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James Joyce
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, DC 20585

Dear Mr. Joyce,

We appreciate the opportunity to provide comments on the *Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site* (EA). This evaluation is of particular interest to Oregon because the U.S. Department of Energy's (DOE) actions on high-level radioactive waste (HLW) will likely affect more decisions on the Hanford Site than on any other site in the country. These actions will in turn affect the real and perceived safety and value of the Columbia River, in which we have a permanent interest.

The action evaluated in the EA is DOE's first attempt to apply its new interpretation of the definition of HLW. DOE has selected a waste for first use of this new interpretation that effectively illustrates that not all waste currently managed as HLW requires deep geologic disposal in order to achieve the same standard of protection as that for low-level radioactive waste (LLW). This is not a new revelation. The DOE and U.S. Nuclear Regulatory Commission (NRC), with support from Congress, have for years implemented a rigorous method to define and evaluate which wastes are worthy of being classified as "other than HLW." What is different now is a new method and a new process by which DOE wishes to arrive at this determination alone.

This EA uses present-day data on a waste stream in order to anticipate its constituents 12 years[1] in the future when DOE is actually prepared to make a waste determination decision. Based on the prospective description of the recycle waste stream in the EA, it appears this waste could most likely be safely disposed in a LLW disposal facility. Our evaluation of the EA found that the total activity of the anticipated 10,000-gallon waste stream would be approximately 495 Curies of Cs-137, 0.5 Curies of Sr-90, and 0.11 Curies of Tc-99, plus potentially trace quantities of actinides below the current analytical detection limit. If concentrated into a single cubic meter of waste, this amount of radioactivity would not rise to the level of Class C LLW. Spread across the entirety of the grouted waste volume, these radionuclides would present a manageable hazard if disposed in a LLW disposal facility that has been verified to meet the 10 CFR 61 performance objectives for wastes with these characteristics.

DOE's proposed action is not taking place in a policy vacuum, however. The method and process by which DOE makes this non-HLW determination could have broader effects for other future reprocessing wastes within Oregon's sphere of interest. More than a year after the first notice regarding this new

[1] There is some confusion as to when this waste will actually be disposed, as described in our technical comments.

interpretation, we are still in the dark regarding how it will affect the final form and resting place of many Hanford wastes for which the expectation has long been deep geologic disposal. If we have one overarching comment, it is that DOE should communicate its full intentions for how it will implement its new interpretation. This reluctance to be transparent will only damage trust in the communities that stand to ultimately host these wastes for the long term.

We do not view this NEPA analysis as written to be a sufficient process vehicle by which DOE can or should make a formal non-HLW classification determination. DOE has not identified the formal process by which future determinations will be made, nor has DOE been willing to say whether the public and interested stakeholders will have a formal opportunity beyond the NEPA process to participate in future non-HLW classification decisions. While we acknowledge a formal waste determination evaluation is not part of this NEPA analysis, we are taking this opportunity to document our comments on the waste determination method because it has not been made clear whether the public and interested stakeholders will get another chance.

Our most significant technical concern in the EA is the inability for a reader to follow how the evaluated waste meets the performance objectives of the disposal facility, as required by DOE's new interpretation of HLW. We are not suggesting that disposal of the DWPF recycle wastewater at the Waste Control Specialists (WCS) facility would fail to meet performance objectives or otherwise be unacceptably dangerous. Our concern is that an excessively streamlined analysis for this waste may set a precedent of inadequate analysis and traceability for future waste classification determinations – especially for more complex or uncertainty-laden wastes such as found at Hanford.

As we said in our formal comments on the HLW interpretation Federal Register Notice, we agree that the decision where and how to dispose of a long-lived hazard can be based on the safety needs of that particular hazard – so long as uncertainty is responsibly managed and public trust is upheld.

