

**COMMENTS to the HPNS DRAFT FIFTH FIVE YEAR REVIEW REPORT**

Submitted via email to: [HPNS FYR Comments@us.navy.mil](mailto:HPNS_FYR_Comments@us.navy.mil)

Berkeley Law’s Environmental Law Clinic submits these comments to the Navy’s *Draft Fifth Five Year Review Report*, Hunters Point Naval Shipyard (“HPNS” or “Shipyard”) San Francisco, California, November 2023 (“*Draft Review*”), on behalf of Greenaction for Health and Environmental Justice (“Greenaction”) and its members and constituents in Bayview Hunters Point, San Francisco, and other communities around San Francisco Bay.

**I. INTRODUCTION**

Greenaction is a multiracial grassroots organization founded and led by local leaders from low-income and working class urban, rural, and indigenous communities. Its mission is to fight environmental racism and injustice and build a clean, healthy, and just future for all. Greenaction has been involved in health and environmental justice advocacy in Bayview Hunters Point (“BVHP”), a community disproportionately impacted by pollution, since Greenaction was founded in 1997. BVHP residents have borne the brunt of the impacts of the toxic and radioactive waste at the Shipyard. As such, they have a direct, personal, and long-standing interest in assuring a cleanup of the Superfund site that protects human health and the environment in the short and long term.

The *Draft Review*’s Climate Resilience Assessment (“CRA”) is inadequate. It fails to use the most current data and projects forward only to 2065, an arbitrary date supported by no rationally defensible reasons when the planned Shipyard development will be occupied well beyond that date.

The *Draft Review*’s radiological sections are flawed and fundamentally dishonest.

The Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”), 42 U.S.C. 9601, *et. seq.*, the National Contingency Plan (“NCP”), 40 C.F.R. 300.400, *et. seq.*, and the Federal Facilities Agreement (“FFA”),<sup>1</sup> govern this cleanup. They require that responsible parties act in good faith; there is an inherent obligation to tell the truth. For example, cleanup decisions must be supported by facts, by data in the record. Those facts must be true, not fraudulent, or misleading.

Instead of acting in good faith, the Navy has consistently misled the public throughout the cleanup, a practice it unfortunately continues in its *Draft Review*.

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<sup>1</sup> *Federal Facilities Agreement for Naval Station Treasure Island – Hunters Point Annex* (“FFA”).

A glaring example of the Navy's bad faith is that, despite five years' notice and without factual or legal justification, it simply ignored the statutory deadline for its *Fourth Five Year Review* ("*Fourth FYR*"), publishing it approximately nine (9) months late. The Navy further violated the law by publishing three *Fourth FYR Addenda*, the last of which issued approximately twenty (20) months after the deadline. Now, the Navy has the audacity to grant itself an ongoing extension, to institutionalize its *Fourth FYR* deadline violations by repeating them in its *Draft Review*. Rather than reverting to the lawful deadline, November 8, 2023, which the Navy has already blown past, the Navy says it will publish its *Final Fifth FYR* in July 2024.

The Navy's treatment of Congressionally mandated deadlines illustrates the contempt it has shown for the law throughout this cleanup.

The Navy's primary five-year review obligation is to assure the remedy remains protective. The Navy generally claims radiological remedies "will be protective,"<sup>1</sup> when radiological retesting is done. However, the Navy has no factual basis for those claims.

Undisclosed in the *Draft Review* is that the Navy's radiological contractor, Tetra Tech EC, Inc., (TtEC) committed fraud, all its data had to be discarded, and the Navy only intends to retest one-third of the soil remediation Tetra Tech did. Even if that one-third retesting found no contamination – which it **has** in all three Parcels undergoing retesting to date – the Navy would have no data on which to base a protectiveness determination in the other two-thirds.

Greenaction, among others, has always insisted that 100% retesting of Tetra Tech's work is necessary to rectify the fraud. The *Draft Review* is not honest enough to even mention the distinction between one-third retesting and 100% retesting or its significance to protectiveness.

CERCLA requires 100% retesting. Without it, a data-driven long-term protectiveness determination is impossible.

As described further below, the Navy's own agreement also requires 100% retesting. But the Navy has spent the last three years attempting to **invalidate its own data!** Characteristically, the *Draft Review* fails to even acknowledge the agreement, that retesting in 2021 found radiological contamination triggering 100% retesting, or that the Navy has reneged on its agreement in violation of the retesting work plans.

If the Navy insists it will do only one-third soil retesting, it must articulate what data it is relying on in making any representations about protectiveness of the two-thirds of soil it did not or will not test.

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<sup>1</sup> See Table 1.1.

## II. RADIOLOGICAL COMMENTS

### A. All Shipyard Sites Should Be Identified As “Radiologically Impacted” Until Demonstrated Otherwise

Much of the radioactive contamination at HPNS comes from sandblasting ships involved in atomic weapons testing, leaving dangerous residual radioactive contamination at the site, and from the Naval Radiological Defense Laboratory (NRDL), which operated from 1948 to 1960. Radioactive contamination was spread through the Shipyard by air, water, and other activities (i.e., physical tracking from truck tires, shoes, and animals) at a time when little thought was given to containing radiation and there were few safety precautions.

Radioactive contamination did not neatly conform to the artificial boundaries of the Shipyard or, within it, to the boundaries of Parcels the Navy assigned in later decades to facilitate the cleanup.

Furthermore, the Navy has repeatedly declared – definitively – that Shipyard sites were **not** radioactively contaminated when that turned out not to be true. For example, the Parcel B Record of Decision identified no radiological impacts in Parcel B, requiring no radiological remediation.

But the Navy was dangerously wrong; Parcel B **was** radiologically impacted. The ROD had to be amended to address radiological contamination and remediation.

More recently, the *Draft Review* admits that:

ROs [radiological objects] were identified during excavation and remediation of soil in areas **that were not considered radiologically impacted**. There is a high degree of confidence that discrete ROs were removed to a depth of 2 feet below ground surface (bgs). However, there is a potential for ROs to be present in material below 2 feet bgs where shoreline expansion has occurred since 1946. (Emphasis added, p. 5-37.)

The unexpected nature of this discovery highlights that the Navy has not properly characterized whether all Shipyard locations are radiologically “impacted.” It must revisit the issue in light of the facts and identify all parcels and sites as “radiologically impacted,” until and unless it can demonstrate with defensible scientific data that any particular site is not impacted.

The Navy must test for radioactive contamination in all areas of the Shipyard and because radiation may have been spread beyond the Shipyard, beyond its boundaries, as well.

### B. The Navy Continues to Mislead the Public

The Navy’s contempt for the law and its agreements extends to the Navy’s public participation obligations. By continuing to mislead, the Navy deprives the public of the ability to comment meaningfully on the Navy’s *Draft Review*.

The Navy misleads primarily through omission. A reader of the *Draft Review* and the two *FYRs* that preceded it would never learn about TtEC's fraud, for example. The Navy did not mention it in the *Third* or *Fourth FYRs*.

Accordingly, in its 2018 comments to the *Draft Fourth FYR*, Greenaction stated: "The Navy must not be allowed to mislead the public and regulators by dismissing the fraud's impact on the clean-up."<sup>2</sup> Unfortunately, the *Draft Review* **continues** to ignore the impact of the fraud on the clean-up, presenting an incomplete and misleading narrative.

The Navy has misled the public by omitting the entire history of the radiological remediation, including that:

- TtEC committed fraud and violated quality assurance and quality control requirements;
- The Navy allowed TtEC to investigate and clear itself;
- The Navy defended TtEC for six years after the fraud was discovered, claiming its **invalid** data was **valid**;
- The Navy did its own evaluation of TtEC data and found much more evidence of fraud than TtEC did;
- Regulators did an independent data review and found that data from one parcel was 97% suspect, and another was 90% suspect;
- The Navy agreed, after six years of defending TtEC's data, to discard it as unreliable;
- The Navy and EPA decided, despite vociferous public objections, to a retesting plan that required only one-third soil retesting, with the proviso that if any contamination was found, that finding would trigger 100% soil retesting;
- Contamination **was** found in all three parcels retested, including 23 strontium 90 ("Sr-90") samples from 9 different Parcel G locations that exceeded the remedial goals; and
- The Navy has spent three years attempting to **invalidate** its own **valid data** to renege on its retesting agreement.

The *Draft Review* omits more than a decade of the cleanup's history. Rather than acknowledge the fraud and its impact, the Navy merely says, "evaluations determined previous data were unreliable,"<sup>3</sup> and cites "uncertainty with a portion of the radiological survey and remediation work."<sup>4</sup>

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<sup>2</sup> Greenaction, *Comments to the Draft 5 Year Review Hunters Point Naval Shipyard* (2018), p. 12.

<sup>3</sup> See, for example, pp. xviii, 3-45, 4-45, 5-37, 6-57.

<sup>4</sup> See, for example, pp. xviii, 3-45, 4-19, 4-45, 5-16, 5-37, 6-12, 6-57.

To describe what regulators found – Parcels with 97% and 90% defective data – as “uncertainty” in a “portion” of the work is grossly misleading.

Considering that EPA and others, including Greenaction, have repeatedly pointed out these omissions through multiple *FYRs*, these omissions are clearly intentional.

In sum, the Navy omits any facts that do not support its desired conclusion: that no further remediation will be required no matter what retesting finds.

### **C. Radiological Retesting**

The Navy proposed and EPA approved three related work plans to retest the TtEC’s work: the June 2018, *Final Parcel G Removal Site Evaluation Work Plan*; the April 2022, *Final Parcel B Removal Site Evaluation Work Plan*; and the August 2022, *Final Parcel C Removal Site Evaluation Work Plan* (collectively, the “*Retesting Work Plans*”).

The *Retesting Work Plans* each memorialized the retesting agreement:

For Phase 1, 100 percent of soil will be re-excavated and characterized at 33 percent of trench units (TUs) associated with former sanitary sewers and storm drains in Parcel G. Soil sampling and scanning at the remaining 67 percent of TUs will be performed as part of Phase 2 to increase confidence that current site conditions comply with the Parcel G ROD RAO. **The Navy will re-excavate 100 percent of Phase 2 TUs if contamination is identified in Phase 1 TUs.** (Emphasis added.)<sup>5</sup>

#### **1. Strontium-90 Exceedances Were Identified in Parcel G Retesting**

Using approved EPA methods, retesting in 2021 in Parcel G found at least 23 samples, from 9 different trench units, exceeding the strontium 90 (“Sr-90”) remediation goal, 0.331 picocuries per gram (“pCi/g”).

Instead of accepting its own sampling results and living up to its 100% retesting agreement, the Navy made false claims about the Sr-90 results. These claims include that the results were (1) false positives; (2) within “background” radiation levels; (3) invalid data; and (4) not considered a risk to human health or the environment.

All these falsehoods served a single purpose: to invalidate the Sr-90 exceedances and avoid triggering 100% retesting.

However, EPA objected to the Navy’s attempt to invalidate the Sr-90 results. In September 2021 emails obtained through the Freedom of Information Act (“FOIA”), EPA stated: “[t]he previous strontium-90 results are valid data. It's inaccurate to suggest the data were not

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<sup>5</sup> *Final Parcel G Removal Site Evaluation Work Plan*, Former Hunters Point Naval Shipyard, June 2019, p. 3-5. *Final Parcel B Removal Site Evaluation Work Plan*, Former Hunters Point Naval Shipyard, April 2022, p 3-5; *Final Parcel C Removal Site Evaluation Work Plan*, Former Hunters Point Naval Shipyard, August 2022, p. 3-6.

precise enough. EPA has been clear that in the absence of convincing evidence, we cannot support using the new data to supersede existing results.”<sup>6</sup> (Emphasis added.)

The *Draft Review* ignores the Sr-90 findings.

## 2. Radioactive Objects Were Found in Parcels B & C Retesting

The Navy also found radiological contamination in Parcels B and C. At a public meeting on September 25, 2023, the Navy disclosed scanning of Parcel C soil, previously “remediated” by TtEC, found an easily identifiable, radioactive “deck marker.” At a public meeting on December 4, 2023, the Navy disclosed it found a radioactive object in Parcel B soil, a glass object contaminated with Radium-226.

These findings are also ignored in the *Draft Review*. Like the Sr-90 exceedances the Navy would rather not mention, these omissions indicate the Navy’s determination to keep inconvenient facts out of the record.

## 3. The Navy Reneges on the Retesting Work Plan

Three years after the SR-90 was found exceeding remedial goals, the Navy still refuses to accept the exceedances as valid data. It has announced it is conducting an Sr-90 “verification study,” which it plans to release in June 2024.<sup>7</sup>

There is no mention of this study in the *Draft Review*. If the Navy releases the verification study in June 2024, that will be a month **after** the comment period for the *Draft Review* closes on May 7, 2024. This precludes public comments about the Sr-90 study and deprives the public from exercising their public participation rights.

## 4. The Navy Violates Its Duty to Assure Protectiveness

CERCLA requires *FYRs* to “assure that human health and the environment are being protected by the remedial action being implemented” – in the present tense. (Emphasis added.)

The Navy has consistently, and improperly, deferred this requirement.

The *Draft Review* claims, “This report is intended to identify issues that may **prevent a particular remedy from functioning as designed, which could affect the protection of human health and the environment** should exposure occur.” (Emphasis added, p. xv.)

But it fails to do so.

First, assurance is binary. Either the remedy meets CERCLA’s long-term protectiveness standards, or it does not. The *Draft Review* makes neither of these assertions. Instead, its

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<sup>6</sup> EPA email message to the Navy, RE: HPNS Timely Topic, Sep. 23, 2021.

<sup>7</sup> Navy Presentation to HPNS Citizens Advisory Committee, Strontium 90 Verification Timeline, March 25, 2024, slide 10, [https://hpscac.net/wp-content/uploads/2024/03/HPNS-Update\\_HPSCAC\\_25Mar2024-1.pdf](https://hpscac.net/wp-content/uploads/2024/03/HPNS-Update_HPSCAC_25Mar2024-1.pdf).

Protectiveness Statements misleadingly claim that remedial actions at Parcels B, C, D, and G are “short-term protective.” These claims are based on access controls, such as fences, signage, and caps, to restrict access to contaminated sites.

By focusing on “short-term protectiveness,” the Navy **again** improperly defers its protectiveness determination as it did in its *Fourth FYR*, which promised it would be addressed in the *Fifth FYR*.<sup>8</sup> Now that time has come, but rather than stating the obvious truth – that the remedy is **not** protective of human health and the environment – the Navy defers it once again, defeating the entire purpose of five year reviews.

Second, as mentioned above, the *Draft Review* ignores the single most important factor that “may prevent a particular remedy from functioning as designed, which could affect the protection of human health and the environment should exposure occur,” the TtEC fraud.

Instead of addressing long-term protectiveness, the Navy makes short-term claims, as summarized in the *Draft Review*:

Based on this Fifth Five-Year Review, the remedy at IR-07/18 is Protective, the remedies at Parcels B-1, B-2, C, UC-2, D-1, D-2, UC-1, G, and UC-3 are Short-Term Protective because there are no current uncontrolled exposures, and the remedies at Parcels E and E-2 Will be Protective upon completion of remedy construction. (p. xv.)

