GOLDEN GATE UNIVERSITY | School of Law

Environmental Law and Justice Clinic

June 28, 2019

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Re: Additional Comments to the HPNS *Parcel G Draft Work Plan, Draft Final Work Plan,* and *"Final" Work Plan*

Dear Ms. Duchnak:

This letter is to follow up my letter of February 5, 2019 to Thomas Macchiarella and to augment Greenaction for Health and Environmental Justice's comments to the *Draft Parcel G Work Plan ("Draft Plan") and Draft Final Parcel G Work Plan ("Draft Final Plan.")*

We address this letter to you for three reasons. First, having authored the Navy's Victim Impact Statement in the *Matter of U.S. v. Hubbard* criminal sentencing, you have confirmed the massive impact of the Tetra Tech radiological fraud: hundreds of millions of dollars; a decade-plus of wasted work; and "total lack of confidence in the Navy's intentions and ability to conduct a proper cleanup among the community." (*See* Attachment 1.) These are not our words; they are yours.

You also authored the March 15, 2019 letter to EPA and state regulators informing them of the Navy's unilateral decision to scrap EPA's risk calculators altogether, as further detailed below.

On or about June 14, 2019, the Navy released a purported *Final Parcel G Removal Site Evaluation Work Plan.* In it, the Navy continues to refuse to validate the protectiveness of the remediation goals in the plan, as further detailed below. How does it justify such an open an unapologetic violation of the law? It does not.

Finally, over the past two-plus years we have attempted to communicate with the Navy, first through Derek Robinson. When it became clear Mr. Robinson would not reply to our telephone messages, emails and letters, we tried Thomas Macchiarella. Unfortunately, Mr. Macchiarella, too, has not accorded us a reply. We have submitted detailed comments but the Navy has not once responded to any of them as required by law. We first requested a meeting with Mr. Robinson to discuss the fraud we uncovered in August 2017; we are still waiting. If you are sincere in your stated desire to repair the Navy's relationship with the community, the Navy must take public

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comments seriously and it should meet with us to discuss the deficiencies in the Parcel G cleanup plans.

At the very least, the Navy must publish written responses to all significant comments as specifically required by CERCLA in 42 U.S.C. § 9617(b). In not replying, the Navy is both flouting the law and proving its disregard of the community.

For all of the reasons stated in our comments on the Parcel G cleanup including this one, the Navy must publish a new draft plan which demonstrates it is protective using EPA's risk calculators, provide a formal public comment period, respond in writing to all comments and revise the plan accordingly.

Most importantly, the Navy must comply with the public participation requirements of CERCLA. The Navy should recognize its duty to provide an opportunity for meaningful public review. It must reply to our comments in writing. On a practical level, the community has access to information and expertise on the history of the shipyard and the radiological fraud that the Navy does not have.

For example, the environmental Law and Justice Clinic has conducted a real investigation into the extent of the fraud, locating and interviewing former shipyard rad workers multiple times over a period of months. The Navy has not even contacted the whistleblowers that we have been urging it to interview, unsuccessfully, for more than two years. Nor has the Navy interviewed the approximately fifty additional witnesses whose names we provided to Mr. Robinson in two batches on January 30, 2018 and February 16, 2018.

The Navy refuses to see what the community sees; there is a clear connection between a thorough, defensible investigation of the fraud and a thorough, defensible radiological cleanup.

I. The Navy Has Intentionally Thwarted Public Participation

The Navy has a history of significantly downplaying the extent of the Tetra Tech fraud and its impact on the radiological cleanup. Both Greenaction and EPA pointed this out in comments to the *Draft Plan.*

Similarly, the Navy has consistently mischaracterized the extent of participation offered to the public in the cleanup planning process. Derek Robinson, for example, told the January 28, 2019 meeting of the Environment and Reuse Committee of the Citizen Advisory Committee ("CAC") that the Navy was completely transparent; he claimed it releases everything for the public to review and "there is a formal comment period on all decision making." *See* Attachments 2 and 3, videos of Mr. Robinson's statements.[1]

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[1]Attachment 2: "We put it all out there to you – to the public – so you see what we're doing and can review it."
Attachment 3: "There's a formal comment period on all our decision making."

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Unfortunately, what Mr. Robinson says is not what the Navy does. In fact, we have repeatedly requested – in writing – that documents necessary to understand and comment on the *Draft Plan* be provided. We have been rebuffed every time. When the *Draft Plan* was released, for example, we requested the Sampling and Analysis Plan ("SAP"), which was omitted from the draft.[2] So did EPA. The Navy refused. The public comment period opened and closed, precluding review and comment.

The Navy could have released the SAP but chose not to. It was released to EPA a mere two days after the public comment period closed, suggesting the Navy not only excludes public participation, it does so deliberately.

Similarly, the Parcel G plans – both the *Draft Plan* and the *Draft Final Plan* – omit any reference to EPA's Preliminary Remediation Goal ("PRG") calculations, the basis for estimating cancer risk and setting cleanup standards. By omitting any mention of PRGs in the *Draft Plan,* or *Final Plan,* the Navy has deliberately barred public comment on the single most important decision in any cleanup: its remediation goals.

