

# HANFORD ADVISORY BOARD

*A Site Specific Advisory Board, Chartered under the Federal Advisory Committee Act*

**Advising:**

US Dept of Energy  
US Environmental  
Protection Agency  
Washington State  
Dept of Ecology

March 4, 2010

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Re: Tank Closure and Waste Management Environmental Impact Statement Comments

Dear Ms. Burandt,

## **Introduction**

The Hanford Advisory Board (Board) recognizes the importance of the draft Tank Closure and Waste Management Environmental Impact Statement (TC&WM EIS) in supporting cleanup decisions at Hanford. This draft TC&WM EIS will provide the basis for cleanup decisions with impacts far into the future. The Board has a long standing interest in this draft since before 2002, when we provided advice regarding the Draft Hanford Solid Waste Environmental Impact Statement (SWEIS), the predecessor of the current draft TC&WM EIS. We thank the U.S. Department of Energy (DOE) for engaging the Board during the development of the current draft TC&WM EIS and for heeding our recommendation to provide the public opportunities to comment on the document in multiple locations in Washington, Oregon and Idaho.

This draft TC&WM EIS is incredibly complicated and the Board does not support in total the package of options contained in any of the alternatives that were presented in the draft document. Instead we will provide you with values-based advice on both the positive and negative elements in the draft document. We have also provided comments and divided the comments and advice into categories that seem appropriate for clarity. Please do not interpret our silence on any given element of the draft TC&WM EIS as an expression of concurrence with that element. The Board expects to continue to engage in an active dialogue with DOE as they respond to and incorporate comments received.

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Hanford Advisory Board  
Subject: TC&WM EIS Comments  
2010-02  
Adopted: March 4, 2010  
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## **OVERARCHING COMMENTS**

### **Background**

The Board has used its independent contractor's analysis of the draft TC&WM EIS to formulate many of the following comments and advice.<sup>1</sup>

The draft TC&WM EIS analyzes a series of potential actions. Many of the actions discussed are integral to the cleanup of the site and are governed by state and federal environmental laws. The full investigation, analysis and decisions on these actions will be made by the regulatory agencies [Washington State Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA)] and not by DOE as a result of this draft TC&WM EIS. This draft will and should support their analyses and decisions.

It is incumbent on both the DOE Richland Field Office (DOE-RL) and the DOE Office of River Protection (DOE-ORP) in proposing various actions in this draft TC&WM EIS, to show that their proposals will conform to the policy and specific directions provided by the National Environmental Policy Act (NEPA) to:

*"...prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man"; "...recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man"; "...without degradation, risk to health or safety, or other undesirable and unintended consequences"; "The Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall –"; "...insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations;"*  
*(40 CFR 1508.7) "Cumulative impacts...the impact on the environment which results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions..."*

Most tank closures and the waste management alternatives appear to lack necessary actions to ensure that the soil and groundwater are not further contaminated, that risk to the environment and human health does not increase in the future, and that the soil and groundwater are restored.

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<sup>1</sup> K.D. Auclair & Associates, LLC, (March 4, 2010). *Hanford Tank Closure & Waste Management Environmental Impact Statement External Independent Review Team Preliminary Assessment Report*.

Per Board Advice #197 *Groundwater Values*, and Board Advice # 173 *Central Plateau Flowchart*, the preferred alternative should not harm groundwater, should return groundwater throughout the entire plume to best use in the near future, and capping waste sites should be considered as a last resort and then only if retrieving, treating and disposing waste is not technically feasible. Treatment waste forms should ensure protection of these values and should minimize contamination of groundwater. The Board has a long-standing belief that DOE should not claim that any shallow soil, vadose zone or groundwater is irretrievably and irreversibly committed to a restricted use category.

### **Advice**

- Considering the breadth and depth of comments to the current draft TC&WM EIS and the potential impact on cleanup decisions based on the TC&WM EIS, the Board advises DOE to issue a revised draft TC&WM EIS for public review before finalizing the TC&WM EIS.

