

60 DAY NOTICE of INTENT to SUE

BY CERTIFIED MAIL – RETURN RECEIPT REQUESTED

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December 7, 2023

Re: Notice of Intent to File Suit for Violations of the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”), the National Contingency Plan (“NCP”), and the *Federal Facilities Agreement, Hunter’s Point Shipyard* (“FFA”)

The Comprehensive Environmental Response, Compensation, and Liability Act requires that citizens give sixty days’ notice of intent to file suit under 42 U.S.C. § 9659. Accordingly, on behalf of Greenaction for Health and Environmental Justice (“Greenaction”), Berkeley Law’s Environmental Law Clinic (“ELC”), hereby provides notice that Greenaction intends to bring suit in the United States District Court for the Northern District of California alleging the United States Navy (“Navy”) and Carlos Del Toro, in his official capacity, and the United States Environmental Protection Agency (“EPA”) and Michael S. Regan, in his official capacity, violated CERCLA, the NCP and the FFA.

Notice has also been given to United States Attorney General Merrick Garland and California Attorney General Rob Bonta.

This notice provides sufficient information for the Navy and EPA to identify the alleged violations of CERCLA, the NCP and the FFA, the activities alleged to be in violation, and the time and location of the alleged violations, as required by 42 U.S.C. § 9659 and 40 C.F.R. §374.3.

I. EXECUTIVE SUMMARY

Greenaction for Health and Environmental Justice submits this 60-day Notice to require the Navy and EPA to comply with the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”), 42 U.S.C. 9601, *et. seq.*, the regulations in the National Contingency Plan (“NCP”), 40 C.F.R 300.400, *et. seq.*, and the *Federal Facilities Agreement, Hunter’s Point Shipyard* (“FFA”), relating to the cleanup of the former Hunters Point Naval Shipyard Superfund site. Specifically, Greenaction will seek a court order:

- Enforcing the EPA-approved Navy work plans that require 100% retesting of the work done by the Navy’s radiological remediation contractor, Tetra Tech, EC, Inc. (“TtEC”). TtEC committed intentional fraud and violated quality assurance and quality control requirements, resulting in *all* its data having to be discarded. According to the work plans, however, only one-third of TtEC’s work would be resampled, with the proviso that if any contamination was found, that would trigger 100% retesting. Contamination has been found multiple times, yet the Navy has reneged on this agreement for more than two years.
- Enforcing the FFA, under which the Navy specifically agreed to conduct the cleanup “in accordance with” CERCLA, the NCP, and EPA’s “Superfund guidance and policy.” The Navy has consistently sought to use methods not approved by EPA and in violation of its guidances.
- Requiring that the Navy comply with CERCLA’s *Five Year Review* process to:
 - Assure its remedy is protective of human health and the environment, using the most up-to-date risk calculations; and that it
 - Meet the statutory five-year deadline for such *Reviews*.

The Navy’s and EPA’s violations of CERCLA, the NCP, and the FFA are not an anomaly. To understand the ongoing violations requires placing them in the broader context of the inadequate and unlawful cleanup the Navy has undertaken, and EPA has approved, since the cleanup began. Accordingly, this Notice will detail the ongoing violations and contextualize them by describing the historical record of the Navy and EPA’s violations of law,¹ including:

- Failure to conduct a complete and accurate review of the Navy’s past historical practices, resulting in a faulty *Historical Radiological Assessment, Hunters Point Shipyard* (“HRA”), the basis for all subsequent cleanup planning. Further, when the Navy became aware its HRA was inaccurate and incomplete, it failed to correct it, resulting in inaccurate information continuing to be used as the basis for all subsequent remedial planning.

¹ Appendix A summarizes the legal requirements of CERCLA, the NCP and the FFA. Appendix B describes the historical violations the Navy and EPA have committed since the cleanup began. Appendix C is a summary of the violations of CERCLA, the NCP, the FFA and EPA guidances alleged in this Notice.

- Failure to properly determine the full horizontal and vertical extent of contamination, as required during a Remedial Investigation and Feasibility Study (“RI/FS”).
- Failure to comply with CERCLA’s non-discretionary duty to choose a remedy protective of human health and the environment.
- Failure to calculate cancer risk properly, resulting in remediation goals that were already outdated when they were adopted and were not protective of public health and the environment.
- Failure to comply with CERCLA’s *Five Year Review* process, violating CERCLA’s mandate that the Navy assure the chosen remedies remain protective of human health and the environment not less than every five years. This includes failing to update its outdated remedial goals for the past seventeen (17) years.
- Failure to comply with the public participation requirements of CERCLA, depriving the public of the right to meaningfully participate in cleanup planning.
- Failure to comply with EPA guidances, as required under the *HPNS Federal Facilities Agreement* (“FFA”).

EPA has participated in and ratified the Navy’s violations of CERCLA, the NCP and the FFA. It approved the Navy’s unlawful and inadequate Remedial Investigation and Feasibility Study (RI/FS), it approved the unlawful, outdated remediation goals the Navy adopted, and has acquiesced in the Navy’s failure to update them over the past seventeen years.

The stakes could not be higher. The shipyard’s surrounding communities have long been overburdened by pollution. An inadequate cleanup further endangers them.

In addition, plans are to build approximately 12,000 residences on the contaminated site.² If the Navy gets away with doing a slipshod, legally insufficient cleanup, the life, health, and safety of the thousands of men and women who will build the new development and the health and safety of the tens of thousands, if not hundreds of thousands of men, women, and children who will live there in the coming decades may be irretrievably harmed. The Navy and EPA have not and will not protect public health and safety. They must be compelled to do so. They must be compelled to comply with the law and the FFA.

² In addition to residential buildings, the Hunters Point Shipyard/Candlestick Point Redevelopment Project includes a school, office towers, parks, and millions of feet of commercial space. See *Long Range Property Management Plan Major Approved Development Project Hunters Point Shipyard/Candlestick Point*. The Navy and the San Francisco Redevelopment Agency signed a memorandum of understanding regarding residential redevelopment. US Navy, *Transmittal of Interim Update for Base Realignment and Closure (BRAC) Cleanup Plan (BCP) of March 1995*, p. 12 (ES 6).

II. INTRODUCTION

The Navy and EPA have failed to comply with CERCLA, the NCP and the FFA in their decades-long mishandling of the HPNS remediation, particularly the radiological cleanup.

Chief among these failures is that the Navy discovered but did not adequately investigate or correct radiological fraud and major quality assurance and quality control (“QA/QC”) deficiencies committed by its radiological cleanup contractor, Tetra Tech EC, Inc. (“TtEC” or “Tetra Tech”). After the Navy discovered clearcut evidence of TtEC’s fraud, it not only failed to conduct an inquiry into the fraud, it allowed TtEC to investigate and clear itself.

Even after Greenaction obtained numerous declarations under penalty of perjury from former HPNS radiological cleanup workers describing widespread fraud, the Navy insisted the fraudulent data was valid for **six years** after the fraud was discovered.

Only after the EPA conducted a review of TtEC’s data and found it riddled with fraud and QA/QC problems, did the Navy finally acknowledge the extent of TtEC’s wrongdoing and agree to jettison all TtEC’s data. However, instead of retesting all TtEC’s discredited work, the Navy and regulators agreed to retest only one-third of TtEC’s work, with the proviso that if retesting found any contamination, that discovery would trigger 100% retesting.

This Notice is prompted by two current and continuing violations of CERCLA, the NCP and the FFA.

First, the Navy has reneged on the retesting agreement. Retesting has found strontium-90 (“Sr-90”) exceeding the cleanup standard in at least 23 samples. Retesting has also found discrete radioactive objects. However, rather than living up to its agreement, the Navy has been trying – for years – to invalidate its own data! By this Notice and subsequent action, Greenaction seeks to enforce the retesting agreement and require 100% retesting of TtEC’s work.

Second, the Navy’s most recent *Five Year Review*, its *Fourth* (“*Fourth FYR*”), was initially published in July 2019 – 9 months late without legal or factual justification. However, the *Fourth FYR* was followed by equally unauthorized *addenda*, the last of which was issued on June 18, 2020, fully 20 months beyond the statutory deadline.

Even after taking nearly seven years to do its five-year review, the *Fourth FYR* and its *addenda* failed to assure that the shipyard remedies are protective of human health and the environment, as required by law. Rather, the Navy unlawfully **deferred** its protectiveness determination for another **five years**, until the *Fifth Five Year Review* (“*Fifth FYR*”). The Navy is currently drafting its *Fifth FYR* despite that it violated the law in its *Fourth FYR* and has never rectified those deficiencies. Based on the Navy’s consistent failure to meet its self-imposed deadlines throughout the cleanup and its past unjustified failure to meet the five-year deadline and to assure protectiveness, all indications are that the Navy will violate CERCLA in its *Fifth FYR* in the same ways it violated the law in its *Fourth FYR*.

Accordingly, Greenaction will seek a court order requiring that the Navy and EPA comply with CERCLA, the NCP and the FFA.

From the very beginning of the HPNS cleanup, the Navy has published false and misleading information. It has disregarded the historical record to improperly exclude large swaths of the shipyard from investigation, and used outdated cleanup standards which it has refused to update since 2006 despite a legal obligation to do so. In attempting to defend its improper cleanup standards, it has, when it suited the Navy's purposes, tried to *validate fraudulent data*. By doing so, it turned a blind eye to the widespread fraud perpetrated by Tetra Tech. Only after EPA published a devastating critique of TtEC's data, finding more than 90% of it to be unreliable, did the Navy finally accept the reality it had to discard the tainted data and start over.

The retesting program requires 100% retesting if any contamination is found. Retesting has found contamination numerous times. Yet, instead of living up to its agreement, the Navy has reneged on it. It now claims that its own *valid data is invalid*. The Navy is wrong. Since the Navy refuses to comply with the law and the FFA, it must be forced to do so by court order.

III. FACTUAL BACKGROUND

The Shipyard is located in the Bayview Hunters Point neighborhood of southeastern San Francisco, a historically Black neighborhood, overburdened by pollution. It was contaminated with chemical and radiological contamination from decades of ship repair work.

After World War II, the Shipyard was used to decontaminate radiologically contaminated Navy vessels that participated in "Operation Crossroads," nuclear weapons testing in the South Pacific. Ship decontamination involved sandblasting the surfaces of the contaminated ships. Due to the high levels of radioactivity on the ships' surfaces, the spent sand, known as "grit," also became highly contaminated. Because of the area's notoriously swirling winds, a large amount of radiologically contaminated grit spread throughout the shipyard.

In addition to radioactive "grit" contamination, roughly 610,000 gallons of radioactive fuel were burned at the shipyard. Radiologically contaminated smoke also spread through the Shipyard on the wind.

In 1989, the EPA declared the Shipyard a Superfund site. The shipyard was divided into alphabetically designated geographic areas entitled Parcels A through F. Because the Navy's 2004 *HRA* indicated Parcel A was not involved in industrial activities – it was used primarily for housing – the Navy concluded it was not impacted chemically or radiologically and Parcel A was transferred to the San Francisco Redevelopment Agency and then to a developer, which built housing there.

Parcels B through E were used for industrial purposes associated with shipbuilding and repair and were contaminated with both chemical and radioactive materials. Parcel F consists of tidal land abutting the shipyard and is mostly under Bay water.

Originally, the Navy promised to conduct a full cleanup of all sites at the shipyard, to do what was necessary for unrestricted residential use. This was anticipated to involve excavation

and removal of all radioactive contamination and other hazardous chemicals.³ However, as the Navy performed more rigorous analyses of the site, it discovered that it had made a series of incorrect assumptions in its *HRA* about the nature and extent of the contamination. Full excavation and removal of chemical and radiological contamination, the Navy discovered, would require much more work and expense than originally anticipated. In response, the Navy changed the fundamental nature of its remedial action from complete removal of contamination necessary for unrestricted residential use to a combination of some removals, “capping” areas with residual contamination with “durable covers,” and imposing “institutional controls” intended to prevent future users of the property from contacting contamination left at the site.

A. The TtEC Fraud

1. Finding of “Anomalous” Sample Results

The initial suspicion that TtEC engaged in fraudulent sampling was raised in October 2012, by the Navy’s Radiological Affairs Support Office (“RASO”). While reviewing post-remediation soil sample results, a RASO official identified discrepancies between the first two sets of sample results taken from a single site prior to remediation and a third set purportedly taken from that same site after remediation was claimed to have been completed: “These results reported low potassium-40 (“K-40”) sample activity (i.e. < 5 picocuries per gram) coupled with low activity for radium 226 (Ra-226), bismuth-214 (Bi-214) and lead-214 (Pb-214) in 36 out of 36 samples.”⁴ (Parenthesis in original.)

These differences in lab results raised the prospect that the post-remediation samples were taken from a different location than the first two sets of systematic samples, different than claimed on chain-of-custody (“COC”) documents.

2. The Navy Allows Tetra Tech to Investigate and Clear Itself

The Navy did not conduct an investigation of the fraud. Instead, the Navy relied on TtEC to investigate itself.

TtEC’s “investigation” into the fraudulent samples (though TtEC referred to them as “anomalous,” rather than fraudulent), resulted in an April 2014 report, *Investigation Conclusion Anomalous Soil Samples at Hunters Point Naval Shipyard* (“the *Anomalous Samples Report*”). It claimed TtEC was unable to determine the source of the fraudulent samples or who was responsible.⁵

Even so, the *Anomalous Samples Report* conceded the “anomalous” samples were not taken from the areas that TtEC’s records claimed. It speculated they could have been taken from two areas of the Shipyard: “Either the former Building 707 Triangle Area or the Building

³ *Hunters Point Shipyard Final Parcel B Record of Decision, October 7, 1997* (“*Parcel B ROD*”), p. 1-2.

⁴ *TtEC Investigation Conclusion Anomalous Soil Samples at Hunters Point Naval Shipyard, Revision 1*, (Apr. 2014), p. ES-1.

⁵ *Id.*, p. ES 2.

253/211 drill cuttings, or a combination of both, may have been used as substitute soil samples; however, the investigators were unable to conclusively determine a source.”⁶

Not only the low K-40 results indicated fraudulent sampling. So did the sample’s uniform physical characteristics, which “led the investigators to conclude that the samples were not collected from” the sites claimed on the chain-of-custody documents: “One clear feature is that the samples from the third set of systematic samples do not appear similar in color to any of the other systematic samples, and all of the samples within the set look extremely similar, if not identical.”⁷

In fact, examination of the COCs alone evidenced fraud. Proper procedure calls for samplers to note the correct time and location for every sample. However, COCs for numerous samples reported they were collected in precise five-minute intervals, on each succeeding five-minute mark.⁸ Other COCs claimed samples were taken every three minutes, without deviation.⁹

Soil samples cannot be taken with such rigid regularity. The need to prevent cross-contamination precludes it. Indeed, in an interview of TtEC supervisor Justin Hubbard (who later pled guilty to federal criminal charges stemming from the fraud) conducted for the *Anomalous Samples Report*, Hubbard noted that “[o]ne sample could take 40 minutes.”¹⁰

COCs also reported that samplers took more samples than was physically possible and that samplers were in two places at once.¹¹ Neither Tetra Tech nor the Navy has ever offered an explanation for these dubious COC patterns. However, whistleblowers who came forward explained it. They say the COCs were filled out in advance – including the time of sampling and who took the sample – by someone other than the actual sampler, a clear violation of sampling protocols and EPA guidances.

⁶ *Id.*, p. ES-2.

⁷ *Id.*, p. 15.

⁸ For example, COCs for “anomalous” samples were taken by someone who claimed he took 8 samples on June 7, 2011, starting at 13:40 (using a 24-hour clock), 13:45, 13:50, 13:55, and every five minutes thereafter, exactly, until 14:15. The next day, COCs claim he took 20 samples every 5 minutes from 8:15 am until 10:20 and an additional 20 samples every 5 minutes from 10:30 a.m. until 12:05 p.m. Similarly, COCs for a sampling supervisor claimed he took 20 samples on June 4, 2012, at: 13:00; 13:05; 13:10 and exactly five minutes thereafter until 14:35.

⁹ For example, 18 samples purportedly taken by a third sampler on May 22, 2012, were supposedly taken at 10:00; 10:03; 10:06; 10:09; 10:12; 10:15; 10:18 and continuing exactly every three minutes thereafter until 10:51.

¹⁰ *Id.*, p. 16; *Anomalous Samples Report*, Attachment 9, Personnel Interviews, p. 7.

¹¹ When interviewed by Tetra Tech, “both Justin Hubbard and Ray Roberson stated that collection of more than two sets of systematic samples in one day would be difficult.” But “Roberson was listed on chains of custody for four sets of systematic samples from the North Pier, which is extremely rocky and difficult to sample, as well as an additional trench segment survey unit, all on May 31, 2012.” (*Anomalous Samples Report*, at 11.) Even more remarkably, Roberson (who has since died) supposedly collected soil samples at Survey Unit 304 “at the same time he was listed as collecting soil samples at North Pier Survey Unit 11.” (*Id.* at 16.)

Although the Navy’s original suspicions centered on 36 phony samples, the *Anomalous Samples Report* indicated there were many more samples with suspect K-40 results: “Since January 1, 2008, approximately 2,500 samples meeting the definition of ‘low K-40’ samples have been collected at HPNS.”¹² Accordingly, even Tetra Tech acknowledged that *thousands* of samples may have been involved, not just the few dozen originally identified.

Although Tetra Tech interviewed various people during its investigation – some of those listed on the COCs, their supervisors, other members of the sampling crews and laboratory personnel – it stated, “[t]he results of the interviews were inconclusive.”

False samples were also taken over a lengthy period of time. According to the COCs in the *Anomalous Samples Report*, the earliest listed fraudulent samples were taken on March 4, 2011, while the latest were taken nearly a year-and-a-half later, on August 15, 2012. Whistleblowers say the fraud went on even longer, beginning before 2009 and continuing until at least late September 2012.

Despite these multiple red flags, the Navy accepted Tetra Tech’s whitewash uncritically and concluded that TtEC’s data were valid and reliable. It maintained that position for approximately six years, from the 2012 discovery of the “anomalous samples,” until 2018, when the Navy was forced to discard all TtEC’s data.

3. Greenaction Files NRC Petition Supported by Sworn Statements Evidencing Widespread Fraud

On June 28, 2017, Greenaction filed a Petition with the Nuclear Regulatory Commission (“NRC”) seeking to revoke Tetra Tech’s radioactive materials license, supported by numerous statements under penalty of perjury by former radiation cleanup workers at the shipyard.¹³

According to those sworn statements, Tetra Tech employees and the subcontractors it directly supervised were involved in at least six types of fraud:

- (1) fake sampling, in which soil samples – potentially by the thousands – were reported to have been taken at one location when they were actually taken from another;
- (2) discarding samples and analytical results when they came back radiologically too “hot” (i.e., above the cleanup standard);
- (3) altering scanning data to make them appear radiologically acceptable;
- (4) conducting false building surveys in which certain scan results were completely fabricated and others were falsified;
- (5) remediating radioactive material in soil improperly, resulting in potentially radioactively contaminated soil being shipped offsite as well as being used as backfill for trenches at the Shipyard; and

¹² *Anomalous Samples Report*, p. 3.

¹³ *Greenaction v. Tetra Tech*, 10 CFR §2.206 *Petition to Revoke Materials License No. 29-31396-01* (2017).

(6) altering Portal Monitor procedures¹⁴ so potentially radioactively contaminated soil was allowed to be shipped offsite to places unknown.

Because fake samples indicated areas were “clean” when they were not, shipyard sites that required additional cleanup were not remediated and remained contaminated.

Despite the overwhelming sworn testimony of participants in the fraud, the NRC denied Greenaction’s Petition and failed to impose any financial penalty on TtEC. However, Greenaction’s Petition spurred the Navy and EPA to conduct a review of TtEC’s data, as further detailed below, and apparently caught the interest of the U.S. Attorney.

4. The Federal Charges

The U. S. Attorney brought criminal charges against two TtEC supervisors, Justin E. Hubbard and Stephen C. Rolfe. Each pleaded guilty to one count of destruction, alteration, or falsification of records in federal investigations, in violation of 18 U.S.C. § 1519. They were both sentenced to eight months incarceration. Hubbard was fined \$10,000; Rolfe was fined \$2,000.

According to a May 3, 2018, press release by the U.S. Attorney:

The defendants admitted that, rather than take samples from the intended survey units undergoing analysis, they participated in the substitution of dirt that was “clean” (containing acceptable levels of radionuclides) fraudulently taken from other areas within the former naval base.

Rolfe said in his March 14, 2017, plea agreement that, “my motivation came from pressure applied by the Tetra Tech supervisors.” He also said, “One told me on multiple occasions to ‘get the hell out of that area,’ in reference to a particular survey unit that was not testing clean. Another told me on more than one occasion that we were ‘not remediating the whole goddam site.’” Rolfe said an assistant project manager “told me on numerous occasions to ‘get clean dirt.’”

“I understood these statements as a direction to go outside the appropriate survey unit and get dirt from other areas that was known to be clean, that is not containing excessive levels of radiation,” Rolfe stated.

Despite the evidence TtEC’s management participated in the fraud, the U.S. Attorney charged only Hubbard and Rolfe.

In addition to the criminal charges, the U.S. Attorney also joined private False Claims Act cases against TtEC brought by whistleblowers alleging that Tetra Tech’s “corporate

¹⁴ Portal monitors are large scanning devices used to assure that individuals, vehicles, and cargo that pass through them are not radioactively contaminated. At HPNS, vehicles and their contents were screened by a portal monitor to test for contamination before they were cleared to leave the shipyard.

management,” including its President Andrew Bolt, “initiated and directed” the fraud.¹⁵ These actions are pending.

5. The Navy Attempts to Validate Invalid Data

Based on the whistleblowers’ testimony, Greenaction, other community organizations, and individuals following the cleanup demanded that the Navy discard all the Tetra Tech data and retest 100 percent of Tetra Tech’s work.

However, the Navy insisted Tetra Tech’s data could be proven reliable through statistical analyses. To validate the data, the Navy conducted a “data review,” starting with data from Parcels B and G, which was “[b]ased solely on a review of the data previously collected by TtEC.”¹⁶ The review was explicitly intended to **validate** rather than investigate the fraudulent data:

The objective of this evaluation is to review the historical radiological data collected by TtEC at HPNS, assess the potential for data falsification or manipulation, and recommend follow-up data collection **to validate previous decisions** regarding the property condition.”¹⁷ (Parenthesis in original, emphasis added.)

Rather than validate Tetra Tech’s data, however, the review identified additional evidence of fraud: “Evidence of **potential data manipulation and falsification was discovered** during the Navy’s soil data evaluation of Parcels B and G.”¹⁸ (Emphasis Added.)

This was the case even as the Navy admitted the data review was incomplete. A key component of any data review is examining the chain-of-custody documents. Yet the report was drafted **before** that review was done: “An inventory and evaluation of the available COCs is currently being done and was not complete at the time of this report.”¹⁹ In other words, the Navy’s data review never confronted the clear evidence of fraud contained in the COCs – samples taken at precise 3 or 5 minute intervals – outlined above.

Even with these faults, the Navy’s data review could not help but conclude that the TtEC fraud was not limited to the 36 “anomalous” samples. The Navy released three drafts of its data review: the first reviewed soil sampling data and five (5) building scans from Parcels B and G; the second involved soil sampling data and two (2) building scans from Parcels C and E; the third involved the bulk of building surveys basewide.

¹⁵ The whistleblower lawsuits are: United States ex rel. Jahr, et al. v. Tetra Tech, EC, Inc., et al., Civil Action No. 13-3835 JD (N.D. Cal.); United States ex rel. Smith v. Tetra Tech EC, Inc., et al., Civil Action No. 16-1106 JD (N.D. Cal.); and United States ex rel. Wadsworth v. Tetra Tech EC, Inc., Civil Action No. 16-1107 (N.D.Cal.).

¹⁶ *Draft Radiological Data Evaluation Findings Report for Parcels B and G Soil*, September 2017, p. iii.

¹⁷ *Id.*, p. ii.

¹⁸ *Id.*, p. v.

¹⁹ *Id.*, p. 3-4, fn. 2.

a. Parcels B and G Findings

The Navy's data review of Parcel B data stated: "The areas evaluated in Parcel B included 70 trench units, 110 fill units and 5 current and former building sites with 17 survey units." The review found: **40%** (2 of 5) of current and former building sites evidenced fraud; **17.3%** (19 of 110) of fill units evidenced fraud; and **5.7%** (4 of 70) of trench units evidenced fraud.²⁰

The Navy's review of Parcel G found: **100%** (2 of 2) of the current and former building sites evidenced fraud; **50.4%** (54 of 107) of fill units exhibited evidence of fraud; and **31.7%** (20 of 63) of trench units evidenced fraud.²¹

In these two parcels, the Navy found evidence of 142 "suspect" testing units.

b. Parcels C and E Findings

Like the review for Parcels B and G, the reviews of Parcels C and E found additional evidence of Tetra Tech's fraud. The Parcel C report concluded there was a high probability that at least some of the soil samples collected in that parcel were "not representative of the respective survey units" they were supposed to have sampled.²² Also like the previous data review, the report was drafted before any review of the chain-of-custody documents.²³

In Parcel C, the Navy reported: **78%** (94 of 120) of fill units evidenced fraud;²⁴ **73%** (8 of 11) of survey units from the North Pier evidenced fraud;²⁵ and **46%** (32 of 69) of trench units evidenced fraud.²⁶

The review of Parcel E data found: **67%** (64 of 96) of fill units evidenced fraud;²⁷ **60%** (61 of 102) of current and former building sites evidenced fraud;²⁸ and **46%** (26 of 57) of trench units evidenced fraud.²⁹

In sum, The Parcel C and E report identified instances of potential fraud impacting 67% (134 of 200) of the total trench, fill, and sample units. Moreover, the report provided independent, third-party verification of allegations by prior Tetra Tech employees; in 21 of the 32 suspect trench units (66%) at least one worker alleged wrongdoing.³⁰

²⁰ *Id.*, p. iii.

