	4.9×10^{-4}			7.2×10^{-4}	1.4×10^{-3}

= Cancer Risk > 1×10^{-4} or HI > 1.0

SUMMARY OF LEAD UPTAKE/BIOKINETIC MODEL RESULTS
SCENARIO 5 - RESIDENTIAL (FUTURE) - CHILD
MCALLISTER POINT LANDFILL

	Soil Lead Concentration (ppm)	Mean Blood Lead Concentration (ppm)	% Children w/ Blood Lead Concentration > 10 ug/dl
Mean Soil Lead for Entire Site	99	2.7	0.01
Mean Soil Lead for "Impacted" Zone	634	8.2	27
Maximum Soil Lead for "Impacted" Zone (and Site)	1,980	22	98

APPENDIX C
ARARs ASSESSMENT
Site 01 - McAllister Point Landfill
NETC - Newport, Rhode Island

TABLE C-1
FEDERAL LOCATION-SPECIFIC ARARs AND TBCs
RECORD OF DECISION
McALLISTER POINT LANDFILL
NETC - NEWPORT
RCRA SUBTITLE C MULTI-LAYER CAP
WITH SURFACE AND INSTITUTIONAL CONTROLS

MEDIA	REQUIREMENT	STATUS	SYNOPSIS	APPLICABILITY TO SITE CONDITIONS
Wetlands/Water Resources--	Executive Order 11988 and 11990; Statement on Proceedings of Floodplain Management and Wetlands Protection (40 CFR 6, Appendix A)	Applicable	Requires action to avoid whenever possible the long- and short-term impacts associated with the destruction of wetlands and the occupancy and modifications of floodplains and wetlands whenever there is a practicable alternative which promotes the preservation and restoration of the natural and beneficial values of wetlands and floodplains.	Will be applicable if implementation of the cap or associated shoreline protection impacts coa or on-shore wetlands.
	Clean Water Act Section 404 (40 CFR 230.10) Requirements for Discharge of Dredge or Fill Material and Rivers and Harbors Act (Section 10) Prohibition of Filling a Navigable Water	Applicable	Prohibits the discharge of dredged or fill material to a water of the United States if there is a practicable alternative which poses less of an adverse impact on the aquatic ecosystem or if it causes significant degradation of the water. Rivers and Harbors Act prevents filling of a navigable water.	Applicable to the construction of a cap and associated shoreline protection along Narragan Bay. If during the design process it is determi that cap construction cannot be limited to are within the toeprint of the existing landfill, mitig of any impacted wetlands will be required and mitigation plan will be developed and distribute public comment prior to implementation.
	Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661) Protection of Wildlife Habitats	Applicable	Requires consultation with federal and state conservation agencies during planning and decision-making process which may impact water bodies, including wetlands. Measures to prevent, mitigate or compensate for losses of fish and wildlife will be given due consideration whenever a modification of a water body is proposed.	If the implementation of a remedial action resu in an impact to a water body, consultation wit U.S. Fish and Wildlife Service, RIDEM, and ot federal and state agencies involved in fish an wildlife matters is required. ARAR for constru of a cap and associated shoreline protection a Narragansett Bay.

TABLE C-1 (Continued)
FEDERAL LOCATION-SPECIFIC ARARs AND TBCs
RECORD OF DECISION
McALLISTER POINT LANDFILL
NETC - NEWPORT
RCRA SUBTITLE C MULTI-LAYER CAP
WITH SURFACE AND INSTITUTIONAL CONTROLS

