



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 1  
JOHN F. KENNEDY FEDERAL BUILDING  
BOSTON, MASSACHUSETTS 02203-0001

November 30, 1998

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: Geophysical Investigations at Old Fire Fighter Training Area

Dear Mr. Shafer:

In order to answer your question regarding the need for additional geophysical investigations at Old Fire Fighter Training Area ("OFFTA"), EPA reviewed available data presented in the 1994 RI and subsequent reports on OFFTA. The following explains why the previous geophysical investigations are deficient.

The depth of exploration (*i.e.*, 6' to 12') for the electromagnetic survey was not adequate in the vicinity of the central mound. The mound is elevated approximately 20 feet above the former land surface elevations that existed before site demolition. Thus, the electromagnetic survey did not penetrate into the subsurface where the underground storage tanks and pipelines were previously located. The grid spacing (*i.e.*, 50') for the electromagnetic survey was inadequate for detection of small ferrous and non-ferrous anomalies. The optimum data recording interval is 20 feet for the EM-31 equipment. The smaller the data recording station interval, the more likely small objects (such as individual buried drums) will be detected. Any additional geophysical survey to be conducted should have smaller data recording intervals (*i.e.*, smaller grid spacing between stations and traverses) in order to target small ferrous and nonferrous anomalies. Therefore, the electromagnetic survey results are inconclusive as to the presence or absence of underground tanks and pipelines in the vicinity of the central mound.

In order to adequately characterize the central mound with a geophysical technique, the method should be able to penetrate to a depth of 30 feet below the existing land surface, and not be compromised by the elevation change. With these limitations on the use of a geophysical technique, an intrusive investigative technique would provide better information for the central mound.

The prior geophysical investigations of the remaining OFFTA area also have deficiencies. A new geophysical survey of the complete area using a refined grid that exhibits closer data recording stations will address these areas.

The draft final RI (page 2-3, paragraph 3) mentions an EM-31 survey previously conducted by TRC across the entire site during the Phase I investigation. The Executive Summary states that Phase I RI results conducted at the OFFTA are presented in the draft final RI along with the Phase II RI results (page ES-3, paragraph 3). The grid spacing, methodology and results of this survey are not described in the text of the draft final RI. Therefore, the technical quality of the initial EM-31 survey cannot be evaluated and data gaps cannot be identified.

The Phase II geophysical surveys were conducted in isolated areas near the western and central mound in order to follow-up on anomalies identified from the Phase I geophysical surveys. Thus, the entire site was not investigated under the Phase II geophysical surveys as it was under the Phase I geophysical surveys. In fact, the Phase I EM-31 and magnetic contour maps depicted in Appendix C of the draft final RI identify some anomalies to the east of the central mound. This area was not investigated under the Phase II geophysical surveys.

The magnetometer is limited if used within 20 feet of a metal fence or reinforced concrete. The OFFTA facility has a fence behind Building #144, along Taylor Drive and at Katy Field. This fencing may have influenced the data recorded by the magnetometer since both the Phase I and Phase II surveys were conducted within 20 feet of these fences. Therefore, the areas near the fencing may not be accurately characterized for ferrous anomalies. I recommend that the magnetometer results be re-evaluated to determine the influence of the metal fencing on the data. If necessary, the areas adjacent to the metal fencing should be re-surveyed with an appropriate geophysical method that will not be influenced by the fences.

The grid spacing (*i.e.*, 50') for the magnetometer survey is not adequate for detection of small ferrous anomalies. The optimum data recording interval is 10 feet for the magnetometer. Although greater than 10 feet spacing may yield satisfactory results, smaller shallow features, such as underground storage tanks, drums and piping may be missed. Again, the smaller the data recording station interval, the more likely small objects will be detected.

The figures in the August 1994 draft final RI and Appendices reference different elevation datum which make it difficult to compare field investigation results in the third dimension (*i.e.* vertically related to elevation). Some figures refer to "mean low tide" as the elevation datum while other figures do not make a reference to an elevation datum. This is considered a data gap since comparisons cannot be made between historical figures depicting site operations, geologic profiles, geophysical profiles and the RI investigative results.

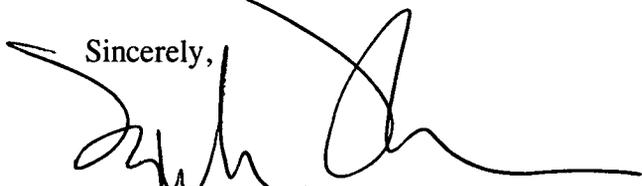
It is not clear if auger refusal in B-14 and B-15 within the central mound was caused by a former concrete pad, the top of bedrock, or some other physical object. Boring logs for B-14 and B-15 indicate fill material to a depth of 23 feet and 20 feet, respectively. The fill material contained wood, brick and concrete fragments. Boring logs B-14 and B-15 indicate auger refusal at a depth of 28 feet and 22 feet, respectively. The boring logs estimate bedrock to occur at a depth equal to the last retrievable split spoon. The last retrievable split spoon contained fill material for both borings. Thus, it is not clear if bedrock was encountered in

these borings. It is possible that auger refusal may have been caused by the former concrete pad where the open fire tanks previously existed.

The test pit observations, geophysical findings, boring log observations and analytical results need to be spatially correlated to PWD Drawing No. 637869 to assist with understanding potential subsurface conditions. All of the figures should be the same scale for comparison purposes. In addition, the field investigation findings should be compared to the pre-existing site conditions in terms of vertical elevations. For example, the elevation of auger refusal in B-14 and B-15 should be compared to the elevation of the former concrete pad that housed the open fire tanks and Christmas trees.

I look forward to working with you and the Rhode Island Department of Environmental Management toward the cleanup of the OFFTA. We should discuss these data gaps, how they affect remedy selection, and determine when they may be filled. Please do not hesitate to contact me at (617) 918-1385 should you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kimberlee Keckler', written over a horizontal line.

Kimberlee Keckler, Remedial Project Manager  
Federal Facilities Superfund Section

cc: Paul Kulpa, RIDEM, Providence, RI  
Melissa Griffin, NETC, Newport, RI  
Jennifer Stump, Gannet Fleming, Harrisburg, PA  
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