²¹ *Id.*, p. iv.

²² *Draft Radiological Data Evaluation Findings Report for Parcel C Soil*, November 2017, p. 2-4.

²³ *Id.*, p. 3-4, fn. 3.

²⁴ *Id.*, p. 4-20.

²⁵ *Id.*, p. 4-31.

²⁶ *Id.*, p. 4-2.

²⁷ *Draft Radiological Data Evaluation Finding Report for Parcel E Soil*, December 2017, p. 4-17.

²⁸ *Id.*, p. iv.

²⁹ *Id.*, p.iii.

³⁰ *Id.*, at pp. 4-2 to 4-16.

The review of Parcels C and E data contained identical language specifically finding the fraud was more extensive than reported in *the Anomalous Samples Report*. Both evaluations “found evidence that **potential manipulation and falsification were not limited to the survey units addressed by TtEC in their *Investigation Conclusion, Anomalous Soil Samples Report*** (TtEC 2014).”³¹ (Emphasis added).

c. Building Surveys

In March 2018, the Navy released its *Draft Building Radiation Survey Data Initial Evaluation Report*, reviewing building scans done between 2006 and 2016. Its Executive Summary is blunt: “**Evidence of data manipulation and/or falsification was found in the building radiation surveys.**”³² (Emphasis added.) The Navy reported:

While the Navy selected four methods for the initial survey evaluation, **additional inconsistencies and anomalies were noted but not investigated fully because the initial evaluation provided ample evidence that the building radiation surveys had been manipulated** and could not be used to support a recommendation for unrestricted radiological release.³³ (Emphasis added.)

6. Regulators Release Devastating Data Review

By letter of December 27, 2017, the U.S. EPA, and the California Departments of Toxic Substances Control (“DTSC”) and Public Health (“CDPH”) transmitted comments concerning the Navy’s review of the Parcels B and G data summarized above.³⁴

The cover letter served as an executive summary. It said regulators conducted a detailed, independent review of the Parcels B and G soil-sample report “with a technical team including national experts in health physics, geology, and statistics.”³⁵ They found:

In Parcel B, the Navy recommended resampling in 15% of soil survey units in trenches, fill, and building sites. EPA, DTSC, and CDPH found signs of potential falsification, data manipulation, and/or data quality concerns that call into question the reliability of soil data in an additional 76% of survey units, **bringing to 90% the total suspect soil survey units in Parcel B.** (These do not add exactly due to rounding.) (Parenthesis in original, emphasis added.)³⁶

As to Parcel G:

³¹ *Id.* at p. 4-32; *Draft Radiological Data Evaluation Finding Report for Parcel C Soil*, November 2017, p. 4-32.

³² *Draft Building Radiation Survey Data Initial Evaluation Report*, March 2018, p. iii.

³³ *Id.* “Unrestricted radiological release” is required for residential development, the intended end use of HPNS after the cleanup is completed.

³⁴ 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)*.

³⁵ *Id.*, December 27, 2017, letter, p.1.

³⁶ *Id.*

The **data revealed not only potential purposeful falsification and fraud** in terms of sample and/or data manipulation, they also reveal the potential failure to conduct adequate scans, a lack of proper chain of custody for ensuring samples were not tampered with, extensive data control issues (including off-site laboratory data) and general mismanagement of the entire characterization and cleanup project.” (Emphasis added.)³⁷

While the Navy “recommended resampling 49% of survey units” in Parcel G, EPA concluded that “a total of **97% of survey units**” contained suspect data.³⁸

7. The Navy Discards TtEC’s Data and Agrees to a Retesting Program

Having no choice considering the regulators’ devastating data review, the Navy finally agreed, after defending TtEC’s data for nearly six years, that it was not reliable, and it had to be discarded. The Navy and regulators agreed, over vociferous community objection, to a resampling plan that did **not** call for retesting 100% of TtEC’s work. Rather, the plan was to resample only **one-third** of Tetra Tech’s work. However, if **any** resampling results found contamination, EPA, California agencies, and the Navy agreed that it would trigger 100% retesting.

This agreement was memorialized in the retesting workplans for Parcels G, B, and C.³⁹ For example, the *Parcel G Work Plan*’s Introduction stated:

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.**⁴⁰ (Emphasis added.)

The bolded language above is repeated in the *Parcel G Work Plan*’s Executive Summary. The work plans for Parcels B and C contain the same retesting language.

The retesting agreement was also publicly acknowledged in a PowerPoint presentation the Navy gave to San Francisco Mayor London Breed on September 23, 2021. In slide 4, a Navy bullet point said the plan called for: “Excavation and sampling of 33% of the trenches and surface scanning of all remaining trench areas at Parcel G.”⁴¹ The presentation altered the trigger

³⁷ EPA Final Comments on Draft Navy Radiological Data Evaluation Parcels B & G Report (December 27, 2017), p. 10.

³⁸ December 27, 2017, letter, p. 1.

³⁹ See, e.g., *Final Parcel G Removal Site Evaluation Work Plan*, Former Hunters Point Naval Shipyard, CH2M, June 2019, p. iv; *Final Parcel B Removal Site Evaluation Work Plan*, Former Hunters Point Naval Shipyard, GES, April 2022; *Final Parcel C Removal Site Evaluation Work Plan*, Former Hunters Point Naval Shipyard, GES, August 2022.

⁴⁰ Final Parcel G Removal Site Evaluation Work Plan, Former Hunters Point Naval Shipyard, CH2M, June 2019, p. 1-1.

⁴¹ *Former Hunters Point Naval Shipyard, CA Update for Mayor London Breed*, PowerPoint presentation, Sept. 2021, slide 4. The presentation is attached hereto as Exhibit 1.

language from “if contamination is identified,” to, “**Any exceedances of radionuclides trigger 100% excavation of trenches.**” (Emphasis added.)⁴²

8. Testing Found Strontium 90 Exceeding the Remediation Goal

The Navy began retesting in Parcel G. Sampling results from June, July, and August 2021 found at least **23 samples** taken from 9 different trench units **exceeding the cleanup standard for Strontium 90 (“Sr-90”) – .331 picocuries per gram (“pCi/g”)**. The 23 samples ranged from .3375 to .604 pCi/g, nearly double the remedial goal. As of the date of this Notice, these results have not been publicly released by the Navy. Rather, they were obtained through a Freedom of Information Act (“FOIA”) request.

Under the terms of the retesting agreement, these findings trigger 100% retesting of TtEC’s soil “remediation.”

However, rather than live up to its agreement, the Navy has advanced a series of contradictory excuses over the last two years designed to negate the agreement. In the process, it has consistently misled the public. Initially, the Navy mislabeled the 23 Sr-90 results as “false positives.” Then it claimed they were within “background” radiation levels. Eventually, the Navy settled on a claim that the sample results – the Navy’s own data –were invalid.

In its September 2021 presentation to Mayor Breed, the Navy claimed it found problems with strontium 90 results but did not acknowledge that exceedances were found. Instead, it claimed it found “false positives.” A bullet point in slide 5, entitled, “Strontium,” stated: “Navy chemists evaluated the Strontium data - laboratory procedures are likely causing ‘false positives.’”

The slide also says, “The Navy is adjusting the laboratory procedures to lower the detection limit, to increase measurement precision, and to reduce method uncertainty,” and it would “reanalyze all past strontium samples” using the “updated method to confirm whether or not strontium is present.” The slide also claimed the SR-90 levels were “within regional background levels and below risk levels.”⁴³ (Emphasis added.)

None of these statements were true. Strontium 90 results were not “false positives.” They are valid. They were not “below risk levels,” they exceeded the remediation goals. They were not “within regional background levels,” they were more than double them.⁴⁴ Finally, the EPA approved methods that were used are reliable. EPA does not approve methods with uncertain detection limits, accuracy, or precision.

The Navy eventually admitted to the Sr-90 exceedances online, but that could only be found by following a series of internet links that did **not** mention them. First, one must click on the Navy’s radiation cleanup website’s “Timely Topic” page.⁴⁵ Then one must click on a

⁴² *Id.*

⁴³ *Id.*, slide 5.

⁴⁴ The Navy claims the background for Sr-90 at HPNS is .15 pCi/g. The remedial goal is .331 pCi/g.

⁴⁵ <https://www.bracpmo.navy.mil/BRAC-Bases/California/Former-Naval-Shipyard-Hunters-Point/Timely-Topics/> (last visited Oct. 23, 2023).

headline, dated September 24, 2021: “Navy to Improve Lab Method for Strontium-90 to Increase Precision in Retesting Data.”⁴⁶ An entry on that page says, “A fact sheet is available to answer questions the public may have about HPNS strontium samples.” The words “fact sheet,” links to a document, dated October 2021, entitled, “Strontium-90 Laboratory Procedures, Frequently Asked Questions” (FAQs).⁴⁷ Only by clicking on this link is one connected to a document that discloses the exceedances. But it but downplays them:

Approximately 10% of samples indicate strontium-90 levels slightly above the remediation goal. To date, two samples were re-analyzed to confirm results and strontium-90 was not detected. To remedy this, the Navy worked with regulatory agencies and chemists to refine the laboratory procedure to produce more precise analytical results. (Emphasis added.)

The Navy’s October 2021 FAQs also made it appear that **all** Parcel G soil samples would be retested. Under the heading, “Exactly what is changing?” the FAQ states, “The Navy **will reanalyze all Parcel G soil samples using the updated method.**” However, the last paragraph of the FAQ indicates: “The Navy will reanalyze **all of the Parcel G strontium-90 soil samples collected to date.**” (Emphasis added.)

Since the Navy only tests 10% of samples for Sr-90, the Navy will reanalyze only 10% of the Parcel G soil samples, not all of them, as promised. In fact, 90% of the samples are never tested for Sr-90, a major deficiency in demonstrating protectiveness.

In addition, the FAQ asks the question, “Is there reason to be concerned about strontium-90 at HPNS?” Its response is, “No. Strontium-90 lab results to date have not indicated levels considered a risk to human health or the environment.” This is untrue. As mentioned, 23 Sr-90 samples exceeded the remediation goals; remediation goals are calculated to be the level above which exposures are deemed a risk to public health.

The FAQ page also claims: “The U.S. Environmental Protection Agency (EPA) method for identifying strontium (EPA Method 905.0 MOD) **will continue to be used.**” (Parentheses in original, emphasis added.)

However, the method the Navy is using to challenge the Sr-90 results is not a refinement of the EPA method. It is a different method entirely, **not** an EPA-approved method.

The Navy has provided limited information publicly about this new method. At community meetings, the Navy indicated that it involved two changes to the EPA method. First, the size of the sample to be tested would be larger, 2.5 grams, instead of 1 gram. Second, the “ingrowth” period, the time over which the procedure is conducted, would be doubled, from 7 to 14 days.

⁴⁶ “Navy to Improve Lab Method for Strontium-90 to Increase Precision in Retesting Data,” NAVFAC (Sep. 24, 2021), <https://www.bracpmo.navy.mil/BRAC-Bases/California/Former-Naval-Shipyard-Hunters-Point/Timely-Topics/Display/Article/2998526/navy-to-improve-lab-method-for-strontium-90-to-increase-precision-in-retesting/>.

⁴⁷ Strontium-90 Laboratory Procedures, Frequently Asked Questions, NAVFAC (Oct. 2021), https://media.defense.gov/2022/Mar/02/2002948140/-1/-1/0/HPNS_20211021_SR90_FAQ.PDF.

Procedurally, a “Field Change Request” (“FCR”) is required to change the analytical methods that were previously approved, in this case by the *Final Parcel G Removal Site Evaluation Work Plan*. The FCR for the Sr-90 retesting has not been released publicly. It was obtained through a FOIA request.

The FCR is dated August 16, 2021. It identifies the Navy’s proposed new method, which it says, “is based on ASTM Method C1507-07 and Eichrom Method SRW01” (“the Eichrom method”). There is no mention of EPA Method 905.0 MOD or any other EPA method.

According to the FCR, there are *three* differences between the two methods. In addition to the larger sample size and longer “ingrowth” period, the third, publicly undisclosed change, treats sample preparation very differently than the EPA method. Method 905.0 MOD separates out strontium using chemical precipitation. The Eichrom method, in contrast, separates out Sr-90 through acid digestion and application of a resin, a proprietary product of Eichrom Technologies, Inc. These are significant departures from the EPA’s method 905.0 (MOD). Thus, the Navy’s assertion that EPA Method 905.0 MOD “will continue to be used,” is untrue.

9. The Navy Attempts to Invalidate Valid Data

The Navy’s acknowledgement of the 23 Sr-90 exceedances on one of its web pages did not signify a change in the Navy’s approach. Instead, it pivoted to a claim that **its own sampling data are invalid!**

EPA pushed back.

An email chain between the EPA and the Navy from September 14 - 24, 2021, regarding the FCR was also obtained through FOIA.⁴⁸ In a September 23, 2021, email, EPA wrote:

The proposed FCR does not describe how the results generated by reanalyzing previously collected Parcel G soil samples will be used in relation to the existing results. We do not object to reanalyzing previously collected samples but **would not support, in the absence of convincing evidence, using the new data to supersede existing results.** (Emphasis added.)

The email chain also commented on a draft of the “Timely Topics” post the Navy was preparing. Among other comments, EPA objected to the Navy’s attempts to declare the Sr-90 exceedances invalid. EPA emphasized: “[t]he **previous strontium-90 results are valid data. It’s inaccurate to suggest the data were not precise enough.**” It repeated, “EPA has been clear that in the absence of convincing evidence, we cannot support using the new data to supersede existing results.” (Emphasis added.)

Furthermore, EPA wrote: “**It reads as if the Navy is suppressing data results it doesn’t like in regards to strontium 90 data.**” It added, “**It seems as if the communication goal is to discredit data the Navy has already collected.**”⁴ (Emphasis added.)

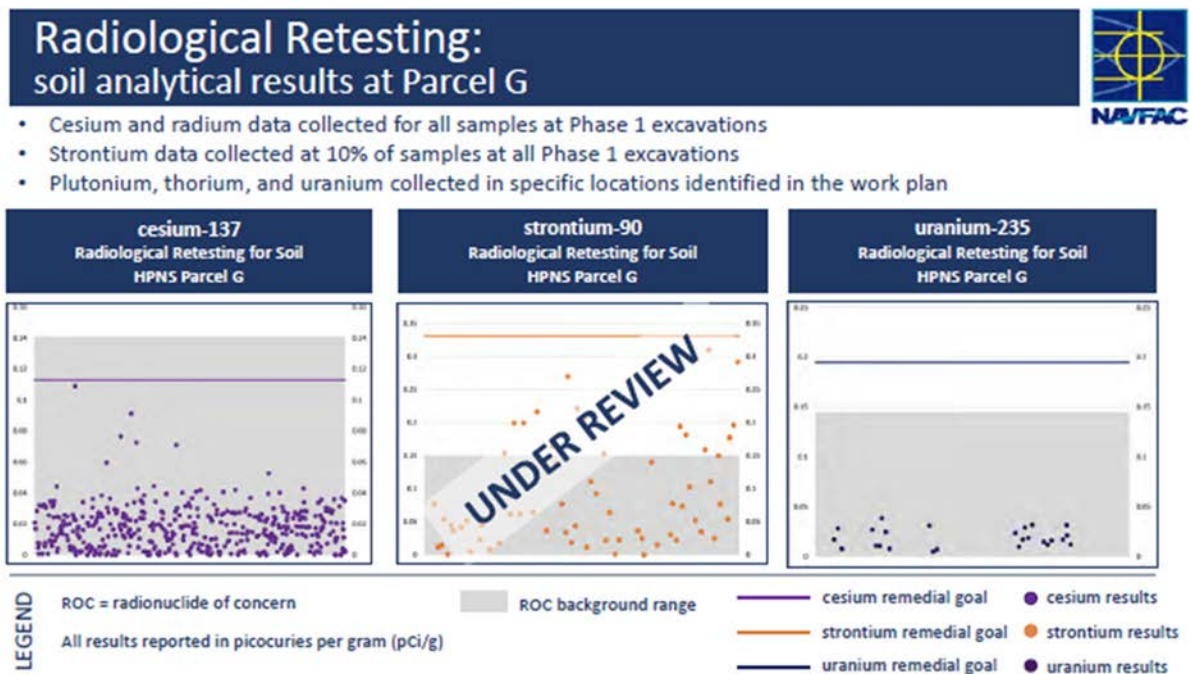
⁴⁸ The email chain is attached hereto as Exhibit 2.

As of the date of this Notice, the EPA and the Navy are still engaged in an ongoing, two-year dispute about the need to retest the SR-90 exceedances and the method the Navy has proposed to do so.

10. The Navy Continues to Mislead the Public

A body appointed by the San Francisco Mayor to monitor the shipyard cleanup has been meeting for many years called the “Hunters Point Shipyard Citizens Advisory Committee” (“CAC”). The Navy gives several presentations to the CAC each year.

Despite EPA’s pushback the month before, in an October 25, 2021, presentation to the CAC, the Navy gave a misleading PowerPoint presentation. Slide 23, reproduced below, was entitled “Radiological Retesting: soil analytical results at Parcel G.”



The portion of the slide relating to Sr-90, “strontium-90 Radiological Retesting for Soil HPNS Parcel G,” contains a line representing the strontium 90 (“Sr-90”) remediation goal, .331 picocuries per gram (“pCi/g”). Instead of showing the 23 exceedances as data points above the line, however, **no exceedances were included**. A label overlaid on the chart says, “Under Review,” but there is no explanation for why the Sr-90 results were being reviewed.

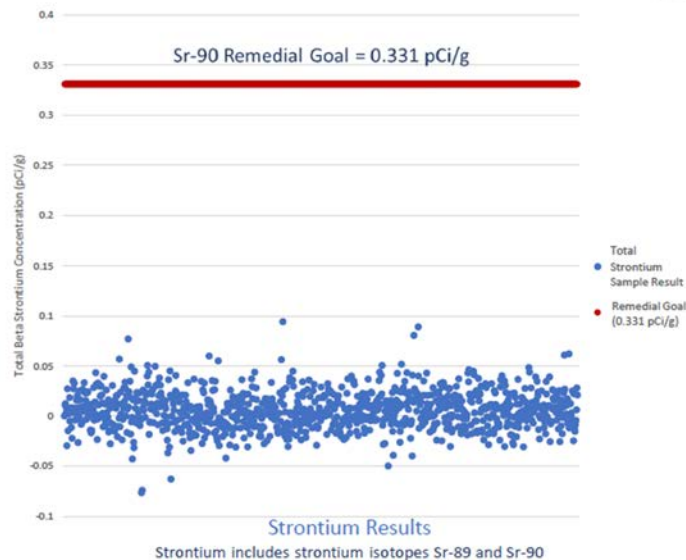
Note also that there are more than a dozen data points indicating sample results between .15 pCi/g, the purported “background” level of Sr-90, and .331 pCi/g, the remediation goal.

Nearly a year later, at an August 22, 2022, CAC meeting, the Navy distributed another chart, reproduced below, which also contained **no** Sr-90 data points above the line representing the .331 pCi/g remedial goal, ignoring the 23 exceedances.

Parcel G: Radiological Soil Strontium Results



- Strontium results have been compared to the Remedial Goal for Strontium 90 (Sr-90)
- More than 1,000 projects samples were analyzed
- No samples have exceeded the Navy's Remedial Goal for Sr-90
- A validation study is underway to provide quality control and confidence in results
 - Began in June 2022
 - Results expected by the end of September 2022



However, these exceedances were not the only data omitted from the August 22, 2022, presentation. In addition, though the strontium summary slide with the overlay “Under Review” presented at the October 25, 2021, CAC meeting contained more than a dozen samples between the background levels and the remediation goal, the August 22, 2022, slide (above) omitted them.

Further confusing matters, the slide contains numerous Sr-90 data points – approaching half of all Sr-90 samples – **below zero**. How analysis could so consistently find negative values of Sr-90 is unexplained but raises significant questions.

Slide 8 of the August 22, 2022, presentation also contained contradictory statements about the retesting. Under the heading, “Environmental Cleanup Status,” the Navy states, “Radiological testing ongoing” and “Scheduled completion: Fall 2023.” However, the Navy’s true intention – that retesting will **not** result in additional remediation, despite the Sr-90 exceedances – is spelled out in the statement, “**Remedial action complete.**” (Emphasis added.)

Remedial action in Parcel G cannot be “complete” until all the resampling has been finished and radiation that exceeds a remedial goal is lawfully disposed.

In an April 24, 2023, CAC PowerPoint presentation, the Navy revised its projected timeline for completing the retesting from “Fall 2023” to “Spring 2024.”

The Navy also made a PowerPoint presentation at a July 18, 2023, CAC meeting. Slide 40 contained a timeline for what the Navy calls the Sr-90 “verification study.” It indicated that the final report would be issued to regulators on June 30, 2024. This means that the years-long dispute between the EPA and Navy about the strontium will not be resolved until next spring at the earliest, nearly three years since the Sr-90 exceedances were identified.

11. The Eichrom Method Confirms Sr-90 Exceedances

The Navy claims that retesting the samples that identified Sr-90 exceedances using the Eichrom method did not confirm the exceedances. This is untrue. In fact, Eichrom method analysis **confirmed** Sr-90 exceeding the remedial goal in at least five samples.

An undated PowerPoint presentation which was given by the Navy to EPA on March 17, 2022, entitled, “Hunters Point Sr-90 Extraction Chromatography Analysis, Suspected Bias Investigation” was obtained through a FOIA request.⁴⁹ In its fourth slide, there is a chart of Eichrom test results for Sr-90. There are eighteen (18) samples summarized. Of those, five (5) exceeded the Sr-90 remediation goal, .331 pCi/g.⁵⁰

The purpose of the “Suspected Bias Investigation,” was stated in the second slide:

- Site personnel observed Sr-90 results above the action limit for samples not expected to contain Sr-90 activity.
- The data set seemed to have an overall high bias.
- At the request of Aptim,⁵¹ the laboratory investigated potential sources and identified the cause. (Bullet points in original.)

According to the presentation, possible “high bias” resulted from interference from lead 210 (Pb-210). The solution was to retest for “Total Beta Strontium.” The presentation presents results using this method which found Sr-90 below the remediation goal.

In other words, the Navy did not accept the Sr-90 exceedances identified by EPA Method 905.0 MOD. It attempted to invalidate those results using the Eichrom method. However, the Eichrom method confirmed the exceedances in more than 27 percent of the samples.⁵² The Navy then sought to invalidate *those* results by testing for Total Beta Strontium. To get the results it wanted, the Navy used a non-EPA method and then had to modify it **twice** – first to get rid of alleged Pb-210 interference and then to measure “total beta strontium.”

Characteristically, the Navy has never publicly acknowledged the two Eichrom modifications it had to make to explain away the Sr-90 exceedances. More importantly, it has continued to actively mislead the public. Despite the March 17, 2022, “Suspected Bias Investigation” presentation’s slide showing the Eichrom method **confirmed** five Sr-90 exceedances, at a CAC presentation on April 23, 2023, the Navy claimed, in slide 4, “**No exceedances to date have been found using the new method.**” Slide 5 repeats this falsehood: “**No samples to date have exceeded the Navy’s remedial goal for Sr-90.**” (Emphasis added.)

⁴⁹ The presentation is undated, but an email dated March 17, 2022, from the EPA to the Navy, also obtained by a FOIA request, refers to the presentation and thanks the Navy for participating “in this morning’s discussion with the Navy and the lab.”

⁵⁰ The presentation is attached as Exhibit 3.

⁵¹ Aptim is a Navy contractor.

⁵² 5 of 18 = 27.77%

The Navy has gone to great lengths and great expense trying to justify renegeing on the retesting plan. In the process it has consistently misled the public. If the Navy will not tell the truth and live up to its legal obligations and its agreements, it must be required to do so.

12. Retesting Identifies Contamination in Parcel C Soil

At a CAC meeting on September 25, 2023, the Navy disclosed that the Sr-90 exceedances were not the only findings from resampling that trigger 100% retesting. Scanning of soil from Parcel C that had previously been “remediated” by TtEC found an easily identifiable radioactive “deck marker.”⁵³ Like the Sr-90 exceedances, this finding alone should trigger 100% retesting of TtEC’s work.