MEDIA	REQUIREMENT	STATUS	SYNOPSIS	APPLICABILITY TO SITE CONDITIONS
Endangered Species--	Endangered Species Act of 1973 (16 U.S.C. 1531) Protection of Endangered Species	Applicable	Restricts activities in areas inhabited by registered endangered species.	Information supplied by the RIDEM Natural Her Program, Division of Planning and Developmen a letter dated August 3, 1993 indicates that RI was not aware of any rare plants or animals or ecologically significant natural communities in vicinity of the McAllister Point Landfill. The U. and Wildlife Service will also be contacted duri Phase II RI to further define the potential prese of endangered species.
Cultural Resources--	National Historic Preservation Act of 1966 (16 USC 470, et seq.) Protection of Historic Lands and Structures; Archaeological and Historic Preservation Act of 1974 (132 CFR 229 & 229.4, 43 CFR 7 & 7.4); Historic Sites, Building and Antiquities Act.	Applicable	Several statutes which govern the preservation at historic, scientific and archeological sites and resources. Includes action to recover and preserve artifacts, preserve historic properties and minimize harm to National Historic Landmarks.	Remedial actions must be coordinated with preservation agencies and societies to minimiz loss of significant scientific, prehistoric, histori archaeological data. ARAR for cap constructio

TABLE C-2
STATE LOCATION-SPECIFIC ARARs AND TBCs
RECORD OF DECISION
McALLISTER POINT LANDFILL
NETC - NEWPORT
RCRA SUBTITLE C MULTI-LAYER CAP
WITH SURFACE AND INSTITUTIONAL CONTROLS

MEDIA	REQUIREMENT	STATUS	SYNOPSIS	APPLICABILITY TO SITE CONDITIONS
Wetlands--	Rhode Island Wetlands Laws (RIGL 2-1-18 et seq.); Rhode Island Department of Environmental Management Rules Governing the Enforcement of the Fresh-water Wetlands Act - as amended, Dec. 21, 1986.	Applicable	Defines and establishes provisions for the protection of swamps, marshes and other freshwater wetlands in the state. Actions required to prevent the undesirable drainage, excavation, filling, alteration, encroachment of any other form of disturbance or destruction to a wetland.	Regulation will be applicable if cap construct impacts a wetland area.
Coastal Zone--	Rhode Island Coastal Resources Management Law, (RIGL, Title 46, Chapter 23) and Regulations	Applicable	Creates Coastal Resources Management Council and sets standards and authorizes promulgation of regulations for management and protection of coastal resources.	Since McAllister Point Landfill is located in a area, the lead agency will coordinate with th Island Coastal Resources Management Coun will ensure that all actions are consistent, to maximum extent practicable, with the Coast Management Plan. ARAR for capping.

TABLE C-3
FEDERAL ACTION-SPECIFIC ARARs AND TBCs
RECORD OF DECISION
McALLISTER POINT LANDFILL
NETC - NEWPORT
RCRA SUBTITLE C MULTI-LAYER CAP
WITH SURFACE AND INSTITUTIONAL CONTROLS

AUTHORITY/ ACTION	REQUIREMENT	STATUS	SYNOPSIS	ACTION TAKEN TO MEET ARAR
Capping	RCRA (40 CFR 264) Subtitle C Requirements:	Relevant and Appropriate	Outlines specifications and standards for design, operation, closure and monitoring of performance for hazardous waste storage, treatment and disposal facilities.	Substantive RCRA requirements will be met a adhered to on-site.
	• 40 CFR 264.10-264.18 Subpart B - General Facility Standards	Relevant and Appropriate	General requirements regarding waste analysis, security, training, inspections, and location applicable to a facility which stores, treats or disposes of hazardous wastes (a TSDF facility).	This regulation may be applicable to remedial actions which address a waste which is a list characteristic waste under RCRA and which constitute current treatment, storage, or disp as certified by RCRA.
	• 40 CFR 264.30-264.37 Subpart C - Preparedness and Prevention	Relevant and Appropriate	Requirements applicable to the design and operation, equipment, and communications associated with a TSDF facility, and to arrangements with local response departments.	This regulation may be applicable to remedial actions which address a waste which is a list characteristic waste under RCRA and which constitute current treatment, storage, or disp as certified by RCRA.
	• 40 CFR 264.50-264.56 Subpart D - Contingency Plan and Emergency Procedures	Relevant and Appropriate	Emergency planning procedures applicable to a TSDF facility.	This regulation may be applicable to remedial actions which address a waste which is a list characteristic waste under RCRA and which constitute current treatment, storage, or disp as certified by RCRA.
	• 40 CFR 264.90-264.101 Subpart F - Ground Water Protection	Relevant and Appropriate	Ground water monitoring/corrective action requirements; dictates adherence to MCLs and establishes points of compliance.	Studies to be conducted as part of this operat will include a ground water monitoring progra Monitoring standards will be met.
	• 40 CFR 264.110-118 Subpart G - Closure/Post Closure Requirements	Relevant and Appropriate	Establishes requirements for the closure and long-term management of a hazardous disposal facility.	Substantive standards and requirements will

