



DEPARTMENT OF THE NAVY

NORTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

10 INDUSTRIAL HIGHWAY

MAIL STOP, #82

LESTER, PA 19113-2090

N00129.AR.000605
NSB NEW LONDON
5090.3a

5090
Code 1823/ME

IN REPLY REFER TO

08 JAN 1998

Mr. Mark Lewis
Connecticut Department of Environmental Protection
Bureau of Water Management
Permitting, Enforcement & Remediation Division
79 Elm Street
Hartford, CT 06106-5127

SUBJ: RESPONSES TO CONNECTICUT DEPARTMENT OF ENVIRONMENTAL
PROTECTION COMMENTS DATED DECEMBER 3, 1997 ON THE DRAFT
FEASIBILITY STUDY FOR THE GOSS COVE LANDFILL SITE, NAVAL
SUBMARINE BASE - NEW LONDON, GROTON, CT

Dear Mr. Lewis:

Please find enclosed the Navy's responses to your comments of
December 3, 1997 on the Draft Feasibility Study for the Goss Cove
Landfill site at NSB-NLON.

Please call me at (610) 595-0567 ext. 162 if you have any
questions or wish to discuss this issue further.

Sincerely,

MARK EVANS

By direction of the
Commanding Officer

Copy to:

Mr. Dick Conant, NSB-NLON
Ms. Kymberlee Keckler, USEPA Region I
Mr. Jean-Luc Glorieux, B&R Pittsburgh

**RESPONSES TO
CTDEP's DECEMBER 3, 1997 LETTER OF COMMENTS
REGARDING THE
SEPTEMBER 1997 DRAFT FS REPORT
FOR THE GOSS COVE LANDFILL SOIL OU
NAVAL SUBMARINE BASE NEW LONDON
GROTON, CONNECTICUT**

January 6, 1998

GENERAL COMMENTS

1. Cover Letter, page 1, second paragraph

Comment The State is concerned that this report does not adequately consider all options for addressing the threat to human health and the environment posed by landfill wastes. Significant amounts of waste are located above the water table, and are subject to infiltration by precipitation. Ground water continues to flow through wastes located below the water table. All of these wastes represent a significant source of pollution to the waters of the State which must be addressed. The Navy states that contaminant migration from waste materials to Goss Cove and the Thames River is not of concern. While contaminant migration from waste material to Goss Cove and to the Thames River and ground water may not be of concern to the Navy, it is of great concern to the Department. Section GW4 of the Ground Water Quality Standards embodies those concerns.

Response Both of the capping alternatives developed in the FS achieve the remedial action objective of protection of human health by preventing direct contact with the waste material in the landfill. Although the capping alternatives leave contaminated soil and debris on site and partially within the groundwater, contaminant transport modeling results (discussed in Section 1.3.3.4 and Appendix A) indicate that the impact of contaminants in the landfill to the ecological receptors in Goss Cove is expected to be minimal.

Generally, the region of highest ecological COC concentrations in soil were used to perform the surface water and groundwater contaminant fate and transport modeling. This area is located in the southeast corner of the Goss Cove Landfill and groundwater from this area discharges to Goss Cove. Concentrations of ecological COCs were detected in other areas of the landfill. Groundwater from all other areas of the landfill excluding the southeast corner flow toward and discharge into the Thames River. Because only a portion of the groundwater at the site flows toward the Thames River, and because of the greater dilution provided by the river, the impacts to the Thames River are also expected to be minimal. This aspect has been discussed in Section 2.1.1 of the FS. Based on this rationale, the U.S. Navy believes that even under existing conditions, the impacts to the adjacent surface water bodies are minimal. Therefore, the attainment of the remedial action objective to prevent unacceptable risk to receptors in Goss Cove and the Thames River would be verified by the groundwater monitoring component of the capping alternatives.

Groundwater contaminant fate and transport was performed using the ECTran model to evaluate migration of contaminants from the landfill to the adjacent Goss Cove. In addition, surface water contaminant fate and transport modeling was performed using the procedures and equations presented in the Superfund Exposure Assessment Manual. The focus of the modeling was to determine future impacts to ecological receptors in Goss Cove. This information was previously submitted to the CTDEP for review and comment as an interim submittal. The CTDEP previously gave no indication that the modeling effort was unacceptable.

Finally, the U.S. Navy does in fact believe that the potential for contaminant migration from the waste material in the landfill to the adjacent surface water bodies is of great concern. However, as shown by the contaminant transport modeling, the migration of contaminants from the soil at this site is of minimal concern as it does not result in unacceptable risks to human health and the environment.

2. Cover Letter, page 1, third paragraph

Comment: The Navy's conclusion that contaminant migration is not of concern is partially based on ground water flow calculations and contaminant transport modeling which are significantly flawed. In addition, long term ground water monitoring as part of this remedy, and as part of the planned base wide ground water Operable Unit has yet to be conducted. For these reasons, the Navy's conclusion that contaminant migration is not of concern cannot be supported.

Response: This comment requires further clarification as to exactly what aspects of the modeling effort are "flawed" As discussed in the response to General Comment No. 1, groundwater contaminant fate and transport was performed using the ECTran model to evaluate migration of contaminants from the landfill to the adjacent Goss Cove In addition, surface water contaminant fate and transport modeling was performed using the procedures and equations presented in the Superfund Exposure Assessment Manual. The focus of the modeling was to determine future impacts to ecological receptors in Goss Cove. This information was previously submitted to the CTDEP for review and comment as an interim submittal. The CTDEP previously gave no indication that the modeling effort was unacceptable.

The U.S. Navy believes that the contaminant transport modeling results indicate that the impact of contaminants in the landfill to the ecological receptors in Goss Cove is expected to be minimal, and based on the discussion presented in the second paragraph of the response to General Comment No. 1, the impact to the ecological receptors in the Thames River is also expected to be minimal. The long-term groundwater monitoring program is proposed to verify the findings of the modeling evaluation. Questioning the validity of the monitoring program because it has yet to be implemented is comparable to rejecting a groundwater treatment system because the facility has yet to be constructed.