13. Retesting Identifies Contamination in Parcel B Soil

At a CAC meeting on December 4, 2023, the Navy disclosed it found a radioactive object in Parcel B soil, a 3/16th inch glass shard. Analytical results of sampling the object and the soil around it are not yet available. With this discovery, retesting in all 3 of the Parcels with approved retesting workplans, Parcels B, C, and G, has discovered radiological contamination. Taken together with the Sr-90 exceedances in Parcel G and the Parcel B deck marker, the justification for retesting 100% of TtEC’s work is overwhelming.

IV. THE NAVY AND EPA HAVE VIOLATED CERCLA, the NCP and the FFA

A. The Navy’s Has Reneged on the Retesting Agreement, Violating CERCLA, the NCP and the FFA

The *Final Parcel G Removal Site Evaluation Work Plan*, the *Final Parcel B Removal Site Evaluation Work Plan*, and the *Final Parcel C Removal Site Evaluation Work Plan* commit to 100% retesting of TtEC’s work “if contamination is identified” during phase one retesting of one-third of TtEC’s work.

As detailed above, retesting has found contamination in all three of the Parcels with approved retesting workplans: 23 Sr-90 samples from 9 trench units in Parcel G exceeding the remedial goals; a radioactive deck marker found in Parcel C soil; and a radioactive glass shard found in soil from Parcel B.

Any of these findings individually should have triggered 100% retesting. Taken together, they demonstrate why full retesting is imperative. The 23 Sr-90 exceedances in Parcel G show the soil must be fully retested to rectify TtEC’s widespread fraud; radioactive objects like those found in Parcels B and C can only be located by 100% retesting.

Without 100% retesting, the Navy cannot comply with the CERCLA and NCP requirements that remedies be protective of human health and the environment, violating 42

⁵³ “Deck markers” were small radioactive devices, roughly the size of a silver dollar, which glowed in the dark and for a time were affixed to the decks of Navy vessels so sailors could see their way at night.

U.S.C. § 9621 and 40 C.F.R. 300.430, respectively. Nor can the Navy comply with its commitment under the FFA if it reneges on the retesting work plans cited above.

B. The *Fourth Five Year Review* Violated CERCLA, the NCP and the FFA

The *Final Fourth Five Year Review for Hunters Point Naval Shipyard* (2018) (“*Fourth FYR*”) violated CERCLA, the NCP and the FFA. First, it did not assure that the remedies continue to be protective of human health and the environment. Second, it violated the statutory requirement that such reviews be done “no less often than each 5 years,” as 42 U.S.C. § 9621(c) mandates. Third, it did not tell the truth about the TtEC fraud and its impact on the cleanup.

Furthermore, the Navy violated EPA’s *Comprehensive Five-Year Review Guidance*. The *Fourth FYR* failed to: determine whether there have been changes in toxicity or other contaminant characteristics which need to be investigated; identify “recent” toxicity data; revisit the validity of cleanup levels; and recalculate risk assessment to account for changes in standards and/or toxicity data. It failed to properly answer the three key questions that five-year reviews must address:

- Question A - Is the remedy functioning as intended by the decision documents?
- Question B - Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?
- Question C - Has any other information come to light that could call into question the protectiveness of the remedy?⁵⁴ (Bullet points in original.)⁵⁴

1. The *Fourth FYR* Did Not Assure Protectiveness Because the Navy Has Refused to Update Its Cleanup Standards Despite Repeated EPA Demands

At sites with remedies that leave residual contamination onsite, CERCLA requires a review of the remedy every five years “to assure that human health and the environment are being protected by the remedial action being implemented.”⁵⁵ The Navy violated CERCLA by using the same table of remedial goals in each of its removal actions, remedial actions, work plans, RODs, and *FYRs* for the past seventeen years, despite significant changes in the EPA’s radiological Preliminary Remediation Goals (“PRGs”) and advances in scientific knowledge about the risks of radiation. Refusal to update the PRGs violates Superfund guidance “recogniz[ing] that EPA should use the best science available” and requiring prioritization of the “most current” data sources.⁵⁶ The Navy’s refusal to update the PRGs is also a violation of the FFA, which clearly and repeatedly requires the Navy to comply with EPA guidance.⁵⁷

EPA has consistently asked the Navy to update its radiological PRGs. The Navy has just as consistently refused.

⁵⁴ *Comprehensive Five-Year Review Guidance*, (June 2001), OSWER 9355.7-03B-P, p. 4-1.

⁵⁵ 42 U.S.C. § 9621(c).

⁵⁶ *Human Health Toxicity Values in Superfund Risk Assessments*, OSWER Directive 9285.7-53 (2003), 2-3, <https://www.epa.gov/sites/default/files/2015-11/documents/hhmemo.pdf>.

⁵⁷ *Federal Facility Agreement, Hunters Point Shipyard* (1992), Attachment G: EPA Comments on RI/FS Workplan.

The Navy **has** updated its chemical PRGs. For example, Parcel B’s ROD was followed by two Explanations of Significant Differences (“ESD”), the second of which modified cleanup standards for chemical contamination, prompted by EPA’s update of its PRGs for chemically contaminated soil: “This ESD revises the soil cleanup values presented in Table 8 to incorporate EPA’s 1999 PRGs. . . .”⁵⁸ Why the Navy has agreed to update its chemical PRGs but refuses to update its radiological PRGs has never been publicly explained.

EPA periodically updates and publishes default radiological PRGs to reflect advances in understanding risk. It did so for soil PRGs in 2004, 2007, 2010, and most recently in February 2023. The 2023 default soil PRGs were significantly strengthened compared to 2006, when the Navy adopted its release criteria. Below is a comparison of EPA’s 2023 soil default PRGs and the 2006 remediation goals adopted by the Navy:

SOIL RELEASE CRITERIA COMPARISON – Residential – 1997 to 2023

Radionuclide	HPNS (2006)⁵⁹	EPA 2/20/23⁶⁰
Americium-241	1.36	.4800 (4.80E-01)
Cesium-137	0.113	.0401 (4.01E-02)
Cobalt-60	0.0361	.0285 (2.85E-02)
Europium-152	0.13 ^f	.0384 (3.84E-02)
Europium-154	0.23 ^f	.0467 (4.67E-02)
Plutonium-239	2.59	.4450 (4.45E-01)
Radium-226	1.0 ^g	.00192 (1.92E-03)
Strontium-90	0.331	.00477 (4.77E-03)
Thorium-232	1.69	.00170 (1.70E-03)
Tritium	2.28	no value listed
Uranium 235+D	0.195	no value listed*

f. Based on EPA-decay corrected PRGs for commercial reuse and a previous action memorandum (TtEMI, 2000a, 2001). (Footnote in original Table 1.)

g. Limit is 1 pCi/g above background, per agreement with EPA. (Footnote in original Table 1.)

* EPA does not list a value for U-235+D; its value for U-235 is 6.13E-03 (.00613).

As is plain, the EPA’s 2023 default PRGs are orders of magnitude more protective than those adopted by the Navy in 2006. The 2006 release criteria are grossly out-of-date, as they do not use up-to-date toxicity data. Accordingly, the Navy is violating and will continue to violate CERCLA, the NCP, and the FFA until it updates its remedial goals with current toxicity data.

⁵⁸ *Second Parcel B Explanation of Significant Differences*, at p. 1.

⁵⁹ Footnotes “f,” and “g” are included in the 2006 Release Criteria. *Final Basewide Radiological Removal Action at Hunters Point Shipyard*, Action Memorandum 2006 Revision at 30 (April 21, 2006).

⁶⁰ EPA publishes the defaults using scientific notation, as in the parentheses; they are converted to numeric values here for ease of comparison with the 2006 HPNS Release Criteria. *Summary PRGs February 2023*.

a. Soil

In its comments to the Navy's February 2018 *Draft Work Plan for Radiological Survey and Sampling*, EPA wrote:

EPA has previously recommended that this evaluation should use the current versions of USEPA's Preliminary Remediation Goals (PRG) Calculator for soil and the Building PRG Calculator for buildings (BPRG). The new work performed under this Work Plan should use cleanup criteria that reflect findings of the updated risk evaluations to ensure protectiveness of the cleanup.

Similarly, in a letter to the Navy on August 14, 2018, commenting on the Navy's *Final Parcel G Removal Site Evaluation Work Plan*, EPA wrote:

Based on national practices directed by EPA headquarters, EPA expects this process to use the most current version of the EPA Preliminary Remediation Goal (PRG) Calculator and Building (PRG) Calculator to assess ROD radiological RGs. The Work Plan should use only those cleanup goals confirmed through this analysis to be protective.

Likewise, in its comments on the Navy's *Fourth FYR*, transmitted on September 21, 2018, EPA asked that the Navy update its remediation goals using the most recent versions of the soil PRG calculators using current toxicity data. EPA even helpfully included a link to a list of all the changes made to the PRGs over the previous five years. However, the Navy never agreed to EPA's request, responding only by revising the *Fourth FYR* to include a statement that it would "evaluate additional data collected (during retesting) using current guidance to ensure the radiological remedies are protective of human health."⁶¹ In other words, without any legal or factual justification the Navy unlawfully "kicked the can down the road," rather than update its cleanup goals.

In November 2019, EPA sent the Navy a comment letter unambiguously stating the Navy failed to meet its legal obligation that the *Fourth FYR* "assure protectiveness." The comment, *EPA Review of the Draft Addendum to the Fourth Five-Year Review Evaluating Radiological Remediation Goals for Soil*, states:

In the draft addendum, the Navy concludes that the soil radiological remediation goals are protective for all future land uses, including residential. We recognize that the evaluation makes some Site-specific conservative assumptions that may not reflect actual conditions at the Site. **However, at this time, EPA cannot verify that the soil radiological remediation goals are protective of human health for long-term protectiveness**, for several reasons . . . (Emphasis in original)

EPA then summarized the reasons. "First, the draft addendum does not provide sufficient justification for exceeding the 1×10^{-4} cancer risk generally used by EPA to make risk management decisions at CERCLA sites . . . Second, the draft addendum does not evaluate the

⁶¹ *Final Fourth Five Year Review*, Appendix F, Responses to Comments from the EPA Region 9 on the Draft Five-Year Review for Hunters Point Naval Shipyard (2018), at pdf p. 501 (Table 1, page 4).

additive cancer risk from multiple radionuclides and chemicals . . . Third, the draft addendum does not present a total risk estimate for radium-226.”

On August 20, 2020, EPA followed up on the above comment concerning soil with a letter to the Navy regarding *EPA Review of Navy Draft Evaluation of Radiological Remediation Goals for Onsite Buildings*. It stated:

Therefore, at this time we cannot concur with the Navy’s conclusion that the radiological building RGs remain protective of human health or support the use of RRB⁶² as part of the evaluation of HPNS building RGs. (Underline in original.)

EPA cited several reasons for its finding. First, it did not accept the Navy’s alternative risk evaluation method to the EPA’s preferred method: “[W]e were unable to gain confidence in a key parameter used by RRB to estimate cancer risk.” Second, EPA was “unable to conclude the Navy calculator’s evaluation of contaminated dust “is consistent with EPA guidelines or justified by site-specific circumstances.” Third, EPA was “unable to verify that the Navy’s RRB simulations appropriately estimate cancer risk because those simulations assume that radiological contamination is present only on the building floor.”

By letter of December 11, 2020, the Navy asked EPA to reconsider its objection to using RRB to allow the Navy to begin radiological retesting of buildings as soon as January 2021. On December 22, 2020, EPA responded to the Navy’s request, reiterating its statements of August 20, 2020, and declining to accept RESRAD-Build.

The Navy’s failure to update the soil and building PRGs over the past seventeen years violates CERCLA’s ongoing mandate that protectiveness of the remedy be assured, based on the most recent risk data. There is no lawful excuse for the Navy’s failure to update its cleanup goals.

Although there was no legal authority for it, the Navy published a series of addenda to the *Fourth FYR* to try to demonstrate its soil and buildings remedies remained protective. But it did not do as EPA requested; it did not calculate PRGs. The Navy submitted its *Addendum to the Five-Year Review, Evaluation of Radiological Remedial Goals for Soil* (“2019 Soil Addendum”) on October 10, 2019. It did not include new PRG calculations. Instead, it reported only RESRAD calculations. EPA again objected. The Navy finally sent EPA a new version of a soil *Addendum* on June 18, 2020 (“2020 Soil Addendum”),⁶³ which purported to report both PRGs and RESRAD.

⁶² RRB stands for RESRAD-Build, a computer model developed by Argonne National Laboratory and sponsored by the Department of Energy to evaluate radiation doses from residual radioactivity in buildings (<https://resrad.evs.anl.gov/>). Rather than using the EPA’s PRG calculators, the Navy proposed using RRB. Letter from Wayne Praskins (EPA) to Derek J Robinson (Navy) re: *EPA Review of Navy Draft Evaluation of Radiological Remediation Goals for Onsite Buildings, Hunters Point Naval Shipyard Superfund Site* (August 20, 2020), p. 2.

⁶³ *Addendum to the Five-Year Review, Evaluation of Radiological Remedial Goals for Soil* (“2020 Soil Addendum”), pp. 1, 3-4.

But the Navy’s analysis was flawed because its calculations violated EPA guidance. Instead of recalculated PRGs, the Navy mathematically converted the RESRAD results, which report maximum annual **dose** of radiation, to risk: “[t]o verify the protectiveness of the radiation remedial goals, the estimated dose from each radiological constituent is converted to a risk value that is then compared to the risk management range as described in the [NCP].”⁶⁴

This resulted in some risks **exceeding** remediation goals. For example, according to the *2020 Soil Addendum*, Table 2 – “RESRAD Evaluation of Radiological Remedial Goals” 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’s starting risk point, 1 in a million.⁶⁵

Similarly, the Navy’s calculated lifetime risk for cancer from thorium-232 exceeded the risk limit.⁶⁶ Its PRG for thorium 232 is 1.7×10^{-4} , or 1.7 excess cancers per 10,000; this is nearly twice the low end of the risk range, 1×10^{-4} . In some site-specific circumstances, a risk of 1 in 10,000 is allowable, but as described above, EPA rejected that because the Navy failed to provide adequate justification for the lower threshold.

In addition, the overall risk values are misleading because of the Navy’s use of “institutional controls” (“ICs”). In this case, the Navy’s risk assumptions rely on excluding all risk to future residents from consuming radiologically contaminated homegrown produce.⁶⁷ The Navy claims it can do so by ICs to be included in deed restrictions that:

will limit homegrown produce by future residents to raised beds with impermeable bottoms and sides and filled with soil not originating on HPNS. . . Since this route of radiological exposure (Pathway) to residents will not exist, it is not included in the evaluation of total site risk.⁶⁸

EPA’s *PRG User’s Guide, Land Use Descriptions, Equations, and Technical Documentation* does allow for exposure pathways to be switched off if “a route of exposure . . . is considered to be unreasonable at their site, both **currently and in the future**.”⁶⁹ (Emphasis added.) But it is not “reasonable” to assume that future residents will forever garden only in raised beds if that limitation is enforced merely by deed notices.

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. Without a realistic plan to **enforce** the ICs continuously, including regular and ongoing inspection and

⁶⁴ *Id.* at p. 2.

⁶⁵ *Id.* at p. 2-3.

⁶⁶ *Addendum to the Five-Year Review, Evaluation of Radiological Remedial Goals for Soil, Hunters Point Naval Shipyard* (2020), p. 2-4.

⁶⁷ *Addendum to the Five-Year Review, Evaluation of Radiological Remedial Goals for Soil, Hunters Point Naval Shipyard* (2020), Enclosure 2.

⁶⁸ *Addendum to the Five-Year Review, Evaluation of Radiological Remedial Goals for Soil, Hunters Point Naval Shipyard* (2020), Enclosure 2.

⁶⁹ *PRG User’s Guide, Land Use Descriptions, Equations, and Technical Documentation* (June 15, 2022) p. 36, https://epa-prgs.ornl.gov/radionuclides/PRG_User_Guide_June_2022.pdf.

maintenance to preserve their integrity, it is entirely foreseeable that raised boxes will deteriorate and residents' gardens will eventually sink roots into the underlying, contaminated soil.

Furthermore, as EPA noted, even if the risk values for individual radionuclides were valid, the Navy failed to demonstrate overall protectiveness because it did not consider **cumulative** risk from all radionuclides as a whole. Nor did it consider possible chemical contamination's contribution to cumulative risk.

Instead of addressing cumulative risk, the Navy announced it would defer doing so until some unknown time in the future. In response to public comments critiquing the *2020 Soil Addendum's* consideration of cumulative risk, the Navy declared it would demonstrate that “the final risk from exposures, **upon property release**, including the risk from chemicals and other radionuclides, will achieve the CERCLA risk range.”⁷⁰ (Emphasis added.) The Navy cites no authority for delaying an essential aspect of its protectiveness review until the property is released. There is none. This is a clear-cut violation of CERCLA's mandate to assure protectiveness every five years.

Finally, even if the Navy's 2006 cleanup goals were to fall within the less protective end of the acceptable NCP risk range, this would still not suffice to meet the Navy's contractual obligations at HPNS. The FFA clearly and repeatedly states that the Navy will comply with EPA guidance.⁷¹ As already discussed, EPA guidance requires risk based PRG calculations using up-to-date toxicity information, something the Navy has ignored in its attempt to maintain, rather than update, its outdated remedial goals for soil.

b. Buildings

The Navy has also refused to update cleanup goals for buildings. EPA published the Building PRG Calculator (“BPRG”) in 2007.⁷² In the years since, the Navy has not used the BPRGs to update its building remediation goals.

Continuing to rely on *Regulatory Guide 1.86* and RESRAD-Build after 2007 was a violation of the FFA; as mentioned, EPA guidance repeatedly stresses the importance of using the “most recent information available” for toxicity values.⁷³ The BPRGs contain more up-to-date toxicity values compared with RESRAD.⁷⁴

⁷⁰ *Addendum to the Five-Year Review, Evaluation of Radiological Remedial Goals for Soil, Hunters Point Naval Shipyard* (2020), Enclosure 2.

⁷¹ *Federal Facility Agreement Hunters Point Shipyard* (1992).

⁷² *Superfund Preliminary Remediation Goals for Radionuclides in Buildings (BPRG)*, OSWER No. 9355.0-114 (2007), p. 2.

⁷³ *Risk Assessment Guidance for Superfund Volume 1 Human Health Evaluation Manual Part A (“RAGS”)*, EPA (Dec. 1989), pp. 7-15.

⁷⁴ *BPRG User's Guide*, EPA, https://epa-bprg.ornl.gov/users_guide.html. Note: Regulatory Guide 1.86 does not state how it arrived at its “acceptable surface contamination levels” but the guidance does not appear to incorporate any toxicity values at all, since the cleanup levels are equal for radionuclides with different levels of toxicity (see discussion of strontium-90 and thorium-232 at fn. 76). For external exposures from buildings, the Navy's standard for cobalt-60 is 3,920 times less protective than the BPRGs, the Navy's standard for europium-154 is 2,340 times less protective than the BPRGs, and the Navy's standard for cesium-137 is 446 times less protective than the BPRGs.

As 42 U.S.C. § 9620(e)(4) provides, EPA is the final arbiter of protectiveness. In light of EPA's conclusions that the *Fourth FYR* did **not** assure protectiveness – for both soil and buildings – the Navy has not assured that human health and the environment are being protected, as required by 42 U.S.C. § 9621(c).

C. There Is No Legal Justification for the Navy's Failure to Meet the Statutory Deadline for the *Fourth FYR*

CERCLA requires five-year reviews to result in one of two actions: either assuring protectiveness or acknowledging its lack with a plan for how protectiveness will be achieved, and notification to Congress.

The *Third Five Year Review* was published on November 8, 2013. The *Final Fourth Five Year Review* was statutorily required to be published no later than November 8, 2018.

The Navy issued its *Final Fourth Five-Year Review* on **July 31, 2019**, more than eight months late. Characteristically, the Navy did not acknowledge its blown deadline. Indeed, in the Introduction, the Review states:

This review is triggered by the date of the third five-year review: November 8, 2013 (TriEco-TtEC Sustainable Resources Joint Venture [TriEco-Tt], 2013b). The review was conducted by Navy personnel and their contractor representatives, from December 2017 **through November 2018**. (Emphasis added, p. 1-2.)

The Navy offered no explanation – or legal justification – for missing its clear statutory deadline. Nor did it explain why a review that ended in November 2018 took an additional nine months to be published.

Eighteen months after the deadline for the *Fourth FYR*, in August 2019, the Navy issued its *Draft Addendum* to the *Fourth FYR*, purportedly evaluating the radiological remediation goals for soil. The Navy issued a similar draft *Addendum* relating to cancer risk for buildings on October 10, 2019. It followed that up with yet another soil addendum on June 18, 2020, **twenty months** after the statutory deadline of November 8, 2018.

D. Other Deficiencies in the *Fourth FYR*

1. The Navy Has Misled the Public

The Navy has consistently ignored or downplayed the TtEC fraud in successive *Five Year Reviews*. For example, as noted, the *Third FYR* was published on November 8, 2013. Though evidence of TtEC's fraud was discovered in 2012, the *Third FYR* never mentioned it.

The *Draft Fourth Five-Year Review* was issued July 9, 2018. The word "fraud," never appeared. Nor is there any mention of the *Anomalous Samples Report* in the body of the review. Rather, there is a single reference to it in Appendix A, where it is included, without any explanation of what it was or what it said, in its "List of References and Documents Reviewed."

Only after comments to the *Draft Fourth FYR* called out the Navy's utter failure to address the fraud, including from the EPA,⁷⁵ did the Navy include a limited disclosure, while still insisting the remediation was complete: "Radiological remediation at Parcel G began in 2007 . . . and was completed in 2011. . . ."⁷⁶ Then, the Navy added:

The Navy has determined that a significant portion of the radiological survey and remediation work completed to date was not reliable because of manipulation and/or falsification of data by one of its radiological contractors. A long-term protectiveness evaluation of the radiological RGs has not yet been completed for this fourth Five-Year Review, and **it is currently not known if the RAOs for radionuclides have been achieved in Parcels B-1, B-2, C, D-1, D-2, G, E, UC-1, UC-2, and UC-3.**⁷⁷ (Emphasis added.)

The Navy failed to explain the contradiction between claiming the remediation was "completed" while simultaneously admitting the data that "completion" relied on was unreliable. In admitting the protectiveness evaluation was **not** part of the five-year review, the Navy also acknowledged it had no intention to comply with the law: "It is anticipated that the radiological rework will be completed prior to the **next** Five-Year Review."⁷⁸ (Emphasis added.)

Rather than identifying corrective action, implementing it, and reporting it to Congress, as required by 42 U.S.C. § 9621(c), the Navy put off its protectiveness determination for **five years**, effectively negating the mandate for five-year reviews.

Downplaying the fraud was but one way in which the *Fourth FYR* misled the public. It also failed to tell the truth about the Navy's response to the fraud. For example, the *Fourth FYR* did not include any mention of the Navy's nearly six-year effort to validate TtEC's fraudulent data. Nor did it acknowledge that the Navy's own review of TtEC's data found new evidence of additional fraud in all four of the parcels it reviewed. Nor did it admit that the EPA's review of the same data found that the Navy's review identified only about half the fraud and QA/QC problems EPA's data review found. Finally, though the Navy agreed to jettison all TtEC data in 2018, the *Fourth FYR*, published about a year later, never mentioned it or the resulting retesting program.

Misleading the public violates CERCLA's inherent mandate that responsible parties act in good faith.

2. Averaging, the Sum of the Fractions and Cumulative Risk

The *Fourth FYR* inappropriately averaged radioactivity, it failed to follow the "Sum of the Fractions Rule," failed to sum the risks from all radionuclides, and failed to include chemical risks.

⁷⁵ Appendix F, Responses to Comments by the EPA, Region 9, p. 1.

⁷⁶ *Final Fourth FYR*, p. 3-34.

⁷⁷ *Id.* at p. 7-3.

⁷⁸ *Id.*

The *Draft Addendum* to the *Fourth FYR* states that remediation is: conducted to ensure average radioactivity concentrations in soil do not exceed the remediation goals.⁷⁹ However, EPA guidance states that averaging for residential uses like at HPNS, where exposures cannot be guaranteed to be random, is inappropriate. Rather, EPA guidance calls for a “not to exceed” approach (i.e., no soil sample can exceed the cleanup level).⁸⁰

The *Fourth FYR* also ignores the “sum-of-the fractions rule.”⁸¹ As EPA’s August 14, 2018, comments to the Parcel G’s retesting plan state:

Cleanup goals should include an analysis of the sum of fractions and the unity rule to ensure total risk to the Reasonably Maximally Exposed (RME) individual posed by multiple ROCs [radionuclides of concern] in soil or buildings does not exceed the CERCLA risk range of 1×10^{-4} to 1×10^{-6} .