This passage contains no statement that the remedies are protective in the long term or, except for Parcels E and E-2, will be. Similarly, in its Protectiveness Statements, the Navy only discusses short term protectiveness, deferring the long term “until retesting is complete:”

Radiological retesting is ongoing to **confirm** that levels in soils and structures are protective of human health. **Until retesting is complete**, short-term protectiveness is met through Navy controls such as access to the parcel through fencing, locked gates, and ICs (restricting intrusive work and maintaining durable covers). (Parenthesis in original, emphasis added, p. xix.)<sup>9</sup>

However, what the Navy is “confirming” is unclear. In 2018, the Navy discarded all TtEC’s data, at least nominally. The Navy has no valid radiological testing data to “confirm.” No long-term remedy can be protective unless 100% retesting of TtEC’s work is done and any remediation it identifies as needed is completed.

Neither CERCLA nor EPA guidance allow using short-term protectiveness to substitute for long term protectiveness. CERCLA requires both. Temporary measures are insufficient to satisfy long-term protectiveness. Fencing off and/or covering over contamination is not a permanent “remedial action being implemented,” they are not CERCLA removal or remedial actions. The *Draft Review* does not assure the remedy is protective for future families who may live on the Parcels for decades to come.

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<sup>8</sup> See *Draft Review*, pp. 1-8, 1-9.

<sup>9</sup> See, for example, pp. xix, xx, xxi, xxii, 3-22, 3-23, 4-20, 4-21, 5-17, 5-18, 6-24.

Furthermore, as discussed further below, the Navy has failed to demonstrate that its remedial goals for buildings and soil meet the current CERCLA risk range, and the Navy has no intention of doing so until after the retesting is complete.

Accordingly, there is no valid data on which to base any assertion that the remedy is protective of human health and the environment in the long-term. For some Parcels, it may have soil data, but only in one-third of the soil tested. The Navy has not released this data. Nor has it released retesting data from buildings.

The Navy will never be able to assure long-term protectiveness with incomplete data. It must retest and if necessary, re-remediate 100% of TtEC's work to satisfy CERCLA.

In fact, the retesting data the Navy has, no matter how incomplete, indicates that the remedy does **not** meet the Shipyard's remedial goals; 23 samples from Parcel G exceed the remedial goals for Strontium 90.

Therefore, the *Draft Review* must state the remedy is **not** protective of human health and the environment and then detail the steps necessary to achieve protectiveness and the timeline within which it will be accomplished.

#### **D. The *Draft Review* Violates the FFA and EPA Guidance**

On January 22, 1992, the Navy, the EPA, and the Department of Toxic Substances for the State of California entered into the Federal Facilities Agreement for Naval Station Treasure Island – Hunters Point Annex (“FFA”).

Section 1, “Purposes of the Agreement,” states that the purpose of the FFA is to:

Establish a procedural framework and schedule for developing, implementing and monitoring appropriate response actions at the Site **in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Contingency Plan (NCP), Superfund guidance and policy, the Resource Conservation and Recovery Act (RCRA), RCRA guidance and policy, and applicable State law....** (Emphasis added).

In other words, the parties agreed EPA CERCLA guidances would be mandatory.

EPA has published numerous guidances, including its *Comprehensive Five-Year Review Guidance*, which “provide[s] an approach for conducting five-year reviews, facilitate consistency across the ten EPA regions, clarify current policy, and discuss the roles and responsibilities of various entities in conducting or supporting five-year reviews.”

The Navy has failed to act in accord with this guidance by failing to: 1) determine whether there have been changes in toxicity or other contaminant characteristics that need to be investigated; 2) identify “recent toxicity data and their sources”; 3) investigate whether the exposure assumptions, toxicity data, and cleanup levels are still valid; 4) recalculate risk



assessment to account for changes in standards and/or toxicity data; and 5) investigate the question, “Has any other information come to light that could call into question the protectiveness of the remedy?”

Although the *Draft Review* acknowledges that “there have been some changes to toxicity values and risk assessment methods,” the Navy summarily dismisses them, concluding they “do not affect remedy protectiveness.” However, the Navy failed to adequately explain **why** the changes do not affect protectiveness, failing to justify this conclusion; it cites no facts, data, or calculations, as required by EPA’s guidance.

## **E. The Navy Failed to Update Risk Calculations (PRGs) Yet Again**

In the *Draft Review*, the Navy claims it updated the risk calculations:

Following the recommendation from the Fourth Five Year Review, the Navy issued addendums evaluating the long-term protectiveness of the RGs [remedial goals] for soil and building structures, which **concluded that the current RGs are protective** for all future land users (Navy, 2020a, 2020b). (Parenthesis in original, emphasis added, p. 1-9.)

However, like much of the *Draft Review*, the Navy’s history of the *Fourth FYR Addenda* is misleading.

EPA insisted the Navy update the PRGs in comments to the *Draft Fourth FYR*. For reasons that have never been made public, after the *Draft Fourth FYR* was “finalized,” the Navy issued the three *addenda* cited above, purporting to validate the RGs.

### **1. Soil Remedial Goals**

The soil remedial goals were adopted in 2006. The two soil *addenda* purported to demonstrate that the Navy did both RESRAD<sup>10</sup> and PRG calculations. According to the Navy, they verified the remedial goals’ protectiveness.

But The Navy’s calculations fell outside of the acceptable CERCLA risk range ( $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ ). For example, according to the *Addendum*, the remedial goal for Cobalt-60, 0.0361 pCi/g, translates to an excess lifetime cancer risk of 1.7 in a million, nearing twice the limit for CERCLA risk’s “starting point” of 1 in a million. The Navy failed to include any facts justifying exceeding a  $1 \times 10^{-6}$  risk, as required by EPA guidance.

On or about November 15, 2019, EPA sent the Navy its *EPA Review of the Draft Addendum to the Fourth Five Year Review Evaluating Radiological Remediation Goals for Soil*, a comment letter unambiguously stating the 2019 Soil Addendum failed to meet its obligation to assure protectiveness: “[A]t this time, EPA cannot verify that the soil radiological

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<sup>10</sup> RESRAD is a computer model developed by Argonne National Laboratory and sponsored by the Department of Energy to evaluate doses from residual radioactivity in nuclear power plants. It is not an approved EPA CERCLA method or guidance.

**remediation goals are protective of human health for long-term protectiveness.”** (Emphasis in original.)

The Navy posted a statement on its website less than two weeks later, on November 26, 2019, stating, “EPA recently concurred on the protectiveness determinations in the Navy’s Five-Year Review.”

Like many other examples, this statement was misleading.

By letter of August 18, 2020, the Navy approved implementing the June 2019 *Parcel G Removal Site Evaluation Work Plan*, as supplemented by the July 2020 *Parcel G Removal Site Evaluation Work Plan Addendum*. The letter also responded to the *2020 Soil Addendum*, which, according to the EPA’s letter, was prepared “to evaluate the long-term protectiveness of the soil radiological remediation goals.” But rather than assuring the remedies **are** protective, the *Addendum* claimed radiological remedial goals are **expected to be**:

Using RESRAD and the PRG Calculator to estimate the maximum radiation dose and risk to residents from exposures to Hunters Point soils has verified that **the soil radiation remediation goals are expected to be protective** for all future land users. (Emphasis added.)

In other words, the Navy **predicts** the remedial goals will be verified sometime in the future, once again “kicking the can” of the PRG/RESRAD dispute – which has been going on for at least **six years** – “down the road” yet again.

EPA’s August 18, 2020, letter clearly states the PRG/RESRAD dispute has **not** been settled. Speaking of the *2020 Soil Addendum*, EPA wrote:

**The FYR Addendum does not complete the long-term protectiveness evaluation of the soil radiological remediation goals.** Instead, the FYR Addendum describes Navy plans to further evaluate cancer risk **after the radiological retesting data are available.** (Emphasis added.)

Again, the Navy improperly deferred its protectiveness determination until some future evaluation. It does not even venture a guess as to when that might be.

The *Fourth FYR Addenda* also deferred all consideration of cumulative risk. The *2020 Soil Addendum* states:

The Navy will continue to evaluate risk during remedial investigations to verify that **combined risks** due to site-related contamination (i.e., radiation, volatile organic compounds, metals, etc.) achieve appropriate protectiveness standards. (Emphasis added.)

EPA’s August 18, 2020, letter addressed deferring the cumulative risk and found it necessary to remind the Navy of EPA’s so-far frustrated expectations:

In this planned **future evaluation**, the Navy **will evaluate the retesting data** to ensure that the additive risk from multiple radiological and chemical contaminants, if present, is within the EPA cancer risk management range. We expect the Navy to examine site-related health risks and risks inclusive of background. Consistent with EPA guidance, we expect the Navy to provide a clear justification for any cancer risks above  $1 \times 10^{-4}$ .

Left unsaid by EPA was that the *2020 Soil Addendum* did not demonstrate the soil remedial goal remained within the CERCLA risk range.

The remedial goals have not been updated since 2006, while EPA’s default Preliminary Remediation Goals have been updated, most recently in 2023.

Following is a chart comparing the EPA 2023 default soil PRGs and the remedial goals the Navy adopted in 2006 and continues to use. The EPA default PRGs are orders of magnitude more protective than the Navy’s remedial goals.

**SOIL RELEASE CRITERIA COMPARISON – Residential – 1997 to 2023**

<u>Radionuclide</u>	<u>HPNS (2006)</u>	<u>EPA 2/20/23</u>
Americium-241	1.36	.4800
Cesium-137	0.113	.0401
Cobalt-60	0.0361	.0285
Europium-152	0.13	.0384
Europium-154	0.23	.0467
Plutonium-239	2.59	.4450
Radium-226	1.0	.00192
Strontium-90	0.331	.00477
Thorium-232	1.69	.00170
Tritium	2.28	no value listed
Uranium 235+D	0.195	no value listed

The Navy needs to explain to the general public, using non-technical, commonly understood language, how the 2006 remedial goals could still be protective considering that the 2023 defaults are orders of magnitude lower than the remedial goals. The Navy must update the PRGS, “showing the arithmetic” to the public to justify the PRGs that result from proper application of the PRG calculators.

**2. Building Remedial Goals**

EPA’s comments to the *Draft Review* clearly state the Navy’s submission of the *Fourth FYR Building Addendum* did not satisfy its demands the Navy update the building PRGs:

**EPA did not approve this addendum** nor the follow-on building re-testing workplans due to our collective inability to reconcile technical differences between the Navy’s use

of the RESRAD Build model and EPA's Building Preliminary Remediation Goal calculator. (Emphasis added.)

EPA then explains the Navy changed the remedy:

More importantly, based on a substantive change in building reuse plans and recent congressional authorization, the Navy is now preparing to demolish and dispose of all potentially radiologically impacted buildings, except two historical structures, rather than certify them for unrestricted reuse.

The RESRAD/PRG dispute having apparently been mooted out, EPA urged the Navy to "ensure building materials are characterized sufficiently to help determine how to safely protect human health and the environment during demolition and how to dispose of the debris in a regulatory-compliant way."

However, as EPA notes, not all buildings are being demolished. Two historical structures will not be demolished. There are also approximately three other historical buildings in other Parcels that will not be demolished. Accordingly, unless the Navy can demonstrate that none of the historical buildings were radiologically impacted, the PRG/RESRAD dispute remains. The Navy must update its building remedial goals as part of this *Fifth FYR*.

### 3. Other Deficiencies

The risk calculations in the *Fourth FYR Addenda* are misleading because of the Navy's misuse of "institutional controls" ("ICs"). For example, the Navy's risk calculations exclude all risk to future residents from consuming homegrown food. The Navy justifies this by ICs which prohibit growing plants except in raised boxes, to be enforced through deed notices.

However, the ICs are insufficient to assure long-term protectiveness. First, EPA's guidance, *PRG User's Guide*, allows for exposure pathways like those from homegrown food to be switched off only if "a route of exposure . . . is considered to be unreasonable at their site, both currently and in the future."

It is unreasonable to assume future residents will forever garden only in raised beds if that limitation is enforced merely by deed notices. And even if all residents were made aware of the institutional controls and tried to comply, it is unreasonable to assume that raised beds will continue to be protective in perpetuity.

Second, the Navy has never provided a realistic plan to realistically enforce the ICs continuously in the future. All discussion of implementation of IC's has been deferred until the Land Use Controls Remedial (LUC) design reports become effective, upon property transfer. (*Draft Review*. p. 1-6.)

Furthermore, the Navy's protectiveness calculations failed to calculate total risk from the sum of all radionuclides. It also failed to sum the radiological risks with chemical risks.

There is no factual justification for deferring assessing cumulative risk until after the retesting is completed, particularly if the Navy does only one-third retesting of soil.

Finally, the Navy has not properly justified its background radiation calculations, as it improperly took background samples at Shipyard sites that were likely radiologically impacted.

#### **F. The Navy Violated the Law by Not Responding to Comments to the *Draft Fourth FYR***

Greenaction submitted substantial, detailed comments to the *Draft Fourth FYR* during the public comment period relating to radiological issues and the impact of global warming on the remedy. They are attached hereto and incorporated herein by reference as Exhibit 1.

CERCLA and the NCP require that the Navy respond to such comments, pursuant to 42 U.S.C. § 9617(b), and 40 C.F.R. 300.430(f)(3)(i), respectively. The FFA also requires it.

The Navy did not respond to Greenaction's comments to the *Draft Fourth FYR*, in violation of CERCLA, the NCP and the FFA.

The Navy must not repeat its *Fourth FYR* violations and respond to all comments to the *Draft Review*.

The Navy must explain in response to our comments why it has omitted virtually all the key facts about the history of radiological remediation, fraud, and retesting.

It must also respond with rational reasons why it has spent the last three years attempting to invalidate its own data, if there are any, other than that the Navy seeks to repudiate its retesting agreements and will do whatever it takes to get out from under them.

#### **G. The Navy Is Still Relying on TtEC's Discredited Data**

Considering EPA found 97% of TtEC's data to be unreliable in one Parcel and 90% unreliable in another,<sup>11</sup> there are no rational reasons for the Navy to continue to cite or rely on TtEC data.

However as with the *Fourth FYR*, the Navy improperly continues to rely on TtEC data. The Index of the *Fourth FYR* listed 117 TtEC documents, 91 of which are entitled either "Final" or "Final Final" status surveys. In the *Draft Review*, the Navy continues to rely on TtEC data. The Index lists 26 Tetra Tech, EC Inc. documents, most of them relating to radiological remediation.

The Navy should either excise all references to TEC data or specify what data it is citing from TtEC and justify its use by demonstrating it is not tainted by fraud and/or quality assurance and quality assurance deficiencies.

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<sup>11</sup> December 27, 2017, letter from John Chestnutt (EPA) to George ("Pat") Brooks (Navy) accompanying EPA Final Comments on Draft Navy Radiological Data Evaluation Parcels B & G Report (December 27, 2017), p. 1.