Decisions on cribs, trenches and tile fields should continue to follow Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) processes. Cumulative and composite impact analysis of the 200 Area vadose zone should be done to inform future RCRA and CERCLA decisions. Points of compliance should be established at the boundaries of the waste management unit.

- Transparency of quality assurance and quality control is either lacking or not presented. The Board recommends that during the revision and incorporation of comments to the draft TC&WM EIS, DOE use more recent available data to enhance the accuracy of the draft.
- The Board recommends the draft TC&WM EIS should discuss Washington State's environmental exposure standards for both toxic chemicals and radiation dose in a manner that is understandable by the public.
- The draft TC&WM EIS should discuss Washington State's regulatory philosophy for limiting the overall lifetime cancer risk for the most highly exposed member of the public that is likely to accrue from all components of exposure (chemical and radiation).

- The Board recommends that DOE focus its future decisions on detailed considerations of the maximum likely drinking water contamination and individual radiation dose for each cleanup alternative as a means of ranking each alternative in terms of potential health risk.
- The Board recommends that DOE-RL and DOE-ORP use consistent exposure scenarios in all of their environmental impact statements.
- The draft TC&WM EIS should present estimates for full life cycle cost analysis using both current year and present value dollars (including estimated costs for natural resource restoration) and risk analyses in all of the alternatives.
- In addition to and preceding the executive summary, the Board recommends DOE include a two or three page high-level summary, in language the public can understand, describing the short and long term impacts of each alternative and why DOE selected its preferred alternatives.
- DOE should include an alternative that meets established standards that are protective of human health and the environment.
- Each alternative presented in the draft TC&WM EIS should be amended to identify mitigation to protect the soil, groundwater, environment and uncounted future generations.
- DOE should document how Quality Assurance/Quality Control (QA/QC) procedures and protocols were used in the performance of the draft TC&WM EIS analysis.
- DOE should revise the draft TC&WM EIS to evaluate cumulative risk in a rigorous way, examining a broader and more representative range of the ninety-eight potential combinations of alternatives evaluated for cumulative risk. This revision will ensure sufficient precision to make decisions among the various combinations of alternatives.
- As part of the cumulative risk analysis, DOE should present alternatives that are based on the present and reasonably foreseeable remediation actions for the vadose zone and groundwater conducted under CERCLA and RCRA (such as pump and treat and vapor extraction).
- As noted by the Board's independent contractor's analysis, there appears to be a number of unit conversion or data errors. These errors raise serious doubts about the quality of the

analysis. DOE should thoroughly review the draft TC&WM EIS and the revised draft TC&WM EIS to ensure that such errors are found and corrected.

## ***TANKS***

### **Background**

Waste has leaked from the tanks, pipelines and related facilities, along with hundreds of millions of gallons that have been discharged from the tanks system. Much of this contamination has moved deeply into the soil. This contamination, combined with more recent contamination, and with residual wastes which may remain in tanks, pipelines, and related facilities, constitute the source term for the tank waste portion of the draft TC&WM EIS analysis. The characterization of the vadose zone contamination is limited which imposes limits on how well the TC&WM EIS team can estimate the waste impacts. The Board is concerned that the analysis may understate the degree of contamination in the vadose zone and give false assurance to decision makers and the public about how much is known about the location, amount and movement of these wastes.

This contamination, particularly in the deep vadose zone, is moving. This leads the Board to conclude that there is great urgency to understand where it all is, how it is moving, and what can be done to remedy that, as well as how to protect the groundwater directly beneath the tank farms and waste sites as well as everywhere on site. The Board believes DOE will likely have to treat the soil to remove various contaminants either in place (through soil washing or other means) or after exhumation.

Because the single shell tanks (SSTs) and related facilities are already at twice their original design life and as there is inherent uncertainty in how much longer they may be relied on to contain the wastes, it is urgent that the wastes currently in SSTs be removed as expeditiously as possible. The current plan relies on the Waste Treatment Plant (WTP) to process tank wastes starting in 2019, thereby providing space in the double-shell tanks (DSTs) to retrieve the remaining SSTs.

