



STATE OF MAINE

# DEPARTMENT OF ENVIRONMENTAL PROTECTION

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May 25, 1995

Commanding Officer  
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**RE: Draft On-Shore Feasibility Study (FS) Report, dated March 1995, for  
Portsmouth Naval Shipyard, Kittery, Maine.**

Dear Jim:

The Department has reviewed the Draft On-Shore Feasibility Study (FS) Report. As I have already explained, our approach is to address the FS on a SWMU-by-SWMU basis, addressing the "worst" SWMUs first. On May 10, 1995, the Department submitted comments based on our review of the DRMO sections of the FS Report. The Department's comments for the DRMO and other DRMO-related issues were discussed at a meeting held at the Shipyard on 17 May 1995. The Department will submit a follow-up letter based on that meeting. The comments contained in this letter relate to our review of the Jamaica Island Landfill (JILF) sections of the FS Report. The Department will submit comments on the remaining SWMU's within the next two weeks.

I have expanded my distribution list to include all RAB members, so that I can better inform members about the State's concerns. I welcome all new members and greatly anticipate their participation in this process.

## General FS Report

As you know, there is a significant missing link between the offshore studies and the onshore SWMU investigations. Contaminant fate and transport mechanisms from SWMUs to the offshore environment are poorly understood. The studies performed, such as seep sampling in the Clark's Cove Embayment and the Back Channel, which could address transport of contaminants from the JILF, have not been made available for review. Site complexities, including tidal flushing, complicate contaminant transport pathways. Recognizing these shortfalls in the data, it is still important to link the offshore and onshore studies together to the extent possible.

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The FS Report focuses on onshore human health risks and excludes any discussion of offshore impacts. The report repeatedly refers to the lack of developed offshore MPSs implying that once the offshore MPSs are developed, we'll know the extent of offshore impacts. This conclusion is incorrect. Offshore MPSs will not address how, or if, contamination has in the past, or continues, to migrate from the Shipyard to the offshore environment. Offshore MPSs will merely establish clean-up goals for surface water and sediment. Migration of contaminants from onshore SWMUs to the offshore environment must be addressed the extent possible. Conclusions must be drawn based on actual data or on educated assumptions.

Many of the remedial alternatives proposed in the FS are contingent on additional monitoring to assess offshore impacts. Additional monitoring may be warranted, but I believe that investigations performed to date have not been adequately utilized to determine how much is known now, based on the data that has already been collected.

The Navy has funded an extensive, expensive, multi-year, offshore study precisely to assess the offshore impacts of past activities performed at the Shipyard. I believe that the Navy can do a much better job of accessing existing information to understand the relationship between offshore contamination and onshore SWMUs. The FS Report fails to incorporate any of the offshore data. Without at least a discussion of offshore impacts, it is very difficult for reviewers to make informed decisions about remedial alternatives.

The data already collected for seeps, sediment, biota, and water in the Clark's Cove Embayment and the Back Cove Area should be presented in this report, as it relates to the JILF. In fact, all of the offshore data should relate to the SWMUs because determining offshore impacts from SWMUs was the primary reason for performing the offshore studies. "Phase II activities, initiated in July 1992, will focus on (1) developing experiments to describe the response of ecological systems to SHIPYARD-associated contaminants, and (2) modeling and evaluating contaminant transport and fate in the estuary. Further chemical marker research will be directed towards fingerprinting contaminants to determine relative contaminant source contributions."<sup>1</sup> The transport and fate modeling has not been presented.

Specifically, all the seep data collected to date should be presented. The Navy has funded multiple seep studies over the past five years, involving the University of Rhode Island, the University of New Hampshire, and the Navy's previous contractor, McLaren/Hart. Where are these data and what are the conclusions that can be drawn from these data?

What are the objectives for the remedial alternatives presented for the JILF? Objectives can be inferred from the remedial alternatives that are included in the report, but where are they defined? Page ES-2 states that, "The FS consists of five tasks:

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<sup>1</sup>Johnston, R.K., et. al., An Estuarine Ecological Risk Assessment Case Study for Portsmouth Naval Shipyard, Kittery, Maine, May 1993.

-Develop remedial action objectives and goals. These objectives and goals are based on minimizing/preventing risks to human health and the environment, and complying with Applicable or Relevant and Appropriate Requirements (ARARs)..."

There is no further discussion of objectives in this section.

FS objectives are further described on page 1.1 in the Scope and Objective section, "The purpose of this FS is to develop, evaluate, and select potential remedial alternatives that can be implemented and that will protect human health and the environment from risks associated with environmental contamination at the Solid Waste Management Units (SWMUs) and the Impact Areas being addressed."

There is no further discussion of objectives in this section.

Page 3-24 in the Remedial Objectives section states, "Remedial Objectives specify the chemicals of concern, the media of interest, exposure pathways, and cleanup goals or acceptable contaminant concentrations."

Chemicals of concern, the media of interest, and the exposure pathways are not mentioned in detail anywhere else in Section 3. There is, however, a short discussion of MPSs. It would be helpful if the Navy would write out the chemicals of concern for each SWMU, the specific media of interest - including the offshore environment, the exposure pathways, and the clean up goals.