Where we primarily took issue with DOE's proposed interpretation regarded when it is wise to take the extra precautionary step of removing key radionuclides to the maximum extent practical. We also differed on the most durable process for verifying that waste classification decisions are justified. We believe in the value of concurrence from an external (non-DOE) technical peer whose responsibility does not include cost effectiveness; to build trust that each decision is rich in the quality of thought that went behind it. If the future of radioactive waste management lies in mathematical models of near-surface disposal facility performance, we believe it is vital to share responsibility for the quality and completeness of those models. This includes the public and other stakeholders – the people who stand to lose if your best estimate is wrong.

Our specific technical comments on the EA follow.

Sincerely,

Ken Niles
Assistant Director for Nuclear Safety

Cc: Brian Vance, U.S. Department of Energy
Alex Smith, Washington Department of Ecology
Dave Einan, U.S. Environmental Protection Agency
Matt Johnson, Confederated Tribes of the Umatilla Indian Reservation
Laurene Contreras, Yakama Nation
Jack Bell, Nez Perce Tribes
Oregon Hanford Cleanup Board
Hanford Advisory Board
National Governors' Association Federal Facilities Task Force

Oregon Technical Comments on the *Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site* (EA).

Clarify how a classification determination will be made (including public process and technical evaluation requirements)

As mentioned previously, we recognize that this NEPA analysis is not the process vehicle for making a non-HLW classification determination. Because this decision process has national significance, we request additional information about how the actual determination decision will be made.

It is critical to understand what additional evaluation process DOE intends to implement for non-HLW determinations; the level of documented technical support required to make such determinations; and what role the public will be able to have to review that technical data prior to DOE making a waste determination. We are concerned that the cursory level of analysis in this EA could set a dangerous precedent for the quality and completeness of future waste determination evaluations for more complex or less certain wastes such as those at Hanford.

Clarify when this classification determination will be made

The liquid waste management plan described in the EA appears to be at odds with the Savannah River Site (SRS) Liquid Waste Management System Plan, Rev. 21[2].

The EA states:

> *Treatment or disposal of this waste at a commercial LLW facility would help to inform planning activities for the three years between the completion of the Salt Waste Processing Facility (SWPF) mission (estimated 2031) and DWPF mission completion (estimated 2034) (SRR 2019). During this period, DOE will not have the option of returning DWPF recycle wastewater to SWPF for processing because SWPF will have completed its mission of treating salt waste from the tank farms and will undergo closure.*

This passage implies that the waste stream under consideration is limited to the wastewater that will remain to be managed following completion of the SWPF mission in 2031. This implication is further supported by the fact that the EA later considered the cumulative effects of disposing of 380,000 gallons of wastewater representing the total estimated wastewater volume in need of management between 2031 and 2034.

Despite these suggestions in the EA, DOE demurred when asked directly about the timeline of an actual waste determination and disposal action[3]. While the EA claims that the waste in question will not be ready for at least 12 years (when the SWPF has been shut down), the most recent liquid waste management system plan for SRS states that DOE will be looking for alternative treatment options for

[2] https://www.energy.gov/sites/prod/files/2019/05/f62/SRS-Liquid-Waste-System-Plan-January-2019-0.pdf
[3] Question from Oregon to DOE during the December 17, 2019 webinar on the EA.

DWPF recycle wastewater starting in 2023[4]. Further clarification is needed on when this waste would actually be disposed.

Subject waste sources are not well defined

The EA states that its scope encompasses a waste called "DWPF Recycle Wastewater," but there are many sources and processes associated with this waste stream that are not well defined in the EA.

- The EA states, "DWPF produces a dilute secondary aqueous radioactive waste stream known as DWPF recycle wastewater." This sentence implies a single generating process, but that is not the case. Multiple contributors to "DWPF recycle wastewater" are claimed. These contributers are separated into "major" and "minor" categories by volume.
    - The major contributors are listed as 1) condensates from processing tank sludge and salt waste prior to vitrification, and 2) condensed offgas from the vitrification melters. The term "processing" requires further clarification. What processing action prior to vitrification results in offgases that can be condensed as recycle wastewater?
    - Are the two listed "Major Contributors by volume" also the major contributors of radionuclides? If they are not, where are the radionuclides in the waste stream coming from, and in what proportion?
    - The "Minor Contributors" category contains names of waste types that are not defined, particularly "decontamination solutions" and "sump flushes." What has been decontaminated and what is the known radionuclide inventory resulting from this activity? Similarly, what sumps are flushed, and what constituents do those sumps contain?
    - The EA and the SRS Liquid Waste System Plan Rev 21 both describe, "beneficial reuse of DWPF recycle for waste removal and tank cleaning." The EA should make clear whether the DWPF recycle wastewater being considered for offsite disposal was used for tank cleaning, as this could introduce greater uncertainty in the inventory of radioactive constituents in the waste stream. If DWPF recycle is reused for tank cleaning, the contents may change over time, requiring additional characterization. A more variable waste stream would warrant more data than the limited sampling that supports this EA.