EPA has insisted in writing since March 2018, months prior to the *Draft Plan's* release, that the PRGs for soil and buildings be included. The Navy has refused for more than a year.

In its answer to the Navy's response to EPA's comments to the *Draft Plan,* EPA wrote:

> The response to General Comment 9 states, "The Navy conducted preliminary calculations of the risk using the USEPA's Preliminary Remediation Goal (PRG) Calculator and found that the current RGs are within the risk management range of 10E-04 to 10E-06." However, documentation that demonstrates compliance with the risk management range has not been provided. Please provide the PRG calculator documentation that demonstrates the current RGs will fall within the Comprehensive Environmental Response, Liability, and Compensation Act (CERCLA) mandate that the excess lifetime cancer risk from carcinogenic substances does not exceed the risk range of 10 E^{-04} – 10 E^{-06}.

Instead of providing PRG documentation, the Navy responded, "The PRG calculator documentation will be provided as part of the Five-Year Review process. Reference to the preliminary calculations was removed from the response." Rather than provide the data, the Navy deleted all reference to it without explanation how work in Parcel G could proceed absent proof of protectiveness of the remediation goals.

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[2] See Attachment 4, my attached letter of August 13, 2018 to Derek Robinson re: "Formal Request for Delay in Closing of Comment Period to the *Draft Parcel G Removal Site Evaluation Work Plan, San Francisco, California, June 2018.*"

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The same failure of transparency took place with the *FYR*. It was released devoid of PRG data. EPA again asked that it be included. Again the Navy refused.

To this day, the PRG calculations have not been released to the public. Yet the Navy's contractor told the CAC committee he'd been working on the calculations since "early 2017." See Attachment 5, a video of Craig Bias.[3] In other words, the Navy had the PRG data for more than two years.

The Navy's acts indicate that the PRGs were deliberately withheld from the public. The deliberate nature of its actions was confirmed by Mr. Robinson's January 28, 2019 appearance before the CAC where he repeatedly stated the Navy would not release them to the public until after "EPA buyoff." The Navy apparently intends for the plan to be a *fait accompli* before the public even sees the risk analysis, precluding public comment. *See* Attachments 6 and 7, videos of Mr. Robinson.[4]

Your March 15, 2019 letter to regulators states that "a top priority [is] to restore public confidence in the radiological rework and the continued environmental cleanup at HPNS." Considering the lengths the Navy has gone to preventing PRG data from being reviewed and commented upon, your "top priority" consists of hollow words, not positive actions.

Words are not enough; the Navy can only restore public confidence through consistent, transparent and publicly vetted plans. The first step should be submitting a new draft plan to regulators including the detailed risk analysis, and subject to formal public comment as contemplated by CERCLA.

In addition, we have called on the Navy for two years to reinstate a Restoration Advisory Board ("RAB") for Hunters Point Shipyard, the only former Navy base in the Bay Area lacking one. If restoring public confidence is your top priority, restoring the RAB should be among your first steps.

It is appropriate here to dispute one thing your Victim Impact Statement in the Hubbard case got wrong, evidencing the Navy's wrongheaded view of the community. It states, "The frustrations of these local constituencies have been channeled into a strong activist element which has made the Navy's public meetings tense, aggressive and explosive." I have attended most of the Navy's public meetings over the past several years and have never witnessed any "explosive" moments. No one was ever arrested or even detained. Tense? Sometimes. Is anger apparent? Sometimes. But the primary reason for that atmosphere is the Navy's history of obfuscation and

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[3] Mr. Bias says, "The cleanup goals themselves I began reviewing in earnest in coordination with EPA Region 9 and US EPA in early 2017 using EPA's own calculators."

[4] In Attachment 6, Mr. Robinson responds to the question of whether the Navy will release the PRG calculations prior to EPA's approval of the *Parcel G Work Plan*. He states, "It's very important before we release any calculations that we have EPA's buyoff on this." In Attachment 7, he repeats, "As I said, we have to have EPA buyoff first before we believe in the numbers."

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mischaracterization at those very public meetings. I refer you again to Attachments 2 and 3, in which Mr. Robinson's exaggeration of public comment opportunities is seriously misleading.

The Navy brought this mistrust entirely on itself. It allowed the fraud to occur. Having found only the tip of an iceberg of potentially fraudulent data, it did not even bother to look below the surface. It allowed Tetra Tech to investigate itself and accepted its whitewash without question. It assured the community – for years – that everything was fine until forced to admit there was much more extensive fraud than what the Navy admitted. It ignored the whistleblowers and to this day denies any responsibility for conducting a comprehensive investigation into the fraud's impact on the cleanup despite the community's two-year call to investigate fully. It gave the community's demand that all Tetra Tech's compromised data be tossed out a figurative back of the hand. It defended Tetra Tech's data even after the Navy's own data review found significantly substantial evidence of fraud and other unreliable data, in the range of 40%. It continued to defend Tetra Tech until it had no choice but to give in when EPA found approximately double the data problems the Navy admitted to. In one parcel, for example, there was evidence of sampling irregularities in 97% of the samples!