The draft *Fourth FYR Addendum* acknowledged the Navy did not follow these rules. Rather, cleanup has only been done when individual radionuclide concentrations exceeded its “radionuclide-specific” remedial goal, even when there are multiple radionuclides, and the sum of their fractions exceed 1. Similarly, the Navy failed to sum multiple radionuclide’s risk, as EPA guidance calls for. Instead, the Navy estimated the risk if a single radionuclide is present, as RESRAD estimates the risk for each radionuclide individually. But if Th-232 and Ra-226 are both present, the risk would be the **sum** of their risks. By the Navy’s own estimates, using RESRAD in the *Fourth FYR Addendum*, the sum of the Th-232 and Ra-226 exceeds the upper limit of the CERCLA risk range, 1×10^{-4} .⁸²

The *Addendum* likewise failed to demonstrate that the risks from possible chemical contamination were considered along with the radiological risks. When chemical risks are included with the risks for Th-232 and Ra-226, the risk is likely well into the 10^{-3} range. Indeed, the *Fourth FYR* failed to perform a proper protectiveness evaluation for chemical contamination. It addressed only three of the dozens of chemicals of concern, and the remedial goal for only one of those was risk-based. This is a fundamental flaw in the *FYR*.

3. Failure to Properly Handle Background Radiation Violated the HPNS RODs and EPA Guidance Until the Navy Recanted

The *2020 FYR Addendum* states: “The RGs presented in Table 1 were intended to be the most conservative available and are to be **added to site- and radionuclide-specific**

⁷⁹ *Draft Addendum* to the *Fourth FYR*, p. 3.

⁸⁰ *EPA Radiation Risk Assessment at CERCLA Sites: Q&A.* OSWER 9285.6-20, EPA (June 13, 2014, Q3), pp. 8-9.

⁸¹ If multiple contaminants are present, as is the case at HPNS, one should calculate for each radionuclide what fraction of its RG it is and add those fractions together. Remediation must be done if the sum exceeds 1 (the “unity rule”). See *Final Fourth Five Year Review, Appendix F, Table 1* p. 5.

⁸² The total risk for Th-232 is $2.7 \text{ E-}04$. The total risk for Ra-226 is $1.2 \text{ E-}04$. The sum of those risks, even excluding all other radionuclides, is $3.9 \text{ E-}04$, nearly four times the upper limit of the risk range.

background.⁸³ (Emphasis added.) However, except for Ra-226,⁸⁴ this addition was inappropriate, underestimated risk, and violated both the HPNS RODS and EPA guidance.

The Navy unilaterally and outside the ROD process attempted to add these changes to the remediation goals established in the RODs, a change that cannot be done except by amending the RODs. And the *2020 FYR Addendum* was not the first time the Navy tried to add background to the remedial goals. In the June 2019 *Parcel G Workplan*, for example, the Navy added a new footnote that had never appeared in the Parcel G table of remedial goals, allowing “addition to background” for all remedial goals, not just radium. Footnote “a” makes this clear: “All RGs will be applied as concentrations **above** background.” (Emphasis added.)⁸⁵

The *2020 FYR Addendum* continued this subterfuge, falsely asserting that the RGs “were intended” to be added to background. It cites no basis for this erroneous statement. Nor does it explain how “intentions” are relevant when specific remedial goals have already been adopted.

In other words, the Navy attempted to improperly weaken standards already approved by the regulators. This “underground” redefinition of the approved remedial goals violated CERCLA, the NCP and the FFA.

EPA recognized this impropriety. In its comments to the *2020 FYR Addendum*, it explicitly called out the Navy’s attempted slight-of-hand:

The report includes the statement that “The RGs ... are to be added to site- and radionuclide-specific background.” As noted in the letter, this statement is correct for radium-226 but **is not consistent with the Records of Decisions for the other radionuclides** present at the Site, or with the remediation goals for chemical contaminants at the Site.⁸⁶

In light of the EPA’s comments, the Navy backed down. Its response to the EPA’s comment was, “The sentence will be changed to remove, ‘and are to be added to site- and radionuclide-specific background.’”⁸⁷

Though the Navy relented, this attempt to circumvent the approved RODS amply illustrates the Navy’s bad faith and the resulting need for the Navy to be closely supervised, if necessary, by a federal judge.

⁸³ Draft *Addendum*, p.3.

⁸⁴ As noted in footnote “g” of the Remedial Goals, Table I, in the Action Memorandum, this applies **only** to radium. The same remedial goals, accompanied by the same footnote, are included in all subsequent RODs.

⁸⁵ *Final Parcel G Removal Site Evaluation Work Plan* (2019), Table 3-5 “Soil Remediation Goals from Parcel G ROD,” p. 3-4.

⁸⁶ *Fourth FYR Addendum*, Enclosure 2, “Responses to EPA Comments” comment 3.

⁸⁷ *Id.*

4. “Durable Covers” And Institutional Controls Do Not Make the Remedy Protective

The Navy’s claims that “durable covers,” and institutional controls (“ICs”) preventing gardening, except in raised boxes, will prevent exposure to contaminants. But this is belied by the facts.

What the Navy calls “durable” covers consist merely of a layer of asphalt, concrete, or soil. The majority are “existing covers,” already present on the parcel. Indeed, the Navy defines “existing covers” to include “existing building footprints, roads, and parking lots,” which were constructed long before it contemplated remedial action at the site.⁸⁸ The Navy intends to construct new covers only over areas it excavated to remove contaminants exceeding remedial goals.⁸⁹

New covers would follow “[s]tandard construction practices for roads, sidewalks, and buildings” or be constructed of “a minimum 4 inches of asphalt or a minimum 2 feet of clean imported soil.”⁹⁰ The Navy estimated that the Parcel B covers would consist of “approximately 16 acres . . . covered with soil, 3 acres . . . covered by the shoreline revetment, and 40 acres [covered by] existing asphalt and concrete surfaces (including buildings).”⁹¹

Based on the performance of the covers now in place, it is already doubtful the Navy’s current remedy will prevent human exposure to contaminated soil at the Shipyard. Holes caused by burrowing rodents have already been discovered on multiple occasions.⁹²

Over time, even “durable” covers will deteriorate. Weathering and plant growth will add to burrowing animals in challenging the integrity of the covers as they age.

There is also already widespread evidence of cracks in the existing covers. But, as with concerns about burrowing animals, the Navy dismissed these problems without evidence,⁹³ though it acknowledges that cracks widened by vegetation are a “typical” problem.⁹⁴ In addition to widening cracks, plant growth has the potential to bring radioactive contamination to the surface via roots that extend below the covers.

Cracks in the covers will likely be exacerbated by heavy vehicles and other machinery that will have to traverse the parcels to build the planned development.

⁸⁸ *Parcel B Amended ROD*, at 9-5.

⁸⁹ *Id.* at pp. xiii and 12-1.

⁹⁰ *Id.* at p. 12-7.

⁹¹ *Id.* The Navy discussed construction of Parcel B covers in its *Fourth Five Year Review*. However, it contradicts itself in reporting when the Parcel B they were constructed, stating that it completed “radiological removal actions” at the parcel between May 2006 and September 2010, but that “hot spot removal was performed between August 2010 and May 2011.” See *Fourth FYR* at Table 2 Page 3 of 4 and 3-11.

⁹² For example, multiple rodent holes were discovered in 2018 in the covers at Parcel C (4th FYR at C3-2, C5-8). Holes were also discovered at IR-07/18, in 2012 (3rd FYR at 36, 79, F-8).

⁹³ *Fourth FYR*, at p. C9-12 (pdf p. 425).

⁹⁴ *Id.*

The construction of residential buildings, schools, offices, and commercial space at the Shipyard will necessarily require that covers be destroyed to build foundations. Yet the Navy has consistently ignored this fact. Its planned use of ICs to “maintain the integrity of the covers” is fundamentally at odds with the planned development.⁹⁵

The ICs are also fundamentally contradictory to protecting the Bay ecosystems and the watershed’s health. As further discussed below in more detail, global warming will cause both Bay-level rise and groundwater rise. Yet, the Navy has ignored how those rising water levels will impact the covers and whether the HPNS remedies will remain protective as they rise.

This logical fallacy is exacerbated by the ICs included in shipyard RODs. Taking the *Amended Parcel B ROD* as an example, it includes an IC restriction on “land disturbing activity,” prohibiting:

“[I]and disturbing” activity which includes but is not limited to: (1) excavation of soil, (2) construction of roads, utilities, facilities, structures, and appurtenances of any kind, (3) demolition or removal of ‘hardscape’ (for example, concrete roadways, parking lots, foundations, and sidewalks), (4) any activity that involves movement of soil to the surface from below the surface of the land. . . .⁹⁶

How this restriction will impact development is not spelled out. Indeed, all discussion of implementation of IC’s was deferred until “the preliminary and final LUC RD [Land Use Controls Remedial Design] reports,”⁹⁷ even though needing to protect construction workers from exposure to contaminated soil during development is entirely foreseeable.

Furthermore, how the ICs will impact future residents of the Shipyard after development is not explained. However, the “durable covers” remedy and restrictions on land-disturbing activities would have to be widely enforced given that the contamination in the soil would remain mostly in place rather than be removed.

⁹⁵ *Parcel B Amended ROD* at pp. xiv, 9-5, and 12-2.

⁹⁶ *Parcel B Amended ROD*, at 12-11.

⁹⁷ “Implementation: The Navy shall address and describe institutional control implementation and maintenance actions including but not limited to frequency and requirements for periodic inspections during development and post development, monitoring, and reporting in the preliminary and final LUC RD reports to be developed and submitted to the FFA signatories and CDPH in regard to IR Sites 7 and 18, for review and approval pursuant to the FFA (see “Navy Principles and Procedures for Specifying, Monitoring and Enforcement of Land Use Controls and Other Post-ROD Actions” attached to January 16, 2004 Department of Defense memorandum titled “Comprehensive Environmental Response, Compensation and Liability Act [CERCLA] Record of Decision [ROD] and Post-ROD Policy”). The preliminary and final LUC RD reports are primary documents as provided in Section 7.3 of the FFA. It may also be necessary to have some of the above institutional controls implementation and maintenance actions in their essentially final form at the time of the early transfer to ensure protection of human health and the environment. The Navy is responsible for implementing, maintaining, reporting on, and enforcing land use controls.”

Although the Navy may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Navy shall retain ultimate responsibility for remedy integrity.” *Amended Parcel B ROD*, p. 12-10.

The Navy's reliance on covers violates EPA's guidance regarding maintenance and monitoring of covers under CERCLA. Specifically, in the *Draft Technical Guidance For RCRA/CERCLA Final Covers*, EPA states:

After a cover system has been constructed, it must be monitored and maintained for some timeframe (i.e., the post-closure period). As discussed in Sections 1.2.6 and 8.1, post closure maintenance must be conducted as long as the waste poses a threat to human health and the environment. . . . For CERCLA facilities, the minimum timeframe for cover system maintenance and monitoring is also often assumed to be 30 years, and the EPA is required to evaluate the performance of the cover system at least once every five years to assure that human health and the environment are being protected by the implemented remedy.⁹⁸

Likewise, in a *Citizen's Guide to Capping*, EPA clarified that "Regular inspections are made to make sure that the **weather, plant roots, and human activity have not damaged the cap** and that plants on vegetative caps are still growing." (emphasis added).⁹⁹

By not adequately detailing how the HPNS caps will be regularly inspected and maintained, particularly during development, the Navy has violated CERCLA, the NCP, the FFA and EPA Guidances.

5. The Navy Inappropriately Turned Off the Garden Pathway in Risk Calculations

Residents will be "required" to garden only in "raised beds" to prevent roots from growing in the potentially contaminated soil underneath. This is made clear in the only Covenant to Restrict Use of Property ("CRUP") issued to date. The following activities are prohibited:

- a. Growing vegetables, fruits, and any edible items in native soil for human consumption. Plants for human consumption may be grown **if they are planted in raised beds (above the CERCLA-approved cover) containing non-native soil**. Trees producing edible fruit (including trees producing edible nuts) may also be planted provided they are grown in containers with a bottom that prevents the roots from penetrating the native soil.¹⁰⁰ (Emphasis added.)

However, like the failure of the Navy to demonstrate how the integrity of covers will be maintained, the Navy has failed to detail how future residents' restrictions to raised boxes will be enforced for the many decades over which the newly developed shipyard will be inhabited. Who will inspect and maintain them? Though these problems are foreseeable, the Navy has not considered them.

Despite these unanswered questions, the Navy used the IC to turn off the garden pathway in EPA's soil PRG calculator, which includes it as a default: "The Toggle All box was unchecked

⁹⁸ *Draft Technical Guidance For RCRA/CERCLA Final Covers*, OSWER 9283.1-26, April 2004, p. 9-1.

⁹⁹ *Citizen's Guide to Capping*, EPA 542-F-12-004, September 2012, p. 2.

¹⁰⁰ *Parcels UC-1 and UC-2 Covenant to Restrict Use of Property*, Sept. 2015, p. 8.

to deselect produce for inclusion in the risk estimates based on stated restrictions on the use of homegrown produce using HPNS soils.”¹⁰¹

The Navy previously included the garden pathway in setting the HPNS remedial goals.¹⁰² Those remedial goals should have been reexamined in the draft *Fourth FYR* but were not. Instead, the Navy “kicked the can down the road” by deferring addressing protectiveness until the *Fifth Five Year Review*, in violation of CERCLA, the NCP and the FFA. And EPA acquiesced.

6. The *Fourth FYR* Failed to Use Up-to Date Sea-Level Rise Data

Rising Bay-level from global warming and its concomitant rise in groundwater will likely overwhelm current remedies. The long-term health of residents throughout the Bay Area and particularly of the future residents of the shipyard will be endangered if the Navy’s assumptions about Bay-level rise are wrong.

The Navy claimed to address sea-level rise in its *Fourth FYR*. It summarized three sea-level rise scenarios in Section 6.3:

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**.
- 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 summarized above, a contingency of up to a 3-foot increase in sea level provides a reasonable level of protection in designing the crest elevation for the shoreline protection structures at Parcels B-1, B-2, E, E-2, and IR-07. . . **No other information has been identified to suggest that the remedies may not be protective of human health or the environment.**¹⁰³ (Emphasis added.)

¹⁰¹ See Addendum to the Five-Year Review, Evaluation of Radiological Remedial Goals for Soil, Hunters Point Naval Shipyard, p. 9.

¹⁰² The Navy’s 2006 radionuclide HPNS RGs, re-adopted in each ROD thereafter, were based on EPA PRGs that included the garden pathway. This can be seen by comparing the HPNS RGs with early EPA PRGs with the garden pathway included as a default. Additionally, the Navy has repeatedly stated that its RGs for COCs included the garden. See, e.g., *Final Explanation of Significant Differences, Parcel B*, San Francisco, Hunters Point Shipyard Site,” May 4, 2000, Attachment A: Original and Revised Parcel B Soil Cleanup Levels, https://www.envirostor.dtsc.ca.gov/public/deliverable_documents/4623766839/Parcel%20B%20ROD%20ESD_5-4-2000.pdf, PDF pp. 5, 37-9.

¹⁰³ *Fourth FYR*, p. 6-15.

The Navy's estimates were based on inadequate, outdated, and incomplete data.

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. Its mission is to protect and enhance San Francisco Bay and to encourage the Bay's responsible and productive use for current and future generations. BCDC also leads the Bay Area's ongoing multi-agency regional effort to address the impacts of rising sea level on shoreline communities.

BCDC's *Adapting to Rising Tides, Bay Area Sea Level Rise Analysis and Mapping Project* ("Adapting to Rising Tides" or "ART")¹⁰⁴ started in 2010 when BCDC and the National Oceanic and Atmospheric Administration's ("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. ART has continued to both lead and support multi-sector and cross-jurisdictional projects that build local and regional capacity to plan for and implement adaptation to climate change.

ART outlined a range of foreseeable water level rise scenarios.¹⁰⁵ The upper bound of these scenarios is **5.5 feet** (66 inches) sea level rise by the year 2100. ART also considered a 100-year extreme tide,¹⁰⁶ which is the coastal water level elevation that has a 1 percent chance of occurring in any given year. It reported that sea level rise of 5.5 feet with the 100-year extreme tide would create a tide **9 feet** above Mean Higher High Water, the average of the high-water mark of each tidal day.

The State of California Ocean Protection Council's ("OPC") *2018 State of California Sea Level Rise Guidance*, was devised by the OPC, California Natural Resources Agency, the Governor's Office of Planning and Research, and the California Energy Commission.¹⁰⁷ This guidance was intended to provide the best-available data on sea level rise projections to be used by state agencies and local governments in their planning, permitting, and investment decisions. It projected that sea-level rise will reach **5.7 to 6.9** feet by 2100 under a medium to high-risk scenario.¹⁰⁸ The highest risk scenarios, such as projects that have a lifespan beyond 2050 and a

¹⁰⁴ See ART *Bay Area Sea Level Rise and Shoreline Analysis Maps*, ADAPTING TO RISING TIDES, <https://www.adaptingtorisingtides.org/project/regional-sea-level-rise-mapping-and-shoreline-analysis/>; *Adapting to Rising Tides Bay Area Sea Level Rise Analysis and Mapping Project*, BCDC (Sept. 2017), <http://www.adaptingtorisingtides.org/wp-content/uploads/2018/07/BAT-A-ART-SLR-Analysis-and-Mapping-Report-Final-20170908.pdf>.

¹⁰⁵ *Adapting to Rising Tides*, Appendix III, p. 13, <https://www.adaptingtorisingtides.org/wp-content/uploads/2018/07/BATA-ART-SLR-Analysis-and-Mapping-Report-Final-20170908.pdf>.

¹⁰⁶ *Id.* at Appendix III, p. 15.

¹⁰⁷ State of California Sea-Level Rise Guidance 2018 Update, https://opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf.

¹⁰⁸ *Id.* at Appendix 3, p. 57.

necessarily low tolerance for risk, including hazardous waste and toxic storage sites (designated “H++ scenarios”), the guidance says, should also consider extreme sea level rise that would result from catastrophic events, such as the collapse of the West Antarctic ice sheet. Its projected sea level rise under the H++ scenario was **10.2 feet** by 2100.

Given this data, the Navy’s assumption that sea-level rise will be limited to 3-feet or less was out-of-line with the then-current state of knowledge. By relying on outdated data, the *Fourth FYR* failed to comply with CERCLA, the NCP and the FFA. The Navy did not have an adequate scientific basis to conclude that its remedies will remain protective in the face of global warming and Bay-level and groundwater rise in the coming decades.

7. The Remediation Design for Parcel E-2 Is Deficient Given Updated Sea Level Rise Projections and Should Have Been Modified in the *Fourth Review*.

The risk of flooding and inundation from Bay-level rise and rising groundwater is especially important for Parcel E-2, due to its history of disposal of hazardous and radioactive waste. According to BCDC’s *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.¹⁰⁹

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

Both BCDC and California’s *Sea-Level Rise Guidance* projected sea level rise to **surpass the 3-foot mark** estimated by the Navy. 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 Parcel E2, the upper bound of 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**.

Because the Navy’s analysis was based on faulty assumptions, the risks to remedies that will be affected by sea-level rise were significantly higher than the unreasonably minimal risk recognized in the *Fourth FYR*.

8. A. Potential Flooding of the Seawall Was Not Considered

The highest point of the design for the shoreline is a concrete sea wall standing approximately 7 feet above the mean sea level. This height was and remains insufficient considering the sea level rise projections referenced above. Combined with the possibility of high tides, king tides, storm surges, wind driven waves and El Nino, the sea level rise

¹⁰⁹ *Contaminated Lands*, SF BCDC Adapting to Rising Tides, <http://www.adaptingtorisingtides.org/portfolio/contaminated-lands/>

possibilities outlined above demonstrate there is a strong likelihood the currently designed sea wall will be inadequate to prevent flooding.

Considering the catastrophic health hazards which could result from Parcel E-2 flooding, the H++ scenario should have been used, accounting for sea level rise of **10.2 feet** by 2100. Accordingly, the *Fourth FYR* erred in underestimating the risk.

9. The Proposed Slurry Wall Was Inadequate

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.”¹¹⁰

The *Fourth FYR* did not address the effect of sea level rise on the proposed slurry wall. Nor did it account for how the rise of groundwater will affect the integrity of the slurry wall as Bay-level rises. The design used current groundwater levels and did not anticipate or plan for rising groundwater levels or new flow direction and pressures associated with rising groundwater.

The Navy also failed to adequately describe the effective life cycle of the slurry wall. If it is intended to last more than 10-15 years, which it must, these sea level rise estimates should have been incorporated into the design. Failure of the slurry wall could adversely affect the remedy, which leaves buried contamination close to the waterfront.

Furthermore, constructing a slurry wall on fractured bedrock is a poorly engineered idea which fails to provide a long-term solution. Regardless of the depth of the slurry wall, water will be able to percolate through the cracks in the bedrock on which the slurry wall sits. This will enable the interaction of the contaminated landfill with both Bay water and uncontaminated groundwater.

The *Fourth FYR* additionally failed to address seismic activity that will occur, which could damage or destroy the slurry wall and fracture the bedrock. This should have been anticipated, as San Francisco is highly susceptible to potentially catastrophic earthquakes like those on April 18, 1906, and October 17, 1989.

A slurry wall combined with capping on top of contamination will do nothing to prevent rising groundwater from inundating and potentially flooding the area, resulting in a substantial risk to public health and the environment. This should have been assessed in the *Fourth FYR*. It was not.

The failures of the *Fourth FYR* to use up-to-date data about sea and Bay-level rise detailed above violated CERCLA, the NCP and the FFA.

¹¹⁰ <http://www.climatecentral.org/blogs/sea-level-rise-may-raise-groundwater-levels>

10. The Navy Failed to Respond to Public Comments to the Draft Fourth Five Year Review

Greenaction and other interested organizations and individuals submitted extensive written comments to the *Fourth FYR*, including specifically challenging the Navy's radiological response to the TtEC fraud and its failure to use up-to-date sea and Bay-level rise data.

The Navy failed to respond to any of these comments, in violation of 42 U.S.C. § 9617(b) and 40 C.F.R. 300.430(f)(3)(i).

2. CONCLUSION

This Notice provides substantial evidence that the Navy and EPA have violated and continue to violate CERCLA, the NCP, the FFA and multiple EPA guidance documents. After the 60-day notice period elapses, Greenaction will file suit to, among other remedies, enforce CERCLA, its regulations, and the FFA, requiring that the Navy comply with EPA guidances and further requiring 100% retesting of the unlawful and improper work done by TtEC.

The suit will also seek an order requiring the Navy to comply with CERCLA's *Five Year Review* mandate that the Navy assure its remedy is protective of human health and the environment using the EPA's PRG calculators and the most up-to-date toxicity data, and that the Navy comply with the deadline for its *Fifth Five Year Review*, no less than five years after the date of its *Fourth FYR*.