TABLE C-3 (Continued)
FEDERAL ACTION-SPECIFIC ARARs AND TBCs
RECORD OF DECISION
McALLISTER POINT LANDFILL
NETC - NEWPORT
RCRA SUBTITLE C MULTI-LAYER CAP
WITH SURFACE AND INSTITUTIONAL CONTROLS

AUTHORITY/ ACTION	REQUIREMENT	STATUS	SYNOPSIS	ACTION TAKEN TO MEET ARAR
Capping	Subtitle C Requirements (Con't): • 40 CFR 264.301-264.310; Subpart N - Landfill Requirements	Relevant and Appropriate	Placement of cap over hazardous waste requres a cover designed and constructed to comply with regulations. Installation of final cover to provide long-term minimization of infiltration. Restricts post-closure use of property as necessary to prevent damage to cover.	Cap design will meet regulatory requirements. Cap maintenance will be attended to. Closure and post-closure substantive requirements will be complied with.
	• RCRA Proposed Rule 52 FR 8712 Proposed Amendments for Landfill Closures	To Be Considered	Provides an option for the application of alternate closure and post-closure requirements based on a consideration of site-specific conditions including exposure pathways of concern.	Cap and post-closure monitoring will be designed taking into account exposure pathways of concern.
	• EPA Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments (EPA 530-SW-89-047)	To Be Considered	EPA Technical Guidance for landfill covers. Presents recommended technical specifications for multilayer landfill cover design.	Cap construction should conform to these standards
	Migratory Bird Treaty Act (16 U.S.C. 703-712)	Applicable	Prohibits hunting, possessing, killing, or capturing of migratory birds, birds in danger of extinction, and those birds' eggs or nests.	Since construction activities during the breeding season may "take" birds or their nests, actions must be taken to avoid destroying nests during breeding season. Phase II environmental assessment will determine if migratory birds live in or around the landfill area.
	Clean Water Act Section 404 (40 CFR 230.10) Requirements for Discharge of Dredged or Fill Material and Rivers and Harbors Act (Section 10) Prohibition of Wetland Filling	Applicable	Prohibits the discharge of dredged or fill material to waters of the United States unless no other practical alternatives are available which pose less of an adverse impact on the aquatic ecosystem or if it causes significant degradation of the water. Rivers and Harbors Act prevents filling of a navigable water.	Applicable to the construction of a cap and associated shoreline protection along Narragansett Bay. If during the design process it is determined that cap construction cannot be limited to areas within the footprint of the existing landfill, mitigation of any impacted wetlands will be required and a mitigation plan will be developed and distributed for public comment prior to implementation.

TABLE C-3 (Continued)
FEDERAL ACTION-SPECIFIC ARARs AND TBCs
RECORD OF DECISION
McALLISTER POINT LANDFILL
NETC - NEWPORT
RCRA SUBTITLE C MULTI-LAYER CAP
WITH SURFACE AND INSTITUTIONAL CONTROLS