Historical precedent in the agency for such complex facilities suggests that DOE should not depend entirely upon the immediately successful operation of WTP on the planned schedule.

### **Comments**

As stated in the draft TC&WM EIS, there is “considerable” uncertainty in the composition of the waste in SSTs. The sampling of the tanks was limited and complicated by the liquid and solid makeup of the tank waste. These limited data do not allow for the high confidence in the estimates of the tank waste compositions used in the draft TC&WM EIS.

The draft TC&WM EIS modeled impacts from leaving waste in the tanks as if the contents are homogenous, but they are not. The impacts modeled for DOE’s preferred alternative to allow one percent of the volume to remain as a heel are based on the contaminant inventory when the tanks were full of liquid and solid waste. The final one percent may contain far more than one percent of heavy metal radionuclides of concern. Conversely, a smaller fraction of the soluble contaminants may be present in the tank residuals.

The estimates of tank waste in the vadose zone consider only known leaks from tanks, pipelines and surface releases. These estimates probably understate the real size of the releases.<sup>2,3,4,5</sup> The estimates appear to omit significant non-leak tank release events, such as tank overflows, other miscellaneous releases, and the quantity of waste in auxiliary equipment appears to be an extrapolation of an estimate which may differ greatly from the actual contents.

The draft TC&WM EIS reports that only relatively clean cooling water was disposed to ponds. Yet, surface contamination in the ponds and ditches was severe. Characterization of the vadose zone beneath the trenches and ponds is needed to establish the severity of the problem. Significant amounts of vadose zone contamination beneath the ponds and ditches do not appear to be included in the draft TC&WM EIS.

The draft TC&WM EIS indicates that high volume streams containing modest levels of contaminants were discharged to cribs and trenches.<sup>6</sup> However, the waste stream disposed in the cribs and tile fields on the west side of the T Tank Farm was tank supernate that flowed from the third tank in a three tank cascade. It is unlikely that 150 million gallons of tank supernate contributed less than a curie of technetium to the vadose zone (Table D-28).

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2 TC&WM EIS D.1.4 “Historical Leaks and Other Releases.” Estimates of tank waste in the vadose zone consider only known leaks from tanks. The estimate does not include or estimate non-leak tank events, such as overflows (e.g. Tank T-101).

3 Presentation to Hanford Advisory Board on Behalf of the Nez Perce Tribe, Feb. 16, 2010, “TC&WM EIS Chemical Cumulative Impact Does Not Take Into Account 96% of the Uranium on Site” – Comparison of PNNL 15829 - 3610.43 Ci to TC&WM EIS for non-EIS (cumulative impact Appendix S) sites cited - 3,220 Ci.

4 Bernhard, et al for the Nez Perce calculates total uranium from PNNL 15289 =  $6.69 \times 10^6$  kg. TC&WM EIS reports total uranium as  $2.73 \times 10^5$  kg.

5 TC&WM EIS Appendix S reports 1,820 curies of uranium disposed in US Ecology. PNNL 11800 (1998) reports greater than 10,800 curies disposed – a difference of an entire magnitude.

6 RPP-23405, Revision 0, “Tank Farm Vadose Zone Contamination: Volume Estimates For Risk Assessments,” J. G. Field, T. E. Jones, December 2004.

The trenches, cribs, and tile fields around the TX and TY Tank Farms received considerable amounts of waste. 216-T-25 received 3 million gallons of evaporator concentrates containing more than 200 curies of technetium. Table D-28 reports total technetium 99 disposed in the TX Trenches as 1.62 curies. The T-19 crib and tile field at the south end of TX-TY received an estimated 120 million gallons of evaporator condensate containing high concentrations of tritium and iodine. These substantial waste volumes appear to have been omitted from the draft TC&WM EIS.

The Board is concerned that these problems may be indicative of a larger and more systemic underestimation of the levels and amounts of vadose zone contamination.

