

**FINAL NAVY RESPONSES TO  
DEPARTMENT OF PUBLIC HEALTH COMMENTS  
ON FINAL BASE-WIDE STORM DRAIN AND SANITARY SEWER REMOVAL  
PROJECT WORK PLAN – REVISION 1  
DATED AUGUST 21, 2007  
BASEWIDE STORM DRAIN AND SANITARY SEWER REMOVAL PROJECT  
HUNTERS POINT SHIPYARD  
SAN FRANCISCO, CALIFORNIA**

Comments dated: October 26, 2007

Comments by: California Department of Public Health (CDPH)

**COMMENTS and RECOMMENDATIONS**

**Comment 1:**

*Section 4.9 of the Project Work Plan states that: "On-site laboratory equipment will be used to analyze most radiological samples collected in the field. Table 4-2 lists the types of measurements and laboratory equipment to be used on-site during survey activities for the sanitary sewer and storm drain removal action..." Table 4-2 includes a column labeled detection sensitivity and for gamma spectroscopy the detection sensitivity listed for Ra-226 is 0.5 pCi/g.*

*The SAP, Appendix A, Page 3, #24 under Elements of the UFP-QAPP and EPA QA/R-5 in relation to this SAP lists "Table 4-2 of the Work Plan" as the Analytical Instrument Calibration Table.*

*Section 7.3 of the SAP, Data Quality Indicators, states that: "in order to meet project DQOs, the QLs listed in Tables A.7-1 (soil) and A.7-2 (water) were established below action levels, and the QC criteria presented in Table A.7-3 are in accordance with the QSM (DOD, 2006)." Table A.7-1 lists the analytical method Quantitation Limit/Minimum Detectable Activity (QL/MDA) for Ra-226 as 0.5 pCi/gm, which is inconsistent with Table 4-2 noted above.*

*As noted above, on-site laboratory equipment will be used to analyze most radiological samples collected in the field. To date, analytical results from the on-site laboratory have not met the specification listed above.*

*Since it appears that Ra-226 analysis specifications provided in the Final Project Work Plan, Revision 1 are not being met by the on-site laboratory analysis, it appears that the Project Work Plan and SAP will need significant revisions to reflect the actual practices or that*

significant numbers of samples may need to be re-analyzed to meet the specifications.

**Recommendation:** a) Re-analyze samples to meet 0.5 pCi/gm MDA for Ra-226 specified in the Project Work Plan and SAP and/or revise Table A.7-1 and specify the reasons or justification for the changes.

**Response 1:** a) The previous value was based on the off-site laboratory method. The Navy should have separated the QLs for Ra-226 for the on-site and off-site laboratories since two different methods are used for analysis. A revision has been made to Table A.7-1 to update the QLs for the project.

The revised QL for Ra-226 at the on-site laboratory is 1.0 pCi/g above background. The cesium-137 QL will also be revised to 0.07 pCi/g to reflect actual off-site laboratory results.<sup>1</sup>

The Navy has chosen these QLs in concert with the conservative remediation practices that will be used on the project. With the QLs as revised, the practice will ensure that no sample results exceed the release criteria for each radionuclide of concern.

**Comment 2:** Section 7.2.2 of the SAP, On-site Laboratory Quality Control Requirements states that: "The analytical laboratory must have written SOPs defining the instrumentation, calibration, method detection, and QC requirements. The SOPs must be available to the

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<sup>1</sup>E-mail comment from Mr. K Jackson, CDPH on 2/21/2008:

The proposed revised quantitation limit (QL) of 1.4 pCi/gm for Ra-226, approximately 1 pCi per gram above the background value used for this project for Ra-226, reflects the Navy's apparent practice so far on this project. Considering that the Ra-226 action level for the project is 1.5 pCi per gram, this QL would appear to ensure that the project will fail to meet Multi-Agency Radiological Laboratory Analytical Protocols (MARLAP) guidance regarding relative method uncertainty (e.g. see MARLAP Chapter 19). Reference 1 at the end of these notes provides general MARLAP information from the MARLAP website and a link to the MARLAP Manual online.