Only then did the Navy agree to what the community had been asking for all along. And despite what should have been a humbling series of events for the Navy, it has apparently learned nothing; it has continued to hide critical information from the public, intentionally preventing public participation, a violation of CERCLA.

The "constituencies" you mention are angry and mistrustful because instead of learning from the fraud and including meaningful public input from communities that have a lot to offer, the Navy continues its arbitrary approach. The Navy cannot treat the community with open contempt and repair that relationship at the same time. The Navy has to earn the trust of its constituencies. To date, we see no evidence the Navy understands that or has done anything concrete in advance of that goal.

The Navy should treat the community as a resource, not a rabble.

II. The Navy Must Finalize the *FYR* Prior to the *Final Parcel G Plan*

The Navy has contradictory positions. On one hand, it refuses to present any data demonstrating the protectiveness of the Parcel G remediation goals until <u>after</u> the *FYR*. On the other hand, it is pursuing regulatory approval for the *Final Plan* <u>before</u> the *FYR*.

The Navy cannot have it both ways. It must either include the PRG data in the Parcel G planning or defer seeking final approval until after approval of a *Five Year Plan* in which the PRGs data has been vetted.

Since protectiveness will have to be demonstrated in the planning for radiological remediation in the rest of the Shipyard parcels, finalizing the *FYR* first makes the most sense; it involves all parcels, not just one.

In any case, the protectiveness of the cleanup is so central, the Navy must provide a formal comment period after the PRG data and all other information bearing on protectiveness is made public.

III. Introducing RESRAD at This Stage of the Cleanup Is Improper

The Navy, it seemed for a brief moment, finally agreed to EPA's longstanding demands. In its response to EPA's General Comment 9 to the *Draft Plan*, the Navy wrote, "The PRG calculator documentation will be provided as part of the Five-Year Review process." (Emphasis added.)

However, your March 15, 2019 letter to regulators, in a direct reversal of what the Navy promised, the Navy revealed it unilaterally decided it will use a Department of Energy ("DOE") risk calculator called "RESRAD:" "[T]he Navy has determined the RESRAD family of codes contain the most scientifically sound exposure models of the available tools and, as such, will be using these codes for determining the residual risk from radionuclides."

EPA has been asking the Navy to provide PRG data since early 2018. It has asked in writing at least since March of that year. In the Navy's responses until now – more than a year later – the Navy never once mentioned RESRAD. It released the *Draft Parcel G Work Plan* in June 2018 omitting a single mention of RESRAD.

The Navy also released its *FYR* without a single mention of RESRAD. The public comment periods for the *Draft Work Plan* and the *FYR* both opened and closed many months before the Navy first raised RESRAD as an issue, making public comment impossible. It withheld this from EPA as well, precluding comment from a Federal Facilities Agreement ("FFA") signatory.

EPA CERCLA guidances have consistently required cancer risk to be calculated using the PRGs. However, instead of complying with those guidances as required by CERCLA and the FFA, the Navy unilaterally and without any comment, let alone reasonable justification, deferred the PRGs to the *FYR*.

Your March 15th letter also says the Navy will take unilateral action to implement the *Draft Final Parcel G Work Plan* without EPA concurrence, another clear violation of the FFA: "However, to initiate field work the Navy will proceed with finalizing the Work Plan using the release criteria established by the current Record of Decision (ROD)." (p. 1.)

The Navy never mentioned RESRAD in the *Draft Plan, Draft Final Plan or FYR.* Nor did the Navy raise RESRAD in any of its responses to comments to the *Draft Plan and FYR*. If the Navy intends to provide the PRG data as part of the *FYR*, it will presumably do so in the near future as the FYR is seriously late. As shown below, RESRAD is inconsistent with CERCLA's requirements.

A. Using RESRAD to Calculate Risk Conflicts with EPA Guidances, Violating both CERCLA and the FFA

The Navy is required to comply with EPA's CERCLA guidances. RESRAD is inconsistent with CERCLA's requirements and EPA guidances.

CERCLA section 120, 42 U.S.C. § 9620, requires federal agencies and departments to comply with "all guidelines, rules, regulations, and criteria" set by the EPA Administrator. Subsection 9620(a)(2) states, in part that, "[n]o department, agency, or instrumentality of the United States may adopt or utilize any such guidelines, rules, regulations, or criteria which are <u>inconsistent with the guidelines</u>, rules, regulations, and criteria established by the Administrator under this chapter." (Emphasis added.)

In addition to the statutory requirement, Paragraph 6.1 of the FFA requires that the Navy's cleanup be performed "in accord with CERCLA [and] CERCLA guidances."