### **Advice**

In its revised draft TC&WM EIS, the Board recommends DOE should:

- Evaluate the actual composition (radionuclides and hazardous constituents), mass and volume that are likely to exist in each tank heel, and between the inner steel tank and the concrete shell of each tank on a tank by tank basis. Analyze the impacts from DOE's preferred alternative to leave one percent of the tank waste volume as a heel in the tanks based on a more conservative assumption than the waste is homogenous. The analysis in the current draft likely misinterprets the impacts by assuming that the concentration of contaminants in the heel is in the same proportion in the overall waste volume.
- Consider a reasonable alternative for providing additional tank capacity and/or other new facilities to allow for continued retrieval of SSTs prior to the WTP beginning full operation, and after operation when current projections are that retrieval will have to halt.
- Do more characterization of the fate and extent of contamination from wastes leaked or released from tank farms and related pipelines, transfer boxes and cribs or other structures that may have discharged tank wastes to the soil.
- Should also have estimates of non-leak tank release events, such as tank overflows, other miscellaneous releases, and undated leak events in the draft TC&WM EIS. The draft should include the uncertainty in that estimation. These estimates should be found in the broad scale uncertainty estimates in the modeling.
- Evaluate an alternative for tank waste management that results in compliance with all applicable standards.

- Reassess the discharge estimates for the cribs and tile fields associated with T, TX and TY tank farms to ensure that the best available information was used and that uncertainties in those estimates are fully addressed. If significant data were missed for these facilities, the draft TC&WM EIS should reassess the discharge estimates for such facilities associated with all tank farms.
- Include an estimate of the contamination beneath ponds, ditches and other release sites contaminating the vadose zone and the uncertainties in the risk estimates as part of the cumulative analysis.

## ***WASTE MANAGEMENT***

### ***Background (Waste Management)***

NEPA requires that environmental impact statements present a reasonable range of alternatives and disclose and consider the impacts of all related pending federal agency proposals for action, including cumulative impacts.

The Board opposes further consideration or implementation of the importation and disposal of off-site low-level waste (LLW) and mixed waste (MW) at Hanford due to the high impacts to groundwater and risk from existing wastes, and the documented increase in impacts projected from offsite waste.

### ***Advice (Waste Management)***

- The draft TC&WM EIS should present an alternative which does not use Hanford as a national radioactive waste disposal site for LLW or MW.
- The draft TC&WM EIS should present an alternative which will exhume and dispose off-site significant quantities of Hanford's long-lived radioactive waste (e.g. pre-1970 buried transuranic waste).
- DOE should withdraw its February 2000 Record of Decision (ROD) which designated Hanford as a national waste disposal site for LLW and MW.

### ***Comments (Groundwater)***

The draft TC&WM EIS identifies unacceptably high impacts to human health and the environment from contamination which will reach the groundwater from on-site disposal of existing waste and wastes which are projected to be created during Hanford cleanup. These



impacts are compounded by existing high levels of contaminated groundwater and future groundwater contamination from the vadose zone, as projected from the draft TC&WM EIS alternatives presented. Secondary waste disposal from the WTP and tank farm closure activities are also expected to cause significant groundwater impacts. Technetium and iodine are drivers for elevated impacts. Adding off-site waste greatly increases these impacts. The Board has a long held value for DOE to return groundwater quality to its highest beneficial use.

#### **Advice (*Groundwater*)**

- Choose a preferred alternative that will restore all groundwater to beneficial use throughout the plumes.
- For the combined groundwater analysis, DOE should consider an alternative which would remove and treat long-lived, extremely radioactive or mixed chemical hazardous wastes for disposal in deep geologic repositories or regulated off-site landfills which are not projected to cause contamination in excess of relevant standards [e.g. remove and dispose in a deep geologic repository radioactive or mixed wastes buried before 1970 or in soil discharge sites; and, remove and dispose of tank farm equipment, piping, equipment and residues as Greater Than Class C (GTCC) – like waste in a geologic repository]. The combined groundwater analyses should also be presented with and without the contribution from a "closed" U.S. Ecology landfill.
- The draft TC&WM EIS should examine additional treatment processes for immobilization for technetium storage and/or disposal options to minimize release to the groundwater.
- The draft TC&WM EIS should adequately report all chemical inventories from all disposal sites at Hanford (including non-DOE Environmental Management (EM) disposal sites, e.g. U.S. Ecology) to ensure a credible analysis of the actual and potential cumulative impact to groundwater.
- Points of compliance should be established at the boundaries of the waste management unit.
- Points of analysis should be established at unit boundaries, geographic area boundaries, along the Columbia River, and other points of concern.