Also, given the data seen to date for on-site laboratory analysis that does meet this proposed QL, it will ensure that few if any samples counted at the on-site laboratory for Ra-226 are within 20 percent of the counting time or MDA for the analysis of the same samples at the offsite laboratory. This greater than twenty percent difference in count times or MDA means that specifically defined quality assurance requirements in the work plan will not apply to these results (e.g., see Work Plan Sections 5.3 and 5.4).

Given the above concerns, the Navy needs to explain why it believes that this added quantitation level (QL) for the on-site laboratory analysis will result in final status survey sample results that will be likely to support unrestricted release of the site, contrary to the MARLAP guidance. This explanation should take into consideration and specify the conservative remediation practice used by the Navy to date. The Navy needs to explain in the Work Plan what factors were taken into consideration to convince Navy project managers that by adding this QL for the on-site laboratory, which is much less restrictive than the QL in the existing work plan, the final status survey results from the on-site laboratory will likely support unrestricted release of the site.

*analysts performing the work. The SOPs must meet or exceed the requirements of the analytical methods cited in this SAP."*

**Recommendation:** a) *Provide the on-site laboratory SOP in the SAP for gamma spectroscopy that includes the information specified in Section 7.2.2 of the SAP.*

**Response 2:** The SOP has been updated to incorporate in a single document the on-site laboratory QA and QC requirements, and procedures.<sup>2</sup> The SOP has since been provided to CDPH. The SOP and SAP work together to provide the specific QC requirements for the on-site laboratory. The most restrictive requirements from both documents govern the operation of the on-site laboratory at HPS.

**Comment 3:** *Section 5.1 of the SAP, Background and Reference Sampling, states that "Prior to the start of pipeline excavation activities, an average background level will be determined by performing a minimum of 18 measurements at systematic or random locations...The soil samples will be analyzed by the on-site laboratory by gamma spectroscopy to establish average background values for Ra-226 and Cs-137...Data collected in reference areas will be statistically evaluated using graphical format, such as a frequency distribution chart, and approved by RASO. The purpose of the evaluation is to ensure that the data collected in the reference area are consistent with a normal distribution and that the variability of the background is not too high..."*

*Section 5.1 of the SAP appears to indicate it is the intent of the Project Work Plan that the reference area sample analysis results for Ra-226 and Cs-137 be quantified and should allow for determination of*

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<sup>2</sup> E-mail comment from Mr. K Jackson, CDPH on 2/21/2008:

*The revised on-site laboratory gamma spectroscopy procedure is generally well-written and clear. One exception where additional clarification or explanation appears to be needed is discussed below:*

*Section 8.4.3 of the revised procedure indicates that acceptable criterion for the difference in duplicate pairs is when the lowest activity is within twenty percent of the highest activity. Additional requirements may be imposed through the other work documents.*

*Does the criterion only apply only to samples with results greater than MDA and without F flagged results? If so, that should probably be stated in the procedure.*

*For this project, how will this criterion be applied to Ra-226 results from the on-site laboratory and where is that specified in the project work plan or SAP? Will Section 8.4.3 of the laboratory procedure be superseded or overridden by the Work Plan specifications for this project?*

*distribution characteristics and variability of reference area sample results. Contrary to this apparent intent, the on-site laboratory analysis of reference area samples analyzed for Ra-226 produced results that were mostly less than MDA. This appears to be another indicator that the on-site laboratory analysis method currently in use for Ra-226 does not match the Project Work Plan intent or requirements.*

*The average reference area result as measured by the on-site laboratory and used for project decisions for Ra-226 is 0.485 pCi/gm with a two sigma uncertainty of 0.548 pCi/gm. The Remedial Response Objective (RRO) is 1 pCi/gm above average reference area result or 1.485 pCi/gm with a two sigma uncertainty of 0.584 pCi/gm.*

**Recommendation:**

*a) Review Section 5.1 of the Project Work Plan and the reference area sample results from the on-site laboratory and consider whether a lower detection limit or MDA needs to be achieved in order to adequately determine the average, distribution characteristics and variability of Ra-226 concentrations found in the reference area.*

**Response 3:**

The Navy disagrees that twice the standard deviation of the measurement results is indicative of the total propagated uncertainty for the measurement results.

