UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA

September 24, 2018

George ("Pat") Brooks
US Department of the Navy
33000 Nixie Way, Bldg 50
San Diego, CA 92147

Dear Mr. Brooks:

Thank you for providing for review the *Draft Parcel G Removal Site Evaluation, Sampling and Analysis Plan*, Hunter's Point Naval Shipyard, San Francisco, California, August 2018 ("SAP"). The U.S. Environmental Protection Agency (EPA) has independently reviewed this report in detail with a technical team including national experts in health physics, geology, and statistics, and our comments are attached.

The SAP gives details related to *Parcel G Removal Site Evaluation Work Plan, Former Hunters Point Naval Shipyard*, San Francisco, California, June 15, 2018 ("Work Plan"). Therefore, many of the comments that EPA made on the Work Plan also apply to the SAP. The draft SAP arrived for review at the same time that EPA submitted its comments on the Work Plan, so the Navy would not have had the opportunity to incorporate the Work Plan comments into the SAP. Because of this timing, the attached writeup includes one general comment to summarize Work Plan comments that are also relevant to the SAP. Additional general and specific comments cover other issues that are separate from the Work Plan comments.

We look forward to working with the Navy to finalize both the Work Plan and the SAP and begin the sampling component of the radiological assessment effort as soon as possible. If you would like to discuss any of these comments, please contact me at 415-947-4187 or lee.lily@epa.gov.

Sincerely,

Lily N. Lee
Remedial Project Manager
Superfund Division

Attachment

cc: Nina Bacey, State of California Department of Toxic Substances Control
Matthew Wright, State of California Department of Public Health
Tina Low, California Regional Water Quality Control Board
Amy Brownell, San Francisco Department of Public Health

EPA Review of the Draft Parcel G Removal Site Evaluation, Sampling and Analysis Plan (SAP), Hunters Point Naval Shipyard, San Francisco, California, August 2018
EPA Comments dated September 2018

GENERAL COMMENTS

1. The SAP Worksheet #9, Project Scoping Session Participants Sheet, states that statistical tests will identify anomalies in the data, including running tests designed to identify instances where data may have been falsified; however, the SAP does not acknowledge that not all instances of falsification may be identified using the statistical tests. Therefore, the investigation must be designed to require that if any sample result from any of the Phase I TUs exceeds the remedial goals (RGs) specified in the Parcel G ROD, then all TUs will require excavation and analysis. Please revise the SAP to acknowledge that statistical tests may not identify all types/instances of falsification so that 100% excavation will be required if any sample from Phase I TUs exceeds RGs.

2. SAP Worksheet #11, Project Quality Objectives/Systematic Planning Process Statements, Step 1, State the Problem, does not describe how soil background values will be developed for all fill types for Ra-226 and other naturally occurring radioactive material (NORM)/fallout radionuclides. There is no proposal to separate results by fill type in the Work Plan and this would likely require a number of additional samples to generate background values for each soil type. Furthermore, SAP Worksheet #17, Sampling and Survey Design and Rationale, states that "additional sample locations at Bayview Park or other reference areas may be added as necessary to characterize different soil types and depositional areas," but there are no criteria for this decision and insufficient details that explain how this would be done (e.g., how soil types will be determined, the number of required soil samples per soil type, how reference background areas would be expanded, etc.). Please revise the SAP to provide detailed criteria for evaluating whether background values will be calculated for different soil types, including the number of required samples and how reference background areas will be expanded to cover multiple fill types.

3. The SAP Worksheet #11, Project Quality Objectives/Systematic Planning Process Statements, Step 3, Identify Inputs to the Objective, inputs include performing a gamma scan survey to identify biased soil sample locations; however, the SAP does not propose a scanning survey method to identify any potential remaining Sr-90 radiological objects. Please revise the SAP to discuss how Sr-90 radiological objects will be identified.

4. SAP Worksheet #11, Project Quality Objectives/Systematic Planning Process Statements Step 5, Develop Decision Rules, is inconsistent with the Parcel G ROD. Step 5 states "If the building and soil investigation results demonstrate that site conditions are not compliant with the Parcel G RAO [remedial action objective] and exceed background levels, then the data will be evaluated to determine whether site conditions are protective of human health using USEPA's current guidance on Radiation Risk Assessment at CERCLA Sites (USEPA, 2014a). A Removal Site Evaluation Report will be developed to include recommendations for further action." However, the ROD requires each sample result meet the RGs, therefore any reference to assessing risk must be applied within the context of meeting the RGs.