EPA released the CERCLA guidance, *Radiation Risk Assessment at CERCLA Sites*: *Q&A* on June 13, 2014, "*Q&A*") making recommendations for how to conduct radiological risk assessments. Appendix A, to the *Q&A* is entitled, "EPA's Recommended Guidance for Radiation Risk Assessment at CERCLA Remedial Sites." It lists the following twelve guidances:

- The *Preliminary Remediation Goals (PRGs) for Radionuclides* electronic calculator, known as the Rad PRG calculator (U.S. EPA 2002a).
- The Building Preliminary Remediation Goals for Radionuclides (BPRG) electronic calculator (U.S. EPA 2007).
- The Radionuclide Outdoor Surfaces Preliminary Remediation Goals (SPRG) electronic calculator (U.S. EPA 2009a).
- Soil Screening Guidance for Radionuclides (Rad SSG) at CERCLA sites (U.S. EPA 2000a, 2000b).
- ARAR Dose Compliance Concentrations for Radionuclides (DCC) electronic calculator (U.S. EPA 2004a).
- ARAR Dose Compliance Concentrations for Radionuclides in Buildings (BDCC) electronic calculator (U.S. EPA 2010a).
- ARAR Radionuclide Outdoor Surfaces Dose Compliance Concentrations for Radionuclides (SDCC) electronic calculator (U.S. EPA 2010b).

- Chapter 10, "Radiation Risk Assessment Guidance" *Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals,* commonly called and referred to herinafter as "*RAGS,*" Parts A and B (U.S. EPA 1989a).
- Chapter 4, "Risk-based PRGs for Radioactive Contaminants," of RAGS Part B (U.S. EPA, 1991a).
- Appendix D, "Radiation Remediation Technologies," of RAGS Part C (U.S. EPA 1991b).
- RAGS Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments (U.S. EPA, 1998a), and
- Superfund Radiation Risk Assessment and How You Can Help: An Overview (U.S. EPA, 2005a).

No RESRAD calculators are among those listed in the *Q&A's* Appendix A.

Using RESRAD in setting remediation goals is inconsistent with EPA guidance for numerous reasons and violates § 9620(a)(2).

1. RESRAD Was Developed as a Dose-Based Model While CERCLA is a Risk-Based Model

RESRAD was developed by the Argonne National Laboratory for the Department of Energy ("DOE"). It is a dose-based risk model; it is measured in millirem per year ("mrem/yr").[5] CERCLA cleanup goals, by contrast, have always been risk-based. They are measured in excess cancers per unit of population, generally, one-excess cancer per million people.

Multiple EPA's guidances going back many years have stated explicitly that dose-based models like RESRAD are not appropriate for CERCLA cleanups, and that the risk-based PRG model should be used.

In 1991, for example, EPA released a guidance called "*Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals)*, commonly referred to as "*RAGS.*" [6] The very name of the guidance uses the words "risk-based." In the intervening years, EPA has revised its risk-assessment guidances, but has remained consistent that CERCLA remediation goals are to be risk-based.

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[5] We understand that RESRAD's capabilities were later expanded at the request of the NRC to add a risk-based option; the DOE still sets its cleanup levels under the dose-based algorithm and is not commonly used according to our understanding, in favor of PRGs. When we ran RESRAD-Onsite, it was not readily apparent how to change from dose-based to risk-based calculations.

[6] EPA/540/R-92/003, Publication 9285.7-018, December 1991.

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In 1999, EPA released *Radiation Risk Assessment at CERCLA Sites: Q & A ("1999 Q & A").*[7] Its endorsement of risk-based models is clear and is reiterated throughout, starting with its cover letter, which refers to risk, not dose: "Cleanup should generally achieve a cumulative risk within the 10^{-4} to 10^{-6} carcinogenic risk range based on the reasonable maximum exposure." The cover letter also carves out a limited exception for dose-based assessments and specifically rejects Department of Energy ("DOE") and Nuclear Regulatory Commission ("NRC") guidances:

> This Risk Q&A clarifies that, in general, dose assessments should only be conducted under CERCLA where necessary to demonstrate ARAR compliance.[8] Further, dose recommendations (e.g., guidance such as DOE Orders and NRC Regulatory Guides)[9] should generally not be used as to-be-considered material (TBCs). Although in other statutes EPA has used dose as a surrogate for risk, the selection of cleanup levels for carcinogens for a CERCLA remedy is based on the risk range when ARARs are not available or are not sufficiently protective. Thus, in general, site decision-makers should not use dose-based guidance rather than the CERCLA risk range in developing cleanup levels. (Emphasis added, p.2.)

EPA's *1999 Q&A* cover letter goes on to emphasize:

> In a policy statement to its regional offices that perform Superfund cleanups, EPA's Headquarters stated that "...site decision-makers should not use dose-based
> guidance rather than the CERCLA risk range in developing cleanup levels. (Emphasis added p.2.)

Question 15 in the *1999 Q&A* asked: "**What calculation methods or multimedia radionuclide transport and exposure models are recommended by EPA for Superfund risk assessments?"**[10] The answer starts by referring to risk-based cleanup goals: "Currently, only the equations in *RAGS Part B* (U.S. EPA, 1991 a) - which are used to develop risk-based preliminary remediation goals for hazardous chemicals and radionuclides - are recommended by EPA for Superfund radiation risk assessments."