### III. COMMENTS ON the CLIMATE RESILIENCE ASSESSMENT

Greenaction and its community partners are extremely disappointed that the Navy continues to proceed with capping radioactive and toxic waste at this shoreline site. The Navy's continued reliance on capping and seawalls is unacceptable and a recipe for disaster. It is also in defiance of and contradictory to the Superfund law's mandate that a remedy must remain protective. The current remediation methods for multiple parcels includes capping radioactive and toxic waste along the shoreline, which will NOT remain protective when inundated and flooded by groundwater and sea level rise. **We cannot accept an inadequate cleanup that includes capping of waste where it will be flooded and spread into communities and the environment.**

*Comment one – The Five Year Review must use the government's scientific projections when planning for risks before and beyond 2065.*

#### *Sea-level and Bay-level Rise*

Sea level rise and groundwater rise does not have an endpoint in sight. In fact, the Navy's planning only until 2065 makes it the only such agency to pretend it is not currently necessary to plan beyond 2065. All the relevant regional, state, and federal agencies involved with this issue are using higher sea level rise projections, and a longer time period as well, for planning.

The HPNS Superfund site is located directly on the shoreline of San Francisco Bay. Sea level rise and groundwater rise will cause negative and potentially devastating impacts to the health of adjacent communities and San Francisco Bay.

The Navy's Climate Resilience Assessment ("CRA") section of the *Draft Review* improperly uses sea-level rise ("SLR") projections of 1.0 feet by 2035 and 3.2 feet by 2065. These projections are too low to adequately assess the risk of sea level rise or the resilience of the proposed and current remediation.

The latest report from the Ocean Protection Council ("OPC") recommends sea level rise planning should use projections of 0.8ft- 1.2ft by 2050 and 3.1ft- 6.6ft by 2100.

To protect the environment and communities living on the shoreline, all development, adaptation plans, and related activity on the shoreline must plan and prepare for the worst-case scenario and highest projections. This is not just an issue of potential flooding infrastructure but also potential inundation and spreading of toxic and radioactive waste, including atomic bomb residue.

The CRA does not follow all the requirements of DTSC's *Sea Level Rise Vulnerability Assessment* ("SLRVA"). As their *Sea Level Rise Guidance* states: "The initial SLRVA should be based on the California SLR Work Plan recommendation to assess pathways to resiliency to 3.5 feet of SLR by 2050 and 6.0 feet by 2100."<sup>12</sup>

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<sup>12</sup> State of California Sea Level Rise Guidance: 2024 Science and Policy Update <https://opc.ca.gov/wp-content/uploads/2024/01/SLR-Guidance-DRAFT-Jan-2024-508.pdf>.

Instead, the CRA only includes projections until 2065. It is not adequate, and indeed, is extremely reckless and unscientific, to dismiss projections beyond 2065 and ignore the risks associated with higher projections until the next Five Year Review. The remediation methods for cleaning this site must remain protective indefinitely and prioritize the health and safety of the community and the environment. The CRA must be redone to include projections until at least 2100. And there must be additional opportunities for public participation once the revision of the CRA to include projections into 2100 takes place.

### ***Groundwater Rise***

Dr. Kristina Hill, an esteemed University of California Berkeley Professor and expert who studies groundwater rise, found that rising groundwater can infiltrate underground pipes, alter foundations, require underground waterproofing, remobilize old soil contaminants, emerge as surface water, and cause flooding.<sup>13</sup> She also concluded that:

With 1 meter of sea level rise, we can expect to see about 18,000 acres of flooded land (saltwater). [Their] map analysis shows that about 26,000 additional acres are at risk of flooding from freshwater groundwater, rising up through the soil. Even if we build walls and levees to protect from saltwater, groundwater flooding could still affect as much as 37,000 acres of what today is dry land.<sup>14</sup>

Dr. Hill's report is referring to the entire San Francisco Bay shoreline, but it highlights just how massive an impact groundwater rise can have. The CRA states the "historical high groundwater table from December 2012 was used as the baseline [to identify areas that may experience a groundwater table rise to a depth of 3 feet below ground surface.]" (p. A-15,16). Using data from more than a decade ago is unacceptable when this assessment is supposed to identify risks far into the future.

***Comment two – Capping contamination or using “durable” covers cannot be an acceptable form of remediation at the HPNS because of the risk associated with sea level rise, groundwater rise and inundation, and increased flooding from storms.***

Rising sea levels, rising groundwater, human, animal, and seismic activity all increase the risk of caps deteriorating and losing effectiveness. It is highly likely that contamination will come in contact with groundwater and threaten the health of community members, as well as the health of Bay ecosystems and its environment. With sea level rise, groundwater rise, and associated flooding, durable covers, capping, and containment of waste cannot be an acceptable form of remediation. This is especially true when there is radioactive contamination remaining at the site.

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<sup>13</sup> *Rising coastal groundwater as a result of sea-level rise will influence contaminated coastal sites and underground infrastructure*, by Dr. Kristina Hill, et al: [https://d197for5662m48.cloudfront.net/documents/publicationstatus/139385/preprint\\_pdf/5480722e3998464796727ca6838328de.pdf](https://d197for5662m48.cloudfront.net/documents/publicationstatus/139385/preprint_pdf/5480722e3998464796727ca6838328de.pdf). p. 7.

<sup>14</sup> *Id.*, p. 22.

There must not be any risk of exposure to toxic and radioactive contamination from an improper cleanup based on defective science. The *Draft Review* relies on monitoring to detect if the caps are working properly. However, once a monitor detects leaks, damage has already been done and contamination has begun to spread. Conducting maintenance on these leaks will also grow increasingly difficult as the site becomes temporarily or permanently flooded or covered by development. The facts are clear: capped waste will eventually be flooded, and at some point in the future, likely under water. That would be a major environmental disaster.

It would be impossible and near useless to try to monitor “durable” covers and capped contamination if and when the site becomes flooded, perhaps permanently. Using capping as a form of remediation for this cleanup, or any cleanup project along the shoreline, is a temporary fix that cannot protect surrounding communities and environments from exposure when the site is flooded. Capping waste requires monitoring and maintenance indefinitely.

Removing and/or treating the waste on-site will allow for less monitoring and maintenance.

Capping contamination rather than completely removing it leaves the Bayview Hunters Point community in close proximity to toxic and radioactive waste. Generations from Bayview Hunters Point have experienced environmental harm, a variety of pollution, poor air quality and toxic exposure as a result of living next to the Shipyard Superfund site. This community deserves a clean, safe, and healthy environment **now**.

The Hunters Point Naval Shipyard [Census Tract: 6075980600] ranks in the 83rd percentile for the overall CalEnviroScreen 4.0 Percentile score, which is based on pollution burden and population characteristics. Some census tracts surrounding the Shipyard rank even higher, since there is a higher population density, as reflected in the following table:

Census Tract	CalEnviroScreen 4.0 Percentile
6075023103	88
6075023200	92
6075023400	84
6075061000	76

EPA’s guidance, *Citizen’s Guide to Capping*, states that, “A cap will continue to isolate contamination **as long as it does not erode or develop cracks or holes that allow water to reach the contaminated material.**”<sup>15</sup> (Emphasis added.) This simple guideline should be enough to prove that capping along the shoreline, where we can expect over 6 ft of sea level rise,

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<sup>15</sup> EPA *Citizen Guide to Capping*: [https://19january2017snapshot.epa.gov/sites/production/files/2015-04/documents/a\\_citizens\\_guide\\_to\\_capping.pdf](https://19january2017snapshot.epa.gov/sites/production/files/2015-04/documents/a_citizens_guide_to_capping.pdf).



will not be protective. Caps will eventually erode or develop cracks that can result in migration of contamination into the environment.

***Comment three – Flooding has already occurred at the HPNS and has already threatened the health and safety of the surrounding community and environment.***

During the heavy rains in early 2023, Greenaction staff observed large areas of flooding in the Shipyard, including pools of water that lasted weeks and perhaps months in some areas. The Navy cannot defer considering the threat of flood-caused mobilization of contamination to a future time; the problem is already here. Contamination can be mobilized and spread by storm flooding and spread into community spaces, environments, and ecosystems. Some flooding also occurred in early 2024 during the heavy rains and atmospheric rivers.

***Comment four – As this is a shoreline contaminated site in a heavily impacted community subject to sea level rise and groundwater rise, the entire site must be completely cleaned up to residential standards, with no contamination remaining on-site.***

The HPNS Superfund Site is at extreme risk of permanent flooding from sea level rise and groundwater rise. The cleanup should be as close to a 100% cleanup as possible, no matter what the future land use may be. Leaving toxic and radioactive waste at the site has the potential to harm the entire Bay, including all other San Francisco Bay shoreline communities. There is no excuse for leaving hazardous waste on the shoreline when there is a high chance of flooding and inundation in the future. The site also must be completely cleaned because the surrounding Bayview Hunters Point community has long been harmed by exposure to dangerous chemicals, radiation, and pollution. They deserve a clean environment.

***Comment five – Pursue and research safe, alternative treatment technologies that do not leave toxic and radioactive waste along the shoreline.***

Greenaction urges the Navy and government regulatory agencies to pursue the use of safe, alternative treatment technologies to the extent possible during site mitigation as an alternative to dumping or burning toxic waste at disposal sites in other vulnerable communities.

The Navy stated in its latest bus tours that it plans to transport and dispose of waste from the Shipyard at the Kettleman Hills disposal facility. It is unacceptable, negligent, and unjust to dispose of the hazardous waste in dumps operating on expired permits, like Kettleman Hills.

Hazardous waste must also not be shipped out of state to locations where there are fewer restrictions on how hazardous waste is stored and managed. The Navy and EPA are responsible for treating the site and disposing of waste in a way that does not move the environmental burden and pollution from one community to another.

#### IV. CONCLUSION

Widespread fraud and quality assurance/quality control deficiencies, a botched cleanup and lack of proper regulatory oversight have compromised the cleanup of the HPNS contamination. This *Draft Review* is the time and process to re-evaluate the remedies because:

- They are not protective of public health or the environment,
- The remedial goals are outdated,
- The Navy only intends to retest one-third of the soil remediation done by Tetra Tech, and
- The remedies do not reflect latest scientific consensus on expected sea level rise due to climate change.

These comments highlight serious flaws and omissions in the *Draft Review* that must be corrected, including inadequate consideration of the impact of the radiological fraud on the cleanup.

The *Draft Review's* remedy analysis also fails to adequately address rising sea levels due to climate change which threaten San Francisco Bay and its waterfront. The threat that rising Bay levels could inundate portions of the shipyard, including Parcel E-2, is real and foreseeable, as is the inadequate revetment and retaining wall design that will not provide adequate protection from contaminants reaching the Bay. As Greenaction stressed in its comments to the *Fourth FYR*, these climate change threats must be addressed, not ignored.

The Navy must plan for – not underplay – predictable risks such as those posed by global warming, especially at Parcel E-2, where buried contamination is extensive and will continue to be toxic far into the future. If the Navy gets it wrong because of its refusal to factor up-to-date science into the five-year review, it could unleash a catastrophe to public health and the environment. As more and more data on sea-level and Bay-level rise emerges, the Navy must reconsider and conclude that the buried hazardous and radioactive waste at Parcel E 2 needs to be removed from proximity to residents and the rising Bay.

The *Draft Review* needs to be revised to incorporate up-to-date science and public health

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data. Common sense and environmental justice require that remedies be reappraised. Revised remedies must prioritize removal of all hazardous and radioactive contamination from the Shipyard.

Respectfully Submitted,

May 7, 2024



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Steven J Castleman

Supervising Attorney  
Environmental Law Clinic  
Attorney for Greenaction for Health and Environmental Justice

**EXHIBIT 1**

**Greenaction's Comments to the *Draft Fourth Five Year Review***

## Environmental Law and Justice Clinic

**TO:** Derek Robinson, HPNS BRAC Environmental Coordinator  
Department of the Navy  
BRAC Program Management Office West  
[derek.j.robinson1@navy.mil](mailto:derek.j.robinson1@navy.mil)

**FROM:** Greenaction for Health and Environmental Justice  
Environmental Law and Justice Clinic, Golden Gate University  
School of Law

**RE:** Comments to the *Draft 5 Year Review Hunters Point Naval Shipyard, San Francisco, California, June 2018*

**DATE:** September 7, 2018

## I. INTRODUCTION

The Environmental Law and Justice Clinic of the Golden Gate University School of Law submits these comments to NAVFAC's *Draft Parcel G Removal Site Evaluation Work Plan, Former Hunters Point Naval Shipyard, San Francisco, California, June 2018* ("Draft Review"), on behalf of Greenaction for Health and Environmental Justice ("Greenaction") and its members and constituents in Bayview Hunters Point, San Francisco and in other communities located along San Francisco Bay.

Greenaction is a multiracial grassroots organization founded and led by grassroots leaders from low-income and working class urban, rural, and indigenous communities. Our mission to fight environmental racism and injustice and build a clean, healthy and just future for all. Greenaction has been involved in health and environmental justice advocacy in Bayview Hunters Point since it was founded in 1997. This low-income community of color continues to be negatively and disproportionately impacted by pollution, gentrification, health disparities, and other forms of environmental, social and economic injustice.

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Bayview Hunters Point residents have borne the brunt of the impacts of the toxic and radioactive waste at the Hunters Point Naval Shipyard (“HPNS”). As such, they have a direct, personal and long-standing interest in assuring the maximal cleanup of the Superfund site.

### **A. The Community Doubts the Navy’s Commitment To Rebuilding Trust**

“The fraud and uncertainty surrounding Tt EC's work at HPNS has caused a complete loss of trust in the Navy by the local community.”<sup>1</sup> This is not a member of Greenaction speaking. This is the Navy’s Laura Duchnak, BRAC PMO’s Director. She’s right.

Unfortunately, though the Navy acknowledges it has lost all credibility, it remains adamant that it will do nothing to address or correct it. It continues to downplay the fraud and its effects on the cleanup. It promises one thing but delivers another. It has not taken the evidence of previous contamination in Parcel A at all seriously.

If the Navy truly wants to start to repair relations with the community, it must take actions that demonstrate in concrete terms how it will change its approach. This is not just another cleanup; it’s a cleanup tainted by massive fraud.

As Ms. Duchnak’s letter said, the fraud “had far-reaching consequences for the United States, its employees, the City of San Francisco, the local residents, and the taxpayers.” The Navy should act like it. The loss of trust extends to the hazardous waste cleanup as well.

The revisions of the *Draft Parcel G Work Plan* and this *Draft Review* are likely to be the first two tests of the Navy’s willingness to change course. Will it live up to the promises it made to the community to resample all Tetra Tech’s work? Will it incorporate

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<sup>1</sup> *Victim Impact Statement in the Matter of US v. Hubbard*, March 15, 2018, attached as Appendix IV.

the community's concerns into its final work plan and five-year review? Or will it betray the community's trust yet again?

**B. The *Draft Review* Does Not Comply with Navy Policy**

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA § 121(c) sets forth the requirement for a five-year review:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

Similarly, Title 40 Code of Federal Regulations §300.430(f)(4)(ii)] states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

To implement five-year reviews at properties owned by the Navy, it promulgated a policy, *Department of Navy Policy for CERCLA Five-Year Reviews*.

This Fourth Five-Year Review states its objective: "The purpose of the fourth five-year review is to provide an update on the status of remedial actions (RAs) and post-RA activities implemented since the third five-year review, evaluate whether these RAs and post-RA activities are protective of human health and the environment,

and assess the progress toward meeting the recommendations made in the third five-year review.”<sup>2</sup>

Unfortunately the *Draft Review* neither complies with the *Department of Navy Policy for CERCLA Five-Year Reviews* nor the intention stated above. For example, paragraph 9a of the policy states, “The Five Year Report should; 1) clearly state whether the remedy is or is expected to be protective, 2) document any deficiencies identified during the review, and 3) recommend specific actions to ensure that a remedy will be or will continue to be protective.” (Emphasis added, p. 4).