Given the uncertainties described above, the EA does not currently provide technical support for the implicit assertion that the sampling conducted to support this EA will be representative of the actual waste DOE proposes to dispose offsite in the future. DOE should provide additional quantitative information and process history related to the DWPF recycle wastewater composition expected at the time DOE plans to dispose of this waste.

[4] The SRS Liquid Waste System Plan Rev 21 states, "This System Plan assumes that in FY23, the DWPF recycle stream will be diverted for treatment outside of the Tank Farm, but a specific treatment path has not yet been selected. (Page 7)" This statement suggests that DOE may elect to implement the proposed action before 2031.

Environmental Impact Statement not needed, but greater traceability of disposal impacts is needed

Our view is that this particular proposed action does not constitute a major federal action warranting a full Environmental Impact Statement. In the case of a predominantly cesium-137 waste stream, disposal in a facility licensed to accept waste in these concentrations is a relatively simple prospect. However, it is critical to make the full basis for a waste determination available to the public as reprocessing wastes around the nation, long managed as HLW, begin to shift into a waste class destined for near-surface disposal.

We note that we can find no record of a final NEPA analysis for the Federal Waste Facility disposal cell at Waste Control Specialists (WCS) in Texas[5]. The need for such an analysis is supported by the fact that DOE performed a supplemental analysis to its Greater-than-Class-C (GTCC) EIS that specifically evaluated the disposal impacts associated with GTCC disposal at WCS. Further, the EA's stated purpose is to, "evaluate the capability to dispose DWPF recycle wastewater . . . at a licensed commercial facility," yet the environmental impacts associated with disposal in a commercial facility are not included in the EA.

Therefore, the existing EA does need to incorporate any existing Performance Assessment and NEPA analysis for the WCS and EnergySolutions facilities by reference and make them available in the Administrative Record.

Demonstrate attainment of performance objectives to satisfy the new HLW interpretation

Because this is DOE's first attempt to use its new interpretation of HLW, now is the time to establish that DOE will clearly document that each non-HLW determination will be accompanied by a full waste determination evaluation. This should encompass the generation of the waste through a traceable demonstration that the waste will meet the performance objectives of the disposal facility.

DOE's new HLW interpretation states that in order to classify a reprocessing waste as "non-HLW" one of two criteria need to apply:

1. Does not exceed concentration limits for Class C LLW as set out in 10 CFR 61.55 and meets the performance objectives of a disposal facility, or
2. Does not require disposal in a deep geologic repository and meets the performance objectives of a disposal facility as demonstrated through a performance assessment conducted in accordance with applicable requirements.

Between the initial Federal Register notice and the supplemental notice, DOE added the phrase "and meets the performance objectives of a disposal facility," to the first criterion. This addition is explicit recognition that merely meeting the concentration limits for Class C LLW is not sufficient to demonstrate compliance with DOE's new interpretation.

[5] The 2008 Draft Environmental Assessment that was contemporary to the initial WCS permit application contained several deficiencies identified by TCEQ, which resulted in license conditions requiring additional analysis. No follow-up environmental analysis can be found to exist. Similarly, no versions of the WCS license application or performance assessment are discoverable via the web.