3. Cover Letter, page 1, fourth paragraph and page 2, first paragraph

Comment. The State also feels that the Navy has not adequately demonstrated that the *Presumptive Remedy for CERCLA Municipal Landfills* is applicable in this case. The Navy estimates (Appendix B) that approximately 105,400 cubic yards of waste are present in the landfill. EPA's guidance document entitled "Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills" (Office of Solid Waste and Emergency Response Directive No. 9355.0-67FS, dated December, 1996) indicates that "landfills with a content of more than 100,000 cubic yards... would normally not be considered for excavation" The estimated amount of waste present in the landfill only slightly exceeds this guideline. For this reason, the Feasibility Study should fully consider excavation and removal. Please note that if waste is to remain in place, a variance allowing use of an engineered control under Section 22a-133k-2(f)(2) of the Remediation Standard Regulations would be required. Cost of removal in comparison to the cost of implementing an engineered control is one of the criteria that is to be considered in approval of an engineered control.

Response: The U.S. Navy is aware that one of the criteria for selection of implementing an engineered control is to show that the cost of removal in comparison to implementing engineered control is not justified Section 2.4 of the FS discusses the various aspects to be considered for the application of the presumptive remedy, including the fact that excavation of a volume exceeding 100,000 cubic yards would be impractical. This indirectly implies that the costs would be unjustified. For example, assuming a nominal non-hazardous waste landfill disposal cost of \$50 per cubic yard, the cost of disposal of waste material in the Goss Cove Landfill, not including excavation, labor cost, dewatering, transportation, etc., would be over \$5,000,000. The costs of disposal would be even higher if a portion of the material is

determined to be hazardous by TCLP characteristic. Cost of treatment for the excavated material, assuming that technologies are available to address organic as well as inorganic contaminants, and considering that heterogeneous debris and other wastes may be present in the landfill, would very likely be of the same order of magnitude. The U.S. EPA has provided a guidance to the regulated public to apply a presumptive remedy to help streamline the feasibility study and remedy selection process based on the most cost effective and overall protective remedy that was selected at similar sites all over the country

4. Cover letter, page 2, second paragraph

Comment. The impact of landfill waste on Goss Cove and the Thames River, as well as ground water, has not yet been fully evaluated, and will not be fully evaluated until ground water monitoring as part of this remedy and under the base wide ground water operable unit has been conducted. Until the base wide ground water operable unit is completed, any remedial actions at the Goss Cove landfill other than excavation and off site disposal must be considered interim actions

Response As discussed in the response to General Comment No. 1 and General Comment No. 2, the U.S. Navy feels that the impact to Goss Cove and the Thames River has been shown to be minimal. Also, as discussed in the responses to these comments, groundwater monitoring has been included to verify that the migration of contaminants from the wastes through the groundwater into either Goss Cove or the Thames River would be minimal in the future. However, the U.S. Navy agrees that until a base-wide groundwater Operable Unit Feasibility Study is completed, any remedial alternatives (other than excavation and off site disposal) recommended in the Goss Cove Landfill (Site 8) Soil Operable Unit Feasibility Study, must be considered as interim actions.

5. Cover Letter, page 2, third paragraph

Comment The State is concerned that capping alone may not meet the requirements of the Remediation Standard Regulations, or of the State's Ground Water Quality Standards. If the Navy chooses to cap the landfill, the Navy will be required to evaluate the continuing impact to ground water from saturated wastes, for which capping provides no benefit. Section GW4 of the Ground Water Quality Standards, which became effective April 12, 1996, states in relevant part that the Department's policy, in areas with a ground water classification of GB, is to regulate discharges to the ground water in order to prevent further degradation of ground water. The Department considers the ground water contamination originating from landfill wastes to be a discharge. If monitoring of ground water quality immediately downgradient of the landfill demonstrates that capping is effective as a source control to eliminate this discharge, then no further remedial action (other than monitoring) may be required to address degradation of ground water. If the Navy is unable to make this demonstration, then leachate collection may be required.

Response If the results of future groundwater monitoring indicate that the landfill wastes are impacting the groundwater immediately downgradient of the landfill, then the U.S. Navy agrees that capping alone will not be sufficient and therefore, leachate collection or another groundwater control component must be included in the remedial design. However, if monitoring of the groundwater immediately downgradient of the landfill demonstrates that capping is effective as a source control, then no further remedial action other than monitoring should be required

6. Cover Letter, page 2, fourth paragraph

Comment The feasibility study also does not adequately discuss the requirements of the Remediation Standard Regulations (RSRs). Although the report does consider the RSRs, in several instances the report contains incomplete or erroneous interpretations of the requirements. Our specific concerns in this area are detailed below in the Specific Comments

Response: This concern will be addressed in the responses to the individual specific comments detailed in the next section

SPECIFIC COMMENTS

1. Page ES-2, Risk Assessment, first paragraph

Comment: The seventh line notes that the Connecticut target cancer risk of 10^{-5} was exceeded. Under Section 22a-133k-2(l) of the Remediation Standard Regulations, the 10^{-5} target cancer risk applies to the cumulative risk posed by polluted soil containing multiple polluting substances. The Target Cancer Risk for individual polluting substances is 10^{-6} , regardless of the number of individual polluting substances. Please revise the text accordingly. This comment applies also on page 1-55, and page 1-60.

Response: The following changes will be made:

- The third sentence of the first paragraph under the Risk Assessment Section on page ES-2 will be revised to read as follows: "The **cumulative** Connecticut target cancer risk of $1E-5$, **which applies to the risk posed by polluted soil containing multiple polluting substances**, was also exceeded by the older child trespasser and construction worker under the RME scenario."
- The last sentence of the first paragraph on page 1-55 will be revised as follows: "Estimated **cumulative** Incremental Cancer Risks (ICRs) were compared to the USEPA target risk range of $1E-4$ to $1E-6$ and the **cumulative** Connecticut target cancer risk of $1E-5$, **which applies to the risk posed by polluted soil containing multiple polluting substances**."
- The last sentence of the second paragraph on page 1-55 will be revised as follows: "All estimated **cumulative** ICRs for these exposure routes are within the USEPA target risk range and less than the **cumulative** Connecticut target risk of $1E-5$."
- The fourth sentence of the third paragraph on page 1-55 will be revised as follows: "Estimated **cumulative** ICRs for the full-time employee, older child trespasser, construction worker, and future resident all exceeded Connecticut's **cumulative** target cancer risk of $1E-5$."
- The last sentence on page 1-55 will be revised as follows: "The **cumulative** ICR ($1E-5$) was within the USEPA and State of Connecticut target risk range."
- The first sentence on page 1-60 will be revised as follows: "...location 8-SS02 (near the submarine exhibits) under RME conditions slightly exceeds $1E-6$ and is within the USEPA's target risk range of $1E-4$ to $1E-6$ and under the **cumulative** Connecticut target risk of $1E-5$."