As further detailed below, the *Draft Review* fails in its most basic function – identifying whether the remedies are protective. Rather, it equivocates. *The Draft Review* must clearly state that the radiological remedies are NOT currently protective. And if the Navy states that the remedies “will be” protective, it should detail what “specific actions” will be taken, parcel by parcel, to assure that will be the case, as required by Navy policy.

Furthermore, the policy’s paragraph 9b states, “Where necessary, five year review reports should contain descriptions of follow up actions needed to achieve, or to continue to ensure protectiveness. Along with these recommendations, the report should list a timetable for performing the actions...”

The *Draft Review* fails to contain descriptions of the specific actions the Navy will take to achieve protectiveness. All it says is that the Navy intends to kick that can down the road until 2023. There is no explanation why what the Navy knows now is excluded; it must be included.

The Navy must revise the *Draft Review* to comply with CERCLA’s plain language and to comply with its own policies.

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<sup>2</sup> *Draft 5 Year Review Hunters Point Naval Shipyard, San Francisco, California, June 2018, p. 1-1.*



## II. RADIOLOGICAL – General Comments

### A. Facts – The Navy Must Tell the Whole Truth

The *Draft Review* is similar to the *Draft Parcel G Work Plan* before it in the way it: mischaracterizes the facts; minimizes the effects of Tetra Tech's radiological fraud and its impact on the remediation; and abandons its public promises.

Emblematic of the Navy's recasting of facts are these remarkable assertions:

The Navy has completed an extensive review of the radiological remediation documents and data as part of its evaluation of the potential contractor manipulation and/or falsification of data and has identified the areas where resurveying for radionuclides is required to address all issues discovered during the Navy's evaluation. Any available information on the status of the review and discoveries made by the Navy were considered during the development of this five-year review. (p. 5-3.)

The Navy pretends it proactively has done everything it can to investigate and redress the fraud, when nothing could be further from the truth. The Navy makes it plain in this review that it still does not believe comprehensive sampling is necessary. Crucially, the Navy actions were limited to a document review – Tetra Tech's discredited documents, no less.<sup>3</sup> Only when one parses the paragraph can one see the Navy's true intentions.

Start with the phrase, "potential contractor manipulation and/or falsification of data." Despite numerous sworn whistleblower affidavits attesting to widespread fraud, despite the Navy's own data review revealing evidence of fraud in approximately 40% of samples in Parcels B and G, despite the EPA finding that the Navy's data review missed about half the data problems,<sup>4</sup> and despite two criminal convictions of Tetra Tech supervisors – the very supervisors identified as culpable in the whistleblowers' testimony – the Navy still insists the fraud was "potential."

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<sup>3</sup> The Navy has provided only two of the 117 Tetra Tech documents listed in the *Draft Review's* "References." See Section IIC below.

<sup>4</sup> The contractor(s) that missed half the data problems have demonstrated their undependability. The Navy should commit to obtaining different contractors that the Navy, the community and the regulators can have confidence in.

The Navy claims it “has identified the areas where resurveying for radionuclides is required to address all issues discovered during the Navy’s evaluation.” That is simply false, unless by “all areas” the Navy means all of Parcels A, B, C, D, E, G, UC-1, UC-2 and UC-3. If the Navy truly has identified answers to all issues arising from the Tetra Tech Fraud, why are they not included in the Draft Review? The Navy should identify “the areas where resurveying for radionuclides is required” on maps of each parcel. (Also see section III (I) below regarding Figure 3-13.)

So far the Navy has proposed resurveying only in one Parcel, Parcel G. The *Draft Work Plan* for that project was so roundly criticized by comments made to it by EPA that it was unresponsive to its concerns that it threatens to invoke the dispute-resolution clauses of the Federal Facilities Agreement (FFA) if the Navy continues to ignore them: “Without the requested changes, the approach will not provide the necessary confidence level to establish when Parcel G would be suitable for redevelopment, and EPA may invoke the dispute resolution process described in the FFA.”

Then the Navy claims “any available information” was considered, but only “any available information” from the data review, that is, any available Tetra Tech data. Pointedly, the Navy cannot claim that it considered “any available information” without that tremendously narrowing qualification.

Among the “available information” the Navy ignores are: all of the whistleblowers’ sworn statements filed in support of Greenaction’s state and federal petitions to revoke Tetra Tech’s licenses;<sup>5</sup> eyewitness and documentary evidence, including sampling documents and test results demonstrating there were elevated levels of radionuclides in Parcel A’s sanitary and storm water sewer systems that should have been investigated but never were;<sup>6</sup> lists of approximately 50 additional witnesses who the Navy should interview;<sup>7</sup> and BRAC’s own victim impact statement in the criminal cases

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<sup>5</sup> The federal petition and its supporting documents are incorporated herein and are available at: [https://www.dropbox.com/sh/1gfn7ja0fc3c5l6/AAD7-9qzmbhhUTkGvpN4p\\_Xua?dl=0](https://www.dropbox.com/sh/1gfn7ja0fc3c5l6/AAD7-9qzmbhhUTkGvpN4p_Xua?dl=0). The state petition and its supporting documents are incorporated herein and are available at: [https://www.dropbox.com/sh/zh2pknpgvuucjp0/AAA-1xjCHxjVtQ\\_s8wvTpm9Za?dl=0](https://www.dropbox.com/sh/zh2pknpgvuucjp0/AAA-1xjCHxjVtQ_s8wvTpm9Za?dl=0).

<sup>6</sup> See Appendix VI, Rad Survey Results.

<sup>7</sup> See Appendix VII, emails from ELJC to the Navy.

against Tetra Tech's former supervisor Justin Hubbard. In a March 15, 2018 letter, Laura Duchnak, the Director of BRAC PMO, wrote of the impact of Tetra Tech's fraud:

The redevelopment of HPNS was supposed to revitalize the community and provide jobs and affordable housing; all of that is now on hold indefinitely as the Navy and the regulatory agencies have determined that TtEC's work is unreliable.

The total cost for the database evaluation, work plan preparation, and preliminary field work is approximately \$8.8M.... The EPA has indicated that it would require all work to be re-performed as originally contracted. However, these discussions are not final. The Navy's best estimates for required re-work costs currently range from \$100M to \$300M.

In sum, the Navy has expended \$272.8 M to date paying TtEC for their work at HPNS, identifying the fraud, and taking measures to prevent further fraud. Depending on the cost of required re-work, this number will certainly rise to \$372.8 M and is likely to rise as high as \$572.8 M. This amount of money would buy a new Littoral Combat ship. It is nearly half of the Navy's total expenditures for *all* environmental clean-up activities at HPNS through fiscal year 2017 (\$991.1 M).

Mr. Hubbard's actions had far-reaching consequences for the United States, its employees, the City of San Francisco, the local residents, and the taxpayers.<sup>8</sup>

Ms. Duchnak does not discuss "potential" fraud. It is actual and extensive. The more the Navy soft-pedals the fraud, the less credibility it has. If the fraud is real enough to have had the effect Ms. Duchnak describes, it is well past time for the Navy to drop references to "potential" fraud.

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<sup>8</sup> See Appendix IV.

Finally, the Navy claims credit for “discoveries made by the Navy.” The Navy did make one important discovery, it’s true. Its employee flagged the low Potassium-40 (K-40) data that first raised the issue of fraud. But after that, the Navy closed its “eyes” and “ears.” It made no further “discoveries.” Rather, it ignored them.

In June 2016, for example, Anthony Smith, one of the whistleblowers, took the Navy and regulators on a tour of the shipyard during which he detailed some of the fraudulent activities he participated in. The Navy has never, to this day, spoken to him to follow up.

More than a year before this *Draft Review* was released, on June 29, 2017, Greenaction filed its NRC Petition seeking to revoke Tetra Tech’s federal license, supported by affidavits signed under penalty of perjury by numerous former radiation workers at HPNS who have come forth to blow the whistle on Tetra Tech’s fraud and the Navy’s complicity in it. They detailed six types of fraud: (1) fake sampling, in which soil samples were reported to have been taken at one location when they were actually taken from another; (2) samples and their analytical results were discarded because they came back too “hot;” (3) scanning data were altered to make them appear acceptable; (4) building survey data were fabricated; (5) radioactive material in soil was inadequately remediated, resulting in potentially contaminated soil being used as backfill for trenches at the Shipyard; and (6) Portal Monitor procedures were altered resulting in potentially radioactively-contaminated soil being allowed to be shipped offsite to points unknown.<sup>9</sup>

Greenaction obtained sworn affidavits from Archie Jackson, Bert Bowers, Susan Andrews, Arthur Jahr, Richard Stoney and Robert McLean, each of whom documented improper activities. Their statements are readily available, as they are exhibits in support of its June 2017 NRC Petition. Greenaction has repeatedly urged the Navy to interview them. The Navy has never, to this day, done so. Sadly, Mr. Jahr has since passed away; any untapped knowledge he may have had is now gone forever.

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<sup>9</sup> See NRC Petition, p. 1.

Greenaction also provided the Navy with two lists of additional witnesses, totaling approximately 50 people. The Navy ignored them. To the best of our knowledge, none of these witnesses have ever been contacted, despite more than a year's urging that the Navy interview them.

Instead of doing what was called for – investigating the full extent of the fraud's impact on the cleanup – the Navy allowed Tetra Tech to *investigate itself*, and accepted its self-serving and false claims the fraud was minimal and closed its eyes and ears to the whistleblowers.

Rather than conduct a meaningful investigation, the Navy spent months and \$8.8 million, according to Ms. Duchnak, on a “data review,” whose purpose was not to find if more fraud took place, but rather to statistically validate Tetra Tech's bogus data. However, in results that were hugely surprising to the Navy but to no one else who has followed the disastrous radiation remediation, the data review not only supported the whistleblowers' testimony, it found much more evidence of potential fraud than even the whistleblowers said – approximately 40%!

Even these remarkable findings underplayed the full extent of the evidence of fraud. The EPA's review of precisely the same data found more than double the data problems the Navy did. EPA's review of data from Parcel G trench units, for example, found a whopping 97% of the data were questionable – virtually all of it.

In addition, two Tetra Tech supervisors have pled guilty to federal charges arising from their role in the fraud and are currently serving eight-month sentences. More charges may be forthcoming.

Despite the plethora of proof, however, the Navy continues to treat the proven facts as mere allegations. Two years ago they were allegations. In the ensuing time those allegations have been proven.

Forced to confront irrefutable proof dashing the Navy's hope that Tetra Tech's data was salvageable, in December 2017 it finally announced the inevitable conclusion it

had been seeking to avoid all along; all of Tetra Tech's data has to be thrown out. The Navy's point man on the project, Derek Robinson, promised multiple times publicly that all Tetra Tech's work would be redone, starting with resampling all locations where the fraudulent firm worked.

EPA heard the same promises Greenaction members did. Here's how Lily Lee, the EPA's HPNS Site Manager described what the Navy said in her interview for the *Draft Review*: "*The Navy, as the lead on cleanup, has responded through a comprehensive radiological data evaluation, increased oversight of ongoing radiological work, development of plans to resample all radiological survey units on site that involved Tetra Tech EC Inc., and increased community involvement outreach.*" (Italics in original, underline added.) Similarly, as Angeles Herrera, the Assistant Director of EPA's Superfund Division, Federal Facility and Site Cleanup Branch, wrote in his August 14, 2018 transmittal letter of the EPA's comments to the *Draft Parcel G Work Plan*, "The Navy has agreed to retest all of the survey units where Tetra Tech EC Inc. did previous radiological work." (Emphasis added.)

"Resample all survey units" was what the Navy promised.

As we pointed out in our comments to the *Draft Parcel G Work Plan*, the Navy has once again demonstrated that its promises are false. Rather than live up to its promises, the Navy's draft plan only intends to resample a small percentage of survey units. It must not be allowed to get away with renegeing on its promises when it comes to either the *Parcel G Work Plan* or this *Draft Review*: it must commit to resampling all Tetra Tech's work.

This *Draft Review*, however, fails to even acknowledge *the Draft Parcel G Work Plan* exists, let alone disclose the extremely limited sampling and scanning it contemplates.

This *Draft Review* was published more than six months after the Navy finally abandoned its efforts to salvage Tetra Tech's data through its data review. Yet there is scant mention of the sequence of events leading to the status that is supposed to be

reported in a Five-Year Review. No mention that the fraud was discovered in 2012. No mention that Tetra Tech admitted to fraud in 2014. No mention that whistleblowers came forward in 2016. No mention of their testimony proving widespread fraud. No mention that the Navy believed a fraudulent firm more than whistleblowers' statements under oath. No mention of the disastrous (to the Navy) results of the data review. No mention of EPA's finding that the Navy's data review missed half the data problems. No mention that the Navy has admitted all Tetra Tech's data is being thrown out. No mention of the Navy's public promises to finally own up to the fraud and do what should have been clear from the beginning; start over. No mention that the Navy's *Draft Parcel G Work Plan* reneges on the Navy's multiple promises to retest all Tetra Tech's work and only test one-third of the trench units and one-half of the buildings.

Here is the bureaucratese the Navy employs instead, using Parcel B-1 as an example: "The remedies completed to date for Parcel B-1 are protective of human health and the environment, noting that the radiological removal actions are being retested." Identical language is used in Section 8, Protectiveness Statement, for Parcels B-2 C, D-2, E, G, UC-1, UC-2 and UC-3.

These statements are false. Given that the Navy has publicly and repeatedly stated it will no longer rely on any Tetra Tech data, there is no factual basis for claiming the radiological remedies "completed" by Tetra Tech are "protective of human health and the environment." This can only be true if the Navy relies on Tetra Tech's discredited data – data even the Navy now agrees, however reluctantly, is useless. As we return to in our comments on Protectiveness Statements (see section II G below), the only accurate answer to the question of protectiveness is "no". There are no data demonstrating protectiveness whatsoever. Unless and until all of Tetra Tech's work is properly and comprehensively resampled and, where necessary, re-remediated, the Navy cannot claim radiological protectiveness.

The phrase, "noting that the radiological removal actions are being retested," does not substitute for the Navy's duty to be factually accurate in its Statement of Protectiveness. "Noting" that all of Tetra Tech's work must be redone is like saying that

the Navy's oversight was exemplary, "noting that the Navy squandered more than \$200 million and more than a decade."

The Navy must not be allowed to mislead the public and regulators by dismissing the fraud's impact on the cleanup anymore.

### **B. Parcel A**

The *Draft Review* completely excludes Parcel A: "Parcel A is not discussed in this report because the parcel required no action under CERCLA." (p.1-2). The reason Parcel A "required no action under CERCLA" is because the Navy did an incompetent job investigating the possibility of radiological contamination there.

Earlier this year, Greenaction brought forth both eyewitness and documentary evidence – including sample results – proving the original Parcel A storm water and sanitary sewer systems contained elevated levels of radionuclides that should have been investigated but never were. Greenaction has requested that the Navy and regulators report all information they have concerning what happened to the Parcel A sewers and their associated soils. The sewer pipes may have been disposed of illegally; it is so far unknown whether contaminated pipes were disposed of at facilities not licensed for radioactive waste. Greenaction has developed information indicating the soils from the Parcel A sewer systems were essentially "pushed over" the hill atop Parcel A into neighboring locations as part of grading Parcel A prior to development. We have asked both EPA and the Navy to investigate. So far as we know, both have flatly refused.

