



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
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October 8, 2002

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

Re: Phase II Predesign Investigation for the Old Fire Fighting Training Area - Environmental Forensic Investigation of Hydrocarbon Sources

Dear Mr. Shafer:

Thank you for the opportunity to review the *Phase II Predesign Investigation for the Old Fire Fighting Training Area* dated September 2002. This letter only provides comments on Appendix E to this report; Additional comments may be provided at a later date on the other parts of the report. Detailed comments are provided in Attachment A.

The appendix reports the results of the analyses of 6 sediment stations, 2 catch-basin samples, 2 soil samples and 1 water sample (plus QA samples). In addition, a series of diesel samples in various weathered and unweathered forms were analyzed. These samples were analyzed for aliphatic and aromatic constituents using GC/FID and GC/MS instrumentation and assessments of the nature of the sources of PAHs in each of the sediments.

It was difficult to assess the FID chromatograms, from chromatogram AA699PB through AA7, because it was not clear whether they were derived from samples or reference standards.

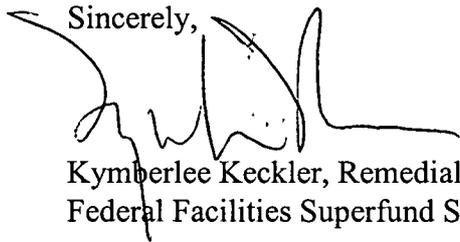
The report should clarify what role used engine oil may have had in the formulation of the petroleum mixtures observed and state the likelihood of their use for fire training purposes. EPA recommends that a sample of used crankcase oil from a well-used internal combustion engine be evaluated and compared with aliphatic and aromatic constituents of the sediment, soil, and water samples taken. Used motor oil chromatograms may be similar to the soil (SO15) and the water sample (AQ11) chromatograms. Additionally, a sample of the asphalt materials found on the shoreline should be analyzed.

Numerous areas along the Old Fire Fighting Training Area coastline exceed risk-based preliminary remediation goals (PRGs). The Navy's own documents state that "...oil was carried into the soils of the training area and to the shoreline of Coasters Harbor Island..." (page 5 of the draft Proposed Plan). The Phase II Predesign Investigation only focused on the areas near the outfall pipes. It is therefore inappropriate to draw conclusions regarding the entire shoreline of

the OFFTA site based on samples that were taken only in the vicinity of the outfall pipes. Many additional samples need to be taken closer to the shoreline (within intertidal zone and in areas that exceed risk-based PRGs). The forensic report therefore does not address uncertainties associated with the source of the sediment contamination. Clearly, there are many sources of contamination in the area and the Navy's reports identify many of them.

I look forward to working with you and the Rhode Island Department of Environmental Management toward the cleanup of the Old Fire Fighting Training Area and its adjacent areas. Please do not hesitate to contact me at (617) 918-1385 should you have any questions.

Sincerely,



Kymberlee Keckler, Remedial Project Manager  
Federal Facilities Superfund Section

Attachment

cc: Paul Kulpa, RIDEM, Providence, RI  
Melissa Griffin, NETC, Newport, RI  
Dennis Gagne, USEPA, Boston, MA  
David Peterson, USEPA, Boston, MA  
Bart Hoskins, USEPA, Chelmsford, MA  
Andy Beliveau, USEPA, Chelmsford, MA  
Jennifer Stump, Gannet Fleming, Harrisburg, PA  
Ken Finkelstein, NOAA, Boston, MA