Please revise the SAP to require remediation of any location where one or more sample results exceed RGs.

5. The number of surface samples is insufficient. Under the SAP Worksheet #11, Project Quality Objectives/Systematic Planning Process Statements, Step 5, Develop Decision Rules, the Background Evaluation subsection states that the statistical difference between data sets will be evaluated using the nonparametric Kruskal-Wallis (KW) test by comparing the calculated p-value against 0.05 significance level. However, background data sets only propose to collect five surface samples at each on-site location, which does not provide a sufficient data pool for estimating population parameters. The number of surface samples per on-site reference background area (RBA) location should be increased to provide sufficient data for statistical evaluation. In addition, the off-site RBA location should include sampling for subsurface soils. Please increase the number of surface samples at each on-site RBA and propose collecting subsurface samples at the off-site RBA.

6. SAP Worksheet #11, Project Quality Objectives/Systematic Planning Process Statements Step 5 – Develop Decision Rules does not state what investigative actions will be taken if the additional six inches of the trench sidewalls and floors has ROCs above RGs. Scanning and/or sampling of the trench sidewalls and floors should be conducted to investigate the location and extent of any remaining contamination. Please revise the SAP to include this requirement and to include this approach in the data quality objectives in Worksheet #11.

7. SAP Worksheet #11, Project Quality Objectives/Systematic Planning Process Statements Step 6 – Specify the Performance Criteria proposes to analyze soil samples for U-238 if Ra-226 is detected to confirm estimates of the background contribution of Ra-226. Per previous EPA comments, all uranium and thorium isotopes should be analyzed and reported by alpha spectroscopy for background evaluations. Please revise the SAP to require alpha spectroscopy of all uranium and thorium isotopes for site samples with elevated Ra-226 results.

8. Site samples should be analyzed for the same radionuclides as the RBA samples. SAP Worksheet #11, Project Quality Objectives/Systematic Planning Process Statements, Step 6, Specify the Performance Criteria, states that all RBA samples will be analyzed by the respective method for the radionuclides listed in Worksheets #15a, #15b, #15c, and #15d, which include most primordial and decay chain radionuclides by gamma spectrometry and isotopic uranium, thorium, plutonium, and americium. Statistical tests will be conducted to compare soil data sets from surface gamma scan surveys, and surface and subsurface analytical concentrations against different identified soil types and against each RBA per sample depth. However, it is unclear how this data will be used in a background evaluation of site sample results since the SAP proposes to only analyze site samples for a limited number of radionuclides and to only perform alpha spectrometry analysis for U-238 if Ra-226 is detected in the gamma spectrometry analysis at concentrations greater than the RG. Per previous Regulatory Agency request, all site samples should be analyzed for the same radionuclides as the RBA samples. At a minimum, the requirement to analyze samples with Ra-226 concentrations above the RG for all uranium and thorium isotopes should be included in the SAP. Please revise the SAP accordingly.

9. SAP Worksheet #14, Summary of Project Tasks, does not discuss potential soil types, including those that are not native to the Bayview Hunters Point area, or how excavated soil will be segregated by soil type. Some fill has been determined to be granite from the Sierra, which has a very different radiological signature from local soil and rock. Also, the sand near the former theater is a unique fill type. While the backfill in the trenches is likely well mixed, the sidewall/floor unit (SFU) soil may not be, but there is no proposal to segregate this material by soil type during excavation. Also, use of the soil sorting system would preclude segregation by soil type. It may be possible to segregate SFU soil by soil type on a radiological screening yard (RSY) pad. Please revise the SAP to provide procedures for segregating SFU soil by soil type.

10. SAP Worksheet #15a, Reference Limits and Evaluation Soil Gamma Spectroscopy requires a Minimum Detectable Concentration (MDC) for cesium-137 (Cs-137) of 0.05 picoCuries per gram (pCi/g), but the laboratory SOP provided quotes a Cs-137 detection limit of 0.1 pCi/g with a 500 gram dry sample. This can be remedied easily by using a counting geometry that would allow for twice the weight, increasing the count time by a factor of 4, or a combination of the two to reach the required detection limit of 0.05 pCi/g. Please revise the SAP to include the requirement that the contracted laboratory to meet the Worksheet #15 MDCs.

