EPA Federal Facilities Superfund Program – RPM Bulletin 2024-01

Considerations When Reviewing PFAS in Five-Year Reviews

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Purpose

The purpose of this document is to assist United States Environmental Protection Agency (EPA) Remedial Project Managers (RPMs) when reviewing how per- and polyfluoroalkyl substances (PFAS) are addressed in Federal Facility Superfund Sites' Five-Year Reviews (FYRs). This Bulletin is rooted in existing guidance and identifies best practices based on a review of how PFAS have been addressed in documents since 2020.

Existing Guidance

EPA, 2001. Comprehensive Five-Year Review Guidance. EPA 540-R-01-007. June 2001. https://semspub.epa.gov/src/document/11/128607

EPA, 2012. Clarifying the Use of Protectiveness Determinations for Comprehensive Environmental Response, Compensation, and Liability Act Five-Year Reviews. OSWER 9200.2.111. September 13, 2012. http://semspub.epa.gov/src/document/HQ/174829

Table of Contents

Purpose 1
Existing Guidance 1
Summary 1
Background 2
Expectations and Considerations 2
Five-Year Review Examples 4
Example 1: 4
Example 2: 4
Example 3: 5
Example 4: 5
Actions and Options for EPA Reviewers 5

Summary

After reviewing numerous FYRs, and considering language in existing guidance documents, EPA's Federal Facilities Restoration and Reuse Office (FFRRO) has identified the following best practices in addressing PFAS and other emerging contaminants of potential concern in FYRs:

a. Include sufficient details to support protectiveness determinations. The description of the emerging contaminant(s) should include a concise summary of the scope of the investigation to date, with the results screened as set forth in guidance, using updated EPA Regional Screening Level Tables for Chemical Contaminants at Superfund Sites ("RSLs", available at: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables). The level of detail should be sufficient to identify lines of evidence to support the Technical Assessment and Protectiveness Designation. There are options for where these details are captured; often the main narrative is a separate section that provides background and data summaries and identify how PFAS will be

addressed going forward. Technical Assessment Question A may be an opportunity to discuss how the existing remedy may or may not also address exposures to PFAS (for example, Land Use Controls may prevent exposure to newly identified contaminants in the short term).

b. Assess the impacts of PFAS and emerging contaminants under Technical Assessment Question B. This is not only in accordance with existing guidance (Page 4-2 of 2001 Guidance), but it also creates the foundation for consideration of potential impacts on protectiveness and required follow-on activities.
c. The Issues/Recommendations section should include any issue(s) identified and proposed follow-on actions, as needed. This section can be concise, providing it builds off of previous sections.
d. Consider the potential impacts of new and emerging chemicals on protectiveness determinations. Address what is known about nature and extent of contamination, potential exposure pathways and risks, and what information is available that justifies the protectiveness determination. This ties into the first point, that there needs to be sufficient data to support the determination built into previous sections of the FYR (e.g., Question B, etc.). If not, then consider deferring protectiveness.

Background

Section 121 of CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), requires that remedial actions which result in any hazardous substances, pollutants, or contaminants remaining at the site be subject to a FYR. The purpose of a FYR is to evaluate the implementation and performance of a remedy to determine if the remedy is or will be protective of human health and the environment. Protectiveness is generally defined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) by the risk range and the hazard index (HI). Evaluation of the remedy and the determination of protectiveness should be based on and sufficiently supported by data and observations.

New and emerging contaminants, such as PFAS, are frequently found in combination with legacy contaminants, such as VOCs, metals, etc. that have been historically addressed in the Superfund program. The identification of any new contaminants in the same location and media as legacy contaminants calls into question the assumptions underlying remedy selection, including the list of contaminants of concern (COCs), exposure assumptions, risk assessment and remedy selection, as the presence of newly identified contaminants calls changes the assumptions that are the basis of these decisions.