2. Page ES-5, Development of Remedial Alternatives, third paragraph

Comment: As discussed above in the General Comments, additional alternatives which include excavation and offsite disposal should also be considered.

The first sentence discusses the use of a cap to meet the State's solid waste landfill closure requirements, which are equivalent to the requirements of RCRA subtitle D. Since the landfill contains industrial and hazardous wastes, the closure requirements of the State's Hazardous Waste Management Regulations (RCSA §22a-449(c) 100 to 110) apply. In addition, if the Navy intends to consider the cap an engineered control, Section 22a-133k-2(f)(2)(B)(l)(aa) of the Remediation Standard Regulations would require that the cap have a maximum permeability of 10^{-6} cm/sec. A variance allowing use of an engineered control

would also be required under Section 22a-133k-2(f)(2).

The third sentence should be deleted, since as Ms. Kymberlee Keckler of EPA points out on pages ii and iv of her comment letter dated October 30, 1997, the ground water flow path way has not been adequately evaluated, and potential effects on the Thames River and Goss Cove, and on on-site ground water, have not been adequately assessed. In addition, a significant portion of the waste in the landfill is located above the water table, representing a potential source of pollution to the waters of the State via infiltration of precipitation

Response Regarding the need for additional remedial alternatives to be considered, please refer to responses to General Comments Nos 1, 3, 4, and 5.

Regarding the first sentence, the U.S. Navy disagrees that the Goss Cove Landfill contains hazardous wastes. Therefore, solid waste landfill closure requirements are ARARs while hazardous waste management regulations are not relevant and appropriate. However, the U.S. Navy agrees that a complete suite of TCLP analyses must be conducted at the time of remedial design to verify the nonhazardous nature of the soils at this site.

The U.S. Navy disagrees that the third sentence of the paragraph should be deleted. As discussed under the responses to General Comments Nos 1, 2, and 4, the impacts from the Goss Cove Landfill to Goss Cove and the Thames River are expected to be minimal. However, the third sentence will be modified as follows to reflect minimal concern as opposed to no concern. "Since *minimal* contaminant migration via the groundwater pathway *resulting in minimal* ~~has been shown to not be of concern~~ and potential impacts to Goss Cove and the Thames River have been shown ~~to be minimal~~, the reduction in mobility of contaminants via reduction in infiltration is not an environmental-risk driven characteristic required for the caps."

3. Page ES-7, Long Term Effectiveness and Permanence

Comment The text states that "migration of contaminants from soils is not of primary concern". The State disagrees with this statement, since polluted soils with contaminants at concentrations exceeding the pollutant mobility criteria are present in the landfill. In addition, waste below the water table is a continuing source of ground water contamination. These materials constitute a source of pollution to the waters of the State, which must be addressed by the Navy

Response The U.S. Navy agrees that the migration of contaminants from the soil should, in principle, be of great concern. However, as shown by the contaminant transport modeling, the migration of contaminants from the soil at this site is of minimal concern as it does not result in unacceptable risks to human health and the environment. Therefore, the sentence will be modified to read as follows: "Since migration of contaminants from the soils ~~is not of primary concern~~ **at this site has been shown through transport modeling to be of minimal concern**, reduction in infiltration is not the main requirement."

4. Page 1-45, Section 1.4.1.1: Goss Cove Landfill Soil, fourth paragraph

Comment The text states that silver in one soil sample marginally exceeded the GB pollutant mobility criteria. The text should also discuss whether the industrial/ commercial direct exposure criteria were exceeded. This comment applies also to the last sentence of the first bullet on page 1-61.

Response The U.S. Navy disagrees that a discussion concerning the exceedance of State of Connecticut industrial/commercial direct exposure criteria is necessary since a site-specific baseline human health risk assessment was performed for the Goss Cove Landfill. The results of this assessment are discussed in Section 1.4.2 of the FS on pages 1-54 through 1-60

5. Page 1-61, Section 1.4.4: Conclusions

Comment: In the last line of the last bullet point, "affects" should be replaced with "effects".

Response: The last sentence on the page will be corrected to read: "However, in each of these cases it has been determined that no adverse health ~~affects~~ **effects** will occur."

6. Page 2-2, Section 2.1: Remedial Action Objectives

Comment: The first paragraph notes that the Connecticut target cancer risk of 10^{-5} was exceeded. Under Section 22a-133k-2(l) of the Remediation Standard Regulations, the 10^{-5} target cancer risk applies to the cumulative risk posed by polluted soil containing multiple polluting substances. The Target Cancer Risk for individual polluting substances is 10^{-6} , regardless of the number of individual polluting substances.

Response: Refer to response to Specific Comment No. 1. The first sentence in the last paragraph of Section 2.1 will be revised to read as follows: "Although the U.S. EPA considers that the acceptable target ICR range for human health risk is 1.0×10^{-6} to 1.0×10^{-4} , according to the CTDEP's Alternative Direct Exposure (under CTDEP's Alternative Direct Exposure Criteria), ~~the~~ **a cumulative** ICR of 1.0×10^{-5} , **which applies to the risk posed by polluted soil containing multiple polluting substances**, must be achieved."

7. Page 2-3, Section 2.1.1: ARARs and TBCs, last paragraph

Comment: The text states that the Regulations offer "exclusions for the soil/fill above this class of groundwater". It adds that these exclusions would not apply since volatile organics are present in the soil. It is unclear what standards and exclusions are being referred to here. In a GB area, the pollutant mobility criteria apply to soils located above the seasonal high water table. They do not apply to soils below the seasonal high water table, regardless of the presence or absence of volatile organic compounds in the soil. The regulations do not provide for "exclusions" to the pollutant mobility criteria for soils above the seasonal high water table. However, the regulations do provide several alternatives for complying with the pollutant mobility criteria in a GB area. These include calculating alternative pollutant mobility criteria, or calculating alternative dilution or dilution and attenuation factors. In addition, Section 22a-133k-2(f)(2) provides that the direct exposure and pollutant mobility criteria do not apply to soils which are contained by an engineered control approved by the Commissioner.