11. SAP Worksheet #17, Sampling and Survey Design and Rationale is incomplete because it does not discuss whether soil samples collected from areas around Buildings 351, 364, and 365 identified in the Historical Radiological Assessment (HRA) as locations where Plutonium-239 (Pu-239) was used will be analyzed for Pu-239 as a requirement. Please revise the SAP to include a requirement to analyze all site soil samples for Pu-239 that are collected from trenches near or around all Parcel G buildings identified in the HRA as being associated with the use or disposal of Pu-239.

12. SAP Worksheet #17, Sampling and Survey Design and Rationale is incomplete because it does not require Plutonium-239 (Pu-239) analysis for all site soil samples collected from trench units near or around Buildings 351A, 364, and 365, which were identified in the Historical Radiological Assessment (HRA) as locations where Pu-239 was used and is a ROC. The SAP states Pu-239 analyses will only be conducted for soil samples with Cs-137 or Sr-90 detections at or above the respective RG. However, the SAP states Sr-90 analysis will only be performed for 10% of the samples, therefore this criterion is not appropriate for TUs near buildings that previously handled Pu-239. Please revise the SAP to include a requirement to analyze all site soil samples from trenches near or around all Parcel G buildings identified in the HRA as being associated with the use or disposal of Pu-239.

13. SAP Worksheet #17, Sampling and Survey Design and Rationale, is inconsistent with Worksheet #11, Project Quality Objectives/Systematic Planning Process Statements, because Worksheet #17 does not propose segregating sidewall and floor unit soil on RSY pads. Please resolve this discrepancy.

14. Previously submitted comments/concerns summary: The SAP gives details related to *Parcel G Removal Site Evaluation Work Plan, Former Hunters Point Naval Shipyard*, San

Francisco, California, June 15, 2018 ("Work Plan"). Therefore, many of the comments that EPA made on the draft Work Plan[1] also apply to the SAP. The draft SAP arrived for review at the same time that EPA submitted its comments on the Work Plan, so the Navy would not have had the opportunity to incorporate the Work Plan comments into the SAP. For convenience, this comment summarizes some examples of the Work Plan comments that are also relevant to the SAP. We appreciate that the Navy stated its intentions to incorporate regulatory comments already given for the Work Plan into the relevant corresponding aspects of the next version of the draft SAP.

a. The SAP states that if site conditions are not compliant with the Parcel G ROD remedial action objectives (RAOs), then the data will be evaluated to determine whether site conditions are protective of human health using the EPA's current guidance on Radiation Risk Assessment at CERCLA Sites rather than that exceedances will be excavated.

b. The SAP Executive Summary and Worksheet #11 Decision Rules do not state that if contamination is identified in any of the initial 33 percent (%) of trench units/survey units (TUs/SUs), then all TUs/SUs in Parcel G will require excavation and investigation.

c. The SAP does not include all the technical information requested for the proposed sample analyses, including a copy of all sampling and analytical standard operating procedures (SOPs) and as applicable, nuclide libraries used to quantitate results.

d. Analysis and reporting of all uranium and thorium isotopes by alpha spectroscopy for samples with elevated radium-226 (Ra-226) are not specified.

e. A requirement to report count times, results, counting and total propagated uncertainty for all radiological results is not specified.

f. Only six locations are proposed for collection of core samples in Phase 2 trenches rather than at the number of locations as identified using the Multi-Agency Radiological Site Survey and Investigation Manual (MARSSIM) formulas for performing a statistical analysis.

g. The SAP does not state how large the SUs will be for Phase II, or how the size will be determined. Note that per MARSSIM guidance, Class 2 land areas should not exceed 10,000 square meters. EPA expects the survey units to be the same size as in previous work, i.e. the size of soil survey units will not exceed 1,000 square meters and the building survey unit sizes will not increase.

h. The SAP discusses the soil sorting operations used to screen excavated soil but does not include an operations plan or include the specifics about which radiological properties

