COMMENTS
ON THE NAVY'S DRAFT ADDENDUM TO THE FIVEYEAR REVIEW, EVALUATION OF RADIOLOGICAL REMEDIAL GOALS FOR BUILDINGS, HUNTERS POINT NAVAL SHIPYARD, DATED OCTOBER 10, 2019

by the Committee to Bridge the Gap
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Introduction

Decades of lax environmental practices by the Navy at its Hunters Point Naval Shipyard (HPNS) in San Francisco resulted in widespread contamination with an array of radioactive isotopes and toxic chemicals. The pollution is so severe that HPNS was placed on the Superfund National Priority List, i.e. officially designated one of the most polluted sites in the country.

The environmental failures that led to the contamination were subsequently replicated in part in the cleanup that followed. The United States Environmental Protection Agency (EPA) has determined that measurements for radioactivity by the Navy's contractor, TetraTech, were apparently falsified at 90-97% of the HPNS survey units. Inadequate supervision, at minimum, by the Navy contributed to the current situation. The Navy admits that the fiscal impact of the fraud is in the hundreds of millions of dollars.

The testing is going to have to be redone. There is, however, substantial question whether that retesting will be free of the problems that plagued the original testing.[1]

The EPA has repeatedly insisted that prior to approval of any retesting plans the Navy demonstrate the protectiveness of the cleanup standards it has been employing at HPNS, and that that protectiveness review be consistent with current EPA guidance, in particular EPA's Preliminary Remediation Goal (PRG) calculators. The Navy finally released its draft protectiveness evaluation for soil cleanup standards in August. As demonstrated in our review, the Navy analysis contained numerous fundamental flaws, but nonetheless showed that the soil cleanup standards it has been employing produce risks outside the acceptable risk range allowed under the Superfund law (CERCLA).[2]

The Navy has now released its draft protectiveness evaluation for its cleanup standards for contaminated buildings, as a draft addendum to its Five Year Review. That draft addendum for buildings repeats many of the same errors as the draft addendum for soil, but makes several additional ones. In the critique that follows, we summarize the main problems with the draft addendum for radiologically contaminated buildings.

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[1] See, e.g., our Critique of the Work Plan for Parcel G Retesting at http://committeetobridgethegap.org/wp-content/uploads/2018/10/WorkPlanCritique.pdf and http://committeetobridgethegap.org/wp-content/uploads/2018/10/CritiqueAppendix.pdf

[2] http://committeetobridgethegap.org/hunters-point-reports/CommentsOnDraftAddendum.pdf

Failure to Be Consistent with CERCLA

At the core of the problems with the Navy's draft addendum for buildings is the Navy's repeated refusal to comply with CERCLA. CERCLA §120(a)(2) governs the cleanup of federal facilities such as HPNS:

> APPLICATION OF REQUIREMENTS TO FEDERAL FACILITIES .—
> All guidelines, rules, regulations, and criteria which are applicable to preliminary assessments carried out under this Act for facilities at which hazardous substances are located, applicable to evaluations of such facilities under the National Contingency Plan, applicable to inclusion on the National Priorities List, or applicable to remedial actions at such facilities shall also be applicable to facilities which are owned or operated by a department, agency, or instrumentality of the United States in the same manner and to the extent as such guidelines, rules, regulations, and criteria are applicable to other facilities. **No department, agency, or instrumentality of the United States may 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 Act.**

Thus, the Navy is *prohibited by statute* from employing guidelines, rules, regulations, or criteria at HPNS which are inconsistent with EPA's guidelines, rules, regulations, or criteria. EPA regulations require cleanup standards at Superfund sites like HPNS to be based on a point of departure of a risk of one-in-a-million (10^{-6}), and only fall back to higher risk levels if a case for doing so can be made based on the nine balancing and other criteria, and in no case to exceed a risk of one-in-ten-thousand (10^{-4}).