Additionally, the Navy revised Section 5.1 of the SAP to discuss the action level for radium-226 and implications that this action level presents. A discussion is also provided regarding how background levels of radium-226 are determined and the use of measurement uncertainty.<sup>3</sup>

**Comment 4:**

*Appendix A, SAP, Section 5.3 on Page A.5-5 and Section 5.4 on Page A.5-6 specify that data from the on-site and off-site gamma spectroscopy analysis will be compared, if minimum detectable activities (MDAs) and count times are within 20 percent of each other. By current practice the on-site laboratory typically counts for 45*

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<sup>3</sup> E-mail Comment from Mr. K Jackson, CDPH on 2/21/2008:

*The added measurement uncertainty usage described on Page A.5-1 appears to be intended to be applicable only to sample results that are less than the QL and this appears to be stated more clearly on Page A.5-5 and Page A.5-6. Page A.5-1 probably needs revision. This specification does not appear to limit or control uncertainty in sample results above the QL. So, this wording appears to apply only to less than MDA results with large uncertainty estimates that have been said in the past to be an artifact of the analysis system and, therefore, any such results should be taken simply to be less than MDA.*

minutes and the off-site laboratory counts samples much longer. Therefore, the MDAs and count times will rarely be within 20 percent of each other and the relative percent difference (RPD) calculation will rarely be required. Because of this there are essentially no comparison criteria that apply to on-site and off-site laboratory radionuclide analysis results. Section 7.3.1 also discusses precision and refers to RPD limits in Table A.7-3. Procedures or criteria for comparison of sample results from on-site laboratory analysis to results for the same samples analyzed by the off-site laboratory need to be specified so that they are applicable to typical analysis parameters used in this project.

**Recommendations:**

- a) *Specify precision requirements, such as RPD limits, for duplicate samples with results greater than MDA as analyzed by the on-site laboratory method.*
- b) *Section 7.0 of the SAP needs to address and clarify the objectives of sending quality assurance samples to off-site laboratories and the selection criteria for sending samples for off-site analysis.*
- c) *Specify in the SAP that a group of samples exceeding the Ra-226 action level, such as those samples resulting in additional remediation as described in Section 3.2.1 of the draft Survey Unit 10 report, will be sent to the off-site laboratory for analysis. This should apply to any survey units with on-site sample results above the action level or RRO. In the applicable survey unit report, compare the results and associated uncertainty estimates for each sample from both laboratories.*
- d) *Analyze some samples that have exceeded the MDA but are less than the action level for Ra-226 at the on-site laboratory in duplicate, as would normally be done for laboratory control samples using the typical count time, and determine if the RPD between these samples counted for the same time meet the 30% acceptance criteria for RPD. Add this comparison as a quality assurance requirement to the SAP.*

**Response 4:**

Section 5.3 and Section 5.4 specify the comparison criteria applicable to the on-site and off-site laboratory. The requirement that "...MDAs and count times are not within 20 percent of each other, the data will be evaluated as appropriate by the laboratory manager..." has been

modified. The comparison criteria are specified using the following text:<sup>4</sup>

*Data from the on-site and off-site gamma spectroscopy analysis will be compared, and the acceptance criteria of RPD for each on-site/off-site laboratory pair are established at 30 in instances where the same method was used for analysis, and when both activities are reported above the MDA (with no associated qualifying flags). If any appropriate RPD is not within the established acceptance criteria, then the RASO and the DON will be notified and corrective actions will be identified and implemented.*

a) RPD requirements for the on-site laboratory are already provided in Table A.7-3 of the SAP. In addition, Section 7.2.4.1 states that results reported greater than the MDA will be used for the assessment of the precision requirements. The laboratory duplicate selection process is designed to be “blind” so that the process also applies to results that are less than the MDA.