Regardless of whether the pollutant mobility criteria apply to soils at this site, contaminated soils and waste will remain below the water table. These represent a source of pollution to the waters of the State, and are considered to be a discharge. The State's policy, as specified in Section GW4 (B) of the Ground Water Quality Standards (adopted April 1, 1996) is to regulate such discharges in GB areas to prevent further degradation of ground water quality.

Please revise this section accordingly.

Response: Regarding the first paragraph, please clarify CGS Section 22a-133k-2(c)-(4)(C)(bb) which appears to offer exceptions to the pollutant mobility criteria.

Regarding the second paragraph, please see the response to General Comment No. 5. The text in Section 2.1.1 will be revised accordingly.

8. Page 2-5, Table 2-2: State of Connecticut Chemical Specific ARARs

Comment In the Citation column, please correct the phrase in parenthesis to reflect the fact that the Remediation Standard Regulations were established pursuant to CGS §22a-133k, rather than §22a-426.

Response At the bottom of the Citation column, the following correction will be made: "(Established pursuant to CGS Section 22a-426~~133k~~)"

9. Page 2-7, Table 2-4: State of Connecticut Location Specific ARARs

Comment The statutes regulating Dredging and Erection of Structures and Placement of Fill in Tidal, Coastal or Navigable Waters (CGS 22a-359 to 363) should be included as Applicable. For the Navy's convenience, I have included a table listing the State statutes and ARARs which should be included as ARARs

Response Although the U.S. Navy is not proposing any remedial activities affecting navigable waters of the state (Thames River) waterward of the high tide line, it is agreed that the regulations could be potentially applicable and therefore the statute will be included in Table 2-4

The U S Navy appreciates CTDEP's assistance in providing the ARARs tables. However, the U.S. Navy disagrees that the Hazardous Waste Management generator and handler requirements and standards, and the Hazardous Waste Management TSDF standards are relevant and appropriate since there is no evidence to suggest that hazardous wastes were disposed of in this landfill. Therefore the associated hazardous waste ARARs will not be included in Table 2-9. In addition, the U S Navy believes that certain PCB regulations related to TSCA are not relevant and appropriate at this site because PCB concentrations in the soil are not expected to exceed 50 mg/kg. This has been agreed to by the U.S.EPA via e-mail from Kimberlee Keckler to Mark Evans dated 10/31/97

10. Page 2-8, Section 2.1.1: ARARs and TBCs

Comment The text states that exceedences of the pollutant mobility criteria for inorganics other than lead and cadmium were based on values which were "conservatively" calculated from the results of mass analyses, rather than upon actual leachate analyses. It should be noted that the regulations require that for inorganics, the results of actual leachate analysis (TCLP or SPLP) must be used to determine compliance with the pollutant mobility criteria. When such calculated results are used in place of actual TCLP or SPLP results, any exceedences noted must be assumed to be real and cannot be dismissed as the result of overly conservative assumptions.

This section does not include a discussion and/ or table regarding compliance with the Direct Exposure Criteria. Please add such a discussion.

In the second paragraph, please delete "ground water pollutant mobility criteria for the protection of surface water", and insert "surface water protection criteria". The volatilization criteria apply also to groundwater at this site.

The last paragraph includes a discussion of the calculation of an alternative dilution factor for the surface water protection criteria. Section 22a-133k-3(b)(3) of the Regulations provides two different methods for calculating an alternative surface water protection criteria. Alternative A (RCSA §22a-133k-3(b)(3)(A)), which does not require approval by the Commissioner, may be calculated for a substance in Appendix D of the most recent Water Quality Standards (the State's Ambient Water Quality Criteria). The alternative surface- water protection criteria is calculated by multiplying the lower of the human health or aquatic life criterion for such substance in said Appendix D by $[(0.25 \times 7Q_{10})/Q_{plume}]$ where Q_{plume} is equal to the average daily discharge of polluted ground water from the subject ground-water plume.

Alternative B (RCSA §22a-133k-3(b)(3)(B)) requires written approval from the Commissioner. Under this paragraph, the Commissioner may approve an alternative surface-water protection criterion to be applied to a particular substance at a particular release area. Any person requesting such approval shall submit to the Commissioner: (i) a report on the flow rate, under seven day ten year low flow conditions, of the surface water body into which the subject ground water plume discharges (ii) a report on other surface water or ground water discharges to the surface water body within one-half mile upstream of the areal extent of the ground-water plume, (iii) a report on the in stream water quality, (iv) a report on the flow rate of the ground-water discharge from such release area to the surface water body and the extent and degree of mixing of such discharge in such surface water, and (v) and any other information the Commissioner reasonably deems necessary to evaluate such request. The Commissioner shall not approve an alternative surface-water protection criterion under this subparagraph unless the requester demonstrates that such criterion will protect all existing and proposed uses of such surface water.

The alternative direct exposure criteria calculations presented by the Navy are not in accordance with the requirements of Alternative A, and have not been submitted for approval by the Commissioner in accordance with Alternative B. In addition, the text states that the estimated ground water discharge to the Thames from the Goss Cove Landfill is 3,200 cubic feet per day. As Kymberlee Keckler notes on page ii of her letter dated October 30, 1997, the ground water discharge rate estimated by the Navy is not valid. For this reason, the estimated rate cannot be used to calculate alternative surface water protection criteria.

Response: First paragraph of this comment: The last sentence of the first paragraph on page 2-8 will be revised to read as follows: "However, it should be noted that exceedances for inorganics, except for lead and cadmium, were the result of conservatively calculated TCLP values based on contaminant concentrations in the soil and assuming complete dissolution into the TCLP extract."

Second paragraph of this comment: See response to Specific Comment No. 4.