- To inform decision-makers and the public of the impacts from potential actions, the Board advises that the revised draft TC&WM EIS provide current concentrations and estimate future maximum concentrations for all potential contaminants, not just concentrations in groundwater which occurred in the past.
- In the revised draft TC&WM EIS, DOE should analyze and disclose cumulative impacts for exposure to all sources at the point of highest contamination, where it is foreseeable that there will be future wells, buildings or intrusions.
- DOE should:
  - Revise the draft TC&WM EIS to address groundwater remediation in accord with Board Advice #197.
  - Revise the draft TC&WM EIS to evaluate how remediation of waste sites may alter groundwater flow patterns and movement of groundwater contamination.
  - Emphasize the potential impacts on human health and the environment from the largest predicted sources of impacts: B/C cribs, past-practice discharges to cribs, trenches, ditches, ponds, and past leaks and releases from SSTs, pipelines and transfer boxes.
  - Not portray lesser impacts that fail to meet regulatory standards as insignificant. All of these impacts should be remedied.
  - Address and include anticipated new technology development and use for addressing groundwater and vadose zone contamination.

### **Comments (*Waste Importation*)**

The Board believes that DOE contradicts itself in the draft TC&WM EIS by seeking to include the import and burial of 82,000 cubic meters of off-site waste (approximately 3 million cubic feet of waste) while also saying that it will honor a moratorium on importing waste until the WTP is operational – projected for the year 2022. Importation of this waste is projected in the draft TC&WM EIS to increase the contamination levels in groundwater by as much as tenfold above the impacts projected for key contaminants of concern for on-site waste. It could reach a cancer risk level for groundwater in excess of one hundred times Washington State’s cancer risk standard for cleanup and landfills.

The draft TC&WM EIS does not include a reasonable alternative to adding more waste to Hanford. The draft TC&WM EIS analysis presents two alternatives for disposal of imported waste at the Integrated Disposal Facility in 200 East and for both 200 East and West. The draft document clearly shows both alternatives have contaminants above legal standards due to quantities and composition of the projected wastes disposed. DOE should have and did not consider an alternative that did not import waste for disposal at Hanford. The appendix notes that a significant portion of the off-site waste may be extremely radioactive remote-handled wastes and contain large amounts of transuranic (TRU) elements whose concentrations are just below the threshold which would require disposal in a deep geologic repository.

#### ***Advice (Waste Importation)***

- DOE should adopt a ROD that it will not add more waste to Hanford, for reasons including the projected contamination levels in groundwater from existing wastes.
- The Board advises DOE and Ecology to bar receipt, from off-site, of any unvitrified or “good as glass” technetium or iodine bearing waste streams that could be released to the soil.
- The draft TC&WM EIS should include specific conditions to mitigate impacts from all waste supposed for disposal, which include treatment methods and waste acceptance criteria, to prevent contamination of groundwater above standard from any landfill.
- DOE should revise and reissue the draft TC&WM EIS with analysis of the direct and cumulative impacts of the pending proposal to import and bury GTCC wastes at Hanford.
- DOE should revise the draft TC&WM EIS to update the 2004 SWEIS analysis and to present route specific transportation impacts and enable the public along all potential truck routes to have notice of potential shipments.
- The draft TC&WM EIS should include the transportation impacts of all pending proposed shipments (e.g. including GTCC wastes and sodium contaminated wastes) along with route specific potential, accident or terrorist caused impacts.