However, in adopting cleanup standards for buildings at HPNS, the Navy simply ignored all these EPA requirements and failed to employ EPA guidance, or to use standards consistent with EPA's, as required under CERCLA. Instead, the Navy used as release criteria radioactivity concentrations derived from a long-outdated and non-protective 1974 regulatory guide from the Atomic Energy Commission (an agency that hasn't existed for more than four decades.) Reg. Guide 1.86 was never health-based, but rather was derived from what hand-held radiation detectors in the 1960s could readily detect. It was not, even at the time, based on a 10^{-6} risk, as required under the CERCLA National Contingency Plan to be the point of departure for cleanup standards; and the Navy did not even attempt to make a case under the nine balancing and other CERCLA criteria for falling back from 10^{-6}. Furthermore, it has long been recognized that the risks from contamination at the Reg. Guide 1.86 levels exceed even the upper 10^{-4} limit of the CERCLA acceptable risk range.[3] Thus, the adoption of these non-protective concentration limits

[3] See "Hunters Point Cleanup Used Outdated and Grossly Non-Protective Cleanup Standards," http://committeetobridgethegap.org/wp-content/uploads/2018/10/HuntersPtReport3CleanupStandards.pdf

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was inconsistent even at the time of inclusion in Records of Decision for remediation of HPNS parcels.[4]

In addition to being required to employ standards that at the time they were initially chosen as consistent with EPA guidance, every five years the Responsible Party is to conduct, under agency supervision, a Five Year Review to ascertain whether any new circumstances have reduced the protectiveness of cleanup standards or other aspects of the remediation project. At the heart of the Five Year Review process is an evaluation, using methods that are not inconsistent with EPA's guidance and criteria, of whether the cleanup standards remain protective. This is precisely what the Navy has failed to do in its draft protectiveness review of its building cleanup standards.

Failure to Employ EPA's BPRG Calculator

EPA's guidance for determining risk from contamination inside buildings is its Building Preliminary Remediation Goal (BRPG) calculator. A Responsible Party like the Navy is generally required to use the BPRG calculator in setting and subsequently evaluating the protectiveness of cleanup standards for contaminated buildings.[5]

The Navy has simply ignored this requirement and chosen to use RESRAD. EPA will under certain circumstances consider a departure from an aspect of the BPRG calculator and use of another model, *if* it is demonstrated that the use of that other model for that purpose is not inconsistent with the BPRG calculator (e.g., there is a site-specific reason to depart from the BPRG calculator).[6] However, the Responsible Party must affirmatively demonstrate that what it proposes to use is not inconsistent with the BPRG calculator and should include runs using both the BPRG calculator and the alternative model being proposed:

> If there is a reason on a site-specific basis for using another model justification for doing so should be developed. The justification should include specific supporting data and information in the administrative record. The justification normally would include the model runs using both the recommended EPA PRG model and the alternative model.[7]

The Navy has defaulted on all these requirements. It did not use the BPRG calculator. It used another model, RESRAD, and provided no site-specific or other justification for doing so. It

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[4] For two radionuclides, the Navy did not use Reg. Guide 1.86 levels but rather a 25 millirem/year dose as calculated by a model called RESRAD. 25 millirem/year has long been declared by EPA to be non-protective and not allowed to be used, even as an ARAR, at Superfund sites, and, as we shall discuss, RESRAD is not to be employed unless it can be shown to be consistent with the PRG calculator, which it isn't and which the Navy has made no attempt even to try to demonstrate consistency.

[5] EPA, "Radiation Risk Assessment at CERLCA Sites: Q&A," OSWER 9285.6-20, June 13, 2014, Q16, p. 20

[6] *ibid.*

[7] *ibid.*

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made no effort to even attempt to show that what it was doing wasn't inconsistent with EPA guidance and the BPRG calculator in particular. And it didn't even submit parallel runs using the BPRG calculator, as required, to support the proposed use of the alternative model. **To repeat: the Navy has defaulted on its obligations under CERCLA to use cleanup standards consistent with EPA guidance and to demonstrate protectiveness of those cleanup standards via methods consistent with EPA requirements.** EPA should reject the Navy violations of CERCLA.

Why did the Navy choose to default on these obligations, not use protective cleanup standards, not use EPA's BPRG calculator as required to demonstrate protectiveness, not even put forward a purported justification for proposing using something other than the BRPG calculator, and not present calculations using the EPA calculator? The inference is hard to avoid: **the Navy knows its building cleanup standards are not protective and that the use of EPA's BPRG calculator would so demonstrate**.

