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TREASURE ISLAND
SSIC NO. 5090.3.A

Geomatrix

June 22, 2007
Project 4850.005.3

Mr. James B. Sullivan
Mr. Charles Perry
Department of the Navy
Base Realignment and Closure
Program Management Office West
1455 Frazee Road, Suite 900
San Diego, California 92108-4310

Subject: Comments on May 2007 Draft Sampling and Analysis Plan (Field Sampling Plan/Quality Assurance Project Plan) for the Field Investigation of Lead Shot at Installation Restoration Site 27 Clipper Cove Skeet Range
Naval Station Treasure Island
San Francisco, California

Dear Messrs. Sullivan and Perry:

On behalf of the Treasure Island Development Authority (TIDA), Geomatrix Consultants, Inc. (Geomatrix) and Maxon Consulting (Maxon) have reviewed the May 2007 Draft Sampling and Analysis Plan (Field Sampling Plan/Quality Assurance Project Plan) for the Field Investigation of Lead Shot at Installation Restoration Site 27 Clipper Cove Skeet Range, Naval Station Treasure Island, San Francisco, California (Draft Site 27 SAP). On behalf of the Treasure Island Community Developers (TICD), the document also was reviewed by LFR. Comments developed by Geomatrix, with input from LFR, are presented below and comments from Maxon are attached.

1. As you are aware, Geomatrix has previously raised questions about the Navy's conceptual model, whereby lead shot in Clipper Cove is believe to be covered by a cap of clean sediment (see Geomatrix comments on the Draft Remedial Investigation Report [RI] and Draft Feasibility Study [FS] Reports). Part of the basis for our concern has been the fact that lead shot was found in the upper one foot of sediment throughout Site 27 during the 1997 investigation. This Draft Site 27 SAP indicates that further investigation is required in the area within 150 feet of the shoreline because sediment erosion has occurred in this area and because lead shot was found in the upper 1 foot of the only sample location within this area (Section 1.1.2). We again wish to point out that lead shot also was found in the upper one foot in four of the nine samples collected in the area of sediment accumulation (beyond 150 feet from the shore) in the 1996 investigation. The source of sediment that was deposited in the area of sediment accumulation may have been lead-shot-affected sediment from the zone of erosion

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(within 150 feet of the shore), resulting in the presence of lead shot in the sediment that accumulated after the skeet range operations ceased. Pending the outcome of this investigation, it may be appropriate to further investigate the area of sediment accumulation beyond 150 feet from the shore.

2. If the Navy learns that lead shot is present in the upper two feet of sediment during this investigation, we recommend that borings be advanced deeper to ascertain the vertical extent of the lead shot. At a minimum, borings should be advanced to a depth of 2 feet below the depth interval containing lead shot. If lead shot is present in the sediment samples proposed in this study at sufficient quantities to require dredging as remediation, then the underlying sediments will not be sufficiently characterized, leaving the post dredging exposure unknown. Furthermore, even if dredging in not required for remediation purposes, the Navy has established that this is an area of sediment erosion. Deeper sediments will be exposed as a result of natural processes and ecological receptors will be exposed to these deeper sediments in the future. The Navy may wish to defer the collection of deeper samples until the currently proposed investigation is complete, however, we believe it is prudent to collect the deeper data during a single mobilization, using judgment based on results of the field screening for lead shot.

3. The document should discuss the measures that will be taken if complete core is not recovered at a sample location. Will the Navy repeat the sampling attempt until a complete core is recovered? If a complete core can not be recovered, how will the sample depths be designated? For example, if only 12 inches of core are recovered in a 24-inch sample run, will the core be assumed to represent the upper 12 inches of the 24-inch sample run?

We appreciate the opportunity to review the Draft Site 27 SAP. Feel free to contact me if you have any questions.

Sincerely yours,
GEOMATRIX CONSULTANTS, INC.