Third paragraph of this comment: The first sentence in the second paragraph on page 2-8 will be revised as follows: "Although the groundwater beneath the Goss Cove Landfill is not expected to be useful for domestic or industrial purposes due to its salinity, this groundwater discharges to two surface water bodies, Goss Cove and the Thames River, and therefore ~~groundwater pollutant mobility criteria for the protection of surface water~~ **surface water protection criteria** must be met." In addition, the following paragraph will be inserted between the second and third paragraphs on page 2-8, and a new Table 2-7 will be created to compare the VOC concentrations in the groundwater to the volatilization criteria. (Old Tables 2-7, 2-8, and 2-9 will be renumbered as Tables 2-8, 2-9, and 2-10). **"Since the groundwater beneath the Goss Cove Landfill contains volatile organic substances within 15 feet of the ground surface, volatilization criteria must also be met. Table 2-7 presents a comparison of a summary of VOC concentrations in the groundwater at and around the site during the most recent round of sampling to the applicable volatilization criteria. The comparison in Table 2-7 shows ..."**

Final paragraph of this comment: It is not clear why the alternative direct exposure criteria calculations presented by the U.S. Navy are not in accordance with the requirements of Alternative A. The U.S. Navy believes it has followed the procedure listed in the fourth paragraph of this CTDEP comment. Please clarify specifically what step is not in compliance. With regard to the questionable groundwater discharge rate, the response to the U.S EPA comment referred to above is as follows:

"It is true that the flow direction of groundwater through the Goss Cove Landfill has different components. It is also true that all groundwater passing through the landfill eventually reaches the Thames River, either directly or indirectly, because Goss Cove is hydraulically connected to the Thames River.

The approach to estimating groundwater discharge rate in the FS will be modified to provide a more accurate estimate. Groundwater beneath the landfill will be separated into two zones, one representing discharge to Goss Cove and the second representing discharge to the Thames River, and a groundwater discharge rate will be estimated from each zone. Hydraulic gradients, as measured in March 30, 1994,

will be used in the calculation Darcy's velocity and a 0.75 tidal factor will still be included in the calculation

Further clarification is necessary regarding the U.S. EPA definition of catchment area. Based on the USGS quadrangle map that covers this area, an approximate catchment area of 1,000,000 square feet (2000 feet by 500 feet) was estimated to drain towards Goss Cove. If an infiltration rate of 8 inches per year is used with this catchment area, the calculated total infiltration rate is 1,826.5 cubic feet per day. This value is within the same order of magnitude as the groundwater discharge rate presented in the FS (i.e. 4.272 cubic feet per day). Therefore, by using the U.S. EPA suggested method, the estimated groundwater discharge rate provided in the FS is confirmed "

11. Page 2-9, Table 2-5: Comparison of Soil Above Groundwater Table to GB Mobility Criteria for Protection of Groundwater

Comment Please delete the shading in the Concentration Range column for 2, 4 dimethyl phenol, as Appendix B of the Regulations does not list a pollutant mobility criterion for that chemical. The correct GB pollutant mobility criterion for total xylenes is 19,500 µg/kg.

The table incorrectly lists the GB pollutant mobility criterion for total 1,2 dichloroethene as 34,000 µg/kg. The applicable GB pollutant mobility criteria are: 14,000 µg/kg for *cis*-1,2 dichloroethene, and 20 µg/kg for *trans*-1,2 dichloroethene. Where the two isomers are not reported separately, the two criteria may not be added to obtain a criterion for total 1,2 dichloroethene. Instead, the lower criterion (14,000 µg/kg) applies to the total results. The concentration range column for total 1,2 dichloroethene in Table 2-5 should therefore be shaded.

Please list the GB pollutant mobility criterion for dieldrin (0.007 mg/kg)

Response: First paragraph: Both the shading in the concentration column as well as the GB pollutant mobility criteria value of 4,000 µg/kg for 2,4-dimethylphenol will be deleted. In addition, the GB pollutant mobility criterion for total xylenes will be revised to read 19,500 µg/kg instead of 195,000 µg/kg.

Second paragraph: The U.S. Navy agrees that since the two isomers were not reported separately, the lower criterion, 14,000 µg/kg, should replace the 34,000 µg/kg value currently in the GB pollutant mobility criteria column. However, since the actual GB pollutant mobility criteria for *trans*-1,2 dichloroethene is 20,000 µg/kg instead of 20 µg/kg as indicated in the comment, the concentration range column should not be shaded.

Third paragraph: The GB pollutant mobility criterion value of 7 µg/kg for dieldrin will be inserted into Table 2-5.

12. Pages 2-13 to 2-14, Table 2-6: Comparison of Groundwater Concentrations to CTDEP Surface Water Protection Criteria

Comment Note 6 to the table indicates that the surface water protection criteria listed for several substances were calculated by multiplying the lower of the human health or the aquatic life criteria listed in the State's water quality standards by a factor of 10. This calculation is not in accordance with the regulations. The calculated surface water protection criteria should be replaced with the surface water protection criteria listed in Appendix D of the Regulations. If the Navy wishes to use alternative surface water protection criteria, they must either be calculated in accordance with Section 22a-133k-3(b)(3)(A) of the Regulations, or calculated and approved by the Commissioner in accordance with Section 22a-133k-3(b)(3)(B) of the Regulations.

Response: The surface water protection criteria shown in Table 2-6 provided calculated values for those contaminants that were not listed in Appendix D of the regulations. All calculated protection criteria in Table 2-6, footnoted as "6", will be removed from the table. This will result in the shading being removed from the following compounds: benzo(g,h,i)perylene, phenanthrene, indeno(1,2,3-cd)pyrene, and chrysene. The text will be revised accordingly to account for the removal of the calculated values.

13. Page 2-15, Section 2.1.1: ARARs and TBCs, second paragraph

Comment: The first sentence should be deleted. The contaminants present in the vadose zone are not relevant to the surface water protection criteria. Compliance with the surface water protection criteria is determined based on the results of ground water sampling. As discussed above under Specific Comment 10, the Navy has not adequately demonstrated compliance with the surface water protection criteria.

Response: See response to Specific Comment No. 10. The first sentence in the second paragraph on page 2-15 will be deleted.

14. Pages 2-16 to 2-17, Table 2-7: Comparison of Groundwater Concentrations to Site- Specific Surface Water Protection Criteria

Comment: Note 6 of this table indicates that site specific values were calculated by multiplying the lower of the human health or ambient water quality criteria in the State's Water Quality Standards by a dilution factor of 10. This does not agree with the accompanying text, which states in the last paragraph on page 2-8 that a dilution factor of 118 was calculated for ground water entering the Thames from Goss Cove. Please correct the table. In any case, as noted above in Specific Comment 10, the dilution factors have not been calculated in accordance with the Regulations.

Response: Footnote 6 of Table 2-7 will be changed to reflect the revised dilution factor resulting from the newly estimated groundwater discharge rate discussed in the response to Specific Comment No. 10. Please see the response for Specific Comment No. 10 with regard to the last sentence of this comment.