At this stage of the process, it is not acceptable to continue down the path of complete separation of offshore and onshore components of this study. It was greatly disappointing to hear on 17 May that there is no possible way to pull the offshore group and the onshore group together to come up with ways to better integrate the two phases of the project. If a lack of data exists then an attempt should be made to pull the data together using educated assumptions.

### **Report Organization**

Each section of this report contains information for each SWMU. It seems reasonable that information for each SWMU could be arranged together in one section, so that the reader is not forced to jump from SWMU to SWMU within each of the seven sections of the report. Combining information by SWMU would vastly improve the readability of this report and would make the material more understandable to lay persons. This re-organization should not be very time consuming or expensive for the Navy and should certainly not approach the \$60,000 dollar mark proposed by your consultant in our 17 May meeting. The effort would involve placing existing information into a different, more readable order by pulling all information for each SWMU including; plan sheets, tables, text, etc., together into one section per SWMU. This format should not appear as a new concept to the Navy. It is the approach the Department recommended a year ago and the

format that we understood was going to be followed in this report, unfortunately the Department's recommended format was not used.

### **Media Protection Standards**

Review of the FS raised several questions regarding the use of media protection standards (MPSs) in evaluating contamination levels at the JILF. Existing groundwater media protection standards (MPSs) pertain exclusively to fresh groundwater and would apply to the hydrologically upgradient portions of the JILF. However, groundwater in portions of the landfill proximal to Clark Cove and the Back Channel consists of salt or brackish water. Figure 2-19 in the FS misrepresents groundwater contamination at the JILF by comparing salt and brackish groundwater samples to fresh groundwater MPSs. Evaluation of the impact of contaminated groundwater migrating from the landfill to the off-shore environment is prevented due to the lack of data for the off-shore environment.

The Department was informed by the Navy that DRMO MPS exceedances for surface soils were not considered for test boring samples collected from 0 to 2 feet below ground surface. The Navy indicated that surface soils were defined as soil collected from 0 to 1 feet below the ground surface. However, the Department will consider all test boring samples collected from 0 to 2 feet below ground surface as surface soils.

Surface soil MPSs were exceeded for zinc, beryllium, mercury, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd) pyrene. Subsurface soils MPSs were exceeded for lead and benzo(a)anthracene. In addition, analytical method detection limits (MDLs) exceeded MPS threshold values for numerous PAHs, arochlor-1254, and pesticides.

No analyses for PAHs was performed for samples collected in test borings MSB-1 thru MSB-5 located at the mercury burial sites despite observations of petroleum odor and sheens recorded in boring logs. No soil samples were collected from MSB-6 and MSB-7 where observations included extensive sand blast grit, petroleum odors, and a cobble size piece of lead collected from 20 to 22 feet in MSB-7.

In our 17 May meeting Debbie Cohen explained that the final MPSs on Table 3-7 were carried over from McLaren/Hart and will not be used to assess soils for the FS. Tag figures in Appendices show proper exceedances. However, no where in the text are the tag figures referenced for final MPSs. Section 3.3.1 Remedial Objectives for Soils indicates the final MPSs for soil are provided in Table 3.7.

## **Jamaica Island Landfill**

The Navy proposes that selection of a preliminary remedial option for the JILF in the FS is contingent on the outcome of a low-flow sampling event. If low-flow sampling indicates particulate transport of metals via groundwater is not occurring, Alternative 1B: Maine Secure Landfill Cap, Institutional Controls would be the preliminary proposed remedial alternative. However, the Navy proposes if low-flow sampling indicates groundwater transportation of contaminants is occurring, Alternative 4B: Maine Secure Landfill Cap, Cut-Off Barriers would be selected as the preliminary remedial alternative.

The Department agrees that low-flow sampling would be appropriate in characterizing groundwater quality in the landfill and at the other SWMUs. The Department has been advocating that position for the last few years. However, the quality of water entering the estuary via seeps in the vicinity of the JILF is of equal importance. Assessment of seep water quality provides a direct measure of contamination entering Clarks Cove and the Back Channel from the landfill.

Results of a previous seep investigation indicates that "certain metals (Cu, Ni, and Zn) may be present at harmful levels.<sup>2</sup>" in water collected from JILF seeps. In addition, "mussel tissue concentrations sampled near the seeps exceeded the Mussel Watch 98th percentile for Cu, Pb, Ni, Hg, and Cr. The elevated heavy metal levels in mussels sampled near the seeps relative to other mussel stations ... suggests that the seeps may be contributing to the exposure levels present, although other sources (possibly sediment contaminated from previous seep releases) would certainly also contribute to the observed mussel residue levels.<sup>3</sup>"

A complete review of seep investigations and low-flow sampling of JILF monitoring wells is required to assess discharge of contaminants from the landfill to the estuary via groundwater. Comparison of reported seep and low-flow groundwater sample contaminant concentrations to Off-Shore MPSs, once they are determined, is necessary in determining the need for a cut-off barrier. A significant amount of seep data should already exist, but has not been presented to reviewers except for one preliminary report that was submitted two years ago. A complete assessment of all the existing seep data must be performed before any decisions can be made about additional sampling requirements.