Similarly, Question 32 underlines EPA's partiality for risk-based rather than dose-based assessments:

> Risks should be characterized in standard Agency risk language consistent with CERCLA guidance. **Cleanup levels not based on an ARAR should be**

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[7] Directive 9200.4-31P, EPA 540/99/006, December 1999.

[8] "Applicable or relevant and appropriate requirements, or ARARs are state-set cleanup goals.

[9] Answer 34 also repudiates another NRC cleanup level as well: "It **should be noted that the Agency has determined that the NRC decommissioning requirements (e.g., 25, 100 mrem/yr dose limits) under 10 CFR 20 Subpart E should generally not be used to establish cleanup levels under CERCLA,** even when these regulations are ARARs." (Emphasis in original.)

[10] All questions in the *Q&A* are rendered in bold type. We maintain that format.

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based on the carcinogenic risk range (generally10^{-4} to with 10^{-6} as the point of departure and 1 x 10^{-6} used for PRGs) and expressed in terms of risk (# x $10^{-\#}$). (Emphasis in original.)

The *1999 Q&A* was updated in 2014 (*"2014 Q&A"*). Its treatment of risk-based and dose-based models, however, was not among the changes made to the earlier version. But by the time the *2014 Q&A* was issued, *RAGS Part B* had been supplanted as the risk-calculation guidance by the PRGs. This could not be stated any more clearly in response to Question 16: "The PRG calculators (U.S. EPA 2002a, 2007, 2009a), which are used to develop risk-based PRGs for radionuclides, are recommended by EPA for Superfund remedial radiation risk assessments."

The Parcel G remedial goals adopted in the ROD were not dose-based ARARs; ARARs do not apply to the Shipyard. Rather, remediation goals at HPNS are to be set to meet the EPA's risk range, with 10^{-6} as the starting point and 10^{-4} being the floor. In short, RESRAD, as a dose-based model, is inconsistent with EPA's longstanding requirement – spelled out in guidances and directives since 1991 – that cleanup standards be risk-based.

a. **Dose Assessments and Exposure Rates Are Only Useful for Limited Purposes, Not Site Characterization**

i. **Dose Assessments**

As quoted from the *1999 Q&*A cover letter above, EPA only uses dose assessments for the limited purpose of complying with state requirements that explicitly require dose-based risk assessment. Such is not the case here.

Question 32 of the *1999 Q&A* asks "**When should a dose assessment be performed?"** The guidance replies:

> OSWER Directive 9200.4- 18(US. EPA 1997a) specifies that cleanup levels for radioactive contamination at CERCLA sites should be established as they would for any chemical that poses an unacceptable risk and the risks should be characterized in standard Agency risk language consistent with CERCLA guidance **"Cleanup levels not based on an ARAR should be based on the carcinogenic risk range (generally 10^{-4} to 10^{-6}, with 10^{-6} as the point of departure and l x l 0-6 used for PRGs) and expressed in terms of risk** (# x $10^{\#}$).

Furthermore, Answer 32 to the *1999 Q&A* states, "In general, dose assessment used as a method to assess risk is not recommended at CERCLA sites." The answer specifies, "**At CERCLA sites dose assessments should generally not be performed to assess risks or to establish cleanup levels** except to show compliance with an ARAR that requires a dose assessment (e.g., 40 CFR 61 Subparts H and I, and 10 CFR 61.41)." (Emphasis in original.)

The *2014 Q&A* repeats the portion of the *1999 Q&A's* Answer 32 quoted above word for word, illustrating that EPA's 2014 update did not alter its preference for risk-based remediation goals, not dose-based.

The *2014 Q&A* discusses dose assessments in Answer 33:

> Dose assessments should be conducted during CERCLA remedial responses only when
> considering compliance of clean up plans with dose-based ARARs. As discussed in
> OSWER Directive 9200.4-18 (U.S. EPA 1997a), cleanup levels for radioactive contamination at remedial sites should be established as they would for any chemical that
> poses an unacceptable risk and the risks should be characterized in standard Agency risk
> language consistent with CERCLA guidance for remedial sites. Thus, **cleanup levels not**
> **based on an ARAR should be based on the carcinogenic risk range (generally 10^{-4} to**
> **10^{-6}, with 10^{-6} as the point of departure and 1 x 10^{-6} used for PRGs) and expressed in terms of risk (# x $10^{-\#}$).**

i. Exposure Rates

Addressing exposure rates, Question 33 of the *1999 Q&A* asked: "**How and when should exposure rate be used to estimate radionuclide risks?**" It answers: "**As discussed previously (see Q24 and Q27), EPA recommends that estimates of radiation risk should be derived using slope factors, in a manner analogous to that used for chemical contaminants.**" (Emphasis in original, slope factors are further addressed below.)

