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LETTER AND COMMENTS ON BEHALF OF SEACOAST ANTI POLLUTION LEAGUE  
REGARDING GEOPHYSICAL SURVEY OF JAMAICA ISLAND AND TOPEKA PIER  
LANDFILLS NSY PORTSMOUTH ME  
6/30/1999  
LEPAGE ENVIRONMENTAL SERVICES

# Lepage Environmental Services, Inc.

P. O. Box 1195 • Auburn, Maine 04211-1195 • 207-777-1049 • Fax: 207-777-1370

June 30, 1999

Peter Vandermark  
Seacoast Anti-Pollution League  
P. O. Box 1136  
Portsmouth, New Hampshire 03802

Subject: Review of the *MTADS Geophysical Survey of the Jamaica Island and Topeka Pier Landfills at the Portsmouth Naval Shipyard*

Dear Mr. Vandermark:

We are transmitting comments to the Seacoast Anti-Pollution League (SAPL) concerning the May 18, 1999, *MTADS Geophysical Survey of the Jamaica Island and Topeka Pier Landfills at the Portsmouth Naval Shipyard*. The report summarizes the work performed in October 1998. Comments from Northeast Geophysical Services are enclosed. Our additional comments are as follows:

- 1. Page 1, Section 1.0 INTRODUCTION.** The September 1998 *MTADS Work Plan* should be cited in this section and should be added to the References section. Any significant deviations from the work plan should also be noted in the report.
- 2. Page 4, Section 3.1.1 The Jamaica Island Landfill.** This section should include a brief description of the two mercury burial vault locations (MBI and MBII) and Site 8 as they are shown on Figure 4 and are important potential sources of contamination associated with the Jamaica Island Landfill.
- 3. Page 5, Section 3.1.2 Site 32 - The Topeka Pier Site.** The final sentence on the page should be revised to read "... and a draft report has been reviewed by EPA, ...".
- 4. Page 11, Section 5.2 Site 32 (Topeka Pier).** "*In contrast with Site 8, this area does not have the same high signal level, nor does it show a high density of unidentified extensive burials. Many buried utility lines can be distinguished by examination of the Arc View overlays from the water, power utilities, and sewer and storm drains, Figures C3 and C4.*"

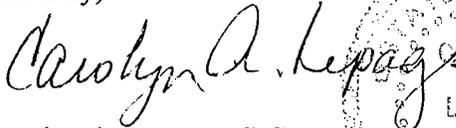
There appear to be a number of areas of potential interest that do **not** match up with the GIS overlays in Appendix C. These areas appear to need additional investigation. Please clarify.

**5. Page 12, Section 6.0 TEST PITS.** Why were 28 targets selected (why not 20 or 40, etc.?)? Why are there no targets located at Topeka Pier where there are some anomalies that are not associated with utilities (see comment 4, above)?

**6. Page 13, Table 2.** Why were these particular 28 targets selected and not other locations? Why was Target 81 selected when it had a relatively low fit quality (6.14 versus .8 to .9 for the vast majority of other targets)?

If you have any questions regarding the comments above, please give me a call at 207-777-1049.

Sincerely,



Carolyn A. Lepage, C.G.  
President



Enc.

cc: Iver McLeod, Department of Environmental Protection  
Meghan Cassidy, Environmental Protection Agency  
Marty Raymond, Portsmouth Naval Shipyard  
Rudy Rawcliffe, C.G., Northeast Geophysical Services

# Northeast Geophysical Services

4 Union Street, Suite 3, Bangor, Maine 04401

207-942-2700/Fax942-8798  
E-mail: NGS@MINT.NET

June 23, 1999

Carolyn Lepage  
Lepage Environmental Services, Inc.  
P.O. Box 1195  
Auburn, Maine 04211-1195

Subject: Review of the MTADS Geophysical Survey of the Jamaica Island and Topeka Pier Landfills at the Portsmouth Naval Shipyard in Kittery, Maine.

Dear Carolyn:

I have reviewed the report of the MTADS Geophysical Survey of the Jamaica Island and Topeka Pier Landfills and following are some questions and comments that I have about the report.

Overall I think the report is very good. The geophysical equipment used (magnetometer and EM-61) are appropriate for the survey objectives. The colorized maps are well presented and clearly show anomalous metal responses. However, there are some things in the report that I feel need clarification.