This inference is reinforced by two facts: First of all, in its soil standard protectiveness review, the Navy did present both RESRAD and PRG runs. As we demonstrated in our comments thereon, the Navy manipulated inputs to try to drive down the estimated risks, but even so, the risks exceed the risk range. Nonetheless, the Navy was able to assert that its use of the PRG calculator for soil produced lower estimated risks than its use of RESRAD. This suggests that the opposite is the case for the buildings, and that no matter how hard it tried to alter the inputs for the BPRG calculator, it continued to come out with risks far exceeding the CERCLA acceptable risk range.

Secondly, we have done the BPRG runs that the Navy has refused to submit, using the calculator's default inputs, for the cleanup standards employed by the Navy, and the results are vastly outside the acceptable risk range.[8] Collectively, the risk from external exposure and removable contamination for the radionuclides considered by the Navy is 1 in 37 (3×10^{-2}), vastly higher than the one-in-a-million (10^{-6}) to one-in-ten-thousand (10^{-4}) acceptable risk range. Even if one doesn't use the defaults for the source and decay output options, one still gets risks far outside the acceptable range. It thus appears likely that the Navy violated EPA guidance by using RESRAD and refusing to even provide parallel BPRG calculations because, even with every alteration of the EPA default inputs it could come up with, the results remained unfavorable, showing unacceptable risk to the public.

RESRAD vs. BPRG Calculator

As discussed above, CERCLA§120(a)(2) obligates the Navy to use no criteria, model, or other guidance that is inconsistent with EPA's standards and BPRG calculator. The Navy gives no reason why it is not using the BPRG calculator except to assert that RESRAD is the "industry standard." However, it is precisely such industries that have contaminated their sites and have a financial self-interest in using the least protective models and thus doing the least amount of cleanup. In fact, however, RESRAD is not an industry model but one produced by the Department of Energy (DOE), whose national nuclear complex of sites collectively represents

[8] "Hunters Point Cleanup Used Outdated and Grossly Non-Protective Cleanup Standards," http://committeetobridgethegap.org/wp-content/uploads/2018/10/HuntersPtReport3CleanupStandards.pdf

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the most radioactively contaminated in the country. DOE has a strong self-interest in pushing for the use of models that would relieve it of the obligation to clean up much of its contamination.

Furthermore, whereas EPA's BPRG calculator has been subjected to *two external peer reviews*,[9] RESRAD-BUILD has apparently not been externally peer-reviewed.[10] RESRAD-BUILD has seemingly only been subjected to "verification" of the code math—most recently (2003) **by TetraTech!**[11] (In addition to the two external peer reviews for the BPRG calculator, the BPRG calculator has also gone through verification, most recently in 2017). The dust models employed in the BPRG calculator largely come from the World Trade Center assessments, which also were subject to external peer review.[12]

Problems with the Navy Use of RESRAD-BUILD

- Even with use of the RESRAD-BUILD model that is inconsistent with EPA guidance and thus in violation of CERCLA §120(a)(2), the Navy changed numerous inputs to try to further drive down the risk estimates. For example, it chose the smallest size room possible 3 meters by 3 meters, which it claims is an OPTION in the PRG calculator. It is the absolute smallest room option available, and far smaller than the defaults. By assuming a tiny room, one artificially drives down the estimated risk for many exposure scenarios.

- Further, the Navy assumed none of the walls or ceilings is contaminated, an assumption for which there is no basis provided for HPNS.

- The Navy reduced the default removable fraction (0.5) to 0.2, despite the fact that EPA told it not to do so and RESRAD's own default is 0.5. The Navy did so based on the assertion that the cleanup standards it was using assumed 20% was removable; but this is only for equipment and waste, not structures.[13] Furthermore, the argument is entirely circular: it is assuming for purposes of assessing the protectiveness of its cleanup standards that 20% of the contamination is removable because it claims it assumed 20% when it set the standards.[14] Since contaminated dust generally dominates the risk, reducing the amount of dust from 50% of total contamination to 20% significantly low-balls the ensuing risk estimates.