For example, if a remedy was designed to remove VOCs from drinking water, one cannot assume that the remedy will also remove any newly identified contaminants recently detected in that same aquifer. It is necessary to measure concentrations of the new contaminants in the influent and effluent to demonstrate the new contaminants are also being addressed. In this case, the new information—the identification of new contaminants—calls into question the protectiveness of the remedy. It would be misleading to the public to state that the remedy continues to be protective, without direct knowledge of the efficacy of the remedy in addressing the newly identified contaminants too.

To address these concerns, a description of what is known about the new and emerging contaminants should be included in the FYR. To build a case to support the analysis of whether the newly identified contaminants could impact the protectiveness of the existing remedy, the FYR should incorporate what is known and not known about the contamination, and whether existing remedies may fully or partially mitigate risks.

Expectations and Considerations

To guide the review, EPA recommends focusing on four components:

1. *Scope and Documentation:*

   Adequate documentation is required to support protectiveness determinations. When reviewing the documentation of PFAS, it is useful to consider:

   - Is the scope appropriate? Were all potential source areas included in the scope?
   - Where was sampling and evaluation for PFAS and/or other emerging contaminants summarized?
   - Does the summary provide adequate details to support the identification of issues, recommendations, and protectiveness?

2. *Technical Assessment:* Were emerging contaminants included in Question B?

   Most relevant to the issue of where to address new contaminants, the 2001 Guidance specifies the new contaminants or contaminant sources should be addressed under Question B.

   Exhibit 4-1: Three Questions Used to Determine Whether a Remedy is Protective

When you ask...	you should consider whether...
Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?	• there are changes in standards identified as Applicable or Relevant and Appropriate Requirements (ARARs) in the ROD, newly promulgated standards, and/or changes in TBCs identified in the ROD, that could call into question the protectiveness of the remedy; • there are changes in land use or the anticipated land use on or near the site; • new human health or ecological exposure pathways or receptors have been identified; • new contaminants or contaminant sources have been identified; • there are unanticipated toxic byproducts of the remedy not previously addressed by the decision documents; • there are changes in the physical site conditions; and • there are changes in the toxicity factors for contaminants of concern.

   This is also important because it reinforces other EPA guidance (such as Risk Assessment Guidance for Superfund) that require multimedia risk assessment that include all relevant contaminants, and not just those most recently identified. It is also an important preface to supporting both the protectiveness determination, and the identification of issues and recommendations.

3. *Issues and Recommendations:* Were issues pertaining to the emerging contaminants identified? How were they addressed via recommendations?

   The 2001 Guidance states "You should identify all issues that currently prevent the response action from being protective or may do so in the future. You should document all such issues and follow-up actions needed to ensure the proper management of the remedy in your Five-Year Review report." New contaminants that are co-located can result in changes to the risk assessment, which is multi-media and inclusive of all relevant contaminants). It also facilitates the tracking of new information so that important new issues do not get dropped.

4. *Protectiveness:* Does the presence of emerging contaminants affect protectiveness?

   When PFAS are present, the protectiveness determination hinges on what is known about the nature and extent of PFAS contamination, and the potential for current and future exposures,

leading to potential risks. Adequate lines of evidence must be provided to substantiate the protectiveness determinations.

In general, facilities should be selecting short-term protective if they have at least a preliminary understanding of PFAS contamination and can show that there are no current exposures, for example, due to the presence of land use controls. Facilities should be selecting to defer protectiveness if the characterization is incomplete. If there are current known or likely exposures to PFAS that are not controlled, e.g., private wells that are contaminated, but alternate water supplies have not yet been provided, then a finding of not protective may be warranted. The region must be presented with sufficient documentation to defend the protectiveness designation. If the facility cannot or will not develop sufficient documentation or provide the necessary lines of evidence to support the protectiveness designation, the region can choose to write an independent finding. Other new and emerging contaminants should be addressed in a similar manner.