15. Pages 2-20 and 2-21, Section 2.4: General Response Actions

Comment: The text states that under the presumptive remedy, the Navy would use the cap as justification to seek a variance from the direct exposure and pollutant mobility criteria. It also states that an engineered control cap meeting the 10^{-6} cm/s permeability *may* be used, and that to meet the State's Solid Waste Management Closure requirements, a cap with a minimum thickness of 2 feet would be required. It should be noted that if the Navy intends to apply for a variance based on the use of an engineered control, the engineered control *must* meet the maximum permeability requirement of 10^{-6} cm/s. The second full sentence on page 2-21 should be deleted, since the Navy has not demonstrated that migration of contaminants through ground water is not of concern. Ground water monitoring will be required. If ground water monitoring detects unacceptable ground water contamination, specific remedial action beyond soil and sediment sampling may be required.

Response: See responses to General Comments Nos. 1 and 5 and Specific Comments Nos. 2 and 3. The U.S. Navy believes that the migration of contaminants from the soil at this site is of minimal concern as it does not result in unacceptable risks to human health and the environment. Therefore, beginning with the second full sentence on page 2-21, the text will be revised as follows: "Since migration of contaminants through groundwater is not **believed to be** a major concern, as discussed in Sections 2.1 and 1.3.3.4, **it is anticipated that** no groundwater controls, **are such as leachate collection, will be** required. ~~Leachate collection and treatment is not applicable because there is no bottom liner to this landfill.~~ **However, if the results of future groundwater monitoring indicate that the landfill wastes are impacting the groundwater immediately downgradient of the landfill, then capping alone would**

not be sufficient, and therefore leachate collection or another groundwater control component would be included in the remedial design. Landfill gas collection and venting may be implemented only as a good engineering practice since putrescible wastes (such as household refuse or biological waste/sludge) are not known to have been disposed of at this landfill. It is possible that low levels of gas that may be generated by organic plant material may need to be vented. Institutional controls including an environmental land use restriction would be used to prevent future residential land use."

16. Page 2-23, Table 2-9: State of Connecticut Action Specific ARARs and TBCs

Comment: Throughout this table, please delete "Potentially" from the Status column.

In the Requirements column, CGS §22a-250 is a Solid Waste statute, rather than a regulation.

The Air Pollution Control Regulations should also include RCSA §22a-174-3 (Stationary Sources), §22a-174-20 (Control of Organic Compound Emissions), and §22a-174-29 (Control of Hazardous Air Pollutants). The State's Hazardous Waste Management Regulations (RCSA §22a-449(c)100 to (c)-110) should also be listed as Applicable.

Please correct the citation for Disposition of PCBs. These should be listed as CGS §22a-467. This comment applies also to table 4-10 on Page 4-25.

The Water Pollution Control Statutes (CGS §22a-430 and 22a-430 b) and the Water Pollution Control Regulations (RCSA §22a-430-1 to 8) would be applicable to any discharge resulting from dewatering or other activities, and should be included in the table.

The Water Diversion Policy Act (CGS §§22a-365 to 378) would be Applicable if dewatering is necessary during excavation.

Response: First paragraph: The U.S. Navy disagrees that the word "potentially" should be removed from the status column throughout this table since the determination of a specific remedial alternative has not been made in Section 2.0. However, in the alternative-specific ARARs tables in Section 4.0, it is agreed that the word "potentially" should be eliminated.

Second paragraph: Under the requirement column on the first page of Table 2-9, for Citation CGS 22a-250. Solid Waste Management Regulations will be revised to read Solid Waste Management Statute.

Third paragraph: The U.S. Navy believes that only the Control of Organic Compound Emissions, and not the Stationary Sources Emissions should be included in the Air Pollution Control Regulations in Table 2-9; however, as discussed in the response to Specific Comment No. 9, the U.S. Navy disagrees that the State's Hazardous Waste Management Regulations should be listed as applicable in Table 2-9.

Fourth paragraph: Also, as discussed in the response to Specific Comment 9, the U.S. Navy believes that certain PCB regulations related to TSCA are not relevant and appropriate at this site because PCB concentrations in the soil are not expected to exceed 50 mg/kg. Therefore, this citation will be removed from Table 2-9 as well as from Table 4-10 on page 4-25.

Fifth paragraph: The U.S. Navy disagrees that the Water Pollution Control Statutes and Regulations are applicable and should be listed in Tables 2-9, since no groundwater remediation systems or wastewater dewatering systems are proposed.

Sixth paragraph: The U.S. Navy disagrees that the Water Diversion Policy Act is applicable and should be placed into Tables 2-9.

17. Page 3-5, Section 3.2.2: Minimal Action- Effectiveness

Comment The text states that the pavement will be maintained under "current institutional controls". The text should specify what institutional controls are currently in place.

Response: The current institutional controls refer to NSB-NLON's administration, which is currently maintaining the Nautilus Museum parking lot. The sentence will be modified to read as follows: "The existing paved parking area is being maintained ~~under the current institutional controls~~ **by NSB-NLON**, and this pavement is effectively preventing visitors ~~to the Nautilus Museum~~ from being exposed to the **underlying** contaminated material ~~underlying the pavement~~."

18. Page 3-6, Section 3.2.3.1: Capping

Comment: This section does not include a discussion of leachate collection as one of the components of capping. Capping alternatives must include leachate collection unless the Navy can demonstrate through ground water monitoring that saturated waste is not impacting ground water at the down gradient property line. Please revise the text accordingly.

Response Please refer to the responses to General Comments Nos. 1, 2 and 4. Leachate collection has not been included because saturated waste is not expected to be impacting the groundwater, as shown by contaminant transport modeling.

19. Page 3-8, Section 3.2.3.1: Capping, second paragraph

Comment: The text notes that because contaminated soils are located within 2 feet of the ground surface in areas which would remain grass-covered, this option would not meet the State's requirements for minimum cover thickness at solid waste disposal areas. The text should also state that this alternative would not meet the Remediation Standard Regulations standard to be considered "Inaccessible Soil". Please delete the last sentence, since State and Federal Hazardous Waste Management statutes and regulations are Applicable.

Response The fifth sentence of this paragraph will be modified to read as follows: "Therefore, the State of Connecticut's solid waste cover requirement of two feet of compacted clean fill overlying the **wastes and the Remediation Standard Regulations definition of "Inaccessible Soil"** is not met in certain portions of the paved area and all of the grass-covered areas."

