HANFORD ADVISORY BOARD

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

EnviroIssues
Hanford Project Office
713 Jadwin, Suite 3
Richland, WA 99352
Phone: (509) 942-1906
Fax: (509) 942-1926

September 7, 2012

Jane Hedges, Program Manager
Washington State Department of Ecology
3100 Port of Benton Blvd.
Richland, WA 99354

Re: Hanford Facility Dangerous Waste Permit

Dear Ms. Hedges,

Background:

The Draft Hanford Facility Dangerous Waste Permit for the Treatment, Storage, and Disposal of Dangerous Waste (Permit) is the Washington State Department of Ecology's (Ecology) tool for regulating hazardous waste at Hanford. The Permit establishes conditions that the U.S. Department of Energy (DOE) and its contractors must meet to protect human health and the environment during the construction, operation, cleanup, closure, and post-closure of Hanford Site facilities. The Permit, last released in its entirety for review and public comment in 1994, is complex, complicated, and demanding.

The Hanford Advisory Board (Board) has reviewed the draft Permit and is issuing the advice listed below. Accompanying this advice as separate documents are Addendum 1 and Addendum 2, which provide explanatory background to the advice. Addendum 1 includes specific, detailed comments, inputs, and observations that may improve the permit's content and guidance to Ecology and DOE. Much like a Sounding Board, this addendum is not a consensus product; instead, it represents an unedited collection of responses to the Permit offered by individual Board members. The Board encourages Ecology to review, evaluate, and respond to the items in Addendum 1 for inclusion in the permit. Based on the Board's informal discussions with Ecology, it understands that Ecology will consider the comments, input, and observations.

Addendum 2, which is an unedited, relatively unpolished reference document synthesized by the Board's Site-Wide Permit issue managers, provides additional context and background for the advice points and for the information discussed in Addendum 1. As with Addendum 1, Addendum 2 is not a consensus product.

Advice:

- The Board advises Ecology to comprehensively review and revise Closure Permit(s) condition(s) to ensure that when the permit conditions refer to unavailable, but appropriate past reference documents, the permit includes appropriate citations and requirements for periodic re-evaluation (e.g. five-year post-closure re-evaluations). All references in the Permit(s) should be updated and requirements should reflect current or anticipated future actions.

- The Board advises Ecology to identify in unit-specific permit(s) within the appropriate Addenda, all cited documents and the cited revisions to these documents (e.g., Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] Sampling and Analysis Plans [SAPs] used for groundwater which are referenced rather than included in the Permit). The complete citations to the Tri-Party Agreement and other external documents should also be included. Furthermore, the Board advises Ecology to include active hyperlinks within the Permits to the appropriate section(s) of these cited documents.

- The Board advises Ecology to use its omnibus authority under Washington Administrative Code (WAC) 173-303-815 and to include Permit(s) condition(s) to ensure that external documents or processes cited by Ecology in the Permit as permit conditions are subject to an equal public review and comment time period as required under WAC 173-303.

- The Board advises Ecology to maintain a central repository for unit-specific permit information (e.g., design information needs, problem reports, corrective action reports and-so-forth) that is open to public review. In addition, the Board advises Ecology to make these records available electronically with remote access for continuous public review.

- The Board advises Ecology to make past versions of the Permit available for public review to promote Permit comparisons.

- The Board advises Ecology to explicitly reserve its Resource Conservation and Recovery Act (RCRA) authority in the Permit instead of yielding its principal decision-making authority to either DOE or the U.S. Environmental Protection Agency (EPA) via CERCLA actions (e.g., deferral to future remedial

investigation/feasibility studies, proposed plans, and record of decision documents to meet presently required Dangerous Waste Regulation requirements under WAC 173-303 for corrective actions).

- The Board advises Ecology to revise the Permit Part A forms and Permit conditions to reflect current operational needs and current waste volumes and appropriate waste codes for waste now in Hanford storage units (e.g. 400 Area interim waste storage facility and the Low Level Burial Grounds [LLBG]).

- The Board advises Ecology to evaluate and confirm that all information on the Part A forms is consistent with: the Washington State Dangerous Waste Regulations (WAC 173-303), the Dangerous Waste Permit Application, the Part A Form and Instruction publication ECY 303-31 (6-2003) requirements, information presented in the State Environmental Policy Act checklists submitted with the Part B Permit application, the unit(s) specific draft Permit Conditions, and the draft factsheet(s).

- The Board advises Ecology to revise the Permit to use enforceable words such as "shall" and "must" when referencing requirements and to make this convention consistent throughout the entire Permit (e.g., III.10.H.5.d.ii "These drawings shall include all equipment …").

- The Board advises Ecology to include a Part II or unit-specific Permit condition requiring submittal of a modification request when any unit-specific new waste stream(s) have been identified and that this modification be distributed for public comment and review. Any modification requests for additional or new waste codes should also be distributed for public review according to the WAC process.

- The Board advises Ecology to include in unit-specific Permit conditions requirements for upgrades and equipment replacement necessary to ensure the safe operation of Hanford RCRA-permitted facilities (e.g., 242-A Evaporator, WTP melters systems, and-so-forth).