This EA does not demonstrate to the public that disposal of the identified waste stream will meet the performance objectives of 10 CFR 61. Instead it is assumed that if the disposal facility has been licensed by its Agreement State and has Waste Acceptance Criteria (WAC), then any waste with concentrations that meet the WAC will automatically meet the 10 CFR 61 objectives. This is in contradiction to the FR Supplemental Notice, which states, "The technical means to demonstrate compliance with performance objectives are through a modeling and analytical tool commonly referred to as a performance assessment. Safe disposal also entails compliance with *other* facility requirements, such as waste acceptance criteria." (emphasis added) (FR 26835, p.5)

We can appreciate the attempt to streamline the regulatory process by not including the full cradle to grave analysis in this EA (represented by a waste- and facility-specific evaluation of disposal performance). However, if this is the only publicly available window into DOE's new non-HLW classification process, then as interested stakeholders we are not able to trace a technical basis for how this waste meets DOE's new criteria. A waste-specific analysis showing how the waste will meet the performance objectives of the disposal facility is necessary.

In order to complete the implementation of DOE's new HLW interpretation, DOE should trace the attainment of performance objectives for the target disposal facility and incorporate by reference the performance assessment that supports the claim. This performance assessment must also be readily available for public review[6].

DOE's new simplified non-HLW determination analysis so far appears to rest on the judgment by the Agreement State as represented by the Waste Acceptance Criteria. If the Agreement State has not made the basis for their judgment publicly available, then DOE should do so both to satisfy NEPA and to demonstrate compliance with their own new interpretation of HLW. The EA (or future formal waste determination evaluation) should also include a waste-specific justification connecting the DWPF recycle wastewater to the performance assessment and clearly explaining why this disposal environment will be safe for the duration of the radiation hazard.

Cross-country transport of liquid waste to be solidified does not pass the common sense test

We recognize that the evaluation of transporting the liquid waste to a commercial treatment facility in Richland, Washington is characterized as a "bounding analysis" of transportation impacts. Nevertheless, we would be remiss not to comment that the transportation of a liquid waste from South Carolina to Washington for solidification, then back to Utah or Texas for disposal, would be a nonsensical journey. Further, we perceive that the analysis leans too heavily on a low estimated probability of a fatal accident or an associated release of waste into the environment, without proper consideration of whether the consequence of misfortune is warranted.

[6] Our research found that the Performance Assessment and associated analysis supporting WCS is not available for public review without submitting a public records request to the State of Texas, subjecting the requested records to a confidentiality evaluation by the state Attorney General's office, and paying associated fees.

Management of all reprocessing wastes as HLW until otherwise classified

We wholeheartedly support the statements made in the EA and during the December webinar that, "DOE will continue its current practice of managing all its reprocessing wastes as if they were HLW unless and until a specific waste is determined to be another category of waste based on detailed assessments of its characteristics and an evaluation of potential disposal pathways." We interpret the phrase "all its reprocessing wastes" to include tank wastes that leaked or were otherwise released into the environment.

We interpret that the definition of HLW in the Nuclear Waste Policy Act of 1982 applies as soon as material "results" from reprocessing activities. It does not indicate that the definition ever ceases to apply, or only applies once waste has been exhumed for disposal. We strongly encourage the DOE to formally document that this practice applies across the EM complex.

Removal of Key Radionuclides to the Maximum Extent Practical

Under the Waste Incidental to Reprocessing classification structure that preceded DOE's new interpretation, the first criterion for making a determination that a waste is not HLW required removal of key radionuclides to the maximum extent practical. While DOE has proposed to make this criterion no longer relevant, we will evaluate DOE's proposed action against it anyway.

As previously stated, the wastewater in question is expected to contain approximately 500 Curies of Cs-137, which has been historically treated as a "key radionuclide" pertinent to the HLW definition. DOE's argument has been that if a disposal facility's Waste Acceptance Criteria would already cover a waste containing cesium-137 in this concentration, it is inefficient to conduct further removal. In the case evaluated here, we agree, although we believe DOE could also have made a defensible justification within the structure of the existing WIR process. We see a defensible argument under the WIR process that further Cs-137 removal would not pass the test of "practicality" given the low relative risk, the high cost of additional pretreatment, and the consequent creation of a new, more concentrated Cs-137 waste stream that would present a relatively greater risk to a future intruder. In this instance, additional pretreatment would also not provide additional certainty about the composition of the waste prior to final disposal.