#### ***Comments (Retrieval/Capping)***

The draft TC&WM EIS’s cumulative impact analysis projects that the Hanford Site will persist in re-contaminating groundwater and the Columbia River over thousands of years. Persistent contamination will continue long after current allocated budgets and identified

cleanup are done. There is no acknowledgement within the current draft of the potential to drive down cumulative impacts by initiating additional retrieval from burial grounds, tank leaks, tank bottoms and other sources where there are significant amounts of waste discharges and buried waste. Lack of characterization data pose a problem for a defense of leaving the waste in place.

The Board has clearly advised that the agencies utilize remedies which remove, treat and dispose of waste (Advice #197). The impacts from relying on caps without prior remediation are shown to exceed relevant standards in the draft TC&WM EIS modeling. Within the draft document, DOE does not discuss Washington State requirements to remove contamination to the degree practicable before capping.

The estimated risk arising from the quantity of waste already in the ground at Hanford and from the proposed volumes to be buried in shallow landfills after being generated during vitrification and other processes exceeds Model Toxicity Controls Act (MTCA) standards. Mitigation actions should be identified to reduce this risk to meet regulatory standards. These risks would be further compounded by DOE's intention to add more waste to the site.

#### ***Advice (Retrieval/Capping)***

- The draft TC&WM EIS should evaluate the potential to reduce the cumulative impacts by exploratory exhumation of buried waste sites, to the degree practical, before capping.
- The draft TC&WM EIS should contain an evaluation of the need for further characterization of wastes proposed to remain buried under caps.
- The draft TC&WM EIS should consider reasonable alternatives which would remove and treat long-lived, extremely radioactive or mixed chemical hazardous wastes for disposal in deep geologic repositories or regulated off-site landfills.
- The draft TC&WM EIS should consider and disclose to the public for comment mitigation actions that could be applied to landfills and other waste management units to achieve compliance.

#### ***Comments (Chemical Inventory)***

The chemical inventory appears to be incomplete as reported in the draft TC&WM EIS. Certain chemicals are missing or under-reported from the non-tank inventories (e.g.

numerous volatile organic chemicals in burial grounds, metals and uranium volumes)<sup>7</sup>. Certain chemical analyses seem to be lacking as well. Uranium, which has to be considered a toxic metal as well as a radionuclide, is under-reported for tank discharges and leaks<sup>8,9,10</sup>. It is also missing from the chemical toxicity inventory for proposed imported wastes along with volatile organic chemicals.

### **Advice (*Chemical Inventory*)**

- The draft TC&WM EIS should include documentation of all hazardous chemical constituents (e.g. chemicals known to be disposed in or releasing from landfills; total uranium).
- The draft TC& WM EIS should adequately report all chemical inventories from all disposal sites at Hanford (including non-EM disposal sites, e.g. U.S. Ecology) to ensure a credible analysis of the actual and potential cumulative impact to groundwater.

### **Comments (*Modeling*)**

The alternatives analysis is based on one deterministic model, with limited model runs and lack of documentation. The draft TC&WM EIS applies the model site-wide, although it does not appear to be comprehensive in quantifying all needed criteria for analysis.

Additionally, there is no concerted or documented attempt to address the propagation of uncertainties between the various parts of the draft TC&WM EIS important to analyzing long-term consequences within the draft TC&WM EIS subject areas of Environmental Consequences and Cumulative Impacts.

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7 While hard data on the quantities disposed is impossible to determine without characterization, the draft TC&WM EIS ignores all the VOCs with the exception of Carbon Tetrachloride – comparing WA MTCA investigation of US Ecology to chemical inventory data in Appendix S; comparison of Appendix S Burial Ground data for Uranium in Curies to reported kilograms Ur for chemical inventory (e.g., US Ecology, W-3, W-4A, W-5 burial grounds) – by Richard Heggen for Heart of America Northwest.

8 Ibid - TC&WM EIS D.1.4 “Historical Leaks and Other Releases.” Estimates of tank waste in the vadose zone consider only known leaks from tanks. The estimate does not include or estimate non-leak tank events, such as overflows (e.g. Tank T-101). Comparing RPP-7494, Rev. 0, (2001) to TCWMEIS for intentional releases to cribs, trenches, etc... from A, AX and C Farms.; and, Floyd Hodges, Ph.D. memo to HAB regarding estimates of tank waste in the vadose zone (D.14) failing to report non-leak events such as T-101 overflow.