AUTHORITY/ ACTION	REQUIREMENT	STATUS	SYNOPSIS	ACTION TAKEN TO MEET ARAR
Venting	Clean Air Act (40 CFR 50) New Source Performance Standards (NSPS) Proposed Subpart WWW 56 FR 24468-24528 (5/30/91)	To Be Considered	Requires Best Demonstrated Technology (BDT) for new sources, and sets emissions limitations. Proposed Subpart WWW sets a performance standard for non-methane organic compounds (NMOC) emissions of 150 Mg/yr (167 tpy) for existing municipal solid waste landfills.	These standards should be considered in the d of a landfill gas management system.
	Clean Air Act (40 CFR 61) National Emissions Standards for Hazardous Pollutants (NESHAPS)	To Be Considered	Establishes emissions limitations for hazardous air pollutants and sets forth regulated sources of those pollutants.	Although EPA has not promulgated final Maximum Achievable Control Technology (M/ standards for municipal landfills, the lead age should use air control technology to control emissions of hazardous air pollutions. MACT standards prescribe technology that is used by best 12% of industries in the source category
	Clean Air Act, Section 5 171 through 178, 42 USC §§ 7471-7478 (Requirements for Non-Attainment Areas)	Applicable or Relevant and Appropriate (Depending on Modelling Results)	RI has adopted State Implementation Plan (SIP) requirements approved and enforcable by EPA which meet the NSR requirement of the CAA. These provisions require that new or modified major sources of VOCs, defined as a source which has the potential to emit 25 tons per year, install equipment to meet Lowest Available Emissions Rate (LAER), which is set on a case-by-case basis and is either the most stringent emissions limitation contained in any SIP for that category or source or the most stringent emissions limitation which is achieved for the source. NSR requirements apply to non-attainment pollutants, which are VOCs and NO_x in RI.	Monitoring will be conducted to determine if t requirements of this standard are applicable o relevant and appropriate based on the emissio levels and on the need to be protective of hun health and the environment.

TABLE C-3 (Continued)
FEDERAL ACTION-SPECIFIC ARARs AND TBCs
RECORD OF DECISION
McALLISTER POINT LANDFILL
NETC - NEWPORT
RCRA SUBTITLE C MULTI-LAYER CAP
WITH SURFACE AND INSTITUTIONAL CONTROLS

AUTHORITY/ ACTION	REQUIREMENT	STATUS	SYNOPSIS	ACTION TAKEN TO MEET ARAR
Venting	Clean Air Act, Section 5 160 through 169A - Prevention of Significant Deterioration Provisions	Applicable or Relevant and Appropriate (Depending on Modelling Results)	RI has adopted SIP requirements approved and enforceable by EPA which meet the Prevention of Significant Deterioration (PSD) requirements of the CAA. These provisions require that new or modified major sources of VOCs (defined as a source which has the potential to emit 25 tons/year) install equipment to meet Best Available Control Technology (BACT). PSD requirements apply to attainment pollutants, which are SO2, CO, lead and particulates in Rhode Island.	Monitoring will be conducted to determine if requirements of this standard are applicable relevant and appropriate based on the emissi levels.
Drainage	Clean Water Act (40 CFR 122-125) National Pollutant Discharge Elimination System (NPDES) Permit Requirements	Applicable	Permits contain applicable effluent standards (i.e., technology-based and/or water quality-based), monitoring requirements, and standards and special conditions for discharges, including storm water discharges from land disposal facilities which have received industrial waste from industrial facilities.	Storm water drainage improvements would b designed to provide compliance with the substantive requirements of these regulation drainage would be monitored in compliance v these regulations.

TABLE C-4
STATE ACTION-SPECIFIC ARARs AND TBCs
RECORD OF DECISION
McALLISTER POINT LANDFILL
NETC - NEWPORT
RCRA SUBTITLE C MULTI-LAYER CAP
WITH SURFACE AND INSTITUTIONAL CONTROLS