The Navy will provide specific laboratory duplicates in SUPRs in the future. The Navy, as a specific request, has provided CDPH additional duplicate pairs of samples that have indicated radium-226 above the MDA to illustrate the laboratories precision.<sup>5</sup>

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<sup>4</sup> E-mail Comment from Mr. K Jackson, CDPH on 2/21/2008:

*The first paragraph of the response appears to indicate that there will not be any stated comparison criteria for Ra-226 results for the same sample counted at both the off-site and on-site laboratories, since the counting times or MDA will rarely if ever be within 20 percent and this seems consistent with the wording specified the Work Plan in Sections 5.3 and 5.4. It is still unclear where the Navy came up with the criteria that sample counting times and/or the MDA must be within 20 percent to be comparable, when the results reported are both above the quantitation limit. It seems like this limitation may be unnecessary, when results are above the QL.*

*The additions to Section 7.3.1 do indicate that Bi-214 activities reported above the MDA for both laboratories will be compared but it is unclear what the comparison criteria will be. However, Response 8d indicates that Section 7.3.1 of the SAP has been revised to indicate how the Bi-214 comparison is performed.*

*Did the Navy intend to indicate that Bi-214 results from the on-site and off-site laboratories will be compared using the RPD criteria at the top of the page? If so, that appears to contradict the first part of Response 4, which indicates that sample results, where the counting time differs by 20 percent will not be compared, since the counting time for on-site and off-site soil samples by gamma spectroscopy always or nearly always differs by more than 20 percent. Section 7.3.1 should clarify how the Bi-214 results will be compared between on-site and off-site laboratory results.*

<sup>5</sup> E-mail Comment from Mr. K Jackson, CDPH on 2/21/2008:

*Response 4a states that Section 7.2.4.1 specifies that whenever possible the results reported greater than MDA will be used for the assessment of precision requirements. The actual wording in the last sentence of*

b) The Navy has added Section 7.2.4.6 to address CDPH concerns, regarding the selection of samples for off-site analysis for quality assurance purposes.

c) The selection criteria for QA samples will be included in a new Section 7.2.4.6 of the SAP as noted in the revised response above. When appropriate, samples near or exceeding the radium-226 action level will be selected for QA analysis.

d) The Navy already compares the RPD for laboratory duplicates, which is also provided in the SAP Section 7.2.4.1. This section already describes the current procedures being used by the Navy and its contractors. The laboratory duplicate selection process is designed to be "blind" so that process also applies to activities less than the MDA.<sup>6</sup>

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*Section 7.2.4.1 appears to differ some from that response and states: "If the sample analysis identifies no activity greater than MDA to be present, the total activity of the sample will be used for comparison." The Navy provided results for about 150 laboratory duplicate pairs from this project and this wording would mean that few of the duplicate results would have comparable Ra-226 results and that total activity would be used for comparison. While the approach of using total activity for comparison may address detector system and software analysis reproducibility, it does not include all of the factors involved in Ra-226 reproducibility, such as the small number of counts in the Ra-226 peak which may provide a major contribution to uncertainty in the results, as appears likely to be the case for sample results near the action level for Ra-226 analyzed at the on-site laboratory.*

<sup>6</sup> E-mail Comment from Mr. K Jackson, CDPH on 2/21/2008:

*Response 4d indicates that the Navy already compares the RPD for laboratory duplicates. Of the data provided (approximately 150 sets of laboratory duplicate results) few were above MDA for Ra-226 allowing use of the RPD comparison criteria. In those 150 pairs of laboratory duplicates, we found two pairs of duplicates above the action level and one out of two appeared to fail the RPD comparison criteria. The existing data indicates a need to select more samples near the action level and the Navy has indicated this in Section 7.2.4.6 as revised.*

*Given that one out of two duplicate sets above the action level appeared to fail the RPD criteria (as did others below the action level and above the MDA), it is recommended that the Navy count some additional sample duplicates and/or look at more recent laboratory duplicate data to see if they can typically meet the RPD criteria specified for samples near the action level for Ra-226, which is specified to be approximately 1.5 pCi/gm. CDPH made this recommendation in Comment 8a previously.*