9 Ibid - Presentation to Hanford Advisory Board on Behalf of the Nez Perce Tribe, Feb. 16, 2010, “TC&WM EIS Chemical Cumulative Impact Does Not Take Into Account 96% of the Uranium on Site” – Comparison of PNNL 15829 (3610.43 Ci) to TC&WM EIS (3,220 Ci) for non-EIS (cumulative impact Appendix S) sites cited.

10 Ibid - Bernhard, et al for the Nez Perce calculates total uranium from PNNL 15829 =  $6.69 \times 10^6$  kg. TC&WM EIS reports total uranium as  $2.73 \times 10^5$  kg.

New sample modeling data show contamination levels higher than projected in the draft TC&WM EIS's model (e.g. chromium upwelling into the Columbia River and contamination spreading from tank leaks and discharges). The Board believes the draft TC&WM EIS model is not conservative.

### ***Advice (Modeling)***

- The draft TC&WM EIS should be transparent so a reader can follow the modeling development and documentation of input/output process controls and modeling uncertainties.
- The draft TC&WM EIS should document propagation of uncertainties between the various parts of the draft TC&WM EIS and attempt to quantify their consequences.
- The draft TC&WM EIS should incorporate more recent sampling data and inventories which have been identified as incomplete or missing to reduce model uncertainty.
- The draft TC&WM EIS should recognize and report on the uncertainty in the tank waste compositions.
- DOE should revise the draft TC&WM EIS to base it on the International Standard Features, Events and Processes. DOE has already identified this basis as a standard approach to identify the conceptual issues needing to be evaluated and modeled to include all important factors that may influence how contaminants may move in the environment and how people may be impacted.
- Analyses of impacts to groundwater should be considered by the potential effects of increased water infiltration due to climate change or actions such as construction of Black Rock Dam.

### ***Comments (Applicable Law)***

The draft TC&WM EIS does not discuss and consider the relevant state cleanup standards from MTCA in comparing projected contamination levels to what are referred to in the draft TC&WM EIS as "benchmark standards." MTCA standards are ten times more protective of human health for cancer risk than the levels shown in the draft TC&WM EIS.

Additionally, Washington State's State Environmental Policy Act (SEPA) requires that an agency disclose for comment specific conditions that will mitigate projected impacts to bring a facility into compliance, and requires enforceable commitments as part of SEPA. NEPA requires that DOE disclose and consider a range of reasonable alternatives. In the Board's opinion, the draft TC&WM EIS does not present a range of reasonable alternatives to: a) using Hanford as a national waste disposal site or, b) retrieving, treating and removing wastes from Hanford for disposal in geologic repositories and landfills which are not projected to cause impacts to groundwater and would meet compliance standards.

### ***Advice (Applicable Law)***

- Revise the draft TC&WM EIS to conform to the new draft guidance from the Council of Environmental Quality requiring all NEPA analyses to consider long-term impacts of climate change.
- The Board recommends revision and reissuance of the draft TC&WM EIS for public comment with identification of specific mitigation efforts that could bring proposed landfills and other waste management units into compliance with relevant state and federal standards.
- The Board advises Ecology that it: a) should not accept the draft TC&WM EIS for use in RCRA/Hazardous Waste Management Act permit decisions under SEPA if it is not revised for additional opportunities for public comment to identify mitigation conditions which would prevent landfills and units from exceeding state and federal standards; b) should not accept the draft TC&WM EIS for SEPA purposes if it is not revised and reissued for comment to consider state health based cleanup standards under MTCA in comparison to projected contamination levels; and, c) discuss potential benefits from meeting state regulations requiring removal of contamination to the extent practicable prior to use of caps and a landfill closure remedy.
- The draft TC&WM EIS should show the public and decision-makers how the proposed actions and alternatives will impact groundwater when evaluated against MTCA which should be applied for landfill permits or cleanup decisions.