A description of an investigation of Parcel A's sewer systems and associated soils must be added into the *Draft Review*.

### **C. Reliance on Tetra Tech Data**

The Navy improperly continues to rely on Tetra Tech data for the Five-Year Review despite already agreeing to discard it. The Index of the review lists 117 Tetra Tech, EC Inc. documents, 91 of which are entitled either "Final" or "Final Final" status



surveys, none of which have been made available to the public. Greenaction has requested these documents in writing but the Navy refuses to provide them. Accordingly, Greenaction has requested them through a Freedom of Information (FOIA) request.

There are no rational reasons the Navy should rely on or cite any of Tetra Tech's discredited data for any purpose. The *Draft Review* should be scrubbed of all Tetra Tech radiological data; all Tetra Tech documents listed in the References should be excised.

#### **D. Investigating Soil That Was Improperly Allowed to Leave HPNS**

Greenaction has provided credible evidence to the Navy that soil, improperly scanned at Radiological Screening Yard ("RSY") pads or the Portal Monitor, or both, resulted in a significant amount of potentially radiologically contaminated soil being permitted to exit Hunters Point Naval Shipyard improperly. Some of the soil was allegedly disposed of at landfills not licensed for low-level radioactive waste around the San Francisco Bay Area. (See NRC Petition, pp. 22-25.)

It is incumbent on the Navy to track down that soil and take appropriate actions to insure that unwitting people are not exposed to radioactive contamination that originated at HPNS. The *Draft Review* should include a statement that the Navy will investigate and will publish a plan to do so that will be open to public comment.

### **III. RADIOLOGICAL COMMENTS - Specific**

#### **A. Section 1 – Introduction**

The Introduction kicks off the litany of half-truths that litter the Navy's *Draft Review*. It claims it, "identifies issues found during this fourth five-year review and recommendations to address them."

In addition to the issues already mention in section IA above, the *Draft Review* elides the Navy's own lack of oversight in permitting the fraud to take place under its nose for years, and the regulatory agencies' failures of oversight as well. The Navy should own up to the ugly truth, not attempt to bury it.

## **B. Section 2 – Site Background**

Section 2.5.2 of the *Draft Review*, Future Land Uses, fails to acknowledge that during the five-year review period the proposed use of Parcel G was changed from almost no residential use to the entire parcel being open to residential use. Nowhere in the *Draft Review* is there are discussion of how this changed use will impact the remediation.<sup>10</sup>

## **C. Section 3 – Response Action Summary**

The introduction to Section 3 states that Section 3, among other things, “describes the implementation status of the selected remedy for each parcel.” (p. 3-1). But this is manifestly untrue when it comes to the radiological remedies.

The *Draft Review* provides virtually no information about the status of the re-investigation of Tetra Tech’s work. Although the Navy released a *Draft Parcel G Work Plan* in June 2018, a month before the release of the *Draft Review*, there is not a single mention of it.

The information about the other parcels is just as scant. Although the Navy announced publicly at the end of 2017 that all of Tetra Tech’s work would be redone, the *Draft Review* says absolutely nothing about when draft work plans for the other parcels will be released; what the resampling strategies will be; a timeline for all such actions; or anything else.

The only thing the *Draft Review* says is that “All radiological work is currently being reviewed to determine if current site conditions are compliant with the RAOs.” (Section 3.3.2.1, p. 3-12, for parcel B, for example). What the “review” consists of is not addressed, as if the Navy has no idea what to do and as if it hasn’t already decided exactly what to do.

The Navy must acknowledge the truth; none of the sites Tetra Tech worked on are compliant with the RAOs. The Navy must also abide by what it has promised publicly in

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<sup>10</sup> *Feasibility Assessment for Evaluating Areas with Residential Land Use Restrictions, Parcel G, Hunters Point Naval Shipyard*, San Francisco, California, Nov. 30, 2016.

more than one forum: all Tetra Tech's data have to be thrown out and the Navy must start over. All areas Tetra Tech worked on have to be resampled and if necessary, re-remediated, as the Navy has promised.

While the *Draft Review* omits essential information, it includes irrelevant data as if it were "factual." For example, the Navy congratulates itself on all the work that has been done; in Parcel C, for example, the Navy touts all that was accomplished: "Radiological surveys and remediation have been performed for all radiologically impacted buildings (203, 205 and discharge tunnel, 211, 214, 224, 241, 253, 271, and 272), storm drains, and sanitary sewers, except for Buildings 211 and 253. In total, 37,572 cubic yards of soil was removed from 19,260 linear feet of sanitary sewer and storm drain lines; approximately 987 cubic yards of soil was disposed off site as LLRW (TtEC, 2016d)." (p. 3-18.) Similar summaries are included as to the other parcels as well.

But all that work was done by Tetra Tech. None of the work they claim to have done can be relied on. It all has to be resampled. So why does the Navy list these actions as if they were accomplishments? They are not. Instead, the Navy's summaries of how much dirt was moved, how many buildings were scanned, etc., only serve to illustrate the enormous impact of the fraud on the cleanup. What the Navy fails to say is that each and every one of those "accomplishments" are useless because Tetra Tech's data are useless.

These so-called accomplishments should be removed from the *Draft Review*. They have no relevance to assuring protectiveness.

#### **D. Section 4 – Progress Since Last Review**

Failure to address the Tetra Tech fraud in this, the *Draft Fourth Five-Year Review*, continues its omission in the *Third Five-Year Review* ("*Third Review*"), completed in November 2013. The original suspicions about Tetra Tech were raised a year before, in 2012. Yet nowhere in the *Third Review* is there the slightest hint that Tetra Tech's data might be fraudulent. None of the recommendations for any of the parcels in the *Third Review* include any mention of the discovery of the fraud or what the Navy did about it

between its discovery and the release of the *Third Review*. The Third Review included no recommendations at all concerning the fraud the Navy already knew about.

In Parcel D-2, for example, the *Third Five-Year Review* omitted a protectiveness statement “because the parcel was deemed to require no further action following completion of radiological remediation.” (4.5, p. 4-3). But all Tetra Tech’s data should have been suspect in 2012, calling into question the “completion of radiological remediation.”

When it comes to the radiological fraud, the Navy played “hide the ball” in 2013 and obviously intends no change now. The Navy must be required to tell the whole truth about the radiological disaster it allowed to happen. It must not be allowed to dodge the truth or its responsibility any longer.

#### **E. Section 5 – Five-Year Review Process**

Section 5.2, Document and Data Review, states, “As part of this five-year review, documents and data related to remedy implementation were reviewed for each parcel. The reviews primarily focused on (1) documents and data that provide information on the technical and regulatory considerations that led to remedy selection and implementation, (2) documents that demonstrate remedy completion, and (3) documents and parcel-specific data that demonstrate the remedies continue to be protective of human health and the environment.” (p. 5-2.)

This is a microcosm of all that is wrong with the Navy’s approach to the post-Tetra Tech period. The Navy admits it doesn’t take a dispassionate, objective view. It focuses on “documents that demonstrate remedy completion.” It should be focusing on all relevant documents and data, whether they demonstrate compliance or not, especially if not.

And, when it comes to Tetra Tech’s work, “parcel-specific data that demonstrate the remedies continue to be protective” are non-existent. It’s all unreliable. None can demonstrate protectiveness or anything else.

Furthermore, the Fourth Five Year Review fails to look forward. It must discuss the need to amend all the existing RODs as they relate to radiological contamination, and Parcels E and E-2 for chemical contaminants. The current five year review process is the appropriate place to discuss the need for ROD amendments to account for new circumstances.

In fact, the Navy has done precisely that in the past. For example, it discussed the possibility of an amendment to the Parcel B ROD in the First Five Year Review: “The future RA process for Parcel B could include a technical memorandum in support of a ROD amendment, a proposed plan (with community involvement), a ROD amendment, RD, and RA, followed by closeout activities.” The Parcel B ROD was eventually amended, in part because of the recommendation made in the first review:

In 2007-2008, the Navy prepared two technical memoranda...in support of amending the ROD as recommended by the First 5-year review. These memoranda provided the technical foundation for identification of revised remedial alternatives and preparation of a proposed plan and subsequent amended ROD for Parcel B. (Second Five Year Review at 3.5.8).

The *Draft Review* should provide recommendations for the steps to be taken in the coming five years, informed by which new information that was not considered when the RODs were approved.

#### **F. Section 6 – Technical Assessment**

The *Draft Review* is internally inconsistent. For example, Section 6 states, “Published documents report the completion of radiological surveys and remediation in IR-07/18 and Parcels B-1, B-2, C, D-1, D-2, E, G, UC-1, UC-2, and UC-3.” (p. 6-6.)

Section 6.1.6, Radiological Surveys and Remediation, asks, “*Are the radiological surveys and remediation remedies implemented in IR-07/18 and Parcels B-1, B-2, C, D-1, D-2, E, G, UC-1, UC-2, and UC-3 functioning as intended by the decision documents?* YES (for IR-07/18 and Parcel D-1); NO (for Parcels B-1, B-2, C, D-2, E, G, UC-1, UC-2, and UC-3).P. 6-6).

Again, the Navy cannot claim that remediation has been “completed” but in the next breath admit, “Well, not really.” Having determined under public pressure and the insistence of the EPA that all Tetra Tech data are unreliable, the Navy must drop any pretense that radiological work was “completed.” The *Draft Review* should consistently say that none of Tetra Tech’s work was “completed” and that the remedies it implemented are not protective.

As stated above, The Navy downplays the fraud throughout, including in Section 6. For example, it states, “In January 2018, the Navy determined that a significant portion of the radiological survey and remediation work completed to date was compromised by potential manipulation and/or falsification of data by one of its radiological remediation contractors. Compromised data were identified in reports associated with Parcels B-1, B-2, C, D-2, E, G, UC-1, UC-2, and UC-3. Again, this is an understatement. “A significant portion” of Tetra Tech’s data was not compromised; all of it was. And characterizing the fraud as “potential” is belied by the facts, including those provided by BRAC’s boss. It is past time for the Navy to stop denying that the fraud actually took place.

In Section 6.2.3, Changes in Risk Assessment Methods, the Navy claims it can substitute a 2014 EPA supplemental guidance in place of the risk assessment and, without proof, further claims equivalency: “Use of these updated default exposure parameters in place of the original values used in the risk assessments for each of the parcels primarily results in increasing the RBCs for the adult receptors. The increase is not significantly different from the values estimated in the original risk assessments. As such, EPA changes to default exposure parameters do not affect the protectiveness of the remedies.” (p. 6-12.)

However, as the EPA made quite clear in its comments to the *Draft Parcel G Work Plan*, this substitution is improper; it impermissibly changes the ROD:

At this stage of the CERCLA process, the cleanup goals have already been legally established. A new Radiation Risk Assessment is ordinarily only performed as part of a Five-Year Review to evaluate whether or not the original RG's are still protective. EPA has separately recommended that the Navy conduct this review, and, if any of the RGs are found to be no longer protective using the most current risk calculators, propose amendments to the Parcel G ROD to ensure protectiveness. For the current work plan, however, the current RGs still govern the cleanup and if any material is found on Parcel G that exceeds the RGs established in the Parcel G ROD for the ROCs, excluding naturally occurring and anthropogenic background, the material should be removed and disposed of in accordance with the ROD and other applicable laws and regulations. (p.3.)

On the other hand, Greenaction would welcome it if the Navy did formally what it is attempting to do by sleight of hand – reopen the ROD to include newer, more protective standards. We urge the Navy to accept EPA's suggestion that as part of the five-year review, it formally reassess the standards set in the nine-year-old ROD to make them more protective.

#### **G. Section 7- Issues Recommendations and Other Findings**

The *Draft Review* claims in Section 7 that, "It is anticipated that the radiological rework will span 5 years and be completed prior to the next five-year review." (p. 7-2.) This is yet another example of the Navy's wishful thinking. Consider that: the Navy claims it can redo more than a decade's work by Tetra Tech in less than half that time; to date the Navy still has not obtained an approved work plan for even a single parcel that needs to be reworked, nine months after the Navy finally acknowledged it would be necessary; and the Navy includes no timeline whatsoever detailing what activities will take place or when. Finally, consider this statement from Ms. Duchnak's victim impact statement: "The Navy estimates that the fraud committed by Mr. Hubbard and others has set back the planned transfer of HPNS property to the City by an approximate decade."

The Navy needs to stop stating hope as fact. It cannot claim in the *Draft Review* that the project will be delayed five years, when BRAC's boss says it will be double that.

It is this kind of transparently false optimism that continues to taint the Navy's relations with the community.

Section 7 also states that the "Navy has determined that a significant portion" of Tetra Tech's data was compromised. (p. 7-2.) As mentioned before, this is, at best, an understatement. All of Tetra Tech's data are compromised. The Navy admitted that publicly more than nine months ago. The *Draft Review* must say that clearly and without evasion.

#### **H. Section 8 - Protectiveness Statement**

The *Draft Review* repeats the following uninformative statement it makes as to Parcel B-1: "The remedies completed to date for Parcel B-1 are protective of human health and the environment, noting that the radiological removal actions are being retested." (p. 8.1.) The identical language is used in reference to Parcels B-2, C, G, UC-1, UC-2 and UC-3. (pp. 8-1 through 8-4.)

The Five-Year Review must be factual. It must start by admitting the radiological remedies in those parcels are not currently protective. This is the inevitable conclusion of the EPA's critique of the Navy's data review. And it must acknowledge that the "radiological removal actions" will be retested, not that they "are being retested." The Navy has not obtained regulatory approval for any retesting yet. And if the Navy refuses to accede to the EPA suggestions in its comments to the *Draft Parcel G Work Plan*, any retesting may have to await completion of the FFA's mandated dispute resolution process, further delaying when the Navy can truthfully claim the parcels "are being retested." As stated above, the revised *Draft Review* should describe the radiological work the Navy intends to do in response to the fraud in each parcel, along with a timeline of activities.

The protectiveness statements for Parcels D-1 and D-2 are equally dishonest. The *Draft Review* says the remedy for D-1 "is expected to be protective." (p. 8-3.) Of course, the Navy has "expected" a lot that did not turn out to be true. It expected Tetra Tech to do a proper job. It expected that it had the capacity to adequately supervise Tetra Tech. It expected to obtain free clearance in multiple parcels by now. Regulators and the public



have no reason to believe that the Navy will meet its expectations – it has not so far and, if the *Draft Parcel G Work Plan* and the *Draft Review* are any indication, the Navy has learned nothing from the Tetra Tech fraud and will blithely continue as it has done so far.

As to Parcel D-2, the Navy follows the template it used in Section 3; cite all the “work” it has done and then add the *non sequitor*, “Radiological surveys and removal actions completed in Parcel D-2 were potentially compromised, and corrective actions are required to determine if the RAOs have been achieved.” It does not matter how many cubic yards of soil remediation were fraudulently “completed,” though it is instructive of the impact of the Navy allowing the fraud to take place over so many years.