20. Page 4-1, Section 4.2: Development of Alternatives

Comment: As discussed above in the General Comments, additional alternatives which include excavation and offsite disposal of land fill wastes should be fully considered. Excavation and Disposal are discussed in Section 3.2.4 on pages 3-9 to 3-10. Both processes are found to be effective and implementable, and are retained for further consideration. However, they are not discussed in Section 4 of the FS. Since the Navy has not demonstrated that capping alone can meet the requirements of the State's Water Quality Standards and other ARARs, as well as protect human health and the environment, an excavation and disposal alternative must be considered fully.

Please delete the fourth, fifth and sixth sentences of the last paragraph. Alternative 2A (Soil Cap) would not meet the Remediation Standard requirements regarding Direct Exposure. In addition, the Navy has not demonstrated that migration via the ground water pathway, or potential impacts to Goss Cove or the Thames River, are not of concern.

Response: The U.S. Navy disagrees that additional alternatives consisting of excavation and offsite disposal of landfill wastes should be considered. The rationale for this disagreement is discussed in the response to General Comment No. 3. Please note that excavation and disposal were discussed in Section 3.2.4 only for removal of grass-covered areas around the museum and for consolidation of the excavated material on site. These technologies were not considered for offsite landfilling of Goss Cove Landfill wastes.

The U.S. Navy agrees that Alternative 2A would not meet the definition of "inaccessible soil" in the strict sense of the definition. However, the alternative would meet the requirements of a Solid Waste cover. Since Goss Cove Landfill is not known to contain hazardous wastes, the use of a solid waste cover with institutional controls is expected to adequately minimize exposure to contaminants in the soil. The rationale for this concept is based on the assumption that solid waste landfills in the State of Connecticut that have contaminants other than municipal-waste related contaminants can adequately minimize exposure to receptors by using a solid waste cover with institutional controls. Please note that under CTDEP regulations, solid wastes include so-called "special wastes" such as incinerator ash and demolition debris, which are the main types of wastes that were disposed of at Goss Cove Landfill. The CTDEP regulations do not indicate whether the Remediation Standards (RCSA 22a-133k) take precedence over Solid Waste cover requirements (22a-209). If the former regulations take precedence, then the paved areas must be provided with an additional compacted soil cover thickness of 3 inches and the grass areas must be excavated to a depth of 4 feet and backfilled with compacted soil for a thickness of 3.5 feet followed by top soil cover for a thickness of 0.5 feet with vegetation. If necessary, an additional compacted soil layer thickness of 3 inches can be added under the asphalt paved area of the parking lot, to provide a total compacted soil cover thickness of 24 inches for the entire site. Resolution is required.

21. Page 4-12, Section 4.3.2: Alternative 2- Capping with Institutional Controls and Monitoring

Comment: In the second line of the last paragraph, "displayed" should be replaced by "displaced". This change should also be made in the first bullet point on page 4-16. In the fourth sentence, replace "grass islands in" with "paved areas of".

Response: The typographical error in the word "displaced" will be corrected on page 4-12 and page 4-16. The fourth sentence of the last paragraph refers to grass-covered areas within the parking lot. No correction is proposed.

22. Page 4-13, Section 4.3.2: Alternative 2- Capping with Institutional Controls and Monitoring- Component 1- Capping

Comment: The second paragraph makes a distinction between the areas of the parking lot which will be paved and those which will remain as grassy islands. The text implies that separate cap systems will be placed beneath the islands and paved portions of the parking lot. The text should be revised to clarify that a single, continuous cap will be placed over the entire Goss Cove Landfill. The only differences between the two areas other than that between grass and pavement will be that waste material will be excavated from the grass islands and placed beneath the areas to be paved and the thickness of the materials underlying the grass and pavement. In the fourth sentence of this paragraph, replace "grass islands in" with "paved areas of".

Response: The proposal is to use two separate types of erosion control covers in the parking lot: top soil with grass on the grass islands and asphalt on the paved area, in order to maintain the existing functions of the parking lot to the extent possible. However, as discussed in the text and depicted in the figures in Section 4.0, the lower components for the two types of covers, such as the geonet gas layer, synthetic membrane, and the drainage layer would be common and continuous throughout the parking lot. A sentence will be added to Section 4.3.2 clarifying the fact that these common layers will be provided over the entire Goss Cove landfill. Also note that the waste would be excavated only from the grass-covered

areas surrounding the museum building that are outside the parking lot, such as the area under the submarine displays and the area between the entrance and the sewage pumping station, etc. This excavated waste would be spread over the entire area of the parking lot (paved areas and grassy islands) before the cap is installed. See response to Specific Comment No. 20. No correction required to the fourth sentence. Regarding the last sentence of this comment, please refer to the response to Specific Comment No. 21.

23. Page 4-17, Section 4.3.2: Alternative 2- Capping with Institutional Controls and Monitoring- Component 2- Institutional Controls

Comment: The meaning of the second sentence of the first paragraph is unclear. The State would expect that environmental land use restrictions would be consistent with the Remediation Standard Regulations. However, the land use restrictions are not obtained from or granted by the State. The State expects that the Institutional Controls for the Goss Cove Landfill would be similar to those currently being developed for the DRMO site.

Response: The sentence will be corrected as follows: "Environmental land use restrictions would be ~~obtained from the State of Connecticut~~ **implemented according to State of Connecticut's Remediation Standard Regulations.....**"

24. Page 4-19, Section 4.3.2: Alternative 2- Capping with Institutional Controls and Monitoring- Compliance with ARARs and TBCs

Comment: Please delete the second sentence of the first paragraph. The soil cap envisioned in Alternative 2A does not comply with the Remediation Standard Regulation requirements regarding "inaccessible soil", as defined in Section 22a-133k-1(a)(28). As currently proposed, the cap would consist of a total of 21 inches of material beneath a 3 inch layer of asphalt, and a 2.5 foot thick layer of material above waste in grass covered areas. For soil to be considered "inaccessible", the Regulations require a minimum of 2 feet of material below a 3 inch layer of asphalt pavement, or 4 feet of cover material above waste in areas which are not paved. In addition, this sentence improperly refers to "Alternative Direct Exposure Criteria". It is not necessary to develop alternative direct exposure criteria for soils which will be considered "inaccessible" under the Regulations, since the direct exposure criteria do not apply to such soils.