Respectfully submitted,



Steven J. Castleman
Supervising Attorney
Berkeley Law's Environmental Law Clinic
scastleman@clinical.law.berkeley.edu
(510) 664-4761

Date: December 6, 2023

Attorney for Greenaction for Health and Environmental Justice

EXHIBIT 1



Former Hunters Point Naval Shipyard, CA
Update for
Mayor London Breed

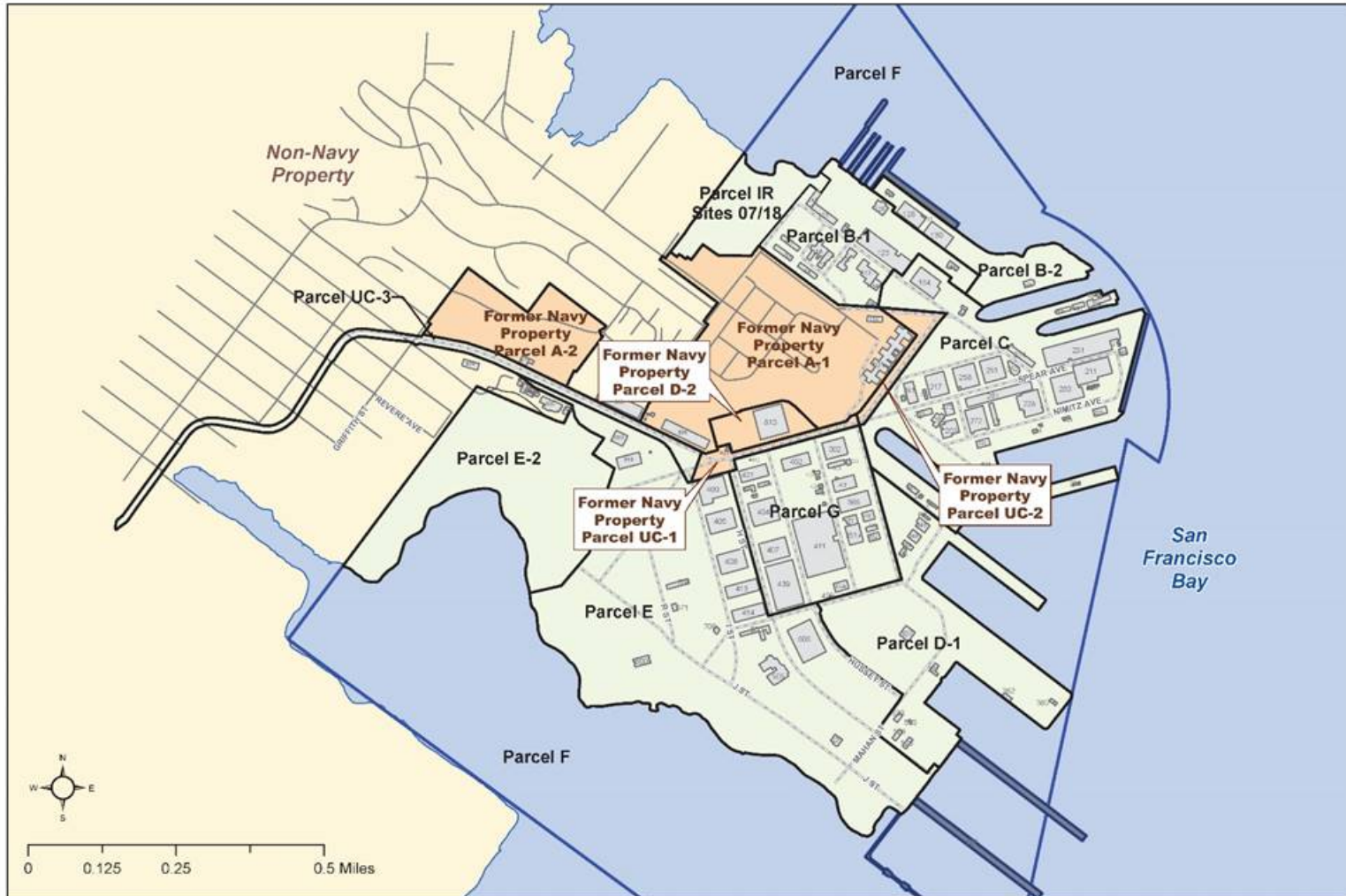
Sept 2021



Hunters Point Background

- Property consists of approximately 934 acres (443 acres are submerged land)
- BRAC 1991 closed the property for disposal
- All property transfers on-hold since September 13, 2016 until radiological reassessment is complete
- DON identified contractor fraud which has delayed property transfers to support the City of San Francisco's redevelopment efforts
- Retesting is underway for soil in Parcel G
- Radiological rework work plans are under review for the remaining parcels

Hunters Point Parcel Map





Hunters Point Radiological Re-Evaluation

- Re-Evaluation of Soil Underway at Parcel G
 - Soil rework is divided into two Phases
 - Phase 1 (Began August 2020)
 - Excavation and sampling of 33% of the trenches and surface scanning of all remaining trench areas at Parcel G
 - Phase 2 (Beginning 2022)
 - Soil sampling at multiple depths in the remaining trenches
 - Any exceedances of radionuclides trigger 100% excavation of trenches
 - Laboratory analysis will be adjusted to address the low detection level needed for Strontium
- Work Plans for Retesting soil in other Parcels (B, C, D-1, D-2, E, UC-1, UC-2, UC-3) are underway. Fieldwork for next parcel scheduled to begin in 2022
- Building surveys will commence in Nov 2021 at Parcel G
 - Data collected will be used to answer remaining EPA questions
 - To date, EPA is still defining their data needs



Strontium

- Strontium levels measured to date are within regional background levels and below risk levels
- Navy chemists evaluated the Strontium data - laboratory procedures are likely causing "false positives"
- The Navy is adjusting the laboratory procedures to lower the detection limit, to increase measurement precision, and to reduce method uncertainty
- The Navy will reanalyze all past strontium samples with the updated method to confirm whether or not strontium is present
- Schedule Impacts
 - New method will add approximately 5 months to the project
 - 2+ years added to the project if full excavation is triggered

Navy Commitments

- Completing environmental work at HPNS while maintaining protectiveness of the local community
- Ensuring our remedial goals are set at levels confirmed by experts to be protective of human health
- Cleaning up Navy impacted areas of the shipyard and ensuring valid data drive our decisions
- Continuing robust community outreach and transparency to guide our communications with stakeholders and the Hunters Point/Bayview communities

EXHIBIT 2

Message

From: Sanchez, Yolanda [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=473C34AE73994A4A8ACAFE6F03E0BAEB-SANCHEZ, YOLANDA]
Sent: 9/24/2021 12:15:23 AM
To: Macchiarella, Thomas L CIV USN COMNAVFACENGCOM DC (USA) [thomas.l.macchiarella.civ@us.navy.mil]; Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) [derek.j.robinson1.civ@us.navy.mil]
CC: Chesnutt, John [Chesnutt.John@epa.gov]; Praskins, Wayne [Praskins.Wayne@epa.gov]; Yogi, David [Yogi.David@epa.gov]
BCC: Sanchez, Yolanda [Sanchez.Yolanda@epa.gov]
Subject: RE: HPNS Timely Topic
Attachments: TimelyTopicStrontium-90 Final 9.23.21_ysEdits.docx

Thomas,

John asked me to share edits/comments on the Navy's draft Timely Topic (attached). As a clarification, EPA is referenced three times in the Timely Topic: when describing fed/state "input"; suggesting agreeance by reg agencies on background; and our lab method.

Yolanda Anita Sanchez, MS, MPA (she/her)
US Environmental Protection Agency
Community Involvement for Superfund, Region 9 (Pacific Southwest)
E-mail: sanchez.yolanda@epa.gov | Desk: 415-972-3880

From: Chesnutt, John <Chesnutt.John@epa.gov>
Sent: Thursday, September 23, 2021 5:08 PM
To: Lansdale, Lawrence L CIV USN (USA) <lawrence.l.lansdale.civ@us.navy.mil>; Ostrowski, Kimberly A CIV USN COMNAVFACENGCOM DC (USA) <kimberly.a.ostrowski.civ@us.navy.mil>; Macchiarella, Thomas L CIV USN COMNAVFACENGCOM DC (USA) <thomas.l.macchiarella.civ@us.navy.mil>
Cc: Herrera, Angeles <Herrera.Angeles@epa.gov>; Sanchez, Yolanda <Sanchez.Yolanda@epa.gov>
Subject: RE: HPNS Timely Topic

Lawrence, Kim, and Thomas:

Thanks for you all reaching out to us with your draft communication. We appreciate your desire to get something out there. I offer some general thoughts below, and my staff will provide your staff with a markup shortly today, if they haven't already. EPA strongly suggests the Navy rewrite this Timely Topic to be focused solely on strengthening the quality of the strontium-90 data through improved laboratory methods, rather than getting into background issues and more. If the Navy does not revise certain statements, EPA may feel compelled to publicly issue our own clarifying statement.

From a technical perspective, we have serious concerns about some language:

- The Navy should not be making statements about background levels being established in agreement with federal agencies, beyond what was agreed to in the memo-to-the-file. In its background study, the Navy determined many different background levels, including background threshold values. EPA did not agree with many of the background levels and some of the background threshold values.
- A background threshold level for strontium-90 determined by the Navy has not been agreed to by the regulatory agencies.
- The previous strontium-90 results are valid data. It's inaccurate to suggest the data were not precise enough. EPA has been clear that in the absence of convincing evidence, we cannot support using the new data to supersede existing results.

From a communications perspective, we have some concerns:

- It's not appropriate to use an ambiguous statement that the regulatory partners "provide input." It seems the Navy is reaching for cover.
- It's unclear how including a discussion on background is helpful. It's providing complex concepts that don't seem to add value. When communicating tricky, scary topics to the public, more concepts lead to mistrust and confusion.
- It reads as if the Navy is suppressing data results it doesn't like in regards to strontium-90 data.
- This document is written at a high grade level. The nature of the subject matter (radiological contamination), already stresses people out. In addition, we all understand the public mistrusts information from the Navy (and the federal government). So, having clear language written at a lower grade level is important. Writing at a high grade level with jargon leads people to mistrust the message. Our markup will highlight some areas that could be reworded.
- It seems as if the communication goal is to discredit data the Navy has already collected. We are concerned that's not the most appropriate communication goal.
- By focusing on the low tiny/fractional levels to measure, the background levels, and protecting public health, people are going to ask why the Navy wasn't using these better laboratory methods all along.

If you'd like to discuss these issues and our markup before you finalize the document tomorrow, please reach out to Angeles and/or I. We are both in tomorrow morning, but likely out in the afternoon.

Thanks, John

From: Macchiarella, Thomas L CIV USN COMNAVFACENGCOM DC (USA) <thomas.l.macchiarella.civ@us.navy.mil>
Sent: Thursday, September 23, 2021 1:00 PM
To: Chesnutt, John <Chesnutt.John@epa.gov>
Cc: Robinson, Derek J CIV USN NAVFAC SW SAN CA (USA) <derek.j.robinson1.civ@us.navy.mil>; Sanchez, Yolanda <Sanchez.Yolanda@epa.gov>
Subject: HPNS Timely Topic

Hi John,

Please find the attached Timely Topic that we plan to post tomorrow. The only reference to EPA is mention of a lab method.

Have fun at the EMEC.

-Thomas.

THOMAS L. MACCHIARELLA, PE
Base Closure Manager
Navy BRAC PMO West
33000 Nixie Way, Bldg 50
San Diego, CA 92147
Phone: 619-203-3644 (Telework)
New Email address: Thomas.L.Macchiarella.civ@us.navy.mil

EXHIBIT 3

Hunters Point Sr-90 Extraction Chromatography Analysis

Suspected Bias Investigation

Investigation Inception

- Site personnel observed Sr-90 results above the action limit for samples not expected to contain Sr-90 activity.
- The data set seemed to have an overall high bias.
- At the request of Aptim, the laboratory investigated potential sources and identified the cause.

High Bias Identified!

- For the process used for Aptim soil samples:
 - Exchange chromatography resin is used to isolate Sr
 - Pb sticks to the resin/cartridge along with the Sr
 - As Pb-210 is present (NORM), the 5-day half-life Bi-210 daughter will begin growing in along with in Y-90
 - When the Y-90 fraction is eluted from the cartridge, Bi-210 will follow along, presenting a **high bias**.
 - This is an issue especially for Sr-90 at **low levels**.

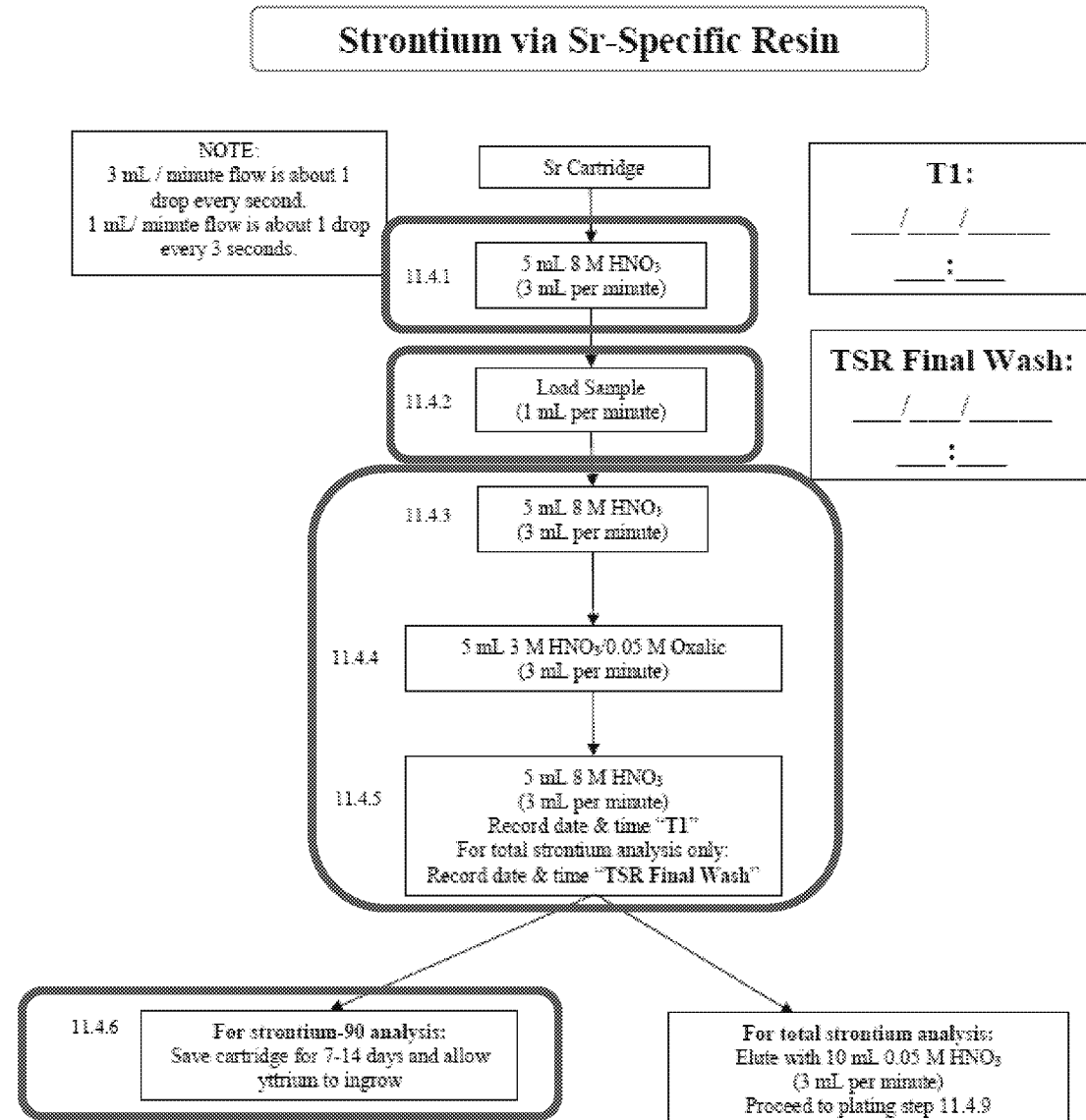
How can we confirm?

Batch	SampleID	ClientID	Analyte	Activity	Flag	UncTotal	DLC	Analyte	Activity	Flag	UncTotal	DLC
552531	160-44722-A-10-A	160-42364-13	Total Beta Strontium	0.0230		0.010	0.019	Sr-90	0.407		0.0857	0.0541
552531	160-44722-A-11-A	160-42364-3	Total Beta Strontium	0.0275		0.011	0.022	Sr-90	0.287		0.0756	0.0556
552531	160-44722-A-12-A	160-42360-1	Total Beta Strontium	0.0081	U	0.012	0.027	Sr-90	0.207		0.067	0.0542
552531	160-44722-A-13-A	160-40443-1	Total Beta Strontium	0.0023	U	0.010	0.024	Sr-90	0.28		0.0719	0.0513
552531	160-44722-A-14-A	160-42314-11	Total Beta Strontium	0.0152	U	0.011	0.023	Sr-90	0.252		0.0706	0.0553
552531	160-44722-A-15-A	160-42314-1	Total Beta Strontium	-0.0135	U	0.009	0.022	Sr-90	0.317		0.0762	0.0383
552531	160-44722-A-16-A	160-43181-3	Total Beta Strontium	-0.0043	U	0.010	0.024	Sr-90	0.278		0.0787	0.0574
552531	160-44722-A-17-A	160-42364-23	Total Beta Strontium	0.0066	U	0.010	0.023	Sr-90	0.365			
552531	160-44722-A-18-A	160-43484-8	Total Beta Strontium	-0.0008	U	0.011	0.025	Sr-90	0.4			
552531	160-44722-A-1-A	160-42764-1	Total Beta Strontium	0.0081	U	0.011	0.024	Sr-90	0.352		0.0833	0.06
552531	160-44722-A-2-A	160-42764-1 DU	Total Beta Strontium	0.0422		0.013	0.025	Sr-90	0.281		0.0736	0.0546
552531	160-44722-A-3-A	160-42715-16	Total Beta Strontium	0.0068	U	0.010	0.022	Sr-90	0.265		0.0732	0.0526
552531	160-44722-A-4-A	160-42525-11	Total Beta Strontium	0.0129	U	0.011	0.024	Sr-90	0.312		0.0743	0.0489
552531	160-44722-A-5-A	160-42525-1	Total Beta Strontium	-0.0049	U	0.014	0.033	Sr-90	0.309		0.0874	0.0668
552531	160-44722-A-6-A	160-40423-26	Total Beta Strontium	-0.0210	U	0.010	0.025	Sr-90	0.337		0.0759	0.0519
552531	160-44722-A-7-A	160-40423-21	Total Beta Strontium	-0.0033	U	0.009	0.022	Sr-90	0.324		0.0751	0.0494
552531	160-44722-A-8-A	160-42460-11	Total Beta Strontium	-0.0143	U	0.012	0.029	Sr-90	0.253		0.0746	0.0601
552531	160-44722-A-9-A	160-42766-1	Total Beta Strontium	0.0025	U	0.013	0.029	Sr-90	0.299		0.0812	0.0612
552531	LCS 160-552531/1-A	LCS 160-552531/1-A	Total Beta Strontium	2.8005		0.146	0.022	Sr-90				
552531	MB 160-552531/20-A	MB 160-552531/20-A	Total Beta Strontium	0.0014	U	0.010	0.024	Sr-90				

What caused the bias?

Initial Cartridge Load:

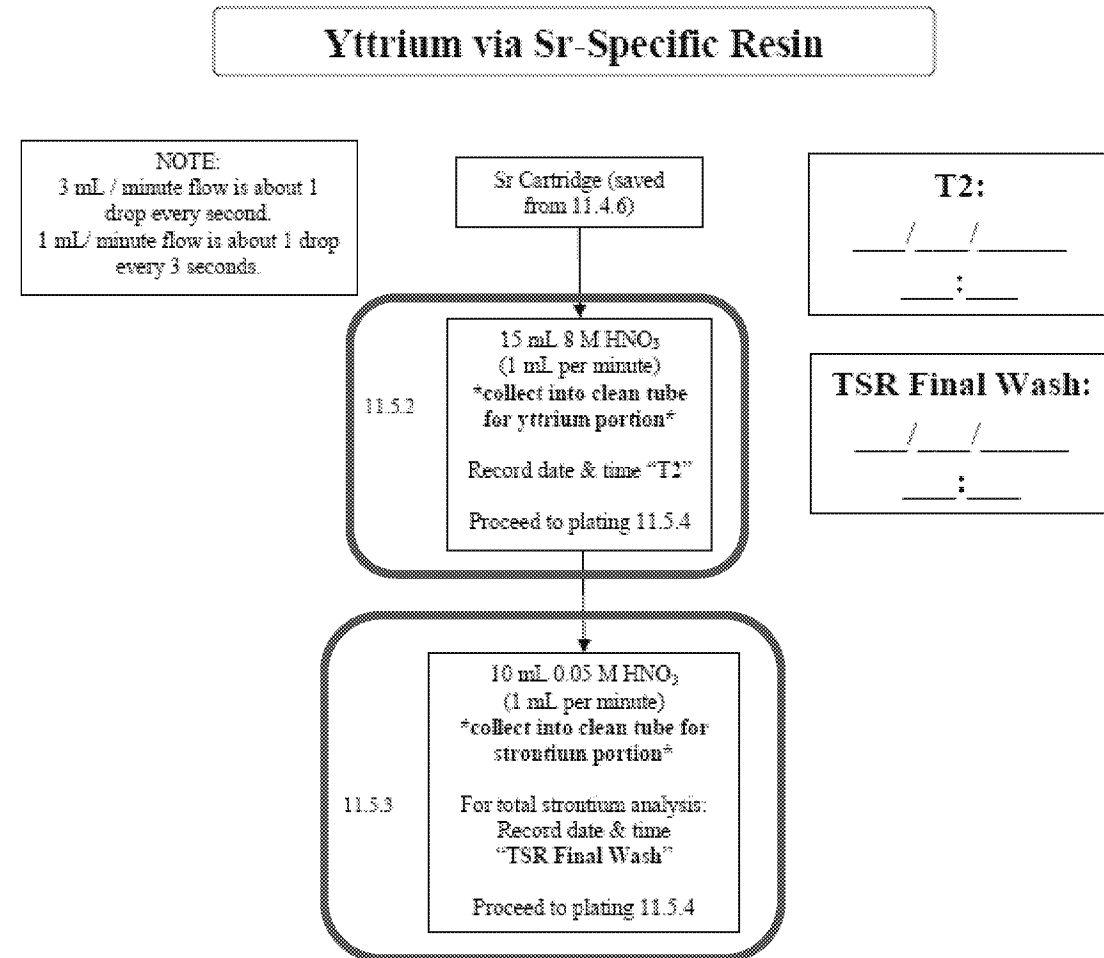
- 11.4.1 – condition cartridge
- 11.4.2 – load sample
- 11.4.3, 11.4.4, 11.4.5, rinse cartridge (removes interferences, Pb remains with the Sr)
- Note: after 11.4.5, Y-90 begins to grow back in



What caused the bias?

Final Cartridge Elution:

- 11.5.2 – elute yttrium
 - Proceed to plating/counting of yttrium fraction
- 11.5.3 – elute strontium
 - Proceed to plating/counting of strontium fraction and/or Sr Chemical Yield

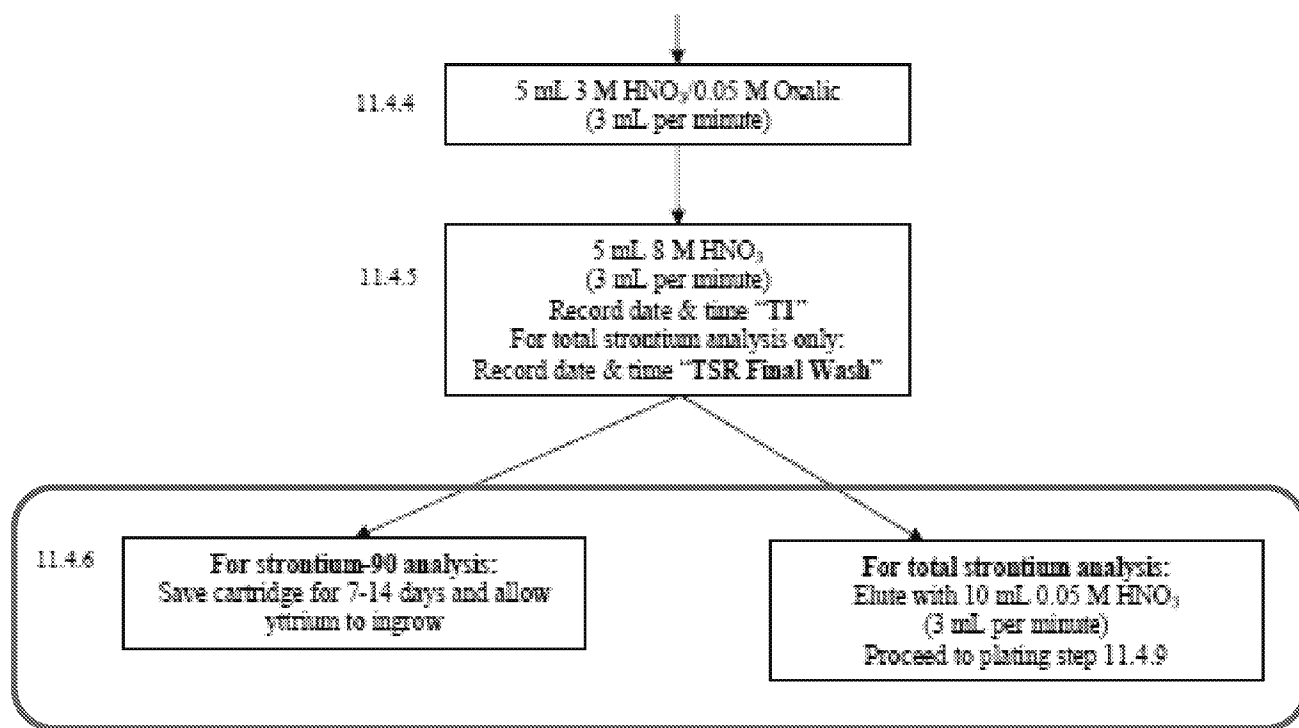


Solution!!