## ATTACHMENT A

<u>Page</u>	<u>Comment</u>
p. 7, §6.0, 3 <sup>rd</sup> bullet	The first sentence in this bulleted text states: "The dominant signature and concentration gradients of pyrogenic PAH clearly favored the catch basins over the fire training activities as a source of PAH in the sediments around the site." Only two soil samples were collected to represent OFFTA generated PAH contamination (SO-15 and SO-11). It seems improbable that these two samples could fully represent the range of contamination that resulted from the fire training activities at the site. It is not obvious that the OFFTA activities can be eliminated as the primary source of sediment PAH contamination because of the limited sampling of areas outside of the catch basin influence.
p. 3, §3.3.4, ¶1	This paragraph indicates that biomarkers are often useful in identifying the sources of petrogenic residues. Are biomarkers not as useful in identifying the sources of pyrogenic residues? <b>Many</b> of the samples were classified as having both a pyrogenic and petrogenic component. Can the presence of a pyrogenic component confound the use of biomarkers in classifying the source of the petrogenic component? Please expand the discussion to address these issues.
p. 4, §4.1, footnote	Please further clarify the difference between the terms pyrogenic and petrogenic. How is a pyrogenic or petrogenic residue defined? Is it defined based on a source material it results from ( <i>e.g.</i> , asphalt or diesel)? Or is it defined based on a set of analytical characteristics ( <i>e.g.</i> , high parent to alkylated PAH ratio)? Also please identify all of the relevant characteristics of a pyrogenic residue versus a petrogenic residue. For example, the footnote discusses the analytical differences pertaining to the ratio of alkylated PAHs to their parents. There is no mention, however, of differences in terms of the preponderance of certain size PAHs ( <i>e.g.</i> , 5 or 6-ring) in pyrogenic versus petrogenic materials. Also, where possible, some rationalization of the characteristics of pyrogenic and petrogenic residues would be useful in evaluating the implications of the data. For example, do pyrogenic residues have a lower alkylated PAH/parent PAH ratio because the alkylated side chains are more readily destroyed in high temperature processes? A few questions that these details will help to clarify include: <ol style="list-style-type: none"><li>(1) Would typical parking lot runoff be expected to be pyrogenic in nature or petrogenic? Motor oils and gasoline spills might lead one to expect parking lot drainage to be petrogenic. The construction materials of the parking lot surface such as asphalt and tar might</li></ol>

lead one to expect the leaching of certain pyrogenic materials into drainage water. Partially or fully combusted fuels from vehicles running on the parking lot might lead one to expect a contribution of fully or partially combusted fuels to the drainage water. The additional detail should provide a better understanding of these expected petroleum-based sources to drainage water and any others that may not have been mentioned.

(2) Could certain petroleum-based wastes that resulted from fire training activities be largely pyrogenic in nature? On the surface it seems that the OFFTA activity of burning various petroleum products would likely result in pyrogenic residues. It is unclear that the samples collected from test pits 11 and 15 fully capture the range of wastes generated by the fire training activities. In addition to providing these additional details, please also provide appropriate references.

- p. 4, §4.2, ¶1 The third sentence of this paragraph states: "While the PAH concentrations of SO11 and AQ11 varied (777 mg/kg dry and 16.7 mg/L, respectively), the ratio of light to heavy PAH (LPAH/HPAH) was nearly identical (Table 3)." A direct comparison of solid phase concentrations and aqueous phase concentrations seems inappropriate. Please review and correct as necessary.
- p. 5, §4.2, ¶1 The third sentence of this paragraph states: "The pyrogenic influence was also evident in the high amounts of 5- and 6-ring PAH." Please clarify this statement. Why would high amounts of 5- and 6-ring PAH indicate pyrogenic sources as opposed to petrogenic sources?
- p. 5, §4.2, ¶2 The second sentence of this paragraph uses the acronym TPAH. It is assumed that this stands for "Total Polynuclear Aromatic Hydrocarbons" but the report does not define this term. Please define.
- p. 5, §4.2, ¶2 A sentence near the end of this paragraph states: "This large difference in concentration dictated that JSC03 was not a likely source of PAH for the sediments located more closely to the old fire training area." This statement is unclear. Why would JSC03 be considered a "source" of PAHs? It would seem that a more relevant question would be "do the PAHs from JSC03 and the sediments adjacent to the old fire training area have the same source?"
- Figure 1 Sample AQ11 is not shown in the Figure. In addition, while I assume that this sample was collected from a monitoring well in or adjacent to test pit

15, there is no explicit mention of this in the report. Please modify Figure 1 and provide some clarify where this sample was taken.

Figure 2

This figure shows characteristic GC-FID chromatograms for the samples analyzed. Chromatogram 2d is characterized as a "typical signature of urban runoff." What is the standard used for the "typical signature of urban runoff?" Please provide references to support your response.

Attachment 5

Each of the PAH histograms in this attachment include "profiles" entitled "Light PAH Profile," "Heavy PAH Profile," and "Weathering Profile." A clear description of these "profiles" is missing from the report. Please fully describe these elements of the histograms.