Answer 33 allows for the use of exposure rates, but only for preliminary assessments, not site characterization:

> The principal benefits of exposure rate measurements is the speed and convenience of analysis, and the elimination of potential modeling uncertainties. However, these data should be of radionuclides concentrations in environmental <u>in conjunction with, rather than instead of, characterization data</u> media to obtain a complete picture of potential site-related risks. (Emphasis added.)

The answer also stresses, in bold type, that basing risk calculations on exposure rate can only be an adjunct to risk-based models like the PRGs: "However, there may be circumstances where it is desirable to **also** consider estimates of risk

based on direct exposure rate measurements of penetrating radiation." The three listed exceptions have nothing to do with setting final cleanup standards demonstrated to be protective:

> • During early site assessment efforts when the site manager is attempting to communicate the relative risk posed by areas containing elevated levels of radiation,
> • As a real-time method for indicating that remedial objectives are being met during the conduct of the response action. The use of exposure rate measurements during the conduct of the response actions may not decrease the need for a final status survey.
> • When risk estimates developed during a risk assessment may underestimate the level of risk posed by radionuclides. An example of this situation would be where the source of the radiation is highly irregular (inside a contaminated structure) instead of being an
> infinite plane, which is the standard assumption used during risk assessments.

Even where one of these narrow exceptions might apply, the guidance emphasizes the limitations of the approach: "In most cases, more accurate estimation of radiation risks will require additional site characterization data, including concentrations of all radionuclides of concern in all pertinent environmental media."

b. EPA Guidance Endorses Slope Factors; Conversion Factors Have Limited Application

Slope factors are used to estimate incremental cancer risks. The PRGs use them. RESRAD, as a dose-based model, calculates that incremental risk using dose conversion factors. As discussed below, translating dose to risk is not a simple, straightforward matter.

The *1999 Q&A* defined slope factors in Answer 20:

> EPA has developed slope factors for estimating incremental cancer risks resulting from exposure to radionuclides via inhalation, ingestion, and external exposure pathways. Slope factors for radionuclides represent the probability of cancer incidence as a result of a unit exposure to a given radionuclide averaged over a lifetime. It is the age-averaged lifetime excess cancer incident rate per unit intake (or unit exposure for external exposure pathway) of a radionuclide (U.S. EPA 1989a).

Answer 21 defined dose conversion factors: "Dose conversion factors (DCFs), or 'dose coefficients', for a given radionuclide represent the dose equivalent per unit intake (i.e., ingestion or inhalation) or external exposure of that radionuclide. These DCFs are used to convert a radionuclide concentration in soil, air, water, or foodstuffs to a radiation dose."

Or, as the *1999 Q&A* says in Answer 31, "Slope factors for both radionuclides and chemicals are used to estimate incremental cancer risk. "

The *2014 Q&A* handles slope factors quite similarly as its earlier version but with more current references. Answer 21 in the *2014 Q&A* states: "EPA has developed slope factors for estimating incremental cancer risks resulting from exposure to radionuclides via inhalation, ingestion, and external exposure pathways," and "EPA recommends the slope factors that are used in the PRG calculators for CERCLA remedial radiation risk estimates (U.S. EPA 2002a, 2007, and 2009a)." This recommendation is repeated in response to Questions 25 and 37.

Question 24 tackles the two calculations head on: "**How should radionuclide slope factors and dose conversion factors be used?"** The guidance answers:

> **EPA recommends that radionuclide slope factors be used to estimate the excess cancer risk resulting from exposure to radionuclides at radiologically contaminated sites for comparison with EPA's target risk range (i.e., I 0^{-4} to 10^{-6} lifetime excess cancer risk).** (Emphasis in original.)

Answer 24 states the limited utility of dose conversion factors: "The primary use of DCFs should generally be to compute doses resulting from site-related exposures for comparison with radiation protection standards and dose limits (see 331-32) that are determined to be ARARs or TBCs." But using dose conversion factors to convert dose to risk is anything but straightforward: "[N]o simple and direct conversion between radiation dose and radiogenic cancer risk is available… Therefore, any conversion between dose and risk now must be performed on a radionuclide- and pathway specific basis."

The *2014 Q&A* includes identical language to that quoted above from the *1999 Q&A's* concerning slope factors and dose conversion factors (though in the *2014 Q&A* it is Answer 25).

The PRGs use slope factors. Since RESRAD substitutes dose conversion factors it is inconsistent with EPA guidances and therefore violates both CERCLA and the FFA.

2. The PRGs Use A More Protective Maximum Dose than RESRAD

Even if RESRAD could otherwise be appropriately applied to the cleanup, it cannot be used because it is less protective than EPA CERCLA guidances allow. RESRAD uses a decades-old old standard, 25 mrem/yr, as the default maximum dose. However, while that default has remained constant, EPA has twice lowered the maximum allowable dose, first from 25 mrem/yr to 15 mrem/yr and then, in 2014, 12 mrem/yr. *2014 Q&A,* Question 35.

Although RESRAD defaults can be changed to reflect maximum doses lower than 25 mrem/yr, only experienced users of RESRAD would be knowledgeable enough to know that the default needs to be reset. When we ran RESRAD-Onsite, it required searching through subscreeens to find how to change the default dose. Thus, RESRAD is hardly user-friendly. In contrast, when we ran the PRGs calculators we found them to be much easier to navigate, an important benefit to community members.