*In addition the revision to Section 7.2.4.6 indicates that a performance evaluation sample will be purchased and analyzed by both laboratories. CDPH concurs with this general approach. The Navy provided CDPH with data regarding one selected PE sample, however, the selected sample activity indicated on the sample information provided appears to indicate an activity of 30 pCi/gm for Ra-226, which is approximately 20 times the action level for this project. One of the major concerns for this project is accuracy and comparability of Ra-226 results near the action level as analyzed by the differing analytical methodologies used at the on-site and off-site laboratories. Any interference from naturally occurring U-235 activity near the 186-kev Ra-226 peak will be masked in the performance evaluation sample, if the Ra-226 activity is 20 times the action level or 30 pCi/gm. Therefore, CDPH recommends*

The Navy has also provided 32 duplicate pairs of different samples that indicated activity near the radium-226 action level. These duplicate pairs were run across all gamma spectroscopy systems, and provided to CDPH. The samples indicated radium-226 RPD less than 30, with a maximum RPD of 18, indicating a very high level of precision at the on-site laboratory.

The Navy procured a special radium-226 standard (NIST certified) from an outside vendor and analyzed this standard on all detectors. The certified activity of the standard was 30 pCi/g, and the on-site laboratory indicated activity within the error of the certified source. The sample was sent to the off-site laboratory as a normal source (an examination without their previous knowledge) for analysis, and the off-site laboratory indicated an activity less than the certified value. The standard was returned, and reanalyzed at the on-site laboratory, and the radium-226 results were within the previously certified error. The source of the off-site laboratory error is being investigated, and the results of this investigation will be provided to the regulators at a later date. All results from these investigations will be provided as an attachment.

**Comment 5:**

*As requested, the Navy provided the draft Survey Unit 10 report, which included sample results where Ra-226 was detected by the on-site analysis method near and above the action level. The Navy has applied a conservative remediation decision criteria (any one sample result exceeding the action level or RRO will require remediation) and this conservative approach effectively overrides the large uncertainty in single sample results. The remediation practice is not well documented in the Project Work Plan.*

**Recommendation:**

*a) Revise the Work Plan to specify and clarify the conservative practice of remediation as described in Section 3.2.1 of the Survey Unit 10 report.*

**Response 5:**

Section 7.12 of the Work Plan specifies the remedial action requirements and approach. Section 5.3 and Section 5.4 of the SAP have been revised to include an expanded discussion of the remedial action approach.

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*purchase of an additional PE sample with Ra-226 activity near the action level for Ra-226. CDPH provided the Navy with some information previously regarding some PE samples that are available in this range.*

**Comment 6:** *Table A.6-1 specifies 6-month holding times for soil and sediment samples being analyzed for radionuclides. What is the basis for this holding time requirement? Was it based, for example, on the holding time for water samples specified in EPA Method 901.1? If so, the holding time may not be applicable to soil and sediment samples. Are soil samples collected in this project required to be archived for later use or re-analysis after trenches have been backfilled?*

**Recommendation:** *a) Delete holding time requirement and archive or save samples for possible re-analysis later.*

**Response 6:** As there is no basis for the maximum holding time, the Navy has revised the table. Each sample analyzed at the on-site laboratory is archived until a final decision has been made on the work performed as documented in the appropriate report identifying the collection, analysis, results, and a recommendation proposed.

**Comment 7:** *Table A.7-5 appears to indicate that field duplicate samples are not applicable for soil samples collected from trenches.*

**Recommendation:** *a) Please revise this table or explain the reasoning for "not applicable" being assigned for field quality control samples of trench soil being analyzed for radionuclides.*

**Response 7:** The on-site laboratory performs a minimum of one laboratory duplicate per single systematic sampling evolution.

Obtaining a field duplicate, where the concentrations of radionuclides may vary slightly might indicate that the gamma spectroscopy apparatus was inaccurate, when the actual results are different due to the spatial distribution of the contaminant.

Table A-7.3 has been updated to indicate that spiked samples of radium-226 and cesium-137 were not used, and that daily energy calibrations verify the accuracy requirements for this analysis.