## **Mercury Burial Sites**

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<sup>2</sup>Johnston, R.K., et. al., Trace Metal Concentrations in Seep Samples from Seavey Island, Piscataqua River, Maine, Review Draft, November 22, 1993.

<sup>3</sup>Johnston, R.K., et. al., op. cit.

The Mercury Burial Sites MBI and MBII are considered in this memo since both sites are located within the JILF and therefore are subject to remedial alternatives proposed for the landfill. The preliminary remedial alternative proposed for MBI was Alternative 2: Removal and Off-Site Disposal of the Mercury containing Concrete Blocks. No remedial alternatives were proposed for MBII as the site was not located during site investigations.

Removal of the concrete blocks containing mercury waste is the most desirable remedial alternative for MBI. This source removal should occur regardless of the remedial alternative selected for the JILF. As indicated in Section 7.3 of the FS, "...the concrete blocks are in contact with saline groundwater. In the long term, contact with saline water could jeopardize the integrity of the concrete blocks, resulting in the release of mercury."

### **Delineation of Landfill**

How was the landfill boundary delineated? In some places the landfill boundary doesn't match up with any shoreline boundary, including the 1940 boundary. For example, in the Stephenson Road area, the landfill boundary is delineated south of Stephenson Road, much farther south than the historical shoreline. Please clarify.

### **Remedial Alternatives**

**Soil/Asphalt Cap:** This cap would be placed on the entire landfill except where existing "good condition" asphalt exists in the SWMU 11 area. There is no discussion about the existing cap. There is no explanation why the existing cap would be replaced by another soil cap. Please clarify.

**Soil component;** There is very confusing general discussion of this alternative in different sections of the report. It appears that a soil cap will be placed, and vegetated except where there will be asphalt. Where is the proposal describing what soil cap performance is proposed? Where is the presentation of soil thickness, grade, or material properties, other than in appendix C cost estimates where there is a 24" soil cost item? There is only a simple general statement that infiltration leaching will be reduced.

**Asphalt component;** same comment as above. The Study provides no specifics.

**Maine Secure Cap:** This Cap would be placed on the entire JILF. There is insufficient site characterization to determine if this type of cap will significantly reduce infiltration leaching or if contamination is primarily the result of groundwater percolation. There is insufficient contaminant delineation to determine if this type of cap is necessary over all of the JILF. For instance there may be areas of clean fill, demo debris, or areas infiltration leaching will not result in MPSs exceedances.

This cap would be a composite of clay and synthetic membrane. The appendix C cost estimate does not include a line item for synthetic membrane.

Remediation with this type of cap would be an appropriate default decision if additional contaminant and site characterization information is not provided. Additional groundwater remedial measures would be necessary with this default decision mode.

**Cut Off Barrier:** This is an elusive item for which to find details to review. Options include; slurry walls, sheet piles, bulkheads, and reaction walls. The reaction wall alternative is very innovative and would require better development of this alternative to justify remedial performance. The Study does not seem to recognize that the reaction wall is a barrier to contaminant migration, but not a barrier to groundwater flow because groundwater pumping and treating seems to be proposed in conjunction with this alternative. The other more conventional cut off wall alternatives are viable technology but will need design investigation and analysis if to be implemented.

**Monitoring:** Each alternative should include a specific monitoring proposal to determine if remediation is working.

**Section 5, Development of Alternatives,** of the Study makes repeated reference to details which will be provided in section 6. Little additional detail is provided in section 6. For example on page 5-14 we are referred to section 6 for alternative 4A and 4B details and for discharge alternative details. Substantial detailed development of alternatives is not provided in section 6.

**Section 6,** the detailed analysis of alternatives is somewhat generic. This is understandable because there are big pieces of missing information in this study, such as; limited contaminant distribution information, limited fate and transport information, unknown off shore media protection standards, and unclear remedial objectives.

#### **Section 7 Preliminary Recommended Alternatives**

The Study's recommendations are open ended. The final alternative selection decision could go in any direction on the basis of the Study. Different alternatives are recommended depending on future characterization and risk assessment. Future work includes off shore risk assessment and may include colloidal transport analysis. Based on the Study any alternative could be selected.

Page 7.4: Provide justification for infiltration rate estimates of 11.3, 4.9, and 1.2 in/yr for existing soil, soil/asphalt cap, and secure cap, respectively.

Page 7.4: Please provide supporting evidence that "Additional protection of the groundwater/river by the Maine Cap, resulting from reduction of infiltration of precipitation, is relatively inconsequential since waste materials are already in contact with the groundwater table."

Page 7.4: Please justify the statement that off shore monitoring is needed for alternative 1B only. This statement implies that monitoring is not needed for the groundwater control

alternatives. Monitoring needs should be established to verify compliance with MPSs and not on the assumption that a technology will work. Monitoring verifies contaminant characterization and fate and transport conclusions and performance of remedial actions.

If you have any comments or questions, please call me at 207-287-2651. Thank you.

Sincerely,



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Office of the Commissioner

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