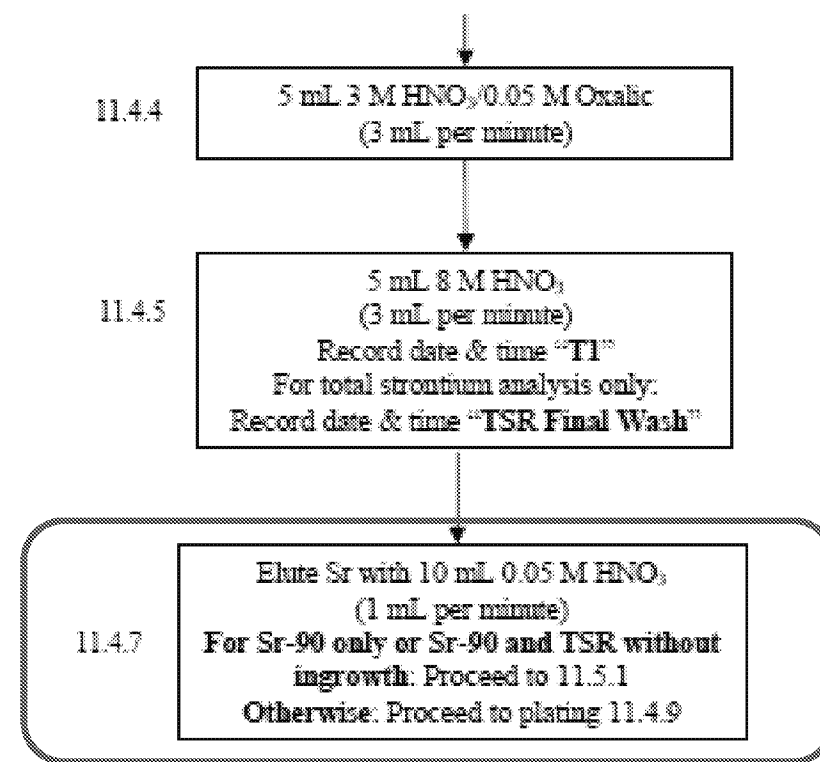
- Immediately after final cartridge rinse:
 - Elute Sr fraction into fresh tube with 0.05M HNO₃
 - Hold on to tube to allow Y-90 to grow back in
 - No Bi-210 of significance present, no Pb-210 either (still on cartridge)
- After 14 day Y-90 ingrowth:
 - Rinse Cartridge with 0.05M HNO₃ (removes any Bi-210 that may have grown back in), then 8M HNO₃ to condition
 - Add conc HNO₃ to Sr fraction in the tube to bring to 8M HNO₃
 - Load Sr fraction
 - Collect the 8M HNO₃ eluant which contains the Y-90, plate and count
 - Elute the Sr fraction with 0.05M HNO₃ for Sr carrier chemical yield

To Avoid the Bias - Flow Chart from Updated SOP

Rev 8

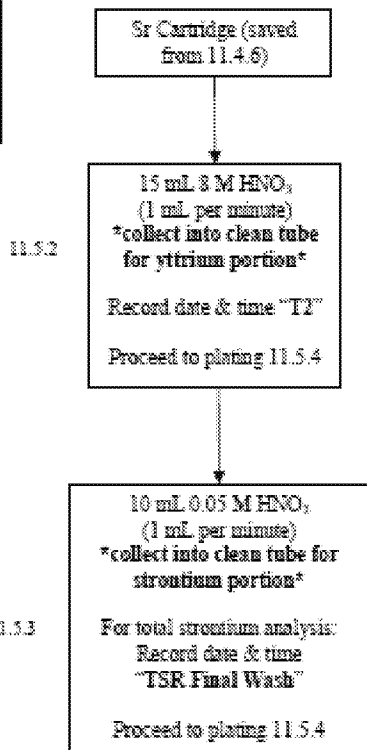


Rev 9



Rev 8

NOTE:
 3 mL / minute flow is about 1 drop every second.
 1 mL / minute flow is about 1 drop every 3 seconds.

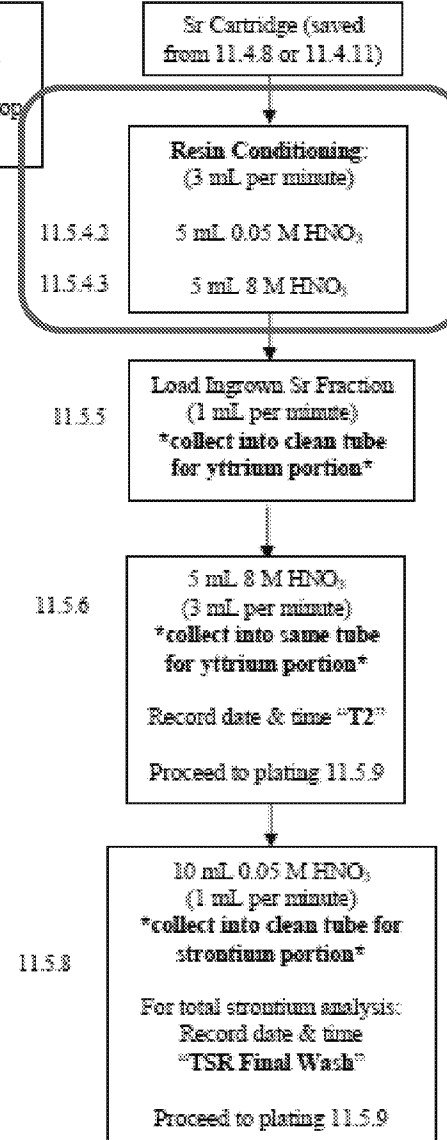


T2:
 ___/___/___
 ___:___

TSR Final Wash:
 ___/___/___
 ___:___

Rev 9

NOTE:
 3 mL / minute flow is about 1 drop every second.
 1 mL / minute flow is about 1 drop every 3 seconds.



T2:
 ___/___/___
 ___:___

TSR Final Wash:
 ___/___/___
 ___:___

Summary

- For the process originally used for Aptim soil samples:
 - Pb-210 (NORM) in the soil presented a high bias to the Sr-90 results, which is an issue at low levels.
- The laboratory confirmed the high bias by counting the Sr chemical yield fraction for Total Beta Radiostrontium
- The laboratory proposes Total Beta Radiostrontium for future analyses: conservative, lower DLC, lower uncertainty
- Confirmation of Sr-90 for any elevated Sr-Tot result can be performed without bias using the Sr-Tot fraction after Y-90 ingrowth

APPENDIX A – LEGAL FRAMEWORK

I. LEGAL BACKGROUND

A. CERCLA Requires Cleanups to Be Protective of Public Health

CERCLA establishes a mandatory duty to select remedial actions protecting human health and the environment. 42 U.S.C. § 9621(b)(1), “Cleanup Standards,” states, “The President shall select a remedial action that is protective of human health and the environment.” If the remedy includes leaving residual contamination at the site, the protectiveness of the remedy must be reviewed “no less often than each 5 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.” 42 U.S.C. § 9621(c).

The mandatory requirement for achieving protectiveness is reiterated many times in CERCLA¹ and in the regulations in the National Contingency Plan (“NCP”). In its Preamble, the NCP states that remedy selection is intended “to ensure that remedies comply with CERCLA’s mandate to be protective of human health and the environment.”²

EPA Guidances follow suit. To cite just one example, its October 1988 document, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, states in Section 1.3.1, “Protective Standards,” that CERCLA remedies are required to be “protective of human health and the environment.”

B. CERCLA Establishes Cleanup Procedures

CERCLA describes cleanup standards and procedures at 42 U.S.C. § 6921. The first steps are a Preliminary Assessment (“PA”) followed by a Remedial Investigation (“RI”) and Feasibility Study (“FS”). The Preliminary Assessment is intended to screen out sites that do not pose a threat to public health or the environment, determine if any short-term “removal actions” are necessary, set priorities for a site inspection and gather data to facilitate a fuller site evaluation.

¹ For example, 42 U.S.C. § 9621(d)(1) requires that “[r]emedial actions selected under this section . . . shall attain a degree of cleanup . . . at a minimum which assures protection of human health and the environment.”

² National Oil and Hazardous Substances Pollution Contingency Plan, 55 Fed. Reg. 8666, 8712 (Mar. 8, 1990). The NCP includes many references to the duty of protectiveness. 40 CFR § 300.430 “Remedial Investigation/feasibility study and selection of remedy,” for example, states CERCLA’s goal: “The national goal of the remedy selection process is to select remedies that are protective of human health and the environment, that maintain protection over time, and that minimize untreated waste.” 40 CFR § 300.430(d), states that remedial investigations are intended to identify “risks” and “threats” to human health. 40 CFR § 300.430(e)(2) requires that “alternatives shall be developed that protect human health and the environment.” 40 CFR § 300.430(e)(9)(iii) sets forth nine criteria that are to be considered in selecting a remedy. 40 CFR § 300.430(f) “Selection of remedy,” categorizes the nine criteria in 3 groups, the first of which is, “overall protection of human health and the environment.” Further, “remediation goals shall establish acceptable exposure levels that are protective of human health and the environment,” 40 CFR § 300.430(e)(2)(i).

The Remedial Investigation (“RI”) characterizes the nature and vertical and horizontal extent of contamination at a site. The Feasibility Study (“FS”) analyzes remedial alternatives, proposes a preferred alternative, and summarizes the data relied upon in selecting the preferred alternative.³ 40 C.F.R. §300.430 (f)(2) states that a plan must be drafted that, among other things, “describes the remedial alternatives analyzed by the lead agency, proposes a preferred remedial action alternative, and summarizes the information relied upon to select the preferred alternative.”

EPA has issued numerous guidance documents for conducting cleanups including, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (“RI/FS Guidance”),⁴ and *Data Quality Objectives for Remedial Response Activities* (“Data Quality Guidance”).⁵ For Superfund sites like HPNS, EPA has issued a multi-volume guidance, *Risk Assessment Guidance for Superfund Sites* (“RAGS”).⁶ For radionuclides, there is *Radiation Risk Assessment at CERCLA Sites: Q&A*,⁷ *Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination*,⁸ and *The Multi-Agency Radiation Survey and Site Investigation Manual* (“MARSSIM”).⁹

EPA’s *RI/FS Guidance* defines a remedial investigation as “the mechanism for collecting data to characterize site conditions; determine the nature of the waste; assess risk to human health and the environment; and conduct treatability testing as necessary . . .”¹⁰ The RI consists of several stages of data collection, each of which builds on knowledge developed in the previous stage, eventually forming a comprehensive site characterization.¹¹

Risk Assessment Guidance for Superfund Sites (“RAGS”) defines site characterization as an analysis of the “nature and extent of threats to human health and the environment.”¹² Under *RAGS, Part A*, lead agencies must determine the potential extent of contamination, including spread of contaminants from their original sources.¹³ To accomplish this, the lead agency is required to gather information on what contaminants are present and in what concentrations. It must also consider how “the environmental setting . . . may affect the fate, transport and persistence of the contaminants.”¹⁴ Accordingly, sampling should include “routes of potential

³ 42 U.S.C. § 9621(d)(2)(B)(ii), 40 CFR 300.430.

⁴ *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, <https://semspub.epa.gov/work/HQ/100001529.pdf>.

⁵ *Data Quality Objectives for Remedial Response Activities*, Appendix C, Sampling Considerations, C-1, <https://nepis.epa.gov/Exe/ZyPDF.cgi/2000A50U.PDF?Dockey=2000A50U.PDF>.

⁶ *Risk Assessment Guidance for Superfund (RAGS)*, <https://www.epa.gov/risk/risk-assessment-guidance-superfund-rags-part>

⁷ *Radiation Risk Assessment at CERCLA Sites: Q&A*, OSWER 9285.6-20, June 13, 2014, Q3, p. 8-9.

⁸ *Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination*, August 22, 1997. OSWER 9200-4.18.

⁹ *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*, <https://www.epa.gov/radiation/download-marssim-manual-and-resources>

¹⁰ *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, 1-6, <https://semspub.epa.gov/work/HQ/100001529.pdf>.

¹¹ *Id.*

¹² *Risk Assessment Guidance for Superfund Part A*, 1-4.

¹³ *See id.* at 4-2, 4-3.

¹⁴ *Id.* at 4-2.

transport.”¹⁵ To assure the investigation is comprehensive, the guidance calls for obtaining “data on concentrations of contaminants in each of the source areas and media of concern.”¹⁶ RAGS Part A states that investigation of contamination must also consider whether contamination could be transported around a site.

EPA’s *Data Quality Guidance* calls for comprehensive sampling of the entire site “to ensure that no area of the site is overlooked.”¹⁷ A proper site characterization must “[d]etermine the [n]ature and [e]xtent of [c]ontamination,” considering both historical records and preliminary sampling data.¹⁸ The agency must also consider factors that may have caused contaminants to migrate from the release source and follow a sampling approach that covers contamination in “both vertical and horizontal directions.”¹⁹ To make “general inferences” about a site, the *Data Quality Guidance* requires sampling to “provide complete coverage of the area of interest.”²⁰

A Feasibility Study analyzes the practicality of potential remedial alternatives, relying on data generated during the RI.²¹ EPA guidance explains that the proposed plan “should clearly describe why the lead agency is recommending the Preferred Alternative.”²² Remediation must ensure the site will be left clean enough not to pose a short or long-term risk to human health.

For radioactive contamination like that at HPNS, the primary long-term risk is from cancer. EPA has issued guidance on how to assess cancer risk. *Risk Assessment Guidance for Superfund Part B* (“RAGS Part B”) calls for the lead agency to develop Preliminary Remediation Goals (“PRGs”) to use for calculating cancer risk from radiological contamination “during analysis and selection of remedial alternatives.”²³ There are several radiological PRG calculators, the primary ones of interest at HPNS being the PRG calculators for soil and buildings (“BPRG”).²⁴

The PRGs implement CERCLA’s requirement that remedies be “protective of human health and the environment.” EPA has set the baseline “point of departure” for protectiveness to be a one-in-a-million risk of excess lifetime cancers (in scientific notation, 1×10^{-6}).²⁵ Under

¹⁵ *Id.* at 4-11.

¹⁶ *Id.* at 4-3.

¹⁷ *Data Quality Objectives for Remedial Response Activities*, Appendix C Sampling Considerations, C-6, <https://nepis.epa.gov/Exe/ZyPDF.cgi/2000A50U.PDF?Dockey=2000A50U.PDF>.

¹⁸ *RI/FS Guidance*, 2-5, 3-13.

¹⁹ *Id.* at 3-13, 3-17.

²⁰ *Data Quality Guidance*, Appendix C Sampling Considerations, C-

5, <https://nepis.epa.gov/Exe/ZyPDF.cgi/2000A50U.PDF?Dockey=2000A50U.PDF>.

²¹ *See id.* at 4-7.

²² OSWER, U.S. EPA, *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* §3.4 (1999) (EPA-540-R-98-031), https://www.epa.gov/sites/default/files/2015-02/documents/rod_guidance.pdf.

²³ *Risk Assessment Guidance for Superfund Part B*, 1.

²⁴ *See generally* Environmental Protection Agency, *PRG Home*, <https://epa-prgs.ornl.gov/radionuclides/>. Note: There is also a vapor PRG calculator, in addition to separate PRG calculators for risk and dose (PRG, DCC, BPRG, BDCC, SPRG, SDCC & RVISL). “PRGs” herein refer to soil PRGs; building PRGs are denoted “BPRGs”.)

²⁵ *See Risk Assessment Guidance for Superfund Part B*, 34.

some circumstances where site-specific conditions justify it, acceptable risk can fall back from 10^{-6} , but it is not to exceed one-in-ten thousand (1×10^{-4}).²⁶

Radiological PRGs are “derived initially by determining the total risk posed by each radioactive contaminant,” and each exposure pathway and then calculating a cumulative total risk.²⁷ The calculation sets a maximum concentration of residual radioactivity, expressed for soil as picograms of radioactivity per gram of soil (“pCi/g”). For buildings, residual contamination is expressed as disintegrations per minute per 100 square centimeters (“dpm/2”).

The PRGs developed during the “scoping phase” are based on default values. They are then modified with site-specific characteristics determined in the RI.²⁸ *RAGS, Part A*, stresses that “because toxicity information may change rapidly and quickly become outdated, care should be taken to find the most recent information available.”²⁹ “Priority should be given to those sources of information that are the most current.”³⁰

C. Five Year Reviews Must Assure Remedial Actions Remain Protective of Human Health and the Environment

CERCLA sets a strict time limit if five-year reviews are required: “no less often than each 5 years after the initiation of such remedial action.” They must “assure that human health and the environment are being protected by the remedial action being implemented.” 42 U.S.C. § 9621(c).

Neither CERCLA nor the NCP authorize any circumstances under which the deadline for a five-year review may be extended. Nor do they authorize deferral of a protectiveness finding until sometime after the five-year review is due. With five years’ notice, there is no legal or practical justification to miss the statutory deadline.

Caselaw reaffirms the duty to assure protectiveness using the most up-to-date information. In *State of Ohio v. EPA*, 997 F.2d 1520 (D.C. Cir. 1993), the court made this clear:

“The States argue that because all remedies must be ‘protective’ as of implementation, the review will never provide an opportunity for new remedial action. EPA responds convincingly that new action will occur when the review reveals that the remedy is no longer protective – for example, where a remedial technology has failed, or where a newly promulgated standard indicates that the old standard is no longer protective.”³¹

If a five-year review cannot “assure that human health and the environment are being protected by the remedial action being implemented,” CERCLA requires that corrective action be identified, implemented, and reported to Congress. As 42 U.S.C. § 9621(c) states:

²⁶ *Radiation Risk Assessment at CERCLA Sites: Q & A*, May 2014, Q 33 & 34.

²⁷ See *Risk Assessment Guidance for Superfund Part B*, 34.

²⁸ See *id.* at 1.

²⁹ *Risk Assessment Guidance for Superfund Part A*, 7-15.

³⁰ *Human Health Toxicity Values in Superfund Risk Assessments*, OSWER Directive 9285.7-53 (2003), 3 <https://www.epa.gov/sites/default/files/2015-11/documents/hhmemo.pdf>.

³¹ *State of Ohio v. EPA*, 997 F.2d 1520, 1535 (D.C. Cir. 1993).

[I]f upon such review it is the judgment of the President that action is appropriate at such site in accordance with section 9604³² or 9606³³ of this title, 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.

Accordingly, five-year reviews must result in one of two actions: assuring protectiveness or acknowledging a lack of protectiveness, an explanation of exactly how protectiveness will be attained, and reporting it to Congress.

EPA's *Comprehensive Five-Year Review Guidance*, identifies numerous requirements for an adequate review, including determining whether there have been changes in toxicity or other contaminant characteristics which need to be investigated; identifying "recent" toxicity data; revisiting the validity of cleanup levels, and recalculating risk assessment to account for changes in standards and/or toxicity data. It raises three key questions that five-year reviews must answer:

- Question A - Is the remedy functioning as intended by the decision documents?
- Question B - Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?
- Question C - Has any other information come to light that could call into question the protectiveness of the remedy?³⁴ (Bullet points in original.)

D. CERCLA Sets Forth Requirements for Federal Facilities

CERCLA requires that all federal facilities comply with its mandatory requirements. 42 U.S.C. § 9620, "Federal facilities," states that all federal agencies, "shall be subject to, and comply with, this chapter in the same manner and to the same extent, both procedurally and substantively, as any nongovernmental entity." 42 U.S.C. § 9620(a)(1).

CERCLA also requires that at NPL (Superfund) sites, federal facilities "shall enter into an interagency agreement with the Administrator for the expeditious completion by such department, agency, or instrumentality of all necessary remedial action at such facility." 42 U.S.C. § 9620(e)(2).

Under 42 U.S.C. § 9620(e)(4), EPA has the ultimate authority over remedial actions at NPL sites. Each interagency agreement must include:

A review of alternative remedial actions and selection of a remedial action by the head of the relevant department, agency, or instrumentality and the Administrator or, if unable to reach agreement on selection of a remedial action, selection by the Administrator.

CERCLA also prohibits federal agencies from inconsistency with EPA guidelines, rules, regulations, and criteria: "No department, agency, or instrumentality of the United States may

³² This section governs removal and remedial actions.

³³ This section governs abatement actions.

³⁴ *Comprehensive Five-Year Review Guidance*, (June 2001), OSWER 9355.7-03B-P, p. 4-1.

adopt or utilize any such guidelines, rules, regulations, or criteria which are inconsistent with the guidelines, rules, regulations, and criteria established by the Administrator under this chapter.” 42 U.S.C. § 9620(a)(2).

E. The HPNS Federal Facilities Agreement

On January 22, 1992, the Navy, EPA, and the California Department of Toxic Substances Control (“DTSC”) entered into a *Federal Facilities Agreement for Naval Station Treasure Island – Hunters Point Annex* (“FFA”). Its stated purpose 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.³⁵

This provision explicitly establishes that, while guidance documents are generally not mandatory, the parties to the FFA agreed to make them mandatory. They agreed the HPNS cleanup would be implemented “in accordance with . . . Superfund guidance and policy.”

The FFA’s written commitment to follow Superfund guidances is repeatedly ratified throughout the FFA. For example, Section 6, “Work to be Performed,” states “The Parties agree to perform the tasks, obligations and responsibilities described in this Section in accordance with CERCLA and CERCLA guidance and policy . . .”³⁶ Similarly mandatory language is found throughout the FFA.³⁷

Furthermore, a federal agency, including EPA, “must follow its own rules.” *Federal Commc’ns Comm’n v. Fox Television Stations*, 556 U.S. 502 (2009).³⁸

The FFA may be enforced by “any person” pursuant to Section 13.1: “Upon the effective date of this Agreement, any standard, regulation, condition, requirement or order which has become effective under CERCLA and is incorporated into this Agreement is enforceable by any person pursuant to CERCLA Section 310,” the provision authorizing citizens’ suits.

³⁵ FFA, Section 1.1(b), 1.

³⁶ FFA, Section 6.1, 8.

³⁷ For additional examples where the FFA requires the cleanup to be done “in accordance with . . . CERCLA guidance and policy,” see Section 7.7(b), “Review of Documents,” (requiring “consistency with CERCLA, the NCP . . . **and any pertinent guidance or policy issued by the EPA**”); Section 11.4(b), “Notice and Opportunity to Comment,” subsections (b) and (c) (“**and in accordance with pertinent EPA guidance**”); Section 26, “Public Participation and Community Relations, subsections 26.1 (“**shall comply with . . . relevant community relations provisions in . . . EPA guidances,**” and 26.3 (“**in accordance with** relevant provisions in . . . EPA guidances.”) (Emphasis added.)

³⁸ See *Bradley v. Weinberger*, 483 F.2d 410, 414 n.2 (1st Cir. 1973) and *United States v. Griglio*, 467 F.2d 572 (1st Cir. 1972).

F. CERCLA Requires Public Participation in Decision Making

CERCLA requires meaningful public participation in the remedy selection process. 42 U.S.C. §9617, “Public Participation,” requires that “a notice and brief analysis of the proposed plan” be published and made publicly available. The public must be provided “a reasonable opportunity for submission of written and oral comments” and an opportunity to attend “a public meeting at or near the facility at issue regarding the proposed plan.”

42 U.S.C. §9617(b) requires, “a response to each of the significant comments, criticisms, and new data submitted in written or oral presentations.”

CERCLA also mandates public participation as to specific parts of the remedy-selection process, such as establishing an administrative record, consideration of alternative remedial options in a RI/FS and the ultimate selection of a remedy in a Record of Decision (“ROD”). For example, 42 U.S.C. § 9613(k) states, “The President shall establish an administrative record upon which the President shall base the selection of a response action. The administrative record shall be available to the public at or near the facility at issue.” 42 U.S.C. § 9613(k)(1).

In 40 C.F.R. § 300.430(f)(2), the NCP provides: “the lead agency shall identify the alternative that best meets the requirements in § 300.430(f)(1), above, and shall present that alternative to the public in a proposed plan....” Furthermore:

[t]he purpose of the proposed plan is to supplement the RI/FS and provide the public with a reasonable opportunity to comment on the preferred alternative for remedial action, as well as alternative plans under consideration, and to participate in the selection of remedial action at a site.

Like CERCLA, the NCP requires an opportunity for the public to provide written and/or oral comments, attend a public meeting, and get a “response to each issue.” 40 C.F.R. § 300.430(f)(3)(i).

EPA guidance also states clearly that the RI/FS and proposed remediation plan, along with other information that forms the basis for choosing a cleanup plan, must be included in the Administrative Record to enable public comment.³⁹

G. CERCLA Authorizes Citizens Suits

CERCLA provides statutory authority for citizen suits. It authorizes two types of actions. First, under 42 U.S.C. § 9659(a)(1), “any person” may bring an action alleging “a violation of any standard, regulation, condition, requirement, or order which has become effective pursuant to this chapter (including any provision of an agreement under section 9620 of this title, relating to Federal facilities).” (Parenthesis in original.)

³⁹ See U.S. EPA, *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* §3.4, 3-10 (1999) (EPA-540-R-98-031), https://www.epa.gov/sites/default/files/2015-02/documents/rod_guidance.pdf.

Second, 42 U.S.C. § 9659 (a)(2) authorizes “any person” to sue for “a failure” of a public officer “to perform any act or duty under this chapter, including an act or duty under section 9620 (relating to Federal Facilities), which is not discretionary with the President or such other officer.” (Parenthesis in original.)

CERCLA requires 60 days prior notice of intent to file a citizens’ suit. 42 U.S.C. § 9659(d) and (e). Notice must be given to the federal government and the State in which the alleged violation occurs. 42 U.S.C. § 9659 (d)(1). The EPA Administrator must also be notified. 42 U.S.C. § 9659(e).

Once the 60-day notice period elapses, the noticing party may sue, unless the government is “diligently prosecuting” the violations alleged:

No action may be commenced under paragraph (1) of subsection (a) if the President has commenced and is diligently prosecuting an action under this chapter, or under the Solid Waste Disposal Act to require compliance with the standard, regulation, condition, requirement, or order concerned (including any provision of an agreement under section 9620 of this title)⁴⁰. 42 U.S.C. § 9659(d). (Parentheses in original.)