**Comment 8:** *The typical precision and accuracy data quality indicators specified in the SAP, Appendix A, Section 7.3 do not seem to be applied to the on-site laboratory data. Table A.7-3 has not applicable (N/A) for required number of samples for accuracy. Table A.7-4 lists an RPD requirement of 30% for soil samples. Section 8.2 exempts the on-site laboratory from independent data validation requirements. Data Quality Assessment in Section 8.3 of Appendix A specifies that PARCC parameters will be determined as specified in Section 7.2 (It appears that the PARCC parameter specifications are actually found in Section 7.3 instead of Section 7.2). The PARCC parameters for accuracy and*

*precision in Section 7.3 do not appear to be applied to on-site laboratory data.*

**Recommendations:**

- a) *Please revise and clarify the data quality indicators and their application to data from both laboratories.*
- b) *Add Section 7.3 data quality indicators for the on-site laboratory analysis.*
- c) *Specify accuracy requirements for the on-site laboratory analysis of soil samples by gamma spectroscopy.*
- d) *The Work Plan and SAP should be revised to include procedures for evaluation of accuracy for Ra-226 analysis and differences between the on-site laboratory results and the off-site laboratory results.*
- e) *Spiked soil samples or samples with well-characterized or known Ra-226 activity near the action level should be provided to both laboratories for analysis and for comparison purposes.*

**Response 8:**

- a) The Data Quality Indicators of Section 7.3 of the SAP have been revised to specifically describe the necessary steps for the on-site laboratory.
- b) The Navy has updated Section 7.3 of the SAP per the request of CDPH to indicate the portions that are applicable to the on-site and off-site laboratory.
- c) The Navy has updated Section 7.3 of the SAP to indicate the precision requirements for the on-site laboratory.
- d) Sections 5.3 and 5.4 of the SAP provide the requested information. In the event that radium-226 activity is not reported by the on-site laboratory, another isotope is used for evaluation of the data; i.e., bismuth-214. Section 7.3.1 of the SAP has been revised to indicate how the comparison of bismuth-214 between both laboratories is performed.
- e) The Navy has ordered a spiked sample of radium-226 from an outside vendor for this purpose. The Navy will provide these results to CDPH once the source has been received and analysis has been completed.

**Comment 9:**

*Data Management in Section 8.1.2 specifies data package requirements for off-site laboratory data, but fails to specify the data*

*package requirements for the on-site laboratory data being used to make project decisions.*

**Recommendation:** *a) Add specific data package requirements for the on-site laboratory data.*

**Response 9:** As stated in Section 8.1.2 of the SAP, the on-site laboratory data package requirements are detailed in Section 4.2 of the SAP.

**Comment 10:** *The Navy has chosen a method for Ra-226 analysis in soil with a short enough count duration to process a large number of samples for the on-site laboratory analysis. The method chosen is essentially a screening method as discussed in References 1 and 2 for samples with Ra-226 levels near or below the action level for the project. The Navy has also chosen to use these results to make decisions regarding remediation and to provide results for a final status survey intended to support unrestricted release of the site. The 186-kev method used for on-site Ra-226 analysis may be biased high for those reported results including the reported MDA. The off-site laboratory results appear to be lower. Most of the on-site Ra-226 results we have seen for this project to date are non-detect results, with Ra-226 less than the MDA. When a screening method is used for on-site analysis that is not capable of quantifying some results or which results in larger uncertainty than other typical analytical methods, a typical approach is to analyze some samples, especially those expected to have results near the action level, by the more definitive methods and link the results from both approaches to show that the project decisions made with the screening results are valid. This would seem to be a major objective of sending samples to the off-site laboratory for analysis. This apparent objective has not been documented in the project documentation or achieved in practice. This is also part of the approach discussed in Reference 1 and other EPA TRIAD Process articles under the concept of "effective data".*

**Recommendations:** *a) To clarify the analytical issues discussed above, the Navy should select 10 reference area or background soil samples and 10 soil samples with Ra-226 above the MDA by the on-site laboratory analysis results but less than three pCi per gram. If possible, the reference area soil samples should be analyzed on-site to quantify Ra-226, which would probably require a much longer count time than is currently used. The same samples would then be sent to the off-site laboratory for analysis. The other 10 samples, with Ra-226 above the MDA by on-site analysis, should be sent to the off-site laboratory for analysis. Once both laboratories have analyzed the samples the results should be compared and used to establish a quantified background level for each analysis method. Review of*

