Hanford Advisory Board Draft Advice

Topic: Remedial Investigation/Feasibility Study & Proposed Plan for Remediation of the 100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2, and 100-IU-6 Operable Units, Draft A

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Originating Committee: River & Plateau

Version #1: **Color:** __pink __yellow __green __purple X **blue** __Salmon

Background

The Hanford Advisory Board (Board) appreciates the opportunity to provide comments and advice for the *Remedial Investigation/Feasibility Study and Proposed Plan for Remediation of the 100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2 and 100-IU-6 Operable Units 100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2 and 100-IU-6 Operable Units, Draft A* (Proposed Plan). Final Hanford River Corridor cleanup decisions are important because inadequate cleanup actions could potentially impact the Columbia River. The 100-F/IU Remedial Investigation and Feasibility Study (RI/FS) and Proposed Plan will provide a template for subsequent River Corridor decisions that follow. It is important to the Board that these decisions are dependable, protective, defensible, and well supported.

The Proposed Plan, as the culmination of the RI/FS process, presents remediation alternatives designed by the U.S. Department of Energy (DOE) and its contractors to address the identified contamination and selects one of the alternatives as the best solution.

The 100-F Operable Units make up the 100-F reactor site adjacent to the Columbia River just upstream from the Hanford Townsite. The 100-F reactor was one of the single-pass, plutonium producing operations that also included laboratories that conducted a number of animal studies. The site contained the usual surface and groundwater contamination, as well as added impacts from the animal housing. Like 100-KE, but smaller in magnitude, the 100-F reactor, now in Interim Safe Storage, has a groundwater plume of spent fuel-related contaminants beneath it.

The Board offers no advice for the IU-2 and IU-6 Operable Units at this time.

The draft Proposed Plan for Remediation of the 100-FR-1, 100-FR-2 and 100-FR-3 Operable Units consists of four alternatives, one alternative with no action except for the completion of source removal of waste sites at the surface, one that relies on institutional controls and monitored natural attenuation for groundwater cleanup (basically the same), and two that include pump-and-treat remediation for the groundwater plumes. The first pump-and-treat remediation alternative (GW-3) remediates the hexavalent chromium plume as well as the northern half of the nitrate plume, uses bio-augmentation and uses air stripping to treat TCE. The final pump-and-treat remediation alternative (GW-4) adds treatment for the entire nitrate plume and doesn't include bio-augmentation.

Draft

Advice[1]**:**

1. The Board advises that DOE identify Groundwater Alternative GW-4 as the preferred alternative, which as pointed out in the Balancing Criteria discussion in the Proposed Plan, "provides the highest reduction of toxicity, mobility or volume through treatment." More importantly (also in the Balancing Criteria) the GW-4 alternative was deemed better due to the fact that "Groundwater extraction and injection wells are also used to contain the Contaminants of Concern plumes, preventing their migration into other uncontaminated areas (like the Columbia River)." Clearly, this alternative addresses both the northern and southern parts of the plume, and provides the most protectiveness of any of the alternatives.

2. The Board advises that the Tri-Party Agreement (TPA) agencies choose Alternative GW-4 instead of the current preferred Alternative GW-2, which only includes the use of institutional controls (IC) and monitored natural attenuation (MNA) for remediation of the site. There is no reasonable way to ensure that ICs will effectively protect human health for the projected 175 years that the Proposed Plan projects will be required for natural attenuation of the 16 waste sites with deep vadose zone contamination (Table 2). These 16 sites contain vadose zone cesium, cobalt, europium-152 and -154, nickel-63 and strontium-90 contamination at levels considered dangerous to human health. If the MNA alternative were to be selected, the worst offender of these sites, 118-F-8:3, with 175 years to reach cleanup levels under MNA, should be considered for removal, treatment and disposal to reduce the overall projected time needed for protective ICs. The remaining sites require less time to decay to acceptable levels (13 to 75 years) and here ICs could be considered protective over this more reasonable monitoring period.

3. The Board advises that a more proactive solution, like a permeable reactive barrier, is required to prevent the 100-F strontium groundwater plume from entering the Columbia River. Samples from several aquifer tubes immediately adjacent to the Columbia River have detected rising strontium levels. The preferred alternative's 150 years of MNA is not a reasonable time frame for remediation of the strontium plume. Allowing strontium to decay is inappropriate when tested technology is available to address the plume. This strontium groundwater plume should be addressed with the tested and apparently successful apatite Permeable Reactive Barrier like that used at 100-N.

4. The Board advises the TPA agencies to base cleanup decisions/actions on the goal of restoring Hanford groundwater to its highest beneficial use [per the Model Toxics Control Act (MTCA)] to protect human health, the environment, and the Columbia River as stated in MTCA regulations [see the Proposed Plan, page 24 and reference to the

[1] *PLEASE NOTE: These advice bullets are numbered for ease of editing; they do not reflect order of importance and will be revised to a bulleted list following the editing process.*

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); The NCP (40 CFR 300)].

5. The Board advises the TPA agencies to choose alternatives which meet the goal of unrestricted use along the River Corridor. Language in the Proposed Plan and selected preferred alternatives indicates that DOE is not considering cleanup to unrestricted use standard and is moving toward a less stringent cleanup based on the Comprehensive Land-Use Plan. The Board believes it is misleading to the public for the Proposed Plan to state "Where the toxicity and mobility of source material combine to pose a potential human health excess lifetime cancer risk (ELCR) greater that one in a thousand (1 x 10-3), treatment alternatives should be identified (A guide to Principal Threat and Low Level Threat Wastes [EPA 1991])." [2] The point of departure for CERCLA remediation is stated as 1 x 10-6 and the Board believes that every effort should be made to meet this standard (EPA 1997). The cleanup exposure scenario needs to be protective of children, including Native Americans exercising their treaty rights to "live along and fish" the Hanford Reach. MTCA requires use of permanent remedies when practicable and cleanup of carcinogens to meet a risk level of 1 x10-5 for all carcinogens.

[2] From the Proposed Plan, referencing 1991 EPA guidance