Gary R. Foote

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Principal Geologist

gf/gm
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Attachment

cc: Mr. Jack Sylvan, TIDA
Ms. Mirian Saez, TIDA
Mr. Henry Wong, Cal EPA Department of Toxic Substances Control
Mr. Christine Katin, U.S. Environmental Protection Agency
Ms. Agnes Farres, Cal EPA Regional Water Quality Control Board

Comments and Recommendations

DRAFT – SAMPLING AND ANALYSIS PLAN (FIELD SAMPLING PLAN/QUALITY ASSURANCE PROJECT PLAN) FOR THE FIELD INVESTIGATION OF LEAD SHOT AT INSTALLATION RESTORATION SITE 27 CLIPPER COVE SKEET RANGE, NAVAL STATION TREASURE ISLAND, SAN FRANCISCO, CALIFORNIA (RELEASED MAY 7, 2007).

PREPARED BY: NAVFAC WITH SUPPORT FROM SULTECH, A JOINT VENTURE OF SULLIVAN CONSULTING GROUP AND TETRA TECH EM, INC.

JUNE 20, 2007

Comments prepared by:

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General comments:

Section 1.0 - Project Description and Management: The project description is misleading and is not relevant to the rest of the document: "The purpose of this investigation is to verify findings reported by the Remedial Investigation (RI) Report (Tetra Tech 2001) ...". If this is the case, a summary of those findings (e.g., displaying the distribution of lead shot) should be included to determine whether the sampling plan truly builds on previous findings. Unless the purpose is revised, the SAP should describe how (e.g., specific data analysis methods, statistics) previous findings will be verified with these new data. The purpose should be revised if the intent is to define the distribution of lead shot in the study area versus the verification of previous findings. Subsequent selection of sample design, analytical method, and the whole section on measurement quality objectives (particularly representativeness, completeness, comparability) in section 1.3.2 have very few constraints if not dovetailed to the earlier studies, other than detection levels below ERL values for residual lead. The sampling design is appropriate if it is based on an assumption that lead shot may exist within 150 feet of shoreline; but it is hard to determine whether it will confirm or amplify previous results.

Section 1.3 – Quality Objectives and Criteria: The most important outcome of this field effort will be the number of retained lead shot in 6 inch cores, yet there is very little information on how this will be accomplished. The idea of performing this in real time, on a ship, is ill-conceived and does not sound like a careful operation. Either a detailed method or a standard operating procedure on lead shot measurement needs to be included in the SAP. In addition to a step-wise procedure, an adequate description of the

differentiation of lead shot from all the other debris larger than 1 mm needs to be included. Historical lead shot in sediment often appears "gravel-like" and bears little resemblance to unweathered lead shot. The geologist or designated field sampler should have previous experience in the identification of *in situ* lead shot; and a DQO should be included for the identification and measurement of lead shot (in the field or laboratory). Since lead shot, like most other sediment chemical parameters, is usually measured in a laboratory under controlled conditions, rationale for the proposed deviation should be provided.

The DQO section is quite detailed for residual lead – an ancillary measurement – but there is no QA/QC for the shot enumeration and no proposal for validation (section 4.1.3). In addition, the proposed duplicates are for lab measurements, not the most critical field measurement (section 2.5.1.1). Finally, even in the assessment and oversight section (especially section 3.1.1), there is no explicit evaluation of the efficiency of the as yet-named geologist that will report the number of lead shot (Table 5). The priorities and level of detail given in this SAP are not aligned with the stated goal of determining lead shot distribution necessary to develop a remedial design. In addition, the method choice for grain size, and lack of method descriptions for lead shot and biomass suggest that the consultant is inexperienced in collection and analysis of data of this type. A qualified and experienced Navy scientist should perform oversight of the field portion of this study to ensure that these critical data are collected and analyzed correctly.

Specific comments and questions:

1. Include a graphic of the depositional depth and all shot data collected in Fig 3.

2. In the decision rule 5, (section 1.3.1), provide a reference for the use of the criterion of 2 shot per 6 inch core. Even though the criterion was agreed to in previous project meetings between the Navy, regulators, and concerned parties, rationale for its use should be documented in the SAP and subsequent report for prospective readers.

3. Decision rule step 6 is unclear. Since the criterion is fixed, and the measurements discrete in value, it is not possible to estimate error (particularly since there is no QC on lead shot measurement). However, estimates of the true lead shot concentration in the parcel as a whole can be estimated by assuming some shot distribution, perhaps a Poisson. Along the same lines in section 1.3.2.1 (precision) it is argued that field spatial variability is not an objective of this project. Some confidence will have to be assigned to the guessed at 2 shot border of the site, so spatial variability will or should be addressed.