EPA guidance recommends against using other federal agencies' dose recommendations for CERCLA purposes. The *Q&A*, for example answers Question 36, **"Should dose recommendations from other federal agencies be used to assess risk or establish cleanup levels?"** The answer is "Generally, no." It goes on to say:

> Dose level recommendations from international and other non-EPA organizations are not enforceable and therefore cannot be ARARs. The selection of cleanup levels for carcinogens for CERCLA remedy selection purposes should be consistent with the NCP and CERCLA guidance – i.e., based on the risk range when ARARs are not available or are not sufficiently protective. EPA has made the policy decision to use the NCP's risk range in developing cleanup levels for radionuclides at CERCLA remedial sites rather than using dose-based guidance since the use of dose-based guidance. (Emphasis added.)

Furthermore, dose based risk models like RESRAD introduce an additional complication in estimating risk, the extra step of having to apply dose-to-risk conversion factors. This conversion unnecessarily introduces additional uncertainty into the calculation of risk. The PRGs, as risk-based models, do not.

3. The PRGs Treat Chemical and Radiological Risks Uniformly; RESRAD Does Not[11]

CERCLA guidances like the *1999 Q&A* make clear that all onsite contaminants must be treated consistently:

> Using dose-based guidance would result in unnecessary inconsistency regarding how radiological and non-radiological (chemical) contaminants are addressed at CERCLA sites. These reasons include: (1) estimates of risk from a given dose estimate may vary by an order of magnitude or more for a

[11] The RESRAD codes used to include RESRAD-Chem for chemical contamination and RESRAD-Baseline, which RESRAD's website says was useful in "evaluating radiation dose and chemical risk to a human receptor based on measured contaminant concentrations in different environmental media. The calculations follow the EPA Risk Assessment Guidance for Superfund (RAGS)." It appears that at one time, RESRAD placed value in a unitary model for assessing both chemical and radiological cancer risk but apparently no longer does. It is also instructive that RESRAD-Baseline followed EPA's risk model, RAGS, but the current RESRAD-Onsite does not reference its improvement, the PRGs; the Onsite user's manual does not mention either RAGS or PRGs. *See* http://resrad.evs.anl.gov/.

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particular radionuclide, and; (2) dose based guidance generally begins an analysis for determining a site-specific cleanup level at a minimally acceptable risk level rather than the 10^{-6} point of departure set out in the NCP.

Answer 16 states, "**To avoid unnecessary inconsistency between radiological and chemical risk assessment at the same site, users should generally use the same model for chemical and radionuclide risk assessment.** (Emphasis in original.)

Likewise, Answer 27 says, "Risks from radionuclide exposures should be estimated in a manner analogous to that used for chemical contaminants." The *Q&A* explained why in answer to Question 10, **How does the exposure assessment for radionuclides differ from that for chemicals?**

> Exposure assessment for radionuclides is very similar to that for chemicals. Both nonradioactive chemical assessments and radionuclide assessments follow the same basic steps--i.e., characterizing the exposure setting, identifying exposure pathways and potential receptors, estimating exposure point concentrations, and estimating exposures/intakes.

The *2014 Q&A* underscores and amplifies EPA's preference for unitary treatment of chemical and radiological risks by repeating verbatim the language quoted above from the *Q&A's.* In fact, the new version added more explicit language:

> EPA has made the policy decision that <u>risks from radionuclide exposures at remedial sites should be estimated in the same manner as chemical contaminants</u>, which is consistent with EPA's remedial program implementing guidance (e.g., EPA 1997g, 1999d, 2000f). Consequently, approaches that do not follow the remedial program's policies and guidance should not be used at CERCLA remedial sites. (Question 10, emphasis added.)

Question 27 asked: **How should radionuclide risks be estimated?** It replies:

> Risks from radionuclide exposures <u>should be estimated in a manner analogous to that used for chemical contaminants</u>. That is the estimates of intakes by inhalation and ingestion and the external exposure over the period of exposure estimated for the land use (e.g., · 30 years residential, 25 years commercial/industrial) from the exposure assessment should be coupled with the appropriate slope factors for each radionuclide and exposure pathway. Only excess cancer risk should be considered for most radionuclides (except for uranium as discussed in Q25). The total incremental lifetime cancer risk attributed to radiation exposure is estimated as the sum of the risks from all radionuclides in all exposure pathways.

Second, the risks of all onsite contaminants must be summed to assess total risk. Question 28 is: **"Should radionuclide and chemical risks be combined?"** The

answer starts, "**Yes. Excess cancer risk from both radionuclides and chemical carcinogens should be summed to provide an estimate of the combined risk presented by all carcinogenic contaminants as specified in OSWER directive 9200.4-18 (U.S. EPA 1997a).**

Although both versions of the *Q&A* repeatedly state the preference for unitary treatment of risks, it allows for other approaches, but only in limited circumstances: Answer 16 to the *1999 Q&A* states:

> To avoid unnecessary inconsistency between radiological and chemical risk assessment at the same site, users should generally use the same model for chemical and radionuclide risk assessment. 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. (Emphasis added.)