### **I. Figures**

Figures 3 through 13 are inaccurate. Each purports to show an “Overview of Remedy Components,” for a specific parcel. Yet none includes radiological components; none of the figure’s “legends” even reference radioactivity.

The Navy knows where Tetra Tech (as well as other radiological contractors) worked and can include such information. For example, the sewer systems have been identified as major radiological remediation sites. The Navy can and should include anticipated radiological work either in these figures or create separate radiological overviews of remedy components.

## **IV. NON-RADIOLOGICAL**

### **A. The Draft Review Must Evaluate Protectiveness Consistent with Up-to-Date, Scientific Sea and Bay-Level Rise Projections**

The *Draft Review* surprisingly and unacceptably fails to consider essential new data that was not available when the remedies were selected. The most important missing data are the latest scientific projections of sea-level rise. Because of the intense toxicity of the hazardous and radioactive wastes (including residue from atomic bomb testing) that current remedies leave capped onsite, and the persistence of

that toxicity, the Navy courts long-term disaster if its Bay-level rise assumptions are wrong. The *Draft Review* must not only evaluate protectiveness in light of estimates of Bay-level rise in the coming decades, but its threat from Bay-level rise centuries into the future as well. If the Navy is wrong now and global warming causes the Bay to rise enough to overwhelm current remedies, the health of nearby residents, subsistence fishers, people recreating on the proposed “open space” and the hundreds of thousands of people living along the San Francisco Bay will all be at unacceptable risk.

State of California governmental agencies have done extensive research, analysis and reporting on the latest projections for rising sea levels – yet the *Draft Review* appears to have ignored this important science.

The San Francisco Bay Conservation and Development Commission (BCDC) is a planning and regulatory agency with regional authority over San Francisco Bay, the Bay’s shoreline band, and the Suisun Marsh. BCDC was created in 1965 and is the nation’s oldest coastal zone regulatory agency. Its mission is to protect and enhance San Francisco Bay and to encourage the Bay’s responsible and productive use for this and future generations. BCDC leads the Bay Area’s ongoing multi-agency regional effort to address the impacts of rising sea level on shoreline communities and assets.

BCDC’s Adapting to Rising Tides project (ART) (<http://www.adaptingtorisingtides.org/>) started in 2010 when BCDC and NOAA’s Office for Coastal Management brought together local, regional, state and federal agencies and organizations as well as non-profit and private associations for a collaborative planning project along the Alameda County shoreline. The project worked to identify how anticipated current and future flooding associated with global warming will affect communities, infrastructure, ecosystems and the economy.

Since then, the ART has continued to both lead and support multi-sector and cross-jurisdictional projects that build both local and regional capacity in the Bay Area

to plan for and implement adaptation. These efforts have enabled ART to test and refine adaptation planning methods (ART Approach) to integrate sustainability and transparent decision-making from start to finish, and foster robust collaborations that lead to action on adaptation. BCDC has conducted extensive scientific research. Its sea level rise projections and mapping are widely accepted as sound by government agencies. Adapting to Rising Tides Bay Area Sea Level Rise Analysis and Mapping Project has the latest data that the Navy must use in development of revised remedies to continue to assure protectiveness into the future.<sup>11</sup>

The State of California Ocean Protection Council's (OPC) *2018 State of California Sea Level Rise Guidance* is also vitally important to consider in developing safe remedies.<sup>12</sup>

The 2018 update of the Guidance was created by the OPC, California Natural Resources Agency, Governor's Office of Planning and Research, and the California Energy Commission. The Guidance provides the best available data on sea level rise projections for California which should be used by state agencies and local governments in their planning, permitting, and investment decisions.

The Remediation Design for Parcel E-2 is deficient given updated sea level rise projections. In Section 6.3 (Technical Assessment Question C, pp. 6-15), the *Draft Review* states:

The estimated sea-level rise in San Francisco under three future greenhouse gas emission scenarios (referred to as representative concentration pathways [RCPs]) is summarized below:

- RCP 8.5 is consistent with a future in which there are no significant global efforts to limit or reduce emissions. In 2100, the likely sea-level rise associated with this scenario ranges from 1.6 to 3.4 feet.

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<sup>11</sup> See <http://www.adaptingtorisingtides.org/project/regional-sea-level-rise-mapping-and-shoreline-analysis/> and <http://www.adaptingtorisingtides.org/wp-content/uploads/2018/07/BATA-ART-SLR-Analysis-and-Mapping-Report-Final-20170908.pdf>

<sup>12</sup> [http://www.opc.ca.gov/webmaster/ftp/pdf/agenda\\_items/20180314/Item3\\_Exhibit-A\\_OPC\\_SLR\\_Guidance-rd3.pdf](http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf)

- RCP 4.5 is a moderate emissions reduction scenario and assumes that global greenhouse gas emissions will be curtailed. In 2100, the likely sea-level rise associated with this scenario ranges from 1.2 to 2.7 feet.
- RCP 2.6 is a stringent emissions reduction scenario and assumes that global greenhouse gas emissions will be significantly curtailed. In 2100, the likely sea-level rise associated with this scenario ranges from 1.0 to 2.4 feet.

Based on the information above, a contingency of up to a 3-foot increase in sea level was considered in designing the crest elevation for Parcels E and E-2.

No other information has been identified to suggest that the remedies may not be protective of human health or the environment. (p. 6-15.)

The assumption greenhouse gas emissions will curtail is speculative at best, and should not be used as a guideline in remediation planning. This is especially true with the current EPA's efforts to abandon stringent greenhouse gas and other emissions limits from coal fired power plants and other industries.

BCDC's "Adapting to Rising Tides Bay Area Sea Level Rise Analysis and Mapping Project" outlines a range of likely sea level rise scenarios (see Appendix III, p. 13). The upper bound of these scenarios is 5.5 feet (66 inches) sea level rise by the year 2100. Adapting to Rising Tides also considers a 100-year extreme tide (see appendix III, p. 15), which is the coastal water level elevation that has a 1 percent chance of occurring in any given year. A 5.5 feet (66 inches) sea level rise with the 100-year extreme tide would create a tide 9 feet (108 inches) above Mean Higher High Water (MHHW, the average of the high water mark of each tidal day observed over the National Tidal Datum Epoch).

Even minimal risk of catastrophic events must be considered and planned for due to the dangerous radioactive and contamination in close proximity to people and the Bay.

According to the 2018 State of California Sea-Level Rise Guidance (Appendix II, p. 57):

- Sea level rise will reach 5.7 to 6.9 feet by 2100 under the medium to high risk aversion scenario.
- Sea level rise will reach 10.2 feet by 2100 under the H++ scenario (detailed below).

The 2018 State of California Sea-Level Rise Guidance suggests that projects with a lifespan beyond 2050, that have a low-tolerance for risk (i.e., hazardous waste & toxic storage sites) should use H++ scenario. H++ scenarios can be considered the “worst-case” possibility and describe an extreme sea level rise scenario that would result from a catastrophic event (i.e., the collapse of the West Antarctic ice sheet), especially under high emission scenarios. The projected sea level rise under the H++ scenario is 10.2 feet by 2100.

The projections used by the *Draft Review* are inadequate because they do not consider the most up to date sea level rise projections or consider a future in which emissions will increase. The State of California Sea Level Rise Guidance 2018 Update has estimated the chance of sea level rise meeting or exceeding various heights in various years (see Appendix I, p. 58). It estimates these percentages under two scenarios: one in a future with low carbon emissions and one in a future with high carbon emissions. The likeliness of sea level rise exceeding 3 feet by 2100 under a future with low emissions is 7%. The likeliness of sea level rise to exceed 3 feet by 2100 with high future emissions is 28%. So, the current design has a 7-28% chance of failure due to sea level rise by 2100, depending on the future carbon emissions. This risk is unacceptable.

The risk of flooding and inundation is especially important for Parcel E-2, due to its history of disposal of hazardous and radioactive waste. According to *Adapting to Rising Tides*, Sea level rise and storm events may cause flooding or groundwater intrusion to contaminated sites and landfill waste containment systems. Temporary or permanent surface flooding, erosive tidal or wave energy, and elevated groundwater levels could cause the release of

hazardous substances with potentially significant consequences on public health, the environment, and the local economy.<sup>13</sup>

The release of any amount of toxic or radioactive substances in Hunters Point would be detrimental because the community is already disproportionately burdened by a multitude of environmental hazards, and would have a significant negative impact on the entire Bay ecosystem.

Both BCDC and the State of California Sea-Level Rise Guidance project sea level rise to surpass the 3-foot mark accounted for in the Navy's design considerations. Three feet above mean sea level is generally considered in the middle of the likely range of sea level rise by 2100. When planning for construction in an area that is as dangerous when flooded as Parcels E and E2 with all the toxic waste they contain, the upper bound of all sea level rise scenarios should be used, which according to BCDC is 9 feet and according to State of California Sea-Level Rise Guidance is 10.2 feet.

Accordingly, the remedies that could be affected by sea-level rise significantly higher than the unreasonably low assumptions made by the Navy must be reconsidered in this review.

#### **A. Potential Flooding of the Revetment Wall Must Be Considered**

As depicted in the Engineering/Remediation Resources Group, Inc.'s Shoreline Revetment Detail the highest point of the design is the concrete sea wall, standing at approximately 7 feet above mean sea level. This height is insufficient in light of current updated scientific sea level rise projections referenced above. Combined with the possibility of high tides, king tides, storm surges, wind driven waves and El Nino, all of the sea level rise possibilities outlined in the previous section indicate there is a strong likelihood of the currently designed sea wall flooding.

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<sup>13</sup> SF BCDC Adapting to Rising Tides. "Contaminated Lands", p. 1.  
<http://www.adaptingtorisingtides.org/portfolio/contaminated-lands/>

Remedial design should reflect the possibility which would most effectively protect the residents of Bayview Hunters Point. Considering the catastrophic health hazards which could result from Parcel E-2 flooding, the H++ scenario should be used, accounting for sea level rise of 10.2 feet by 2100. In conclusion, the construction of a revetment sea wall at 7 foot is inadequate, and will likely expose additional contaminants to a community and San Francisco Bay that are already overburdened with multiple environmental hazards.

### **B. Concerns about Slurry Wall Construction**

The *Draft Review* does not address the effect of sea level rise on slurry walls. As sea levels rise, the levels of ground water tables rise as well. Nor does it account for how the rise of groundwater will affect the integrity of the slurry walls. The design process seems to be using current groundwater levels, but not planning for new levels/flow directions/pressures. The effective life cycle of these slurry walls is not addressed, and if it is more than 10-15 years, which it well should be, these sea level rise outcomes should be a major design consideration. This also of course impacts the “remedy” of leaving contamination buried at the waterfront.

Constructing a slurry wall on fractured bedrock is a poorly engineered idea which fails to provide a long term solution. While the review indicates that the land is not an aquifer due to its limited flow capability, ineffectiveness remains. Regardless of the depth of the slurry wall, water will percolate through the cracks of the bedrock on which the slurry wall sits. This will enable the interaction of the contaminated landfill groundwater with both the San Francisco Bay water and surrounding uncontaminated groundwater.

The *Draft Review* additionally fails to address any seismic activity that may occur, which could both destroy the slurry wall and potentially further fracture the bedrock. This should be a major concern as San Francisco is right on the San Andreas

Fault and, is highly susceptible to major, potentially catastrophic earthquakes like the one on April 18, 1906.

The Navy's reliance on below-ground barriers and capping of contaminated soil with a few feet of barriers are not safe or sustainable remedies for the extremely contaminated land of Parcel-E and E 2. In particular, caps are extremely vulnerable to flooding with increased water levels caused by sea level rise.

### **C. The Slurry Wall Will Not Stop Rising Groundwater Inundation of Contamination**

Increased water levels in the Bay and storm surges are not the only flooding and inundation threat to the "remedy" of leaving buried contaminated waste so close to the Bay. As sea levels rise, so will groundwater.

A study by the US Geological Survey and Yale University states "...as sea level rises, so will groundwater levels, and since underground infrastructure - including sewer pipes and utility equipment - was built with historical groundwater levels in mind, this could lead to expensive headaches for coastal communities."<sup>14</sup>

A slurry wall and capping on top of contamination will do nothing to prevent rising groundwater from inundating and potentially flooding the area, resulting in an environmental and health disaster.

### **D. The Vulnerability of Bayview Hunters Point Residents to Pollution Must Be Factored Into the Review**

The Navy's remediation of the Shipyard Superfund Site must continue to be protective of health and the environment. It must be based on science and take into account the current reality of the health crisis and environmental conditions at and

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<sup>14</sup> <http://www.climatecentral.org/blogs/sea-level-rise-may-raise-groundwater-levels>



near the site, including Bayview Hunters Point, and how potential failure of remedies at the shipyard could significantly exacerbate them.

Unfortunately, the approved remedies do not take into consideration the well-documented health vulnerabilities of residents. Remedies must be based on facts, not on abstract “health” levels that are not appropriate for Bayview Hunters Point.

It is a well-established fact that Bayview Hunters Point is heavily impacted by decades of pollution from industry and the military, as well as from two freeways, the City’s main sewage treatment plant, dozens of contamination sites, freight transport, the Port of San Francisco, and under-regulated and unregulated businesses operating with little or no government oversight.

In January 2017, the Office of Environmental Health Hazard Assessment (OEHHA), on behalf of the California Environmental Protection Agency (CalEPA), released Version 3.0 of the California Communities Environmental Health Screening Tool (CalEnviroScreen). CalEnviroScreen identifies California communities by census tract that are disproportionately burdened by, and vulnerable to, multiple sources of pollution. CalEnviroScreen measures vulnerability through evaluating and quantifying pollution exposures, environmental effects, sensitive populations and socioeconomic factors.

CalEnviroScreen 3.0 found that BVHP is one of the communities in the entire state most at risk from pollution, and concluded that it has a higher pollution burden than 90% of the state.

CalEnviroScreen 3.0, quantifies this community’s significant exposure to environmental hazards, ranking it in the 99th percentile for diesel Particulate Matter, 98th percentile for groundwater threats, and 86th percentile for hazardous waste. It found BVHP to be in the 98th percentile for asthma.

Based on the facts regarding these significant and alarming vulnerabilities, the remedies set forth in the various RODs must be re-evaluated and new, more protective remedies adopted. The appropriate health protective remedies will require an expanded, comprehensive and safe cleanup and removal of as much of the hazardous and radioactive waste as possible from the site – not merely capping waste in place. Leaving radioactive and hazardous wastes buried at the Superfund Site, next to existing and proposed neighborhoods, under what is proposed to be recreational “open space,” and next to the San Francisco Bay waterfront threatened by rising sea levels – projected to be as more than 5 feet by 2100 under “moderate” assumptions and climbing even higher in future centuries - is purely reckless and unacceptable.

**E. The Entire Shipyard Superfund Site and Adjacent Areas Must Be Comprehensively Retested, With Independent Community Oversight**

The Navy must carry through with its public commitment to properly retest all areas, not just some areas, where Tetra Tech did radiological work at the Shipyard. The Navy and other government agencies must test the entire Shipyard Site and adjacent areas, including any locations that information provided by whistleblowers, residents and other reliable sources indicate may have been contaminated from Shipyard operations.