AUTHORITY/ ACTION	REQUIREMENT	STATUS	SYNOPSIS	ACTION TAKEN TO MEET ARARS
Capping	RI Hazardous Waste Management Act of 1978 (RIGL 23-19.1 et seq.) Hazardous Waste Management Rules and Regulations and Proposed Amendments:	Relevant and Appropriate	Rules and regulations for hazardous waste generation, transportation, treatment, storage and disposal.	Substantive requirements applicable to closure will be met and adhered to on-site.
	• Section 7	Relevant and Appropriate	Restricts location, design, construction, and operation of landfills from endangering ground water, wetlands or floodplains	Landfill cap will be constructed so as to prevent contamination of ground water, wetlands, or floodplains.
	• Section 8	Relevant and Appropriate	Outlines requirements for ground water protection, general waste analysis, security procedures, inspections and safety.	Remedial actions will comply with substantive portions of this section applicable to landfill closure.
	• Section 9	Relevant and Appropriate	Outlines operational requirements for treatment, storage and disposal facilities.	Remedial actions will comply with substantive portions of this section applicable to landfill closure.
	• Section 10	Relevant and Appropriate	Outlines design and operations requirements for land disposal facilities, including landfills.	Remedial actions will meet all non-location specific requirements of this section applicable to landfill closure.
	RI Solid Waste Management Facilities Rules and Regulations			
	• Section 14.12	Relevant and Appropriate	Sets performance standard for landfill covers of maximum remolded permeability coefficient of 1×10^{-7} cm/sec.	Design of landfill cover will meet this requirement.

TABLE C-4 (Continued)
STATE ACTION-SPECIFIC ARARs AND TBCs
RECORD OF DECISION
McALLISTER POINT LANDFILL
NETC - NEWPORT
RCRA SUBTITLE C MULTI-LAYER CAP
WITH SURFACE AND INSTITUTIONAL CONTROLS

AUTHORITY/ ACTION	REQUIREMENT	STATUS	SYNOPSIS	ACTION TAKEN TO MEET ARARS
Venting	RI Clean Air Act (RIGL, Title 23, Chapter 23) General Air Quality and Air Emissions Requirements • RI Air Pollution Control Regulations, RI Dept. of Health, Div. of Air Pollution Control, effective 8/2/67, amended 5/20/91			
	- Regulation No. 1 - Visible Emissions	Applicable	No air contaminant emissions will be allowed for more than 3 minutes in any one hour which are greater than or equal to 20% opacity.	Air emissions from remedial actions will meet emission levels in regulation.
	- Regulation No. 5 - Fugitive Dust	Applicable	Requires that reasonable precaution be taken to prevent particulate matter from becoming airborne.	On-site remedial actions will use good industrial practices to prevent particulate matter from becoming airborne.
	- Regulation No. 7 - Emissions Detrimental to Person or Property	Applicable	Prohibits emissions of contaminants which may be injurious to human, plant or animal life or cause damage to property or which reasonably interfere with the enjoyment of life and property.	All emissions from landfill vents will meet this requirement or gas treatment will be required.
	- Regulation No. 15 - Control of Organic Solvent Emissions	Applicable	Limits the amount of organic solvents emitted to the atmosphere.	If emissions from landfill gas vents exceed limits in this regulation, emissions controls will be designed and implemented to meet these requirements.
	- Regulation No. 17 - Odors	Applicable	Prohibits the release of objectionable odors across property lines.	No remedial action or air emissions will emit objectionable odors beyond the facility boundary, as practicable.
	- Regulation No. 22 - Air Toxics	Applicable if air emissions contain regulated substances	Prohibits the emission of specified contaminants at rates which would result in ground level concentrations greater than acceptable ambient levels or acceptable ambient levels with LAER, as set in the regulation.	If necessary to meet these standards, air emissions control equipment will be designed for landfill gas emissions control.

TABLE C-4 (Continued)
STATE ACTION-SPECIFIC ARARs AND TBCs
RECORD OF DECISION
McALLISTER POINT LANDFILL
NETC - NEWPORT
RCRA SUBTITLE C MULTI-LAYER CAP
WITH SURFACE AND INSTITUTIONAL CONTROLS

AUTHORITY/ ACTION	REQUIREMENT	STATUS	SYNOPSIS	ACTION TAKEN TO MEET ARARS
Drainage	RI Water Pollution Control Act			
	• RI Water Quality Regulations for Water Pollution Control (RIGL 46-12 et seq.)	Applicable	Establishes general requirements and effluent limits for discharge to area waters.	In compliance with these regulations, RIPDES requirements pertaining to storm water discha will be met.
	• RI Regulations for the Pollutant Discharge Elimination System (RIPDES) (RIGL 46-12 et seq.)	Applicable	Permits contain applicable effluent standards (i.e., technology-based and/or water quality-based), monitoring requirements, and standards and special conditions for discharge, including storm water discharges from land disposal facilities which have received industrial wastes.	Storm water discharge improvements would b designed to provide compliance with these regulations and drainage would be monitored i compliance with these regulations.