This, too, is repeated verbatim in the *2014 Q&A*.

In other words, if the Navy seeks to substitute RESRAD for the PRGs, it still has to submit the PRG data for comparison in order to be consistent with the EPA guidance so that the EPA and the public can have confidence in the total onsite risk from all contaminants.

The PRG calculators treat both chemical and radiological risks alike, significantly simplifying calculation of aggregate risk from both, as required in setting remediation goals. RESRAD does not. Because RESRAD treats risk from chemical contamination using a very different model than risk from radiological contamination, using RESRAD would introduce an additional layer of potential error.

4. The PRGs and RESRAD Use Different Exposure Models

There are significantly different exposure assumptions used in RESRAD and the PRGs, making them incompatible. For example, the PRGs use "reasonable maximum exposure" ("RME") as the standard for measuring exposure, whereas RESRAD uses the less protective "maximally exposed individual" ("MEI").

Like the PRGs, EPA's longstanding policy is to use RMEs. As far back as 1990, EPA wrote: "EPA will continue to use the reasonable maximum exposure scenario in risk assessment, although EPA does not believe it necessary to include it as a requirement in the rule." 55 FR 8710 (March 8, 1990).

As stated above, EPA published the *Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual,* commonly called "*RAGS*". RMEs are referenced in Chapters 2, 3 and 4. MEIs are not even considered.

The 1999 *Q&A* reinforced EPA's endorsement of reasonable maximum exposure to estimate risk. The cover letter says: "Cleanup should generally achieve a cumulative risk within the 10-4 to 1 o-6 carcinogenic risk range based on the reasonable maximum exposure."

Question 29 asks, **"How should risk characterization results for radionuclides be presented?"** The guidance says, "The reasonable maximum exposure (RME) estimate of individual risk typically presented in Superfund risk assessments represents a measure of the high-end individual exposure and risk." However, other models can be used in addition to the RME. "While the RME estimate remains the primary scenario for risk management decisions, additional risk descriptors may be included to describe site risks more fully."

In answering Question 30, **"Should the collective risk to populations be estimated along with that to individual receptors?"** the 1999 guidance states, "Population risk is generally not used as part of Superfund risk assessments."

> The *2014 Q&A* addresses the collective versus individual risk in its Question 31: **"Is it necessary to present the collective risk to populations estimated along with that to individual receptors?"**
>
> Generally, no. Risk to potential RME individual receptors generally is the primary measure of protectiveness under the CERCLA remedial process (the target range of 10^{-6} to 10^{-4} lifetime excess cancer risk to the RME receptor).

5. RESRAD and Peer Review

EPA has subjected its calculators to rigorous, independent peer review. It is our understanding that RESRAD has not been subject to the same level of scrutiny and validation. However, there are EPA documents currently unavailable to us that we need to ascertain the details of RESRAD's peer review. We are preparing a FOIA request to EPA seeking those documents.

Despite this handicap, the DOE's Director of Regulatory Compliance, Robert Seifert, gave a July 11, 2018 PowerPoint presentation, *DOE Guidance on Applicability of RESRAD and the PRG/DCC Calculator for CERCLA Sites.* Slide 7, attached hereto as Attachment 8, indicates that RESRAD has not been peer reviewed recently. Of the six studies cited that are dated, two were done in 1994, another two were from 1996 and the final two are dated 2003 and 2011.

Although we are not yet in a position to document the state of RESRAD's peer review, the Navy certainly is. It is incumbent on it to establish that RESRAD has been validated by rigorous, independent peer review if it seeks to supplant the PRGs with REARAD.

IV. Conclusion

The Navy must hold the Parcel G planning process in abeyance until after the *Five Year Review*. In the meantime, the Navy must release a new draft plan for Parcel G that includes the PRG calculations demonstrating protectiveness and provide for formal public comment, respond in writing to all comments and alter the plan accordingly.

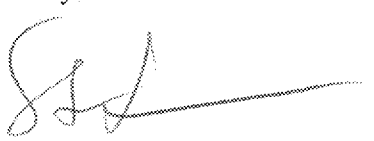
Furthermore, there has been a fundamental change in what was contemplated in the Parcel G ROD, supplemented by the aggregation of significant change. Anything less than a formal amendment to the Parcel G ROD will fail to acknowledge the dire impact the fraud has had on the cleanup.

Without a new draft plan for Parcel G, including risk data substantiating protective cleanup goals, the Navy will violate CERCLA and be acting arbitrarily and capriciously. Moreover, it will also violate CERCLA if the Navy finalizes the *FYR* without certifying protectiveness.

We have raised very serious matters. We request that you meet with us to discuss them at your earliest availability and, in any event, prior to finalizing the *Draft Final Plan* and/or *FYR*.

Thank you for your attention to this matter.

Sincerely,



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