4. Table 8. Did something happen to the number of core intervals after sample 104? Shouldn't the next label be 108 instead of 106?

5. Criteria for the acceptance of a suitable sediment sample for biomass data needs to be defined. This criterion is typically based on volume of sample collected relative to the type of grab. Also, the method and associated DQO's for biomass data are missing.

6. In the laboratory selection and oversight section (2.4.1.3, last paragraph), state why a kickoff meeting will be held regardless of whether QA/QC requirements are consistent with the SOW. What, if any, are the consequences of inconsistencies between lab and SOW QA/QC?

7. In Table 10 there are 80 primary sample locations, instead of the expected 120 (4x30 re Table 8). Explain the difference and correct the number of corresponding MS and ER numbers if it should be 120.

8. Sections 1.6.3 and 1.6.4 describe full data packages and electronic data deliverables that are based on EPA CLP SOWs and reference EPA SW-846 quality control data, yet the only data for which this applies is residual lead. The SAP needs to describe the data packages and corresponding QC for lead shot, sediment physical characteristics, and biomass data at a similar level.

9. In Section 2.1.1 state the GPS accuracy and the coordinate system that will be used to establish sampling stations. Why isn't a differential GPS unit being used? What type of coring devise will be used and how will sediment be extracted from the core barrel? This is critical information, since cores can compact, bleed (overfill) and/or push out sediment during collection. How will equipment be decontaminated in the sampling of residual lead? What is the purpose of weighing sediment to the nearest 0.5 kilogram (roughly 1 lb)? This gross measurement of wet weight sediment will have little use in unit conversions of lead shot (e.g., lead shot/volume sediment or lead shot/kg sediment).

10. It is not clear where and how biota will be "separated by major taxonomic group" and weighed on an analytical balance. The SAP suggests that amphipods comprise a major taxonomic biomass group – which would be a first for benthic macrofauna studies conducted in San Francisco Bay. Also, what is the accuracy of the balance (it would have to be pretty darned good to weigh amphipods)? The major taxonomic groups for biomass need to be defined (e.g., polychaeta, echinoderma, mollusca, crustacea, and combined other taxa). It is not practical to determine biomass for lower taxonomic levels (e.g., amphipods) in the laboratory, let alone the field. State whether wet weight or dry weight biomass will be reported, and how biota will be preserved in the field.

11. Section 2.3.5 (Sample Shipment) states that "enough ice will be added to maintain the sample temperature of below 4 °C, plus or minus 2 °C." It is not possible to add "enough ice" to reduce the ambient temperature of SF Bay sediment (~12-22 °C) to 4 °C over a 1-2 day hold and transfer period. Instead the ambient temperature should be measured in a few of the field samples (taken at different depths) and shipped samples should be transported at or below that temperature. Temperature control is important for TOC only.

12. *Method detection limit (2.5.3.1)*. Since this study includes only "inorganic compounds and physical properties test methods", and the SAP states that these are exempt from MDL reporting, this section should be removed. However, why is there no MDL requirement for residual lead?

13. *Field Assessments (3.1.1).* If lead shot is to be quantified in the field, an independent qualified scientist must be assigned to perform QC of the resulting data to achieve the same level of QC required for less important data (e.g., residual lead). Also, field oversight should be performed by the Navy. These are critical data.

14. ASTM Method E112-96 E2 or any method that produces an average grain size for an assumed unimodal distribution is not an appropriate method for grain size analysis of sediment, assuming that the data will be used to support interpretation of benthic invertebrate (e.g., biomass) or sediment chemical data. Standard sediment grain size methods, such as Plumb (1981) that produce a range of Phi sizes appropriate for the study area, and account for skewness, kurtosis, and bimodal distributions should be used.

References

Plumb, R.H., Jr. 1981. Procedure for handling and chemical analysis of sediment and water samples. EPA/CE-81-1. Tech. Rept. U.S. Army Engineers Waterways Experiment Station, Vicksburgh, Miss., U.S.A.Rex, M.A. 1981. Community structure in the deep sea benthos. Ann Rev. Ecol. Syst. 12: 331-353.