Section 9659 also requires that the 60-day notice required for both types of citizens’ suits “shall be given in such manner as the President shall prescribe by regulation.” The service, content, and timing requirements of the notice are detailed in 40 C.F.R. § 374.1 through 374.6.

In considering the notice required, the Ninth Circuit Court of Appeals relies on *Gwaltney of Smithfield, Ltd. v. Chesapeake Bay Foundation, Inc.*, 484 U.S. 49 (1987), which articulated two purposes: “to [1] give [the alleged violator] an opportunity to bring itself into compliance with the Act and thus likewise [2] render unnecessary a citizen suit.”⁹ The pre-suit notice must be “sufficiently adequate so that the recipient can identify the basis for the complaint” but it does not have to “list every specific aspect or detail of every alleged violation.” *Sierra Club v. Portland Gen. Elec. Co. (PGE)*, 663 F.Supp.2d 983, 999 (D. Ore. 2009).

H. Challenging the Navy’s Cleanup Is Not Barred by 42 U.S.C § 9613

Citizens may not bring an action under CERCLA challenging an ongoing “remedial action.” 42 U.S.C.A. § 9613(h). However, the Ninth Circuit recognizes an exception to this rule when the challenged remedial action is at a federal Superfund (NPL) site. In that case, the §9613(h) bar does not apply and citizens may sue during the remedial action. *Fort Ord Toxics Project, Inc. v. California E.P.A.*, 189 F.3d 828, 834 (9th Cir. 1999).

CERCLA defines a remedial action as any action intended to be a permanent solution to remedy environmental hazards. This includes but is not limited to “cleanup of released hazardous substances and associated contaminated materials” and the “segregation of reactive wastes.” 42 U.S.C.A. §9601(24).

⁴⁰ Section 9620 relates to Federal Facilities.

Because the action at HPNS is a remedial action at a federal facility on the NPL, the 42 U.S.C.A. §9613(h) jurisdictional bar does not apply. Greenaction may file a citizens' suit challenging the HPNS cleanup where violations of CERCLA, the NCP and the FFA have occurred, after providing the required 60-day notice and that period has elapsed.

APPENDIX B – HISTORICAL CERCLA VIOLATIONS

This Appendix places the violations of CERCLA, the NCP and the FFA described in the Notice in the context of the history of CERCLA violations the Navy and EPA have committed throughout the cleanup.

I. THE NAVY HAS VIOLATED CERCLA, THE NCP and the FFA THROUGHOUT the HPNS CLEANUP

A. The Navy Improperly Excluded Wide Swathes of HPNS from Radiological Testing

The first steps in a CERCLA cleanup are a Preliminary Assessment (“PA”) followed by a Remedial Investigation (“RI”) and Feasibility Study (“FS”). The Preliminary Assessment is intended to screen out sites that do not pose a threat to public health or the environment, determine if any short-term “removal actions” are necessary, set priorities for a site inspection and gather data to facilitate a fuller site evaluation.

A Remedial Investigation characterizes the nature and vertical and horizontal extent of contamination at a site. The Feasibility Study analyzes remedial alternatives, proposes a preferred alternative, and summarizes the data relied upon in selecting the preferred alternative.¹

To inform the *HPNS RI/FS*, the Navy reviewed its historical records and published *Hunters Point Shipyard Historical Radiological Assessment* (“HRA”) in 2004. It claimed to be “a comprehensive history of radiological operations conducted by the U.S. Department of the Navy (Navy) and Navy contractors at the Hunters Point Shipyard.”² (Parenthesis in original.)

The HRA, on which all subsequent investigation of the radiological risks at HPNS was based, identified several dozen radionuclides of concern (“ROCs”) that have half-lives long enough to still be present at HPNS and should have been investigated. But not all were.

Table 4-2, “Radionuclides Used at HPS,” lists 108 radionuclides. Table 4-3, “Radionuclides of Concern at HPS,” lists 33 radioactive elements.³ However, in 2006, when the Navy adopted its cleanup standards, it adopted cleanup standards called “release criteria” for only 11 radionuclides.⁴

As a result, remedial goals were adopted for only a third of the radionuclides of concern. The Navy did not adequately justify the elimination of the remaining two-thirds of radionuclides of concern and their risk was never evaluated in the Record of Decision (“ROD”) process or subsequent actions, including *Five-Year Reviews*. Failure to establish remedial goals for the majority of radionuclides of concern identified by the HRA improperly underestimated risk to

¹ 40 CFR § 300.420.

² 2004 *Hunters Point Shipyard Historical Radiological Assessment* (“*Historical Radiological Assessment*”), 1-1.

³ *Id.* at Tables 4-2 and 4-3.

⁴ *Basewide Radiological Removal Action, Action Memorandum* (2006), Table 1.

human health and the environment.

Based on this inadequate review and preliminary radiological surveys, the Navy classified each of 882 shipyard sites as either “impacted” or “non-impacted.”⁵ Sites were “impacted” if the Navy found that “the history of the site indicate[d] that radioactive materials may have been used or stored there,”⁶ including “locations where leaks or spills are known to have occurred.” Conversely, “non-impacted” sites allegedly had “no reasonable potential for residual radioactive contamination.”⁷

If a site was designated “non-impacted,” no further radiological sampling or investigation was conducted because the Navy claimed “there [was] no reasonable potential for radioactive material to be present.”⁸ The Navy only classified 91 of 882 sites at HPNS “impacted.”⁹ Accordingly, the Navy never sampled or tested the remaining 791 sites. To this day, nearly 90 percent of HPNS sites have never been sampled for radiological contamination.¹⁰

The Navy relied on the HRA’s incorrect analysis to justify its failure to sample most of HPNS. This violated EPA guidances requiring more comprehensive sampling, “to ensure that no area of the site is overlooked.”¹¹ While a lead agency may consider “hot spots” as a factor in where to *concentrate* sampling, it was inappropriate for the Navy to entirely exclude nearly 90 percent of a Superfund site from sampling, as it did at HPNS.¹²

Leaving such a large majority of sites unsampled and untested means it was impossible for the Navy to accurately estimate the nature, extent, and concentration of contaminants, as required by EPA RI/FS guidance.¹³

B. The Navy Inappropriately Used Parcel B as a Model for Other Parcels

The first Parcel for which the Navy issued a ROD was Parcel B, in October 1997, *Hunters Point Shipyard Parcel B Final Record of Decision* (“*Parcel B ROD*”). In the *Parcel B ROD*, the Navy proposed “to clean up the entire parcel to residential risk-based standards.”¹⁴

Navy operations contaminated Parcel B with a variety of contaminants including heavy metals and other hazardous chemicals from activities such as “machining and metal fabrication” and “fuel storage and distribution.”¹⁵

⁵ *Historical Radiological Assessment*, 2-2.

⁶ *Id.*

⁷ *Id.*

⁸ *Id.*, at 4-3.

⁹ *Id.*, at 1-5.

¹⁰ *Id.*

¹¹ *Data Quality Objectives for Remedial Response Activities*, Appendix C, Sampling Considerations, p. C-6.

¹² *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, 3-17, <https://semsub.epa.gov/work/HQ/100001529.pdf>.

¹³ *Risk Assessment Guidance for Superfund Part A*, 4-2.

¹⁴ *Parcel B Final Record of Decision*, Oct. 7, 1997, at 43.

¹⁵ *Id.* at 10.

The chemicals of concern identified in the *Parcel B ROD* included chromium VI, copper, lead, mercury, nickel, and selenium.¹⁶ The Navy identified its primary contamination methods to be the release of waste acids, oil, paint, plating solutions, and fuels, largely via disposal into building drains, leaks from storage tanks, or unintentional spills.¹⁷ According to the Navy's *Human Health Risk Assessment* ("HHRA"), the "ingestion of and dermal contact with contaminated soil" at Parcel B, as well as "ingestion of produce grown [by potential residents] at the site," could lead to serious illness.¹⁸

The Navy attributed radiological contamination in Parcel B to seven sources:

(1) potential disposal of decontamination materials from ships used during atomic weapons testing in the South Pacific during the 1950s that were decontaminated at the shipyard, (2) radiological decontamination of personnel, (3) storage of samples from atomic weapons testing, (4) radiological sample counting, (5) storage and disposal of radioluminescent devices, (6) non-destructive testing and gamma radiography, and (7) storage of low-level radioactive waste.¹⁹

The radionuclides of concern identified in the *Parcel B ROD* were strontium-90 ("Sr-90"), cobalt-60 ("Co-60"), cesium-137 ("Cs-137"), radium-226 ("Ra-226"), and plutonium-239 ("Pu-239").²⁰

The Navy's characterization of Parcel B sites as "impacted" or "non-impacted," employed an approach it eventually called the "spill model," and which it eventually applied to all parcels. However, "spill model" is not a term used in CERCLA, the NCP or any EPA CERCLA guidance. Nor does the phrase appear in the HPNS HRA or the *Parcel B ROD*.²¹

The Navy's "spill model" assumed contamination resulted from discreet, well-delineated spills rather than there being more widespread general contamination. It also assumed that discrete chemical spills resulted in "high chemical concentrations . . . near the center of the release and concentrations decrease outward."²² This allowed for less testing than a full site characterization would, as the assumption was that contamination dissipated further from the documented spill; fewer samples were arguably necessary the farther one got from the spill.

As the Navy prepared to remediate Parcel B, however, it was confronted with stark differences between the HRA and the facts on the ground. This resulted in alterations to the *Parcel B ROD* through two *Explanations of Significant Differences* ("ESDs")²³ followed by a

¹⁶ *Fourth Five-Year Review* at 3-10. For a complete list of chemicals of concern, see Table 1, *Fourth Five-Year Review*, at PDF pages 118-121.

¹⁷ The *First 5-Year Review's* Table 1 summarizes soil contamination at Parcel B. See *First FYR* at 57-59.

¹⁸ *1997 Parcel B ROD* at 20.

¹⁹ *Parcel B Amended Record of Decision*, Jan. 14, 2009, 5-6.

²⁰ *Id.*

²¹ *1997 Parcel B ROD*.

²² *Parcel B Amended ROD*, 1-4.

²³ The first ESD, (*Final Explanation of Significant Differences, Parcel B, Hunters Point Shipyard*," August 24, 1998; "*First Parcel B ESD*"), altered the depth of excavation. Originally, the Navy planned to excavate "to the groundwater table or 10⁻⁶ cancer risk (residential)." The new standard called for excavation "to a cleanup level of 10⁻⁶ cancer risk (residential) or to a maximum depth of 10 feet" below ground surface. (*Id.* at 1.) This was done to

January 14, 2009, *Amended Parcel B Record of Decision* (“*Amended Parcel B ROD*”). The “spill model” was first introduced by the Navy in the *Parcel B Amended ROD*.²⁴

The Navy’s model for designating “impacted” and “non-impacted” sites proved to be demonstrably wrong in Parcel B. For example, the “spill model” assumed chemical contamination was quite limited there, but testing found hazardous heavy metals were “ubiquitous” throughout the Parcel.²⁵ In response, the Navy was forced to change the remediation plan for Parcel B and amend the ROD, conceding that “the spill model did not account for all areas where chemical concentrations exceeded cleanup goals . . . [and that] the spill model needed to be supplemented to account for these other areas.”²⁶

Furthermore, as the *Parcel B Amended ROD* summarized, the “spill model” was the basis of the cleanup from the very start, but proved to be wrong in important ways:

The discrete release of chemicals, referred to as the “spill model,” was the basis for the remedial action selected in the 1997 ROD. . . . The spill model for chemical releases was appropriate for many areas at Parcel B. The Navy successfully delineated and removed all contaminants at concentrations above cleanup goals at 93 of 106 excavations implemented for the remedial action. **The ubiquitous distribution of metals in soil, especially manganese, led to reevaluation of the remedy at the remaining 13 excavations at Parcel B, however.**²⁷ (Emphasis added.)

Thus, the Navy knew its assumption that the “spill model” was appropriate to Parcel B’s chemical contamination was incorrect more than 10 percent of the time. This should have called into question continuing to rely on it. However, the Navy did not apply this lesson to investigation of radiological contamination. It continued to rely on the “spill model” as the basis for radiological site characterizations in Parcel B and all other subsequent parcels.

A primary source of radiological contamination at HPNS came from contaminated ships brought to the shipyard in the 1950’s for decontamination after “Operation Crossroads.”²⁸ Enormous amounts of radioactive sand, or “grit,” were contaminated in the process.

The Navy purportedly disposed of the radioactive grit by dumping it directly into the Bay or putting it into containers which were then dumped into the ocean farther from shore.²⁹ However, the *HRA* included testimony of former shipyard employees who said spent sandblast

protect workers who “could be exposed to residual contaminated soils while believing they are protected as long as they do not dig into the saturated zone.” (*Id.* at 3.) The Second ESD, *Final Explanation of Significant Differences, Parcel B, Hunters Point Shipyard*, May 4, 2000 (“*Second Parcel B ESD*”), updated cleanup standards for chemical contamination as a result of EPA’s update of its “Preliminary Remediation Goals” (“PRGs”) for chemically contaminated soil: “This ESD revises the soil cleanup values presented in Table 8 to incorporate EPA’s 1999 PRGs. . . .” (*Second Parcel B ESD* at 1.)

²⁴ *Parcel B Amended ROD*, 1-4.

²⁵ *Id.*

²⁶ *Id.*

²⁷ *Id.* at § 1.3.1 Soil, 1-4.

²⁸ *Historical Radiological Assessment* at 6-21.

²⁹ *Id.* at 6-35. Interviews with former personnel involved in the sandblasting process recalled disposing of sandblast waste in the Shipyard’s landfill as well. *Id.* at B-3.

grit was widely dispersed through a combination of sloppy procedures and natural forces, particularly the swirling winds which have long characterized southeastern San Francisco.³⁰ One employee recalled that it “would have been impossible to catch and containerize all sandblast grit in the drydocks,” and that some of the sandblast grit was collected “in open barrels on the piers [which] blew around because of the nature of the winds at the piers.”³¹ In addition to being widely dispersed by wind, the radioactive grit was regularly washed away with water. Run-off from this process resulted in contamination of the shipyard, particularly its sewage system. There was also evidence that the grit was buried at several shipyard sites.

Another interviewee remembered that “[t]he grit would blow toward the Bay, but, occasionally, the wind would blow it back over the base. Blasting would not stop because the wind changed direction.”³²

The “spill model” was not appropriate to wind-blown radioactive sandblast grit.

EPA pointed out this inconsistency in its critique of the *HRA* and the Navy responded by nominally adding “sediment” as a “potential migration pathway.”³³ However, this addition was not meaningfully incorporated into the designation of “impacted” sites – not a single site designation changed from “non-impacted” to “impacted” after sediment was included as a factor.³⁴

The Navy claimed that the “identification of sandblast grit is not a reason for designating a site as impacted,” even though the entire purpose of sandblasting the “Operation Crossroads” ships was to transfer radioactivity from the ships’ hulls to the particles of sand.³⁵ Responding to comments, the Navy argued that it need not consider airborne sandblast grit since one deposit (a designated testing area around Building 901) was not found to be radiologically contaminated.³⁶

But the absence of contamination at one location did not justify a refusal to test for or consider the extent of windswept radioactive sand – especially since other samples of sandblast grit **did** find radiological contamination.³⁷ Even so, the Navy did not investigate. For example, the *HRA* states, “During remedial investigation at Parcel A, the Navy discovered contaminated sandblast grit under pipes at IR-59. The Navy cleaned up this pocket of sandblast grit; however, **a comprehensive survey for other areas of sandblast grit at Parcel A was not conducted.**”³⁸ (Emphasis added.)

³⁰ Candlestick Park, a stadium notorious for its unpredictable, swirling winds was just across Double Rock Cove from the shipyard.

³¹ *Historical Radiological Assessment* at B-12.

³² *Id.* at B-36.

³³ *Id.* at E-8.

³⁴ *Id.*

³⁵ *Id.* at Appendix E, p. E-46.

³⁶ *Id.*

³⁷ *Finding of Suitability to Transfer for Parcel A* (2004), *Responses to Regulatory Agency, City of San Francisco, and Public Comments on the Finding of Suitability to Transfer for Parcel A, Revision 2, Dated Mar. 26, 2002*, 32, <https://www.nrc.gov/docs/ML1829/ML18291A739.pdf>.

³⁸ *Id.*

The Navy also did not address the very real possibility of migration of contamination; migration was not accounted for in the “spill model.”

Another example of the Navy’s incorrect assumptions related to radioactive smoke from burning contaminated fuel. As the HRA states, “Approximately 610,000 gallons of contaminated fuel oil from the [Operation Crossroads] ships were subsequently burned in the shore power/steam plants at HPS.”³⁹ Smoke from burning that radioactive fuel was carried widely by the wind, like the radioactive sandblast grit.

As a result of these *HRA* inaccuracies, the *Parcel B ROD* incorrectly stated, “[n]o air or radiation concerns were identified on Parcel B.”⁴⁰ It never considered the possibility that Parcel B was contaminated with radioactive sandblast grit and/or smoke from burning radioactive fuel.

The *Parcel B ROD* served as a model for all subsequent parcels’ RODs. Thus, the same faulty assumptions and unlearned lessons identified in Parcel B tainted all subsequent parcels and their RODS.

The Navy’s inappropriate reliance on the “spill model” meant that the Navy failed to comprehensively characterize the shipyard by quantifying the full vertical and horizontal extent of contamination, as required by EPA’s guidances, CERCLA, and the NCP.

C. The Navy Chose Grossly Under-Protective Remedial Goals

1. The Navy Improperly Chose the Cleanup Goals in the 2006 Basewide Removal Action and Applied Them to All Subsequent RODs Involving Remedial Actions.

The Navy first promulgated a two-page table of remedial goals for radionuclides, called “Release Criteria,” in Table 1 to its 2006 *Basewide Removal Action, Action Memorandum* (“*Basewide Removal Action Memo*”), reproduced below.⁴¹

³⁹ *Historical Radiological Assessment* at 6-18.

⁴⁰ *1997 Parcel B ROD* at 10.

⁴¹ *Basewide Radiological Removal Action, Action Memorandum*, Table 1.

TABLE 1
RELEASE CRITERIA

Radionuclide	Surfaces			Soil ^f (pCi/g)				Water ^h (pCi/L)
	Equipment, Waste (dpm/100 cm ²) ^a	Structures (dpm/100 cm ²) ^b	Residual Dose (mrem/yr) ^c	Outdoor Worker (pCi/g) ^d	Residual Dose (mrem/yr) ^e	Residential (pCi/g) ^e	Residual Dose (mrem/yr) ^e	
Americium-241	100	100	18.7	5.67	0.8661	1.36	24.84	15
Cesium-137	5,000	5,000	1.72	0.113	0.2142	0.113	0.2561	119
Cobalt-60	5,000	5,000	6.01	0.0602	0.5164	0.0361	0.3918	100
Europium-152	5,000	5,000	3.21	0.13 ^f	0.5018	0.13 ^f	0.502	60
Europium-154	5,000	5,000	3.49	0.23 ^f	0.9593	0.23 ^f	0.9599	200
Plutonium-239	100	100	18.1	14.0	1.743	2.59	1.138	15
Radium-226	100	100	0.612	1.0 ^g	6.342	1.0 ^g	14.59	5 ⁱ
Strontium-90	1,000	1,000	0.685	10.8	0.1931	0.331	1.648	8
Thorium-232	1,000	36.5	24.9	2.7	24.91	1.0 ^f 1.69	25	15
Tritium	5,000	5,000	0.00053	4.23	0.00179	2.28	0.05263	20,000
Uranium-235+D	5,000	488	25	0.398	0.178	0.195	0.8453	30

Notes:

- ^a These limits are based on AEC *Regulatory Guide 1.86* (1974). Limits for removable surface activity are 20 percent of these values. Risk is 10^{-4} @ 25 mrem/yr.
- ^b These limits are based on 25 mrem/yr, using RESRAD-Build Version 3.3 or *Regulatory Guide 1.86*, whichever is lower.
- ^c The resulting dose is based on modeling using RESRAD-Build Version 3.3 or RESRAD Version 6.3, with radon pathways turned off.
- ^d EPA PRGs for two future-use scenarios.
- ^e The on-site and off-site laboratory will ensure that the MDA meets the listed release criteria by increasing sample size or counting time as necessary. The MDA is defined as the lowest net response level, in counts, that can be seen with a fixed level of certainty, customarily 95 percent. The MDA is calculated per sample by considering background counts, amount of sample used, and counting time.

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TABLE 1
RELEASE CRITERIA

- ^f Based on EPA-decay corrected PRGs for commercial reuse and a previous action memorandum (TETEM, 2000a, 2001).
- ^g Limit is 1 pCi/g above background, per agreement with EPA.
- ^h Release criteria for water have been derived from *Radionuclides Notice of Data Availability Technical Document*, (EPA, 2000) by comparing the limits from two criteria and using the most conservative limit.
- ⁱ Limit is for total radium concentration.

AEC - Atomic Energy Commission
 cm² - square centimeters
 dpm - disintegrations per minute
 EPA - U.S. Environmental Protection Agency
 MDA - minimum detectable activity
 mrem/yr - millirem per year
 pCi/g - picocurie per gram
 pCi/L - picocurie per liter
 PRG - preliminary remediation goal
 TETEM - Tetra Tech EM, Inc.

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A “removal action” is a short-term remedy to an immediate threat, to be done “as promptly as possible,”⁴² but in any case, to be completed in less than a year at a cost under \$2 million.⁴³ A “removal action” may be subject to less stringent cleanup standards in the short-term and may need to be followed by “remedial actions” to assure long-term protectiveness.

A “remedial action,” on the other hand, is designed to protect public health and the environment permanently. This includes but is not limited to “cleanup of released hazardous substances and associated contaminated materials” and the “segregation of reactive wastes.”⁴⁴

“Removal actions” are not included in the public participation provisions of CERCLA whereas “remedial actions” are. 42 U.S.C. §9617, “Public Participation,” states, in part, “Before adoption of any plan for remedial action to be undertaken by the President,” the President “shall” publish a notice of the plan and provide a “reasonable opportunity” for public comment.

As a result of adopting Table 1 as part of a “removal action” rather than a “remedial” one, the Navy excluded the public from participating in the seminal decision adopting these remedial goals. This violated the EPA guidance, *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*, by failing to make information that forms the basis for choosing a cleanup plan available for public comment.

Though the 2006 *Basewide Removal Action Memo*, as its title stated, was a short-term remedy, the Navy subsequently applied the cleanup standards in Table 1 to all subsequent long-term **remedial** actions, including the *Base-wide Radiological Work Plan* in 2007, the RODs for all the other parcels,⁴⁵ and *Five Year Reviews*.

a. Soils

Radionuclides of concern in soil were the only remedial goals in Table 1 that claimed to use EPA methods. However, it is unclear to what extent the Navy actually used them. Table 1 footnote “d” states that its soil release criteria were drawn from “EPA PRGs for two future use scenarios.”⁴⁶ However, the Navy failed to specify the inputs and assumptions for these scenarios. Nor did it publicly disclose its PRG calculations. It also did not refer to default PRGs for radionuclides, which EPA published in 2004.⁴⁷ In some cases, like europium-152 and europium-154, the EPA 2004 default PRGs were orders of magnitude more stringent than what the Navy adopted.⁴⁸

⁴² 40 CFR § 300.410.

⁴³ 42 U.S.C. § 9604(c). There are limited exceptions to which these limits may not apply.

⁴⁴ 42 U.S.C.A. § 9601(24).

⁴⁵ *Parcel C Record of Decision*, p. 41; *Parcel D-1 Record of Decision*, p. 33; *Parcel E Record of Decision*, Table 8, p. 2-33; *Parcel G Record of Decision*, p. 31.

⁴⁶ *Basewide Radiological Removal Action, Action Memorandum*, Table 1, fn. (d).

⁴⁷ The EPA periodically publishes PRGs for individual radionuclides using the default inputs in the PRG Calculator. See *Default PRG Download Area*, <https://epa-prgs.ornl.gov/radionuclides/download.html>.

⁴⁸ As to europium-152, EPA’s default was .0416 pCi/g, while the Navy’s release criteria was .13 pCi/g; the EPA default for europium-154 was .0499 pCi/g versus the Navy’s .23 pCi/g. Footnote “f” indicates that the europium goals were based on “commercial reuse” instead of residential reuse, without justification. *Basewide Radiological Removal Action, Action Memorandum*, Table 1, fn. (f).

According to footnote “g,” EPA agreed that the release criteria for radium would be “1 pCi/g above background,” while the 2004 EPA default was .193 pCi/g. However, the Navy failed to disclose the basis for this agreement or justify it in any way. Furthermore, as discussed further below, the Navy took background measurements in locations on the shipyard that were likely radioactively impacted, skewing background level, and violating EPA guidance for calculating background radiation, *Role of Background in the CERCLA Cleanup Program*, (“*Background Guidance*”), OWSER 9285.6-07P (May 1, 2002).

b. Buildings

The Navy violated EPA guidances, including *Risk Assessment Guidance for Superfund, Parts A and B* (“RAGS”) and *Radiation Risk Assessment at CERCLA Sites: Q and A* (“*Radiation Risk Assessment Q and A*”) by using incorrect methods and toxicity data for setting remedial goals for contaminated buildings.

