



October 5, 2012

Mr. Saul Bloom  
Arc Ecology  
1331 Evans Street  
San Francisco, CA 94124

Re: Independent Technical Review of the Historical Radiological Assessment – Supplemental Technical Memorandum for the Naval Station Treasure Island

Dear Mr. Bloom:

At your request, I performed an independent review of the Historical Radiological Assessment – Supplemental Technical Memorandum (HRASTM) for the Naval Station Treasure Island dated August 6, 2012. This document was written to update the original Historical Radiological Assessment (HRA) written in 2006. As part of the review, I also reviewed the original HRA to get a perspective on the changes. A HRA is generally the first step in the MARSSIM<sup>1</sup> process and is used to identify those areas of a facility that may have been impacted by operations involving the use of radioactive material. This review is generally done by reviewing records, conducting interviews, and looking at photographs. It does not include the performance of any radiological measurements.

As noted in the HRASTM, the reasons for the update were the intrusive investigations performed on waste sites on Treasure Island and the additional research on the historical record of operations performed at Treasure Island. The result of this review was the addition of eight areas identified as impacted that had been previously identified as non-impacted.

In general the HRASTM appears to have been thoroughly researched and documented. The conclusions reached are conservative from the standpoint that even areas that only contained sealed sources were considered impacted.

General recommendation: one of the drivers for the updated HRA was the intrusive investigation that has happened since the original HRA was written in 2006. As additional intrusive investigation is undertaken, radiological screening should be conducted on removed material to ensure that additional undiscovered impacted areas are not present.

General Comment: There is very little information presented regarding selection of reference areas for the final status surveys. These areas need to be selected carefully due to the history of Treasure Island. For example, When Building 343 was surveyed, Building 342 was used the reference area. Building 342 is now listed as impacted which could call into question the results of the final status survey of Building 343. Reference areas for outdoor areas need to be of similar soil types and must be on Treasure Island. It

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<sup>1</sup> MARSSIM – Multi-Agency Radiation Survey and Site Investigation Manual

should be noted if any imported fill material has been placed in the reference area (an example being when the Lake of the Nations was backfilled following the exposition). Such areas should not be used as they will not be representative of the soil present on the remainder of Treasure Island. Care must be taken that the reference area is sufficiently distant from other outdoor impacted areas as to minimize the potential for cross contamination. Reference Areas for buildings should be buildings of similar construction and buildings constructed during the same time frame as the building of interest.

Specific Comments:

Section 6.1.1.2 Building 343

Building 342 was used as the reference area for the Final Status Survey (FSS) of Building 343. As part of that FSS it was assumed the Building 342 had no radiological history. The HRASTM has now reclassified Building 342 as impacted. The FSS for Building 343 should be re-evaluated in light of this reclassification.

Gamma Walkover Surveys

The purpose of Gamma Walkover Surveys needs to be clearly defined. Once the purpose is defined, the sensitivity and limitations also need to be defined. For example, as they are currently being performed, they are adequate to detect hot spot anomalies that are near the surface as noted in several references in the HRASTM. They are not adequate to detect soil contamination that may be near, but above natural background levels. In addition, if the instrumentation used is calibrated to Cesium-137, as is common, the instrument's response to Radium-226 is approximately a factor of two lower which needs to be accounted for in the calculations (See Table 6-7 of MARSSIM, a higher MDC means a lower response). Calibrating the field instrumentation to Ra-226 would eliminate some of this uncertainty. It would not eliminate the inability of a walkover survey to detect soil contamination. In areas where soil contamination is suspected, a sampling protocol should be established that can clearly define whether there is in fact contamination present above natural background levels. As noted earlier, selection of a reference area with which to compare these samples is a key aspect of this sampling protocol.

Impacted Area Surveys

At least two of the impacted areas, USS Pandemonium Site NW and the former Salvage Yard, have had significant construction added on top of the impacted area. Additional supporting documentation is needed to justify only scoping surveys and Gamma Walkover Surveys of these areas given their operational history. This is also supported by the addition of Building 570 and its laydown area where contaminated soil samples from the Solid Waste Disposal Areas on Site 12 were stored and analyzed. The proximity of these SWDAs to the USS Pandemonium Site NE should be evaluated for impact.



Summary:

The HRASTM follows the MARSSIM HRA process and appears to be a thorough and conservative update to the original HRA. The conclusions reached and the recommended actions for each of the impacted areas are reasonable, except as noted, based on the radiological history and the operations conducted in the facilities. The isotopes of interest are reasonable based on the operations of the Treasure Island Shipyard. The HRASTM is a good first step in the MARSSIM process and identifies those areas needing additional radiological investigation. It does not draw any conclusions about their impact on the environment or the public, only that there is a potential impact that needs to be investigated.

Please contact me at (509)942-3639 if you would like to discuss these comments.

Sincerely,

Stephen L. Bump, CHP, CIH, PMP  
Deputy Chief Operating Officer  
**Dade Moeller & Associates**