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[9] See BPRG External Peer Review Record https://epa-bprg.ornl.gov/bprg_peer_review.html
[10] RESRAD's website lists two old "verification reviews" but no external peer review. https://resrad.evs.anl.gov/documents/
[11] https://resrad.evs.anl.gov/docs/Verification%20Report.pdf
[12] https://www.tera.org/Peer/WTC/welcome.htm
[13] See footnote "a" to Table 1, "Release Criteria," Basewide Radiological Removal Action Memorandum, 2006
[14] Note that Reg. Guide 1.86, from which the Navy claims to have taken its standards, does not assume 20% removable but requires actual measurements of the removable amount from surfaces. See footnote "e," Table 1, Reg. Guide 1.86.

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- The Navy—in direct disregard of explicit direction from EPA—also assumes a large depletion factor, depleting the removable contamination rapidly down to zero. EPA had directly told the Navy it could not do so, without clear site-specific data demonstrating it, which the Navy does not even attempt to provide. Instead, it remarkably claims that since all operations at HPNS have ceased, there is no potential for contamination from outside buildings to be tracked in or otherwise replenish the contamination inside. But of course, although naval operations at HPNS have ceased, the contamination remains and is constantly available to be brought back into buildings by air, feet, etc. Indeed, the primary approach the Navy is now taking to the cleanup is to cover it up rather than clean it up, and as demonstrated in our recent report,[15] this produces the potential for contamination being dug up and dispersed through the air as the massive redevelopment project proceeds with excavation and construction for decades. There is no basis whatsoever for assuming depletion of contamination indoors over time, but rather, there is the potential for new contamination to constantly be brought into the buildings from the outside.

- The Navy presumes it will vacuum and otherwise clean the building surfaces to be measured right before measurement, artificially driving down the measurements, as the risk before cleaning would be higher, and after cleaning would get higher again as contamination from outside is tracked in and blown in with the air.

- Rather than calculating risk directly, as required by EPA, the Navy instead used RESRAD-BUILD to put forward dose estimates, and then converted for each to risk. However, it used very outdated dose conversion factors, whereas the most current ones—from the National Academy of Sciences BEIR VII and from EPA's "Blue Book"—are considerably higher.

- The Navy then misrepresents EPA's Superfund cleanup standards, asserting that the EPA says any dose of 12 millirem/year is presumptively safe. In fact, EPA has no such limit, because, as indicated above, EPA requires cleanup be based on risk, not dose; EPA requires a point of departure at one-in-a-million, which is the equivalent of a few hundredths of a millirem/year; and the 12 millirem/year figure is merely a cutoff for determining if ARARs are presumptively non-protective. (There is only one ARAR in the country that is not presumptively non-protective according to that EPA cutoff, that of the State of Maine, and thus 12 millirem/year cannot be used at HPNS.) In any case, CERCLA requires aiming at 10^{-6}, and the upper end of the risk range is not a default cleanup standard by any means.

- The Navy assumes only 26 years of exposure, of which 6 years are as a child. However, the Navy assumes the child is 12-18 years old, whereas the period of time at which a child is most susceptible (and puts more dust/particulates into their mouths) is the first years of life. This appears to be a further attempt to bias the risk estimates low.

[15] http://committeetobridgethegap.org/hunters-point-reports/FromCleanupToCoverup.pdf

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The Navy Repeats the Mistakes of its Soil Standard Protectiveness Addendum

Rather than repeat in detail the points we made in our response to the soil addendum that deal with errors also made in the building addendum, we will merely summarize them here.

- The Navy asserts that its building cleanup standards are for *average* contamination levels. EPA guidance says not to average, but to use "not to exceed" standards, for any use (such as residential) where exposures cannot be guaranteed to be random. The Navy similarly claimed its soil standards were for average concentrations. We understand that in response to an inquiry from EPA, the Navy denied it actually averaged and claimed the word choice in the soil addendum was poor and inaccurate. But the Navy has repeated the claim of averaging in the building addendum; underlying documents show it has been averaging for soil; and the actual risk in a building if averaging were actually employed could thus be considerably higher than the Navy has estimated (i.e., if the peak concentration is in a portion of a room where a child's bed or someone's desk is located). If the Navy believes it chose its words poorly in both addenda and that it does not and will not average contamination but is and will use a "not to exceed" standard for cleanup, confirmation sampling, and risk assessment, it should explicitly correct the misimpression created. If it is not a misimpression, but the Navy actually is and intends to average, in violation of EPA guidance, it should expressly say so, and EPA should block such action, which would increase risks to public health and be inconsistent with EPA guidance.