According to Table 1, the Navy used two sources for the building release criteria, neither of which were EPA-approved. Footnote “a” cites the Atomic Energy Commission’s (“AEC”) *Regulatory Guide 1.86*. Footnotes “b” and “c” cite “RESRAD-Build Version 3.3,” a computer model developed by Argonne National Laboratory and sponsored by the Department of Energy to evaluate radiation doses from residual radioactivity in buildings.⁴⁹

However, EPA’s 1999 guidance document, *Radiation Risk Assessment Q&A*, explicitly criticized the Department of Energy (DOE) risk assessments because they calculated residual contamination’s maximum allowed *dose*; they do not calculate lifetime cancer *risk*, as required by CERCLA. The EPA guidance states: “dose recommendations (e.g., guidance such as DOE orders and NRC Regulatory Guides) **should generally not be used** as to-be-considered materials.”⁵⁰ (Parenthesis in original, emphasis added.)

Although *RAGS Part A* states that the PRGs should be calculated with “the most recent information available,”⁵¹ *Regulatory Guide 1.86* was published in **1974** and was more than three decades old when the Navy adopted the building remediation goals.

Being decades out of date was but one of the problems with using the AEC’s *Regulatory Guide*. Its cleanup criteria were developed for terminating licenses at nuclear power plants and to help plant operators “[s]how that reasonable effort has been made to reduce residual contamination to **as low as practicable levels**.”⁵² (Emphasis added.)

Yet the Navy never explained, let alone justified, why cleanup levels from closed nuclear power plants were relevant to HPNS, a former military base and Superfund site.⁵³ Furthermore,

⁴⁹ <https://resrad.evs.anl.gov/>.

⁵⁰ *Radiation Risk Assessment at CERCLA Sites: Q&A* (1999), p. 2.

⁵¹ *Risk Assessment Guidance for Superfund Part A*, 7-15; see *Risk Assessment Guidance for Superfund Part B*, 14, which states that “the hierarchy for obtaining toxicity values for risk-based PRGs is essentially the same as that used in the baseline risk assessment [of RAGS Part A.]”

⁵² Atomic Energy Commission, *Regulatory Guide 1.86 Termination of Operating Licenses for Nuclear Reactors* (1974), 1.86-4.

⁵³ *Basewide Radiological Removal Action, Action Memorandum*, Table 1.

“as low as practicable” is not the standard for CERCLA cleanups. “As low as practicable” is not synonymous with “protective of human health.” Nor does the AEC standard contemplate the elevated level of protection CERCLA requires when, as here, the future use of the cleaned-up shipyard will be long-term residential use.

EPA guidance has consistently set the primary standard of “protectiveness” to mean remedies that ensure excess lifetime cancer risk remains below one in a million (in scientific notation, 1×10^{-6}), or in site-specific circumstances, one in ten thousand (1×10^{-4}).⁵⁴ However, the release criteria in *Regulatory Guide 1.86* did not calculate lifetime excess cancer risk.⁵⁵ Using cleanup goals that were dose-based rather than risk-based violated the NCP’s protectiveness requirement and EPA guidance.⁵⁶

The Navy’s use of RESRAD-Build was also based on an out-of-date risk threshold. Footnote “b” states that the limits for buildings are based on a maximum dose of 25 millirems of radiation per year (“25 mrem/year”).⁵⁷ However, well before the Navy adopted Table 1 in 2006, EPA guidance explicitly stated that 25 mrem/year was not sufficiently protective under CERCLA. EPA’s 1997 guidance, *Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination*, specifically found that 25 mrem/year “generally will not provide a protective basis” for establishing PRGs under CERCLA.⁵⁸ EPA found that the 25 mrem/year dose limit translated to a lifetime cancer risk of five in ten thousand, far less protective than acceptable CERCLA risk.⁵⁹ EPA considered doses above 15 mrem/year to not be protective.⁶⁰

Accordingly, the Navy should not have used either *Regulatory Guide 1.86* or RESRAD-Build using a 25 mrem/year dose, both of which were significantly outdated.

And, for reasons only EPA can explain but never has, EPA improperly violated its own guidance and agreed to the Navy’s adoption of Table 1 release criteria in the 2006 *Basewide Removal Action Memo*, and all subsequent parcels’ RODs, contrary to CERCLA, the NCP and the FFA.

⁵⁴ *Role of Baseline Risk Assessment in Superfund Remedy Selection Decisions*, 4-5, <https://www.epa.gov/sites/default/files/2015-11/documents/baseline.pdf>.

⁵⁵ Atomic Energy Commission, *Regulatory Guide 1.86 Termination of Operating Licenses for Nuclear Reactors* (1974), Table 1.

⁵⁶ *Risk Assessment Guidance for Superfund Part B*, 1, 34.

⁵⁷ *Basewide Radiological Removal Action, Action Memorandum*, Table 1, fn. (b).

⁵⁸ *Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination* (1997), *Analysis of What Radiation Dose Limit Is Protective of Human Health at CERCLA Sites*, 1, <https://semsub.epa.gov/work/HQ/176331.pdf>.

⁵⁹ *Id.* at 2.

⁶⁰ *Id.* EPA has since lowered the protective dose even further, to 12 mrem/year. *Radiation Risk Assessment at CERCLA Sites: Q&A*, (May 2014), Q. 35.

D. Background Measurements Were Inappropriately Taken from Potentially Contaminated Areas

The Navy inappropriately took samples intended to determine background⁶¹ levels of radiation at the shipyard from shipyard sites that may have been radiologically contaminated. This violated EPA's "*Background Guidance*," which cautions that background samples must not be taken from sites that are at or near contaminated sites.

Background levels are supposed to be taken from "non-impacted" sites. The guidance, *Multi-Agency Radiation Survey and Site Investigation Manual* ("MARSSIM"), defines a non-impacted area as "an area where there is **no reasonable possibility** (extremely low probability) of residual contamination."⁶² (Parenthesis in original, emphasis added.)

However, the Navy selected locations amid the contaminated Superfund site to take background samples, areas that have a significant likelihood of being contaminated from windblown radioactive sandblast grit, migrating contamination, and radioactive smoke, but were inappropriately labeled as "non-impacted."

The use of areas that could be contaminated to measure background raises the possibility that those samples would not be representative of true background, inflating them, and compromising the integrity of the cleanup.

The misuse of shipyard sites to determine background has been true both historically and recently. The Navy's *Parcel G Removal Site Evaluation Work Plan* (2019) was designed to retest Tetra Tech's fraudulent work. However, some background locations were chosen in the midst of the polluted shipyard.⁶³ One building location used for background sampling was actually in an **impacted building**, until commenters pointed that out; the Navy moved the location to a building about a block away, but still on the shipyard.⁶⁴

⁶¹ Background radiation is "the amount of naturally-occurring radioactive elements in soil, water and air." (<https://www.epa.gov/radiation/what-background-radiation-background-radiation-risk-me-and-my-family>.) In other words, it is the radiation that would have been present at Hunters Point Shipyard had radiological activity, such as sandblasting contaminated ships, never occurred there.

⁶² *Multi-Agency Radiation Survey and Site Investigation Manual* ("MARSSIM"), p. GL-14.

⁶³ For example, one site used for background sampling was close to the Parcel E-2 landfill and the site designated IR-04, the Former Scrap Yard. According to the *Final Status Survey Report* for IR-04, "the HRA specifies that known areas with elevated levels of cesium-137 (137Cs) and 226Ra exist within the footprint of the IR-04 Former Scrap Yard Site." Yet a site in this vicinity was chosen for background sampling.

⁶⁴ Building 401 was originally planned to be the site of a background sample, despite that the Navy itself described the building as "impacted." (*Work Plan*, Figure 1-2.) After comments pointed out this error, the Navy moved the sample location to Building 404. (*Work Plan, Responses to Comments*, p. 9.)

E. Parcel B's Institutional Controls Are Inappropriate

The *Amended Parcel B ROD* dramatically changed the remedy in Parcel B in 2009. The original *Parcel B ROD* contained “institutional controls (“ICs”)⁶⁵ restricting the use of groundwater, which the Navy stated was unlikely to ever be of beneficial use.⁶⁶ The *Amended Parcel B ROD* included far more extensive ICs. The remedy was changed to “install durable covers⁶⁷ over the entire parcel to prevent contact with any [chemicals of concern] that are not excavated,” rather than to excavate and remove all contamination.⁶⁸

What the Navy labels “durable” covers were merely a layer of asphalt, concrete, or soil; the majority were “existing covers,” already present on the parcel. Indeed, the Navy defined “existing covers” to include “existing building footprints, roads, and parking lots,” which were constructed long before the Navy contemplated remedial action at the site.⁶⁹ The *Amended Parcel B ROD* called for constructing **new** covers only over areas it had already excavated, “select areas where concentrations of chemicals of concern (COC) exceed[ed] remediation goals.”⁷⁰ (Parenthesis in original.)

These new covers would follow “[s]tandard construction practices for roads, sidewalks, and buildings” or be constructed of “a minimum 4 inches of asphalt or a minimum 2 feet of clean imported soil.”⁷¹ The Navy estimated that the Parcel B covers would consist of “approximately 16 acres . . . covered with soil, 3 acres . . . covered by the shoreline revetment, and 40 acres [covered by] existing asphalt and concrete surfaces (including buildings).”⁷² (Parenthesis in original.)

⁶⁵ “ICs are legal and administrative mechanisms used to implement land use restrictions that are used to limit the exposure of future landowner(s) or user(s) of the property to hazardous substances present on the property, and to ensure the integrity of the remedial action.” *Parcel G Record of Decision*, at p. 43.

⁶⁶ *1997 Parcel B ROD* at 2. It also included restrictions on “any owner and/or tenant of Parcel B who excavates soils containing levels of contaminants in excess of the cleanup goals,” prohibiting them “from placing the excavated soils onto the ground surface and restricted from mixing the excavated soils with soils present in the surface to groundwater zone.”

⁶⁷ “The amended selected remedy includes the installation of durable soil covers to prevent contact with any COCs [chemicals of concern] that are not excavated. Covers will be required at all redevelopment blocks to prevent human exposure to ubiquitous metals in soil that may pose an unacceptable risk. Existing covers, such as buildings and asphalt parking lots, are considered adequate for this alternative. New covers are considered for construction only in areas where there are no existing covers or existing covers have been destroyed in the process of redevelopment. . . . Existing asphalt and concrete surfaces and buildings will be considered existing covers and may include existing building footprints, roads, and parking lots. These existing covers may require rehabilitation, such as sealing or repairing cracks.” *Parcel B Amended ROD*, at p. 12-7.

⁶⁸ *Parcel B Amended ROD*, at p. xiii-xiv.

⁶⁹ *Id.*, at p. 9-5.

⁷⁰ *Id.*, at p. xiii.

⁷¹ *Id.*, at p. 9-5.

⁷² *Id.* The Navy discussed construction of Parcel B covers in its Fourth Five Year Review. However, it contradicted itself in reporting when the Parcel B covers were constructed, stating that it completed “radiological removal actions” at the parcel between May 2006 and September 2010, but that “hot spot removal was performed between August 2010 and May 2011.” See *Fourth 5-Year Review*, at PDF pp. 33 and 124.

In addition to “durable covers,” ICs call for preventing ingestion of potentially radioactive food by prohibiting gardening except in raised boxes to prevent roots from accessing potentially contaminated soil below.

The problems with the “durable cover” and gardening ICs are addressed in more detail in Section IV(D)(4) of the Notice.

F. The Parcel G Cleanup

The Navy issued its *Final Record of Decision for Parcel G, Hunters Point Shipyard* (“*Parcel G ROD*”) on February 18, 2009.

Some of the impacted sites identified by the *Parcel G ROD* were buildings formerly used by the Naval Radiological Defense Laboratory (“NRDL”) for research and administrative functions.⁷³

The radionuclides of concern identified by the *Parcel G ROD* were strontium-90 (“Sr-90”), cesium-137 (“C-137”), cobalt-60 (“Co-60”), plutonium-239 (“Pu-239”), radium-226 (“Ra-226”), thorium-232 (“Th-232”), hydrogen-3 (“H-3”), and uranium-235 (“U-235”).⁷⁴

Metals of concern included arsenic, lead, manganese, chromium VI, and nickel.⁷⁵ Other contaminants included polycyclic aromatic hydrocarbons (“PAHs”) in soil and volatile organic compound (“VOC”) vapors.⁷⁶

The Navy’s original remedy for chemical contamination consisted of, among other things, “excavation and off-site disposal, durable covers, and institutional controls (IC) to address soil contamination.” Its radiological remedy called for “removing” contamination; the *Parcel G ROD* described the radiological remedy to be “surveying, decontaminating, and **removing radiologically impacted structures and soil.**”⁷⁷ (Parenthesis in original, emphasis added.)

The *Parcel G ROD* also called for removing radiological soil contamination to meet its remedial action objectives (“RAOs”):

The remedy for radiologically impacted sites meets the RAOs by identifying and decontaminating any impacted structures. Additionally, remaining contaminated materials, **storm drains and sewers, and soils would be excavated and disposed of off site**, thereby removing the source of contamination.⁷⁸ (Emphasis added.)

However, as the Tetra Tech fraud highlighted, the radiologically contaminated soil excavated in Parcel G was not necessarily disposed of offsite. Instead, it was supposedly

⁷³ See *Parcel G Record of Decision*, at p. 8-98 *et. seq.*

⁷⁴ *Id.*

⁷⁵ *Id.*, at p. 2. The Navy attributes the elevated concentrations of metals other than lead, such as arsenic and manganese, to the bedrock fill quarried to build the shipyard in the 1940s. See p. 15.

⁷⁶ *Id.*, at p. 2.

⁷⁷ *Id.*

⁷⁸ *Id.*, at p. 41.

screened by TtEC to segregate and dispose of soil exceeding a remedial goal. But TtEC's fraud resulted in tainted soil rather than clean soil being backfilled into the trenches from which they came. Accordingly, the *Parcel G ROD*'s remedy, removal of all contaminated soil, was not carried out.

As for chemical contamination of Parcel G, the Navy announced plans to rely on a mix of durable covers and ICs rather than complete removal shortly after it adopted the same combination of durable covers and ICs in the 2009 *Amended Parcel B ROD*. However, the two parcels began with different planned *future* uses. Parcel B was always intended for residential development, while Parcel G was originally to be a mix of industrial uses and open space, with one small area designated as mixed use.⁷⁹ The Navy's shift in Parcel G's planned future use to residential was done without conducting additional remedial action to meet the more stringent health and safety standards required for residential uses.⁸⁰

Instead of using EPA soil PRGs to justify residential uses, the Navy relied on a *Feasibility Assessment for Evaluating Areas with Residential Land Use Restrictions, Parcel G, Hunters Point Naval Shipyard*, (2016), ("*Parcel G Feasibility Study*"). This study was not commissioned by the Navy, but instead was prepared for San Francisco's redevelopment agency, the Office of Community Investment and Infrastructure ("OCII"). Its purpose was to modify areas subject to residential land use restrictions so they could be residential areas, "to facilitate implementation of the updated Redevelopment Plan adopted by the OCII (SFRA, 2010)."⁸¹ The *Feasibility Study* proposed:

reducing the area currently restricted against residential use in areas where COCs [chemicals of concern] in soil do not exceed the identified residential Action Levels. According to this proposal, the residential land use restriction established in the Final Record of Decision (ROD) would no longer apply. Areas with COCs above residential Action Levels remain restricted against residential use.⁸²

Based on the *Feasibility Study*, the Navy issued an *Explanation of Significant Differences* ("ESD") on April 18, 2017, changing the designated future use for most of Parcel G to residential.⁸³

The *ESD* described the cancer risk associated with the change:

For the majority of COCs at Parcel G, residential soil Action Levels are chemical concentrations that generally correspond to a five-in-one million [5×10^{-6}] cancer risk or a non-carcinogenic hazard quotient of five. Following the Navy's accepted risk assessment practices these cancer risks and hazard quotients do not consider the protection provided by several measures already agreed to, such as the durable cover. The cancer risk level that corresponds to residential soil Action Levels (5×10^{-6}) is below the

⁷⁹ *Id.*, at p. 8.

⁸⁰ *Parcel G Explanation of Significant Differences* ("*Parcel G ESD*"), at p. 15.

⁸¹ *Id.*

⁸² *Parcel G Feasibility Study, Executive Summary*, p. 2.

⁸³ *Parcel G ESD* at p. 9-11.

upper bound of the cancer risk management range of 10^{-4} as defined by the National Contingency Plan (NCP).⁸⁴

However, neither the *Feasibility Study* nor the *ESD* provided sufficient site-specific, scientific justification for exceeding the risk threshold of 1×10^{-6} to allow for a risk level of 5×10^{-6} .

Furthermore, the justification for exceeding the 1×10^{-6} cancer risk relied entirely on institutional controls. Except for areas with COCs in soil above Action Levels, which would remain subject to residential land use restrictions, the *ESD* claims that newly designated residential areas, “no longer need a restriction against residential use” provided that durable covers and ICs are in place.⁸⁵

The problems with institutional controls – that it is unreasonable to assume that durable covers and deed restrictions requiring gardening in raised boxes will protect future residents in perpetuity without a meaningful inspection and maintenance program – are more fully explained in Section IV(D)(4) of the Notice and are incorporated herein by reference.

In addition to violating CERCLA, the NCP and the FFA by exceeding CERCLA cancer risk and improperly using durable covers and ICs to justify it, the Navy also violated CERCLA, its regulations and the FFA by changing Parcel G’s end use to residential by means of an *ESD* based on the *Parcel G Feasibility Study* rather than by amending the ROD, as a transformation as significant as converting land use restrictions to allow for residential uses required.

Finally, the saga of Tetra Tech’s fraud and its impact on the cleanup has been playing out in the radiological retesting of Parcel G and is discussed in more detail in Section III of the Notice.

⁸⁴ *Id.*, *Executive Summary*, p. 13.

⁸⁵ *Parcel G Feasibility Study*, at p. 2.

APPENDIX C: SUMMARY OF ALLEGED VIOLATIONS

CERCLA

42 U.S.C. § 9613(k): Failure to establish an administrative record at or near the former Hunters Point Naval Shipyard (“HPNS”).

42 U.S.C. §9617: Failure to provide a reasonable opportunity to provide meaningful comments regarding the remedial goals adopted by the Navy in what should have been a “remedial action,” but which the Navy improperly designated a “removal” action, precluding public comment.

42 U.S.C. § 9617(b): Failure to respond to significant public comments to the *Fourth Five Year Review* (“FYR”).

42 U.S.C. § 9620(e)(4): Failure to abide by EPA’s determinations as the final arbiter of protectiveness.

42 U.S.C. §§ 9621(b)(1) and 9621(c): Failure to select a remedial action that is protective of human health and the environment.

42 U.S.C. § 9621(c): Failure to comply with the statutory mandate that five-year reviews be done “no less often than each 5 years.”

42 U.S.C. § 9621(c): Failure of the *Fourth FYR* to identify corrective action needed to be taken to attain protectiveness, implement it, and report it to Congress.

42 U.S.C. § 9621(d)(1): Failure to attain a degree of cleanup in remedial actions that at a minimum assures protection of human health and the environment.

THE NCP

40 C.F.R. § 300.430(f)(3)(i): Failure to provide an opportunity for the public to provide written and/or oral comments, attend a public meeting, and get a “response to each issue.”

40 C.F.R. § 300.430(f)(3)(ii): Failure to provide additional public comment in cases where new information that significantly affects the cleanup and could not have been reasonably anticipated by the public becomes available after public comment period has closed.

40 C.F.R. § 300.430: Failure to select a remedial action that is protective of human health and the environment and that maintains protection over time.

40 C.F.R. § 300.430(e)(2): Failure to select a remedial action that is protective of human health and the environment.

40 C.F.R. § 300.430(e)(2)(i): Failure to set remediation goals that establish exposure levels that are protective of human health and the environment.

THE FEDERAL FACILITIES AGREEMENT

Section 1.1(b): Failure to conduct the HPNS cleanup “in accordance with” EPA Superfund guidance and policy.¹

EPA GUIDANCES

Citizen’s Guide to Capping:

Failure to plan for and implement regular inspections to assure that “durable” covers are not damaged by weather, plant roots, and human activity.

Comprehensive Five-Year Review Guidance:

Failure to determine whether there have been changes in toxicity or other contaminant characteristics which need to be investigated.

Failure to identify “recent toxicity data and their sources.”

Failure to investigate whether the exposure assumptions, toxicity data, and cleanup levels are still valid.

Failure to recalculate risk assessment to account for changes in standards and/or toxicity data.

Failure to investigate the question, “Has any other information come to light that could call into question the protectiveness of the remedy?”

Data Quality Objectives for Remedial Response Activities, Appendix C Sampling Considerations:

Failure to do comprehensive sampling of the entire site “to ensure that no area of the site is overlooked.”

Failure to conduct sampling to “provide complete coverage of the area of interest,” before making “general inferences” about the site.

Draft Technical Guidance For RCRA/CERCLA Final Covers:

Failure to assume a 30-year lifetime for proposed covers and failure to plan to monitor and maintain covers for that lifetime.

¹ The FFA’s requirement to comply with EPA guidance is reinforced in: **Section 6.1** (“in accordance with CERCLA and CERCLA guidance and policy”); **Section 7.6** (“consistency with CERCLA, the NCP . . . and any pertinent guidance or policy issued by the EPA.”); **Section 7.7** (“consistency with CERCLA, the NCP . . . and any pertinent guidance or policy issued by the EPA.”); **Section 11.4** (“in accordance with pertinent EPA guidance”); **Section 26** (“shall comply with . . . relevant community relations provisions in . . . EPA guidances,” and **Section 26.2** (“in accordance with relevant provisions in . . . EPA guidances.”)

Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA:

Failure to conduct a proper site characterization to determine the nature and extent of contamination considering the historical record.

Failure to consider factors that may have caused contaminants to migrate from the release source.

Failure to follow a sampling approach that defines contamination in “both vertical and horizontal directions.”

Failure to identify “hot spots” only as a factor in where to *concentrate* sampling rather than to use them to limit the nature and extent of sampling or to exclude areas from sampling.

A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents: Failure to make the Remedial Investigation/Feasibility Study (“RI/FS”), the proposed remediation plan, and other information that forms the basis for choosing a cleanup plan, available in the Administrative Record to enable public comment.

Human Health Toxicity Values in Superfund Risk Assessments: Failure to update Preliminary Remediation Goals (“PRGs”) with the most current toxicity data.

PRG User’s Guide, Land Use Descriptions, Equations, and Technical Documentation: Violating the allowance for exposure pathways to be switched off in PRG calculations only if “a route of exposure . . . is considered to be unreasonable” at the site, “both currently and in the future.”

Radiation Risk Assessment at CERCLA Sites: Q & A:

Failure to select a remedy consistent with the NCP’s risk range (10^{-4} to 10^{-6} lifetime excess cancer risk).

Failure to follow EPA’s direction that “dose recommendations (e.g., guidance such as DOE orders and NRC Regulatory Guides) should generally not be used as to-be-considered materials,” when setting remediation goals.

Risk Assessment Guide for Superfund, Part A:

Failure to perform a site characterization that fully analyzes the “nature and extents of threats to human health and the environment.”

Failure to determine the potential extent of contamination, including spread of contaminants from their original sources.

Failure to gather information on what contaminants are present and in what concentrations, considering how “the environmental setting . . . may affect the fate, transport and persistence of the contaminants.”

Failure to conduct sampling that considers “routes of potential transport” of contamination.

Failure to assure investigation of contamination is comprehensive, obtaining “data on concentrations of contaminants in each of the source areas and media of concern.”

Failure to recognize that “because toxicity information may change rapidly and quickly become outdated, decision making must be based on “the most recent information available,” and instead using outdated toxicity information in making decisions.

Failure to accurately estimate the nature, extent, and concentration of contaminants.

Failure to use “the hierarchy for obtaining toxicity values” for risk based PRGs.

Risk Assessment Guidance for Superfund, Part B:

Failure to assess the cancer risk using Preliminary Remediation Goals (“PRGs”) during analysis and selection of remedial alternatives.

Failure to meet the risk range of protectiveness for lifetime cancer risk, 1×10^{-6} (one in a million) and in site specific circumstances between 1×10^{-6} and 1×10^{-4} (one in 10,000).

Failure to derive total risk posed for each contaminant and for each exposure pathway and then calculating a cumulative total risk.

Failure to develop PRGs during the “scoping phase” using default values and then modifying the PRGs based on site-specific characteristics determined in the Remedial Investigation.

Failure to use EPA methods and up-to-date toxicity data to assess contaminated buildings.

Calculating dose-per-year risk rather than calculating risk based on excess lifetime cancer risk.

Using RESRAD, a method not approved by EPA, as the basis for calculating building remedial goals rather than using EPA’s Building PRG Calculator (“BPRG”).

Superfund Preliminary Remediation Goals for Radionuclides in Buildings (BPRG): Failure to update remedial goals for buildings using the EPA’s BPRG.