Where we continue to see a useful role for the "key radionuclides" criterion is for the in-place closure of tanks or contaminated soil sites in future waste classification determinations. We perceive the classification of waste to be sufficiently different when contemplating a well-characterized and packaged waste for disposal in an engineered facility versus a poorly or incompletely characterized waste residual that DOE may propose to leave behind in a makeshift environmental remediation context (e.g., placing a cap over a tank with no liner). The "key" aspect to the "key radionuclides" in this case is the uncertainty regarding their concentration and distribution, and consequently the nature of the long-term hazard that must be managed. Therefore, additional precautionary preventative measures to remove as many of these radionuclides as practical may be warranted.

Our views are consistent with those of the Nuclear Regulatory Commission (NRC) in their comments on DOE's Federal Register Notice[7]. The NRC also discriminated between a waste packaged for offsite disposal versus an in-situ waste management decision when determining the benefit to human health and the environment from additional removal of key radionuclides.

We also want to point out that the interpretation of what constitutes "key radionuclides" may be changing with time and greater experience, much like the HLW definition itself. The original HLW definition from Congress includes the term, "any solid material derived from such liquid waste that contains fission products in sufficient concentrations." At a recent meeting of the National Academies of Sciences, one of the panel members made the observation that the lesson from the Yucca Mountain licensing experience was that, "we were focusing on the wrong radionuclides," and the long-lived mobile radionuclides tend to be the key drivers of long-term risk[8]. Oregon will continue to interpret the definition of HLW to include any waste with "sufficient concentrations" of those isotopes such as Tc-99 and I-129 that could pose a long-term threat to groundwater, and we will continue to advocate for their removal from reprocessing wastes to the maximum extent practical before disposing them in a near-surface environment.

We continue to see value in an NRC review of non-HLW determinations

In 2015, the NRC performed a preliminary review of the WCS GoldSim Performance Assessment model on behalf of the Texas Commission on Environmental Quality (TCEQ)[9]. Their preliminary review of this model – developed to support the potential disposal of depleted uranium at WCS and the removal of disposal limits for technetium-99 and carbon-14 – found many areas of potential concern in the model methodology. Among these concerns were the degradation rate of grout, the starting inventory of waste, and the distribution coefficients for radionuclide transport. The resolution of the NRC's comments has apparently been recently completed to the satisfaction of Texas and the NRC (TCEQ, Pers. Comm.), but the documentation of this resolution is not readily available for public review.

The NRC's preliminary review is further evidence of Oregon's repeated point that an independent review by a technical peer organization is an essential check on the quality and safety of a disposal decision. This review also highlights the importance of having a documented technical justification in order to demonstrate that a waste can meet the performance objectives of a disposal facility as required in DOE's new interpretation of the HLW definition.

In DOE's Supplemental Notice Concerning its interpretation of HLW (84 FR 26835), we and others stated a concern that implementation of the proposed new interpretation would not have rigorous independent oversight of DOE's waste determination evaluations. Specifically, we objected to the lack of required involvement by the NRC in non-HLW determinations. In their response, DOE stated that they are a member of a community of radioactive waste management professionals, and they would not easily deviate from the norms and standards of that community. DOE also stated that they would

[7] https://www.nrc.gov/docs/ML1901/ML19010A136.pdf

[8] Comment by a member of the National Academies of Science, Engineering, and Medicine at a public meeting for the project "Supplemental Treatment of Low-Activity Waste at the Hanford Nuclear Reservation". http://dels.nas.edu/Study-In-Progress/Supplemental-Treatment-Activity-Waste/DELS-NRSB-17-02

[9] https://www.nrc.gov/docs/ML1219/ML12198A060.pdf

continue to maintain a strong relationship with the NRC regarding waste classification and disposal issues.

With these previous responses in mind, we request that DOE identify how it will involve independent third parties in the evaluation and classification determination for the waste stream subject to this NEPA analysis.