First, I would like to know what areas of the study area were not covered by the survey. In the report (section 5.1 page 8) it is stated that about 30% of the 30-acre site (~7.5 acres) was not surveyed. The report also states (section 5.2 page 10) that significant parts of the Topeka Pier site were inaccessible because of surface obstructions such as vehicles and equipment. It would be useful to have a map that shows just the location of the survey points without contours in order to see what areas were not covered. If subsurface information about the Topeka Pier site is important it should be resurveyed after vehicles and other movable surface metal have been removed.

The survey results show hundreds of metallic anomalies. Most of these anomalies are likely caused by scrap metal debris and not metal drums. However it is impossible to confidently tell if an anomaly represents a drum or cache of drums or if it is caused by similar sized pieces of metal. It would be impractical to examine all the anomalies and so only a finite number of locations will be test pitted. It is in the selection of which anomalies to test pit that I disagree most with the authors of the MTADS report.

The primary purpose of the surveys was "to identify ferrous or steel-reinforced concrete containers". A secondary objective was to determine if possible the locations and burial depths of individual targets. The geophysical survey results are to be used to select test pit locations.

In the Draft Remedial Work Plan dated March 1999 it is stated (4.3.2 page 4-4) that approximately 25 test pits will be made and that it is assumed that a maximum of about 40 drums will be encountered at 5 locations. I am curious as to where these numbers came from. Is there information that about this many drums were disposed of in the landfill or is this just an arbitrary number? What it suggests is that caches of drums may exist in the landfill.

## Northeast Geophysical Services

The reason this is important is because in the MTADS report (6.0 page 12) they suggest test pitting 26 positions. Of these 26 positions 19 are of isolated targets and only 7 locations represent large objects or groups of objects. I see no rational reason to assume that any drums that may exist in the landfill were purposely isolated from other drums or metal debris. In fact, I think exactly the opposite is more likely. I don't think it makes sense to devote a majority of the test pits examining individual anomalies at the expense of ignoring the larger, more extensive metallic anomalies.

The authors of the MTADS report explain that the reason they picked isolated targets for further testing is because these were the anomalies that they could model with their computer program that predicts burial depth and size of the object. In Table 2 and more extensively in Table A1 are given modeled predictions of burial depth and size of the analyzed targets to the nearest centimeter. If these are accurate this is impressive and if we were looking for unexploded ordinance this would be important. However, I doubt they are that accurate and for the objectives of this survey this level of precision is unnecessary. The test pits are planned to be about 6 meters deep, whether a target is 2.89 meters or 3.15 meters deep is not that important.

My suggestion is that a much larger percentage of the test pits be sited on the larger anomalies. Certainly it would be more important for the overall investigation if a cache of twenty drums were found than if a single drum were found. There are a lot of elephant-sized anomalies that should be investigated before we look at the rabbit-sized ones.

Another question you may wish to ask is how the EM-61 results compare with the magnetic results. If you compare the magnetic anomaly map A-2 with the EM-61 anomaly map A-3 you will see that there are differences in the anomaly size and locations. Unfortunately the report does not have large-scale EM maps that correspond with the magnetic anomaly maps A-3, 4, and 5. It would be most interesting to see the EM-61 responses of the selected targets.

My own experience has been that the EM-61 has some advantages over the magnetometer in that it is designed to respond more to larger, drum-sized objects and tends to ignore smaller metal objects. This makes it very useful on a site that has abundant bits and pieces of metal because you can focus in on likely buried drums. In the report (2.1 page 2) it is stated that the EM-61 sensors used on this survey were modified so that they would respond to small metal objects. If this is the case perhaps the EM-61 instruments used in this survey no longer have the capability of discriminating larger objects from small ones.

It would also be useful to know what EM-61 measurement was used to generate the EM-61 anomaly map A-3. Normally we contour the differential between the upper receiver coil and the lower receiver coil. Sometimes people contour just the bottom coil response. This is somewhat analogous to the difference between contouring magnetic gradient and total field magnetic readings. I think that the differential contour of the EM-61 results would be most appropriate for this site.

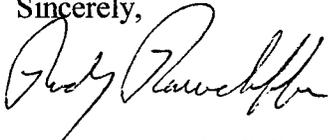
Those are the major points I wanted to make about the report. As I said in the beginning I think it is very good overall. I know there are some other points we discussed earlier on the phone.

**Northeast Geophysical Services**

Hopefully, you wrote down any that were of interest to you. Also, I suggest that you review the questions and comments I made in my letter to you dated August 31, 1998 regarding the work plan for this survey. Check to see if they have been addressed in this MTADS report.

Please contact me if you have any questions.

Sincerely,



Rudy Rawcliffe, C.G.