*previous results for the same background samples analyzed on-site with the normal count duration may be used to show that the MDA reported for them is conservative compared to quantified results obtained by the on-site and off-site laboratory.*

- b) *Once the samples noted above have been analyzed and reported, regulatory agencies involved in the project such as CDPH, NRC or EPA should be provided with an opportunity to analyze some of the samples in their laboratories for verification of the Navy's results. Details of this independent verification approach would need to be worked out with the agencies involved.*

**Response 10:**

The Navy disagrees with CDPH's assumption that the method used to detect Ra-226 activity is a screening method. With advances in gamma spectroscopy, the 186 KeV peak is easily identified with gamma spectroscopy detectors and the associated software programs.<sup>7</sup> The Navy has provided additional background to CDPH regarding the integration process used by the software, including figures indicating the peak overlap issues. The Navy is investigating the results reported by the off-site laboratory (as discussed in Response 4c).

The Navy will provide additional hands-on discussion of how these calculations are performed to interested parties at the on-site laboratory at their convenience. Please contact Mr. Dane Jensen (NAVFAC SW) at (619) 532-0789 to make arrangements for an on-site laboratory visit.

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<sup>7</sup> E-mail Comment from Mr. K Jackson, CDPH on 2/21/2008:

*The first paragraph of the response indicates advances in gamma spectroscopy allow identification of the 186-kev peak with current detectors and software. While we understand that statement is true, we are uncertain whether the Navy's analytical system is capable of separating out and rejecting counts from a U-235 peak near the 186-kev gamma peak. CDPH asked this question more specifically in the comments on the survey unit reports for Survey Units 1 thru 6, 8, 9, 12 and 16 submitted in November 2007 (see Comment 7c).*

*Since the on-site laboratory results for Ra-226 generally appear to be higher than the off-site Ra-226 results for samples analyzed by both laboratories (for the limited data above MDA for Ra-226 provided to date for samples run by both laboratories), it would be useful to know whether or not the U-235 interference is separated out by the on-site laboratory analysis method for Ra-226. There was some discussion of this at the meeting held in December 2007 at Hunters Point and our impression was that the Navy thought that the on-site method using currently available improved detectors and software is capable of separating the Ra-226 and U-235 counts near 186-kev. It would be helpful if this could be clarified or verified.*

a) It is important to note that the Navy had originally chosen to model the radium-226 activity using the MDA as the actual activity present. The Navy revised this approach per the request of CDPH to model indicated activity, both positive and negative, even when the reported activity is less than the MDA. Even if a hybrid approach is used where the background values are reported using indicated activity, and the systematic sampling results are reported using MDA, the difference in radium-226 values are still less than the Action Level. Further, since the decision on the suitability of materials for recommendation for unrestricted release is based on an entire event of systematic samples without a single exceedence, it is unlikely that radium-226 is present in the survey unit above the action level. QA sample results from the off-site laboratory that lack a single systematic result above the DCGL for radium-226 across every survey unit provides the necessary confirmation.

With this in mind, the Navy feels that it would be inappropriate to change the approach.

b) The Navy will be happy to provide CDPH with samples so that an independent assessment can be made. Please contact Mr. Dane Jensen (NAVFAC SW) at (619) 532-0789 to make arrangements for transfer of these samples for confirmation purposes.



TRANSMITTAL/DELIVERABLE RECEIPT

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CTO: 0006
LOCATION: Hunters Point, CA

FROM: A. N. Bolt, Program Manager

DESCRIPTION: Final Navy Response to Department of Public Health Comments on Final
Basewide Storm Drain and Sanitary Sewer Removal Project Work Plan - Revision 1

Dated August 21, 2007. Re-submitting on 06/23/08 error on Title of RTC's; marked "Draft". RTC's
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Please replace the version of the *Final Navy Responses to Department of Public Health Comments on Final Base-wide Storm Drain and Sanitary Sewer Removal Work Plan, Revision 1 of August 21, 2007, Hunters Point Shipyard, San Francisco, California* sent to you on June 18, 2008 with the attached version. No changes have been made to the attached other than to fix a typo in the title (from Draft to Final) and to clarify the version in the footers.



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