Scanning is insufficient and unacceptable if not combined with comprehensive core sampling. Testing must be thorough and comprehensive:

- a. Radiological core sampling must be conducted of the entire site and adjacent areas. It is imperative that all core samples go at least 9 feet beneath the surface, .
- b. The core sampling should create a 2m x 2m mapping grid,
- c. All core sampling must follow split sampling protocols.
- d. All ground water should be tested for radiation contamination, including aquifers A and B,

- e. The Navy must immediately begin working with the State of California and the Bay Area Air Quality Management District to develop and implement standards for fugitive radiological dust, and
- f. Radiologically contaminated soil should be marked with an orange colored dye. Applying this would explicitly identify important areas, help prevent accidental shipments of radioactive soil to landfills, and act as a dust suppression measure.

### **F. Land Use**

Simply stated, kids and other residents should not live, work or play next to or on top of hazardous and radioactive waste. The effect of a botched and inadequate cleanup reverberate far beyond the shipyard, impacting nearby San Francisco neighborhoods, the Bay itself and all who enjoy it and rely upon it, including subsistence fishers, and communities along the Bay.

We call on the Navy and regulatory agencies to reconsider the RODs, as part of this five-year review, to incorporate newer and more protective cleanup standards and a comprehensive remediation.

### **B. CONCLUSION**

The widespread fraud and botched cleanup, the lack of proper regulatory oversight, the lack of transparency and the government's inappropriate relationship with mega-developer Lennar/Five Points have undermined a proper cleanup of the contamination and resulted in the reckless and unscientific "remedies" being evaluated in the *Draft Review*. This is the time and process to re-evaluate the "remedies" because they:

- are not protective of public health or the environment,

- do not take into account the fact that Bayview Hunters Point residents have been found by the State of California to be highly at risk and vulnerable to pollution due to health, environmental and socio-economic indicators,
- endanger San Francisco Bay,
- are based in significant part on “data” produced by Tetra Tech despite the widespread fraud committed by that company during years of “remediation” work at the Superfund site,
- are not based on the pending large scale retesting of much of the Superfund Site which has not yet begun, and
- do not reflect latest scientific consensus on expected sea level rise due to climate change.

Our comments highlight serious flaws and omissions in the Navy’s review that must be corrected. These flaws include, among others, inadequate consideration of the impact of the radiological fraud on the cleanup and outdated assumptions which will particularly impact the large amounts of hazardous and radioactive waste buried at Parcel E-2; the *Draft Review’s* remedy analysis fails to adequately address rising sea levels due to climate change which threaten San Francisco Bay and its waterfront. The threat that rising Bay levels could inundate portions of the shipyard including Parcel E-2, as well as an inadequate revetment design that will not provide adequate protection from contaminants reaching the Bay are real and must be addressed.

The ROD remedies that are subject to the five-year review must be revised as part of this review process to incorporate the entirely foreseeable effects of significant new information, not available when the RODs were adopted. This includes the impact of the radiological fraud and the substantial and growing threat that Bay-level rise presents to the future integrity of remedies selected years ago.

We have already seen the consequences of the Navy’s failure to anticipate foreseeable risks. In August 2000, local residents observed strange-colored smoke from what appeared to be a fire burning underground in Parcel E-2. This subsurface

fire burned for months, with plumes of smoke readily visible to affected residents, some of whom report adverse respiratory affects. The smoke also affected shipyard workers and the police personnel based there. The Navy failed to properly inform the public about the health risks for the better part of three weeks after the fire broke out.<sup>15</sup> That an underground chemical fire erupted and burned for months in a supposedly stable capped “remedy” highlights the risks to protectiveness from leaving highly toxic waste buried on site.

The Navy must plan for – not underplay - predictable risks such as those posed by global warming, especially at Parcel E-2, where buried contamination is extensive and will continue to be toxic far into the future. If the Navy gets it wrong as a result of its refusal to factor up-to-date science into the five-year review, it could unleash a catastrophe to the public health and the environment. As more and more data on sea-level and Bay-level rise emerges, the Navy must reconsider and conclude that the buried hazardous and radioactive waste at Parcel E\_2 needs to be removed from proximity to residents and the rising Bay.

The *Draft Five-Year Review* needs to be redone to incorporate up-to-date science and public health data. Common sense and environmental justice require that remedies be revisited as part of the five-year review and revised remedies must prioritize removal of any and all hazardous and radioactive waste and contamination from the site.

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<sup>15</sup> *Navy Owns Up to Monthlong Toxic Fire at Hunters Point*, SFGate, Sept. 11, 2000, <https://www.sfgate.com/bayarea/matier-ross/article/Navy-Owns-Up-to-Monthlong-Toxic-Fire-at-Hunters-2739820.php>

## Appendices

### Appendix I. Probability that Sea-Level Rise will meet or exceed a particular height (in feet) in San Francisco (State of California Sea-Level Rise Guidance 2018 Update, p. 58)

The chart below displays the chances sea level rise will meet or exceed a certain height by the year listed.

#### SAN FRANCISCO - High emissions (RCP 8.5)

	<i>Probability that sea-level rise will meet or exceed... (excludes H++)</i>									
	1 FT.	2 FT.	3 FT.	4 FT.	5 FT.	6 FT.	7 FT.	8 FT.	9 FT.	10 FT.
2030	0.1%									
2040	3.3%									
2050	31%	0.4%								
2060	65%	3%	0.2%	0.1%						
2070	84%	13%	1.2%	0.2%	0.1%					
2080	93%	34%	5%	0.9%	0.3%	0.1%	0.1%			
2090	96%	55%	14%	3%	0.9%	0.3%	0.2%	0.1%	0.1%	
2100	96%	70%	28%	8%	3%	1%	0.5%	0.3%	0.2%	0.1%
2150	100%	96%	79%	52%	28%	15%	8%	4%	3%	2%

#### SAN FRANCISCO - Low emissions (RCP 2.6)

	<i>Probability that sea-level rise will meet or exceed... (excludes H++)</i>									
	1 FT.	2 FT.	3 FT.	4 FT.	5 FT.	6 FT.	7 FT.	8 FT.	9 FT.	10 FT.
2060	43%	1.4%	0.2%							
2070	62%	4%	0.6%	0.2%						
2080	74%	11%	2%	0.4%	0.2%	0.1%				
2090	80%	20%	3%	1.0%	0.4%	0.2%	0.1%	0.1%		
2100	84%	31%	7%	2%	0.8%	0.4%	0.2%	0.1%	0.1%	
2150	93%	62%	31%	14%	7%	4%	2%	2%	1%	1%

**Appendix II. Projected Sea-Level Rise (in feet) for San Francisco (State of California Sea-Level Rise Guidance, p. 57)**

The chart below portrays the probabilistic projections for sea-level rise height, along with the H++ scenario (shown in the far right, blue column), as seen in the Rising Seas Report.

		<i>Probabilistic Projections (in feet) (based on Kopp et al. 2014)</i>				<i>H++ scenario (Sweet et al. 2017) *Single scenario</i>	
		<b>MEDIAN</b> <i>50% probability sea-level rise meets or exceeds...</i>	<b>LIKELY RANGE</b> <i>66% probability sea-level rise is between...</i>	<b>1-IN-20 CHANCE</b> <i>5% probability sea-level rise meets or exceeds...</i>	<b>1-IN-200 CHANCE</b> <i>0.5% probability sea-level rise meets or exceeds...</i>		
				<b>Low Risk Aversion</b>		<b>Medium - High Risk Aversion</b>	<b>Extreme Risk Aversion</b>
High emissions	2030	0.4	0.3 - 0.5	0.6	0.8	1.0	
	2040	0.6	0.5 - 0.8	1.0	1.3	1.8	
	2050	0.9	0.6 - 1.1	1.4	1.9	2.7	
Low emissions	2060	1.0	0.6 - 1.3	1.6	2.4		
High emissions	2060	1.1	0.8 - 1.5	1.8	2.6	3.9	
Low emissions	2070	1.1	0.8 - 1.5	1.9	3.1		
High emissions	2070	1.4	1.0 - 1.9	2.4	3.5	5.2	
Low emissions	2080	1.3	0.9 - 1.8	2.3	3.9		
High emissions	2080	1.7	1.2 - 2.4	3.0	4.5	6.6	
Low emissions	2090	1.4	1.0 - 2.1	2.8	4.7		
High emissions	2090	2.1	1.4 - 2.9	3.6	5.6	8.3	
Low emissions	2100	1.6	1.0 - 2.4	3.2	5.7		
High emissions	2100	2.5	1.6 - 3.4	4.4	6.9	10.2	
Low emissions	2110*	1.7	1.2 - 2.5	3.4	6.3		
High emissions	2110*	2.6	1.9 - 3.5	4.5	7.3	11.9	
Low emissions	2120	1.9	1.2 - 2.8	3.9	7.4		
High emissions	2120	3	2.2 - 4.1	5.2	8.6	14.2	
Low emissions	2130	2.1	1.3 - 3.1	4.4	8.5		
High emissions	2130	3.3	2.4 - 4.6	6.0	10.0	16.6	
Low emissions	2140	2.2	1.3 - 3.4	4.9	9.7		
High emissions	2140	3.7	2.6 - 5.2	6.8	11.4	19.1	
Low emissions	2150	2.4	1.3 - 3.8	5.5	11.0		
High emissions	2150	4.1	2.8 - 5.8	7.7	13.0	21.9	

**Appendix III. San Francisco Sea Level Rise Scenarios (Bay Conservation and Development Commission's Adapting to Rising Tides Bay Area Sea Level Rise Analysis and Mapping Project, Final Report 2017, Pages 13-15)**

The first six scenarios (12, 24, 36, 48, 52, and 66 inches of SLR above MHHW) relate directly to the NRC SLR estimates, and they capture a broad range of scenarios between the most-likely scenario and the high end of the uncertainty range at both mid-century and the end of the century:

1. 12-inch SLR ≈ 2050 most-likely SLR scenario
2. 24-inch SLR = 2050 high end of the range; or an existing 5-year extreme tide
3. 36-inch SLR = 2100 most-likely SLR scenario; or an existing 50-year extreme tide
4. 48-inch SLR ≈ 2100 upper 85 percent confidence interval; or 6 inches of SLR plus a 100-year extreme tide
5. 52-inch SLR ≈ 12-inch SLR plus 100-year extreme tide
6. 66-inch SLR = 2100 upper-end SLR scenario; or 24-inch SLR plus 100-year extreme tide

Inundation maps were also created for Bay water level elevations of 77, 84, 96, and 108 inches above MHHW. These levels are above current predictions for SLR likely to occur by 2100, but they are helpful in illustrating short-term flooding that could occur when extreme tides are coupled with SLR:

7. 77 inches above MHHW ≈ 36-inch SLR plus 100-year extreme tide
8. 84 inches above MHHW ≈ 48-inch SLR plus 50-year extreme tide
9. 96 inches above MHHW ≈ 66-inch SLR plus 25-year extreme tide
10. 108 inches above MHHW ≈ 66-inch SLR plus 100-year extreme tide

Sea Level Rise Scenario	Daily Tide	Extreme Tide (Storm Surge)						
	+SLR (in)	1yr	2yr	5yr	10yr	25yr	50yr	100yr
	Water Level above MHHW (in)							
<b>Existing Conditions</b>	0	12	19	23	27	32	36	41
MHHW + 6"	6	18	25	29	33	38	42	47
MHHW + 12"	12	24	31	35	39	44	48	53
MHHW + 18"	18	30	37	41	45	50	54	59
MHHW + 24"	24	36	43	47	51	56	60	65
MHHW + 30"	30	42	49	53	57	62	66	71
MHHW + 36"	36	48	55	59	63	68	72	77
MHHW + 42"	42	54	61	65	69	74	78	83
MHHW + 48"	48	60	67	71	75	80	84	89
MHHW + 52"	52	64	71	75	79	84	88	93
MHHW + 54"	54	66	73	77	81	86	90	95
MHHW + 60"	60	72	79	83	87	92	96	101
MHHW + 66"	66	78	85	89	93	98	102	107



## **APPENDIX IV**



DEPARTMENT OF THE NAVY  
BASE REALIGNMENT AND CLOSURE  
PROGRAM MANAGEMENT OFFICE  
33000 NIXIE WAY, BLDG 50 STE 207  
SAN DIEGO, CA 92147

5820  
Ser BPMO/003  
March 15, 2018

The Honorable James Donato  
United States District Court  
Northern District of California  
Federal Building and Courthouse  
450 Golden Gate Avenue  
San Francisco, California

Dear Judge Donato:

SUBJECT: VICTIM IMPACT STATEMENT IN THE MATTER OF U. S. V. HUBBARD

The Department of the Navy has been designated a crime victim under 18 U.S.C. § 3771 as a result of the fraud committed by Mr. Hubbard, a former employee of Tetra Tech EC Inc. (Tt EC), and others. The Navy contracted Tt EC to prepare planning documents, investigate radiological contamination, conduct remediation, dispose of radioactive waste, and document their activities to support closure of radiologically-impacted sites and buildings at Hunters Point Naval Shipyard (HPNS) from 2003 to 2014. These activities were necessary prior to the Navy turning HPNS over to the City of San Francisco for redevelopment. The fraud committed by Mr. Hubbard and other Tt EC employees has caused not only a substantial financial loss to the Navy, but harm to the Navy's reputation, and it has cost the Navy substantial resources and time. The purpose of this statement is to give the Court a sense of the magnitude of the negative impact of this fraudulent conduct and how it has made the accomplishment of both the Navy's and the City's goals more difficult. Because of the widespread and continuing harm that he has caused the Navy, we ask that you award Mr. Hubbard a substantial sentence.

While the fraud committed by Mr. Hubbard and others has caused the Navy concrete and measurable monetary loss (addressed below), this fraud has also caused significant harm to the Navy that is much more difficult to quantify - but very real. The fraud and uncertainty surrounding Tt EC's work at HPNS has caused a complete loss of trust in the Navy by the local community. The new residents at HPNS are understandably anxious for their safety, and this has required additional effort by the Navy and regulators to address these concerns. The transfer of the property to the City will be delayed by many years, and the Navy has had to address the ire and frustration of the Mayor's Office, the Supervisor's Office, and local Congressional staffs. The redevelopment of HPNS was supposed to revitalize the community and provide jobs and affordable housing; all of that is now on hold indefinitely as the Navy and the regulatory agencies have determined that Tt EC's work is unreliable. The frustrations of these local constituencies have been channeled into a strong activist element which has made the Navy's public meetings tense, aggressive and explosive.

The fraud committed by Mr. Hubbard and others has also led to negative national media attention. The effort to respond to this negative media attention has required increased staffing to answer questions, prepare for interviews, and conduct risk communication training – all of which pulled Navy staff away from their primary duties and caused collateral impacts to other Navy bases and projects.

In addition to responding to the media, correcting misinformation, and responding to the concerns of the public and politicians, the Navy's Base Realignment and Closure (BRAC) Office created a special Review Team to assess the fraud allegations, determine what level of additional site investigation was needed, perform sampling, and then incorporate these findings into a new Work Plan for HPNS. These activities diverted significant numbers of BRAC employees from their normal duties, causing additional disruption to numerous other Navy projects across the country. This diversion of personnel and resources resulted in delays and increased costs for these other projects and resulted in constant stress on the Navy staff over a sustained period of time. The efforts of the Review Team and other similar efforts (including legal and contract dispute efforts, technical re-calculations, political briefings to the City and Congressional delegations, and constant communication up and down the Navy chain of Command), has cost Navy personnel hundreds if not thousands of hours of additional work. The Navy estimates that the fraud committed by Mr. Hubbard and others has set back the planned transfer of HPNS property to the City by an approximate decade. This means not only lost development opportunities for the City and the local community, but continued cost to the Navy to hold and maintain the property.