The last sentence of the first paragraph refers to "offsite disposal actions". Please define what materials would be removed from the site under Alternative 2A. This sentence should be deleted since this Alternative would not comply with the Remediation Standard Regulation requirements regarding direct exposure to contaminated soils.

Both paragraphs should include a statement that capping, by itself, may not address the requirements of the State's Water Quality Standards, since waste would remain in place below the water table.

Response: As discussed under the response to Specific Comment No. 20, the U.S. Navy agrees that the caps proposed under Alternative 2A do not meet the definition of "inaccessible soil" in the strictest sense. However, as also discussed in the same response (to Specific Comment No. 20), resolution is required to determine whether the Remediation Standards take precedence over Solid Waste cover requirements, even when the wastes deposited in a landfill are predominantly "special wastes". Also, as discussed under response to Comment No. 20, if necessary, an additional compacted soil layer thickness of 3 inches can be added under the asphalt paved area of the parking lot, to provide a total compacted soil cover thickness of 24 inches for the entire site. Resolution is required.

25. **Pages 4-21 to 4-27, Tables 4-6, 4-8 and 4-10**

Comment: Several State statutes and regulations are missing from these tables and should be included. Please refer to the attached tables for a complete description. Additional ARARs which should be cited for Alternative 2 are:

Location Specific

Dredging and Erection of Structures and Placement of Fill in Tidal, Coastal or Navigable Waters (CGS § 22a-359 to 363) (Applicable)

Action Specific

Air Pollution Control Regulations- RCSA §22a-174-3 (Stationary Sources), §22a-174-20 (Control of Organic Compound Emissions), and §22a-174-29 (Control of Hazardous Air Pollutants) (Applicable)

Hazardous Waste Management Regulations (RCSA §22a-449(c)100 to (c)-110) (Relevant and Appropriate)

Water Pollution Control Statutes (CGS §22a-430 and 22a-430 b) and the Water Pollution Control Regulations (RCSA §22a-430-1 to 8) (Applicable)

Water Diversion Policy Act (CGS §§22a-365 to 378) (Applicable)

Response: Please refer to the response to Specific Comment No. 16. Location-specific (Table 4-8)

Dredging and Erection of Structures and Placement of Fill in Tidal, Coastal, or Navigable Waters (CGS 22a-259 to 363) should not be added to Table 4-8. No dredging or erection of structures in tidal, coastal or navigable waters is being proposed, i.e., Thames River and Goss Cove are not considered part of the scope of this FS.

Action Specific (Table 4-10)

Air Pollution Control Regulations (RCSA 22a-174-3): Stationary Sources should not be added to Table 4-10. No onsite source of air emission such as treatment plant would be constructed and operated. Control of Organic Compound Emissions (RCSA 22a-449 c100 to c-110) will be added as applicable to Table 4-10. Excavation and consolidation activities may cause a release of certain organic contaminants.

Control of Hazardous Air Pollutants (RCSA 22a-174-29) will be added as applicable to Table 4-10. Hazardous air pollutants including pesticides and PAHs present at the site may be released during onsite activities.

Hazardous Waste Management Regulations (RCSA §22a-449(c)100 to (c)-110) should not be added to Table 4-10. See the response to Specific Comment No. 9.

Water Pollution Control Statutes (CGS §22a-430 and 22a-430 b) and the Water Pollution Control Regulations (RCSA §22a-430-1 to 8) should not be added to Table 4-10. No extraction/treatment/discharge of groundwater or surface water is proposed in the alternatives.

Water Diversion Policy Act (CGS §§22a-365 to 378) should not be added to Table 4-10. No surface water diversion actions are proposed in the alternatives.

26. Page 4-28, Section 4.3.2: Alternative 2- Capping with Institutional Controls and Monitoring-Reduction of Toxicity, Mobility and Volume

Comment: Please delete the third sentence since the Navy has not demonstrated that mobility of contaminants is not of concern. The Remediation Standard Regulations regarding pollutant mobility apply unless an engineered control is approved in accordance with the Regulations. One of the purposes of an engineered control cap is to reduce the mobility of contaminants by reducing the amount of precipitation infiltrating through unsaturated waste. In addition, capping alone will not address the significant volume of waste which will remain below the water table.

Response: As discussed under the responses to General Comments Nos. 1, 2 and 4, the contaminant transport modeling results indicate that the mobility of contaminants is of minimal concern as it does not create unacceptable risk to human health and the environment.

27. Page 5-1, Section 5.1: Overall Protection of Human Health and the Environment

Comment: The second sentence should be modified to reflect the fact that Alternative 2B would comply with the Direct Exposure requirements of the Remediation Standard Regulation requirements, while Alternative 2A would not. This section should also acknowledge that capping alone would not address wastes which would remain in place below the water table. The last sentence should be deleted, since the Thames River and Goss Cove are located in close proximity to the landfill.

Response: The U.S. Navy considers both Alternatives 2A and 2B to be equally protective of human health and environment at this site. Therefore, no modification is proposed to the second sentence. As indicated by the contaminant transport modeling results, the presence of wastes below the water table has minimal impact on Goss Cove. Also as discussed in the response to General Comment No.1, the impact on Thames River is also expected to be minimal. Therefore, the last sentence should not be deleted.

28. Page 5-1, Section 5.2: Compliance with ARARs and TBCs

Comment: The third sentence should be modified since Alternative 2A would also not comply with the State's Hazardous Waste closure requirements. The Navy has not yet determined whether either Alternative would comply with the requirements of the State's Ground Water Quality Standards.

Response: The U.S. Navy disagrees that Goss Cove Landfill contains hazardous wastes. Therefore, no modification to the third sentence is proposed. As discussed in the response to General Comment No. 5, the alternatives propose the use of groundwater monitoring to evaluate the future impact of the wastes on groundwater. If impacts on the groundwater due to contaminants in the waste are noted in the future, then groundwater controls or leachate control methods may be considered.

29. Page 5-1, Section 5.4: Reduction of Toxicity, Mobility, and Volume

Comment: Please delete the first sentence, since reduction of contaminant mobility is the primary concern of the pollutant mobility requirements of the Remediation Standard Regulations.

Response: As discussed in the responses to General Comments Nos. 1, 2, and 4, and Specific Comment No. 26, the contaminant transport modeling has indicated the mobility of contaminants is of minimal concern. Therefore, the first sentence should not be deleted.