Five-Year Review Examples

Example 1:

- OU3 has a ROD for VOCs and pesticide impacted groundwater. The ROD includes Land Use Controls (LUCs) that prohibit residential development and use of shallow groundwater for potable water. This remedy is functioning as intended.
- PFAS was detected above screening level in a composite purge water sample collected at the site.
- A PFAS Site Inspection ("SI", pre- remedial investigation scoping) was in progress during the FYR period, but data were not QA'd within the time frame of the FYR review period.
- Protectiveness:
    - The lead Federal Agency notes the PFAS detection and SI work in "other findings" (not question B) and stated that it has no impact on function of the remedy. [For reference, the actual language in the Response to Comments was: "Because the PA/SI process is ongoing and there is currently no basis to conclude that remedial action is necessary, PFAS do not affect the protectiveness of the remedies at Site 1, 3, 18, and 20."] A determination of "protective" was included in the FYR.
    - EPA is issuing an independent determination of "short term protective" because of the known presence of PFAS at the site, but lack of direct human health exposure at this OU.

Example 2:

- Groundwater pump and treat system was initially installed as a pilot to address explosives constituents and chromium VI and was upgraded to meet remedial action objectives, including removal of perchlorate. Treatment consists of granular activated carbon and ion exchange resin beds, and treated water is re-injected back into the aquifer or used for irrigation.
- Given the known use of Aqueous Film-Forming Foam on site, the facility proactively measured PFAS in the influent and effluent of the pump and treat. A PFAS investigation is planned for the future.
- Pre- and post-treatment sampling indicates that PFAS are present, but levels in treated water are below current RSLs.
- Protectiveness:
    - The remedy is determined to be Short-Term Protective, pending the outcome of the PFAS investigation.

- Since the contamination has not been fully delineated, we are unsure of nature and extent and potential for other current or future exposure pathways. Additional investigation is needed to determine if additional actions are required for long term protectiveness.

Example 3:

- At a former metal plating site, metals in groundwater are effectively treated with the installation of permeable barriers and prevent contamination from reaching nearby private wells.
- PFAS sampling has not been completed at this site but is likely to have been used. The barriers would not prevent PFAS from passing through to reach the wells.
- Given PFAS use at most plating operations, the likelihood of exposure could be high, if PFAS are present. In this case, the remedy is deferred.
- Protectiveness:
  - In this case, EPA determined that Protectiveness should be Deferred.
  - Deferrals come with requirements and timelines to address the insufficiencies. In this case, the direction would be to sample groundwater and neighboring wells for PFAS, and take appropriate action based on the results, by a specified date. The Federal Facility would also be required to complete a FYR Addenda by a specified date.

Example 4:

- A Navy site has closed out most Operable Units (OUs), but legacy groundwater contaminants, including VOCs, pesticides and metals remain in water on base.
- A remedial investigation is planned for PFAS, which are known to be present as co-contaminants, based on initial scoping.
- During a FYR, it was noted that off-site residential drinking water well at levels that exceed both the state Maximum Contaminant Levels and the 70 parts per trillion (ppt) that the DoD continues to use as an action level. The federal facility is supplying bottled water to *only* one home that exceeds 70 ppt.
- Protectiveness:
  - EPA determined that the remedy is not protective, based on the homes exposed to PFAS above state values but below the DoD's trigger of 70 ppt.
  - EPA plans to work with the state to discuss PFAS values with the three residences, and potentially offer alternate water sources.

Actions and Options for EPA Reviewers

1. When reviewing FYRs, work with the project team to develop and refer to a crosswalk of operable units and sites that identified media co-contaminated with PFAS to identify OUs and Sites that need to be addressed. Refer to RPM Bulletin on Tracking PFAS and Legacy Contamination for more details.

2. Consult with risk assessors on potential for cumulative impacts that could call into question FYR protectiveness determinations.

3. Examine documentation of PFAS for level of detail and consistency with expectations, as outlined above. There should be sufficient information and detail in the FYR to support the protectiveness determination.