- The Navy fails to follow the sum-of-the-fractions rule and to sum the risk from each radionuclide (and chemical). This failure furthers the underestimation of risk.

- The Navy in its soil addendum claimed its cleanup standards were based on the net concentration above background. When criticized for this because it is inconsistent with EPA practice and would amount to a post-hoc amendment to the Records of Decision without actually modifying the RODs, the Navy has made a similar claim in the building addendum, but slightly changed the language to read that the Remediation Goals (RGs) are "applied" to background. The vaguer language doesn't change the fact that the RGs are supposed to include background, not be net over background. This is one more attempt to try to drive down estimated risk numbers and drive up the amount of contamination that doesn't get cleaned up.

- The Navy repeats the claim it made in its soil addendum that the RGs are the most conservative available. In fact, they are the least conservative available, and far less protective than EPA cleanup standards under CERCLA.

- The majority of radionuclides of concern at HPNS have no limits whatsoever in the cleanup criteria for buildings used by the Navy or considered in its protectiveness review, so unlimited levels are allowed to be present, and their contribution to risk is ignored.

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Conclusion

As was the case with the Navy's soil calculations, even failing to correct most of errors in its building cleanup standards protectiveness evaluation, simply summing the risks admitted to by the Navy from the various radionuclides that are considered pushes one over the upper end of the risk range. Including risks from toxic chemicals, from radionuclides for which no limits are prescribed, from the full measured value rather than just the net above background, and otherwise correcting the various additional errors made, make clear that the risk from contamination in buildings at HPNS at the levels prescribed by the ancient cleanup standards used by the Navy would be far outside the acceptable risk range.

The Navy has defaulted in its obligations regarding the Five Year Review and the protectiveness evaluation of its cleanup standards. Those standards were, from the time they were first adopted, inconsistent with EPA requirements and non-protective, and are more so today. The Navy use of RESRAD-BUILD rather than the EPA BPRG calculator is inconsistent with EPA guidance, and thus contrary to CERCLA. The Navy has made no attempt to justify why its use of RESRAD-BUILD is consistent with EPA requirements and failed even to provide parallel BPRG calculations as required.

EPA should reject the Navy's building standard addendum, as it should the soil addendum, and require the amendment of RODs to revise cleanup standards to ones meeting the 10^{-6} risk level utilizing PRG calculators. Most critically, there can be no approval of retesting plans without screening and detection levels set at or below concentrations corresponding to 10^{-6} risk levels based on PRG calculators. One can't "punt" on determining what the protective risk range concentrations are, using PRG calculators and appropriate, conservative inputs. There may be a temptation to try to not make the required Five Year Review protectiveness determination for the Navy's HPNS cleanup standards and to instead say protectiveness will be determined at the end of the cleanup based on what contamination levels remain. But the retesting—on which so much depends in the wake of the TetraTech scandal--can't be done if one hasn't in advance determined what the cleanup levels should be. That is because the retesting is completely dependent upon setting detection limits capable of seeing contaminants at levels at which cleanup limits should be set. Screening levels are generally set at a fraction of the point of departure, 10^{-6}, because there can be multiple radioactive and chemical contaminants present, and one only falls back from the point of departure if the nine balancing and other criteria can be demonstrated to be met, and then only fall back the smallest amount necessary. Failing to determine those levels now, using the BPRG calculator, as part of the Five Year Review, would make impossible credible retesting.

The Navy's default on its obligations to use the BPRG calculator, to employ cleanup standards that meet the CERCLA requirements of a point of departure of 10^{-6} with strict limits on departing from that level, and which in no case exceed 10^{-4}, now places the retesting at risk, and with it, all plans for remedying the scandal produced by the falsification of prior measurements. A cloud hangs over the credibility of the cleanup, and this draft protectiveness evaluation by the Navy does nothing to lift that cloud. The cleanup project and the public's health that is dependent upon how it is carried out mandate a dramatic change in direction.

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