The fraud has also caused a loss of confidence by the regulatory community (both EPA and California State regulators) regarding the Navy's radiological remediation program and the Navy's competence to implement it. The EPA has expressed to the Navy that they no longer have confidence in the work performed by Tt EC at HPNS, as well as at other Navy radiological sites including those located at Treasure Island and Alameda in the San Francisco Bay Area. The Navy now faces an uphill struggle to rehabilitate itself from this negative connotation in the regulatory community. It will take years to rebuild this credibility.

As I indicated above, the negative fiscal impact to the Navy of the fraud committed by Mr. Hubbard and others at HPNS is consequential, and continues to be assessed. The Navy awarded sixteen contract task orders to address radiological work at HPNS to Tt EC. To date, the Navy has paid Tt EC \$261.8M for work performed at HPNS. Due to the uncovered fraud, all of this work has been called into question and may need to be re-performed. After discovering evidence of Tt EC data falsification/manipulation, and becoming aware of allegations from former Tt EC employees/subcontractors, the Navy hired an independent contractor (Battelle) to provide daily onsite radiological quality assurance for all Navy contractors performing radiological work at HPNS. This cost approximately \$2.2M. The Navy also hired CH2MHill to re-evaluate the work performed and documented by Tt EC at HPNS, CH2MHill reviewed Tt EC's radiological

database for buildings and soil sites for falsification/manipulation using a variety of statistical and logic tests. This analysis provided evidence of previously-undiscovered data falsification and manipulation, which prompted the Navy to begin preparing work plans for an independent analysis of the worksite. The total cost for the database evaluation, work plan preparation, and preliminary field work is approximately \$8.8M. The Navy is currently working with federal and state regulatory agencies to determine the extent of rework that will be necessary at HPNS in order for the Navy to obtain the required "free release" from the regulatory agencies to turn the property over to the City. The EPA has indicated that it would require all work to be re-performed as originally contracted. However, these discussions are not final. The Navy's best estimates for required re-work costs currently range from \$100M to \$300M.

In sum, the Navy has expended \$272.8 M to date paying Tt EC for their work at HPNS, identifying the fraud, and taking measures to prevent further fraud. Depending on the cost of required re-work, this number will certainly rise to \$372.8 M and is likely to rise as high as \$572.8 M. This amount of money would buy a new Littoral Combat ship. It is nearly half of the Navy's total expenditures for *all* environmental clean-up activities at HPNS through fiscal year 2017 (\$991.1 M). This is money that could otherwise have been used by the Navy to train sailors, build ships, purchase aircraft, – in short, to perform the Navy's core mission of fighting the country's wars, deterring aggression, and maintaining the freedom of the seas.

The fraud committed by Mr. Hubbard and others has undermined the taxpayer's trust in the Navy as a good financial steward. Taxpayers trust that the Navy only asks for what it needs, knowing that there are many other important and vital uses for limited funds. The Navy invests an enormous amount of time, energy, and pride in building this trust, and because of that, the military is generally considered one of the most trusted institutions in America. But it only takes the misconduct of a few individuals to erode that essential trust - misconduct like Mr. Hubbard's.

Mr. Hubbard's actions had far-reaching consequences for the United States, its employees, the City of San Francisco, the local residents, and the taxpayers. The Navy therefore respectfully requests that the Court consider a severe sentence for Mr. Hubbard that is commensurate with the adverse impacts of his fraud upon the Navy.

Sincerely,



LAURA DUCHNAK  
Director

## **APPENDIX V**

## DECLARATION OF STEVEN J. CASTLEMAN

1. My name is Steven J. Castleman. I am an attorney licensed to practice law in the State of California. Together with my co-counsel, David Anton, I represent Greenaction for Health and Environmental Justice in this action and a Petition seeking to revoke the federal Materials License of Tetra Tech, EC, Inc. (“Tetra Tech”), License number 29-31396-01, issued by Nuclear Regulatory Commission (“NRC”). The Petition is pending before the Executive Director for Operations of the NRC. That Petition (Exhibit 1 to this action), supported by statements under penalty of perjury, demonstrates Tetra Tech engaged in widespread fraud, including reporting fraudulent sampling and scanning data, which has compromised the remediation of radioactive contamination at the Hunters Point Naval Shipyard in San Francisco, California (“Shipyard”).
2. The U.S. Navy hired contractors to review the data reported by Tetra Tech in an attempt to ascertain which, if any, of those data are reliable. One or more of those contractors wrote the reports entitled *Draft Radiological Data Evaluation Findings Report for Parcels B and G Soil*, dated September 2017, which is attached to the Supplemental Filing as Exhibit 1 and *Draft Radiological Data Evaluation Findings Report for Parcels C and E Soil*, dated December 2017, which is attached to the Supplemental Filing as Exhibit 1. It supplements the evidence of fraud and was not known at the time of the filing of the Petition.
3. On January 12, 2018, I had a telephone conversation with Dr. Kathryn A. Higley, a Professor and Head of the School of Nuclear Science and Engineering in the College of

Engineering at Oregon State University. She has been hired by the U.S. Navy to act as a Community Technical Liaison for the radiation cleanup at the Shipyard.

4. During our phone conversation, Dr. Higley told me that the Navy has concluded, after data reviews including the one represented by Exhibit 1, that virtually all of the data reported by Tetra Tech is suspect. Later in our conversation she qualified what she said, saying a substantial but undefined proportion of Tetra Tech's data was "to a large extent useless." She also informed me that substantial re-sampling and re-scanning will be required to determine the full impact of Tetra Tech's fraud on the cleanup and the planning process for that project is currently under way.
5. On January 31, 2018, I attended a Community Open House meeting hosted by the Navy concerning the Hunters Point Shipyard radiological cleanup. Prior to the meeting I had a conversation with Derek Robinson, of the Navy's Base Realignment and Closure Program Management Office West ("BRAC PMO West"). He is the person in charge of the cleanup of the shipyard on behalf of the Navy. During our conversation, Mr. Robinson confirmed what Dr. Higley told me; the Navy had lost confidence in the Tetra Tech data. Mr. Robinson also said that the Navy was going to treat all Tetra Tech's data as unreliable and resample all locations where Tetra Tech did radiological work.
6. I declare under penalty of perjury that the foregoing is true and correct.



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Steven J. Castleman  
Attorney at Law

June 26, 2018

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Date

## **APPENDIX VI**



## Steven Castleman

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**From:** Steven Castleman  
**Sent:** Tuesday, January 30, 2018 4:26 PM  
**To:** 'Robinson, Derek J CIV NAVFAC HQ, BRAC PMO'  
**Cc:** David Anton; 'Bradley Angel'; brian@greenaction.org  
**Subject:** List of Witnesses/Meeting Request  
**Attachments:** Witness list for Navy-2.pdf

Mr. Robinson,

Attached is the list of potential witnesses to the Tetra Tech fraud who should be interviewed.

The descriptions of what they know are based on information developed from other witnesses; they are not meant to limit the subject matter of interviews, but rather to act as a starting point for inquiry. Trained, professional investigators should be hired who will seek to learn all the witnesses know about Tetra Tech's fraudulent activities and who will follow up on any additional leads that result from such interviews.

I will await your response to our meeting request.

See you tomorrow evening.

Sincerely,

Steve Castleman

---

**From:** Robinson, Derek J CIV NAVFAC HQ, BRAC PMO [<mailto:derek.j.robinson1@navy.mil>]  
**Sent:** Tuesday, January 30, 2018 8:06 AM  
**To:** Steven Castleman  
**Subject:** RE: Meeting Request/List of Witnesses

Dear Mr. Castleman,

I will not be able to meet this week, but have been discussing your request internally and should have a response by early next week.

Thank you for your patience.

Best Regards,

Derek J. Robinson, PE  
BRAC Environmental Coordinator  
Navy BRAC PMO West  
33000 Nixie Way; Bldg 50  
San Diego CA 92147  
Desk Phone: 619-524-6026

-----Original Message-----

From: Steven Castleman [<mailto:scastleman@ggu.edu>]  
Sent: Monday, January 29, 2018 11:54 AM  
To: Robinson, Derek J CIV NAVFAC HQ, BRAC PMO  
Subject: [Non-DoD Source] Meeting Request/List of Witnesses

Mr. Robinson,

I told you I would get you a list by last Friday of percipient witnesses that should be interviewed in the Tetra Tech case. Unfortunately, It that will have to be delayed until later this afternoon or tomorrow because I have gotten tied up on other pressing matters. I apologize for the delay.

On a different subject, are you able to meet this Thursday or Friday? If not, can we schedule a meeting that fits with your calendar?

Thank you.

Steve Castleman

Visiting Associate Professor & Staff Attorney

Environmental Law and Justice Clinic

415-442-6675 | [scastleman@ggu.edu](mailto:scastleman@ggu.edu) <<mailto:scastleman@ggu.edu>>

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## Steven Castleman

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**From:** Steven Castleman  
**Sent:** Friday, February 16, 2018 1:08 PM  
**To:** 'Robinson, Derek J CIV NAVFAC HQ, BRAC PMO'  
**Cc:** 'Bradley Angel'; brian@greenaction.org; David Anton; 'Fairbanks, Brianna'; 'lee.lily@epa.gov'  
**Subject:** Additional Witnesses  
**Attachments:** 2.16.18.ltr.robinson.pdf

Dear Mr. Robinson,

Attached please find a letter to you supplementing the witness list I sent you on January 30, 2018. It contains 5 additional names, all of whom worked in the on-site laboratory and whom we have reason to believe have personal knowledge of improper sample and data manipulation.

The letter also seeks a response to our August 2017 request for a meeting with you.

**Steve Castleman**

Visiting Associate Professor & Staff Attorney  
Environmental Law and Justice Clinic  
415-442-6675 | [scastleman@ggu.edu](mailto:scastleman@ggu.edu)



## **APPENDIX VII**





# Gamma Spectroscopy Results

Sample results given in (pCi/g)  
NWT Field Report

<b>Ufo ID</b>	<b>Sample Description</b>			
2N000031	Parcel A - 01(concrete) 259g 1/28/04 8:40			
<b>Dry Weight (g)</b>	<b>Time Counted (s)</b>	<b>Operator</b>	<b>Date Acquired</b>	<b>Time Acquired</b>
259	2699.1	Paul Wall	02-Feb-04	11:59:35 AM
<b>Library Path</b>	<b>Reviewed By:</b>		<b>Date Sampled</b>	<b>Time Sampled</b>
Hunter's Point 1.Lib			28-Jan-04	8:40:00 AM

Nuclide	Net Activity	MDA	Uncertainty	Soil DCGL
AC-228	7.1877E-01	2.2938E-01	4.9014E-01	*NA
AM-241	*<MDA	1.9088E-01	**	7.8000E+00
BI-212	*<MDA	6.0497E-01	**	*NA
BI-214	3.3371E-01	1.6542E-01	2.2379E-01	*NA
CO-60	1.9866E-02	1.5430E-02	3.4409E-02	4.2000E-01
Cs-137	*<MDA	9.6968E-02	**	1.3000E-01
EU-152	2.8179E-01 *F	1.2557E-01	2.2543E-01	1.3000E-01
EU-154	1.0062E-01	9.2507E-02	8.6375E-02	2.3000E-01
K-40	6.3481E+00	1.5329E+00	2.7700E+00	*NA
PA-234	*<MDA	1.1496E-01	**	*NA
PB-212	2.8228E-01	1.1802E-01	2.4798E-01	*NA
PB-214	5.1734E-01	1.6069E-01	3.2927E-01	*NA
RA-226	2.9653E+00	1.2805E+00	3.3784E+00	2.0000E+00
Th-230	2.2995E+01	1.3831E+01	4.9315E+01	*NA
Th-232	1.2421E+01	2.0385E+01	**	*NA
TH-234	1.1117E+00	1.8065E+00	**	*NA
TI-208	*<MDA	5.4340E-02	**	*NA
U-235	5.9660E-01 #F	3.4542E-01	9.9026E-01	5.7000E-01

\*F=Failed energy identification fraction and key energy tests demonstrating non-existence of the nuclide

#F = All energy peaks determining this isotope had bad poisson shape; this distortion signifies non-existence of the radionuclide

\*<DCGL=Nuclide failed key line energy and shape tests and is determined not to be present in sample

\*<MDA = Activity for this Nuclide is less than the Minimum Detectable Activity (MDA)

\*\* = Activity for this Nuclide is less than the MDA, therefore no Uncertainty is necessary

\*NA = No DCGL available for this Nuclide



# Gamma Spectroscopy Results

Sample results given in (pCi/g)  
NWT Field Report

<b>Ufo ID</b>	<b>Sample Description</b>			
2N000030	Parcel A - 02 259g 1/28/04 8:35			
<b>Dry Weight (g)</b>	<b>Time Counted (s)</b>	<b>Operator</b>	<b>Date Acquired</b>	<b>Time Acquired</b>
259	2698.88	Paul Wall	02-Feb-04	10:58:20 AM
<b>Library Path</b>	<b>Reviewed By:</b>		<b>Date Sampled</b>	<b>Time Sampled</b>
Hunter's Point 1.Lib			09-Feb-04	8:30:00 AM

Nuclide	Net Activity	MDA	Uncertainty	Soil DCGL
AC-228	*<MDA	4.5302E-01	**	*NA
AM-241	6.0949E-02	2.1121E-01	**	7.8000E+00
BI-212	1.0652E+00	6.4706E-01	1.0652E+00	*NA
BI-214	8.6659E-01	1.7318E-01	4.8374E-01	*NA
CO-60	2.6491E-03	1.5431E-02	**	4.2000E-01
Cs-137	*<MDA	1.0565E-01	**	1.3000E-01
EU-152	1.9823E-01 *F	1.4611E-01	2.3041E-01	1.3000E-01
EU-154	1.3078E-01	9.7271E-02	2.6244E-01	2.3000E-01
K-40	1.2301E+01	1.5329E+00	3.3491E+00	*NA
PA-234	3.4336E-01	2.3155E-01	5.9886E-01	*NA
PB-212	1.1345E+00	1.4311E-01	3.1889E-01	*NA
PB-214	1.1768E+00	1.5021E-01	4.4135E-01	*NA
RA-226	3.1165E+00	1.4884E+00	4.0652E+00	2.0000E+00
Th-230	*<MDA	1.2723E+01	**	*NA
Th-232	2.6165E+01	2.4733E+01	4.5565E+01	*NA
TH-234	*<MDA	1.8332E+00	**	*NA
TI-208	*<MDA	7.7685E-02	**	*NA
U-235	6.1342E-01 #F	3.5179E-01	9.7145E-01	5.7000E-01

\*F=Failed energy identification fraction and key energy tests demonstrating non-existence of the nuclide

#F = All energy peaks determining this isotope had bad poisson shape; this distortion signifies non-existence of the radionuclide

\*<DCGL=Nuclide failed key line energy and shape tests and is determined not to be present in sample

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