APPENDIX E
RIDEM LETTER OF CONCURRENCE
Site 01 - McAllister Point Landfill
NETC - Newport, Rhode Island

State of Rhode Island and Providence Plantations
Department of Environmental Management
Office of the Director
9 Hayes Street
Providence, RI 02908

24 September 1993

Paul Keough
Acting Regional Administrator
Environmental Protection Agency, Region 1
John F. Kennedy Federal Building
Boston, MA 02203-2211

RE: Record of Decision for the McAllister Point Landfill,
Naval Education Training Center (NETC), Newport, Rhode Island.

Dear Mr. Keough:

On 23 March 1992, the State of Rhode Island entered into a Federal Facilities Agreement with the Department of the Navy and the Environmental Protection Agency. According to Section 17.3 of said agreement, the State of Rhode Island offers its concurrence with the selected remedy detailed in the September 1993 Record of Decision for the Source Control Remedial Action for Site 01 - McAllister Point Landfill at the Naval Education and Training Center located in Newport, Rhode Island. This concurrence is based upon all aspects of the abovementioned Record of Decision being adequately addressed and implemented during design, construction and operation of the remedy.

The Department wishes to specifically emphasize the following aspects of the Record of Decision:

- This source control remedial action is the first of two operable units for the site. A Record of Decision will be issued for the management of migration operable unit.
- The management of migration operable unit will consider clean up levels and remedial options for contaminated groundwater, leachate, landfill gas, contaminated sediments and potential hot spot areas including non-aqueous phase liquids.
- The Record of Decision will be issued for the management of migration operable unit sufficiently prior to the commencement of construction of the source control operable unit remedial action so that appropriate changes, if necessary, may be implemented in the final remedial design for the first operable unit.

- The remedy as proposed and implemented must ensure compliance with all applicable or relevant and appropriate State and Federal statutes, regulations and policies.

- This remedy must identify institutional controls applicable throughout the remedial action project life, which are protective of human health. Also, in the event that the remedial risk goals cannot be achieved, long-term controls must be instituted to prevent an unacceptable risk to human health and the environment.

- Regarding the final design of the slope protection system, the Record of Decision references the Army Corps of Engineers' Shore Protection Manual which does not appear in the Administrative Record Index or the reference section of the Focused Feasibility Study. As a result, the State has not had sufficient time to locate and review this guidance. However, we view the remedial design phase as an interactive process in which the design staff will work closely with the regulatory agencies in order to assure that the final design addresses the unique engineering considerations for this site.

Finally, the State will continue to participate in the Federal Facilities Agreement and in the review and approval of all phases of the remedial design process.

Sincerely,

Louise Durfee, Director
Department of Environmental Management

cc: James Fester, Associate Director, DEM
Merrill Hohman, Director, EPA Region I Waste Management Division
Mary Sanderson, Chief, RI Superfund Section
Terrence Gray, Chief, DEM Division of Site Remediation
Claude Cote, Esq. DEM Office of Legal Services
Warren Angell, Supervising Engineer, DEM Division of Site Remediation

mpl.rod/gf

The foregoing represents the selection of a remedial action by the Department of the Navy and the U.S. Environmental Protection Agency, Region I, with concurrence of the Rhode Island Department of Environmental Management. Comment and recommend for immediate implementation:

By: _____ Date: 9/24/93
Captain N. J. Pazzarozzi

Title: Captain, U.S. Navy
Commanding Officer
Naval Education and Training Center
Newport, Rhode Island

The foregoing represents the selection of a remedial action by the Department of the Navy and the U.S. Environmental Protection Agency, Region I, with concurrence of the Rhode Island Department of Environmental Management.

By: Paul Keough Date: 9-27-93

Paul G. Keough

Title: Acting Regional Administrator, Region I, USEPA