[1] EPA's August 14, 2018, comments on the Navy's June 15, 2018, draft Parcel G Work Plan are available at this link: https://semspub.epa.gov/work/09/100009276.pdf. EPA's March 26, 2018, comments on the Navy's February 9, 2018, draft Work Plan for retesting survey units where Tetra Tech EC Inc. had previously worked are available at this link: https://semspub.epa.gov/work/09/100009179.pdf.

will be monitored or how alarms will be set to segregate soils that will receive further radiological investigation/analysis.

i. The SAP does not provide the basis for the number of samples planned to be collected from TUs/SUs. It also does not propose incorporating the variance from newly collected data in MARSSIM equation 5-1 for updating the required number of samples to be collected from each survey unit as new data is collected as part of the Parcel G investigation. EPA comments recommend using MARSSIM procedures to calculate those.

j. The SAP does not address the instrumentation and survey parameters for investigating the potential presence of radiological objects such as deck markers containing Strontium-90 (Sr-90) in soil.

k. The SAP does not provide sufficient information to fully evaluate the sufficiency of the buildings investigation. It also does not propose updating the building release criteria using the EPA Building Preliminary Remediation Goal (BPRG) Calculator for radionuclides to ensure the limits remain protective of human health.

l. The SAP does not explain the assignment of MARSSIM classifications to all building survey units.

m. The SAP does not state how the number of static measurements was determined for building survey units and does not propose incorporating the variance from newly collected data in the MARSSIM equation 5-1 for updating the number of static measurements required to be collected from each survey unit as new data is collected as part of the Parcel G building investigation.

n. The SAP does not state if wipe samples will be sent to the laboratory for destructive analysis to determine which radionuclide is contributing to the radiation if release limits are exceeded for gross alpha or gross beta.

o. The SAP proposes to evaluate background data for outliers using Dixon's and Rosner's statistical outlier tests, both of which assume the data are normally distributed. Population distributions are often not normally distributed; therefore, population distribution and careful evaluation of background data should be performed to fully justify removing any data points.

p. The SAP does not propose analyzing and reporting all naturally occurring radionuclides in site samples that are also Radionuclides of Concern (ROCs) to determine if the uranium-238 (U-238) and thorium-232 (Th-232) decay chains are in secular equilibrium prior to conducting any outlier evaluations or comparison of ROCs to background levels of radionuclides.

Please ensure that the SAP is revised to address these issues.

SPECIFIC COMMENTS

1. **SAP Worksheet #9, Project Scoping Session Participants Sheet, Pages 35, 36:** Please include Dave Kappelman in this worksheet.

2. **SAP Worksheet #14, Summary of Project Tasks, Page 59:** The Data Management subsection does not provide sufficient data management requirements. The worksheet states that electronic copies of original electronic data sets will be preserved on a nonmagnetic retrievable data storage device and further states additional details are provided in Worksheet #29 and the Parcel G Work Plan Appendix B SOPs. Worksheet #29 states that data will be maintained in project files and stored for a minimum of 7 years in accordance with the CLEAN 9000 contract requirement. However, given the nature of the planned future use of the site for residential re-development, please revise the SAP to propose retaining files for a longer period of time.

3. **SAP Worksheet #14, Summary of Project Tasks, Page 59:** The Data Management subsection states that project data will be documented in accordance with the Parcel G Work Plan Appendix B. The data management SOP in the Parcel G Work Plan Appendix B, SOP RP-114, Control of Radiation Protection Records, defines documentation requirements for "radiation protection records." Therefore, it appears the intent of this SOP is to govern worker protection records rather than environmental data. In addition, neither Worksheet #29 nor the Parcel G Work Plan specifies the location of the storage facility where these records will be maintained. Please revise the Parcel G Work Plan or SAP to include a SOP, or additional explanation for the requirements storing all project documents, to ensure the integrity and long-term retention of such records.

4. **SAP Worksheet #23, Analytical SOP References, Pages 93-94:** This worksheet includes a listing of methods and SOPs, however some of the SOPs referenced in this worksheet are not included in Attachment 3, Laboratory SOPs. For example, SOP GL-RAD-A-013, The Determination of Gamma Isotopes, Revision 26, February 2017 is not included in Attachment 3. Please revise the SAP to include all analytical SOPs listed in Worksheet #23 and to ensure the nuclide libraries are included for all relevant methods.