### ***PUBLIC INVOLVEMENT***

## **Background**

The draft TC&WM EIS is a very significant opportunity for the public to understand the range of actions for major Hanford cleanup decisions relating to high-level nuclear waste tanks and waste management and disposal, and the impacts of those potential alternative decisions. The process began in 2009 with great hope when DOE joined the Board in recognizing this significant potential and Assistant Secretary Triay committed to an extended public comment period. This extended public comment period has enabled DOE to hold eight public hearings around the Northwest, which the Board applauds and hopes will set a precedent to enable the public across the region to discuss and comment on major Hanford cleanup decisions in the future.

However, the Board notes that DOE did not prepare and provide meaningful notice and it did not significantly change the notice despite input from Board members and citizen groups. The notice prepared by DOE was difficult to read, and failed to provide impacts from proposed actions. The burden of providing notice to encourage turnout fell upon citizen groups and the State of Oregon. Hundreds of people attended public hearings, yet Heart of America Northwest's evaluation forms showed that many were not aware of DOE's notices.

## **Comments**

Since the draft TC&WM EIS was, in relation to the waste management scope, a re-do of the SWEIS, DOE was asked repeatedly to provide summaries of the draft TC&WM EIS and notice of hearings to the thousands of people who asked to be on the notice list, commented on, and/or attended hearings on the SWEIS. We believe that most people did not receive notice from DOE, which undermines the public participation goals for the TC&WM EIS.

The summary document in the draft TC&WM EIS did not present the long-term impacts of the preferred alternatives and other reasonable alternatives for those wanting to review and comment on the draft document without reading 6,000 pages. The document had a significant bias by presenting short-term impacts from retrieving wastes and contamination without a section discussing the long-term health and environmental impacts from not retrieving wastes.

The draft TC&WM EIS also does not present in an easy to understand comparison the potential impacts of each element of an alternative. The alternatives instead overlap making it difficult to discern incremental impacts from each action.



Each alternative combination within the draft TC&WM EIS, which included cleanup actions recommended by the Board such as remediating to the extent practical for tank leaks and discharges, contain unacceptable proposed actions on other decisions. The summary and DOE presentations also discouraged public comment by insisting that DOE would not consider alternative combinations of remedial actions.

### **Advice**

- The draft TC&WM EIS should be revised and reissued for public comment with a clear description of the long term impacts and benefits from preferred alternatives presented in the summary and in notices, including comparisons of state standards to projected impacts and, full disclosure and consideration of related pending proposals with cumulative impacts.
- DOE should take comment on a revised draft TC&WM EIS which allows the public to easily comment on each individual proposed action separately.
- DOE should work closely with the Board and stakeholder groups in designing effective public notices and hearing locations for a revised draft TC&WM EIS. The Board recommends this collaboration should be part of all Tri-Party Agreement (TPA) and DOE notice processes, and a 45-day notice should be provided to stakeholders prior to hearings so they can prepare and mail notices and conduct other public turnout and education activities.
- DOE should add everyone who signed in at the TC&WM EIS hearings to the TPA Hanford Clean-Up mailing and email lists, unless they opt out.
- DOE should record both the presentation and question and answer periods at the hearings, to ensure consistency and accuracy in the information relied upon by the public to comment.
- DOE and the TPA agencies should continue to provide for alternative viewpoint presentations and availability of tables and presentation space for pre-hearing workshops, which significantly aid the public in commenting.
- DOE should prepare summaries (fact sheets) of each proposed action and the long-term impacts for alternatives under each action for use by the public before DOE issues the final TC&WM EIS. Summary documents showing potential impacts and mitigation measures should be developed for each element of the pending RCRA permit. DOE and

Ecology should work with the Board's Public Involvement Committee and stakeholder groups to design these and plan for dissemination.

Sincerely,



Susan Leckband, Chair  
Hanford Advisory Board

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*This advice represents Board consensus for this specific topic. It should not be taken out of context to extrapolate Board agreement on other subject matters.*