- The Board advises Ecology to include a Permit condition requiring the use of a Risk Budget Tool to model cumulative effects to groundwater. The Permit condition should also include requirements for submittal of the parameters used in the Risk Budget Tool, with their selection subject to the permit modification process. The Board suggests this condition be included in the Part II conditions.

More importantly, the Board asks Ecology to validate the Risk Budget Tool model.

- The Board advises Ecology to revise Closure Plan documents to reflect use of Model Toxics Control Act (MTCA) Method B standards. Performance standards for soils should be based initially on the most protective standards.

- The Board advises Ecology to include a Permit(s) condition(s) requiring demonstration of adequate soil characterization and remediation (including both the vertical and lateral extent of the vadose zone), using WAC 173-303-815 under its omnibus authority and under WAC 173-303-645 for all permitted facilities (e.g. tank farms; cribs; ponds; and trenches). The Board advises Ecology to include/revise a permit condition for statistically based sampling design.

- The Board advises Ecology to provide within the Permit(s) the supporting documentation for any waivers to regulations identified in the permits (WAC 173-303-645(11)).

- The Board advises Ecology to include a Permit(s) condition(s) requiring all RCRA-regulated near-surface pipelines to be clean-closed per WAC173-303-610.

- The Board advises Ecology to recognize that requiring placement of a barrier over the top of an area (e.g., a tank farm) or closing an area to industrial closure standards does not remove the obligations to complete the cleanup to the highest standards practicable, in accordance with WAC 173-303-610 & 665.

- The Board advises Ecology to require all Emergency Management Plans and Procedures for all Part III (operational) units to be included in Permit(s) Addenda and be subject to the WAC 173-303-834/840 process and coordinated with DOE requirements.

- The Board advises Ecology to include/revise a Permit(s) condition(s) to ensure that the Independent Qualified Registered Professional Engineer (IQRPE) evaluations for all piping used in operating facilities (Part III units and the Single Shell Tanks) must also evaluate internal corrosion and erosion as well as external cathotic corrosion.

- The Board advises Ecology to include/revise a Permit(s) condition(s) to require a comprehensive corrosion protection program for buried piping, interplant-

connected systems, and in facilities, to assure that vessels, hangers, wiring, wire trays and other components are protected from galvanic, chemical, electrical, and other forms of corrosion.

- The Board advises Ecology to include/revise a Permit(s) condition(s) to require verification, calibration, and real-time monitoring, utilizing sample apparatus that ensures accurate and representative sampling for waste streams and exhaust from the WTP facilities.

- The Board advises Ecology to seek direct delegation of authority from EPA for state application of RCRA to wastes released during the time period between initial RCRA legislation by Congress and the delegation by EPA authorizing state implementation of RCRA.

- The Board advises Ecology to include a Part II condition requiring a cumulative risk budget for all disposal units, which is reserved first for disposal of on-site cleanup wastes.

- The Board advises Ecology to ensure that all Permitted operating units have Contingency Plans as required by WAC 173-303-350 and as designated in Appendix A, 'Crossover Matrix.' The Board also advises Ecology to include individual unit Contingency Plans in the unit-specific Permits.

- The Board advises Ecology to include a Permit condition requiring characterization for all waste streams processed in RCRA-permitted facilities.

- The Board advises Ecology to revise/include a Permit condition requiring response planning for accidental and natural phenomenon (e.g., Cascadia seismic events) that address both the direct and indirect effects from such major events.

- The Board advises Ecology to revise/include a Permit(s) condition(s) to require annual submittal of a schedule for closure of tanks to meet the requirements of Tri-Party Agreement (TPA) Milestones M-045-70 & M-62-45.

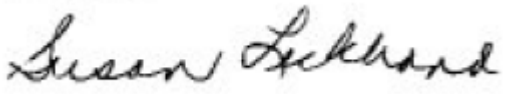
- The Board advises Ecology that it is inappropriate to prospectively accept CERCLA work via the II.Y conditions as satisfying the Dangerous Waste WAC 173-303-645/646 corrective action permit requirements while the remedy selected remains an unproven technology.

- The Board advises Ecology to include/revise a Permit(s) condition(s) to require the Permittee (DOE) to demonstrate that the Waste Treatment and Immobilization Plant (WTP) design is compliant with regulations.

- The Board advises Ecology to require the removal, treatment, and disposal of the materials in the Plutonium Uranium Extraction Plant (PUREX) tunnels and similar facilities as appropriate.

- The Board advises Ecology to revise/include a Permit condition to ensure that tank wastes are properly characterized and immobilized in a durable waste form with performance at least equivalent to glass for the entire waste form. Specifically the Board advises Ecology that it supports vitrification of wastes and opposes alternate waste forms unless their performance can be shown to be at least "as good as glass" (including secondary waste streams - see HAB Advice #258).

Sincerely,



Susan Leckband, Chair
Hanford Advisory Board

This advice is not a consensus product. The following two members objected to the advice going forward:

Jeffrey Luke, Non-Union, Non-Management Employees (Hanford Work Force) and Mark Reavis (Central Washington Building Trades Council, (Hanford Work Force). Their minority reports can be found as Attachment A and Attachment B to this advice.

cc: Matt McCormick, Manger, U. S. Department of Energy, Richland Operations
Scott Samuelson, Manager, U.S. Department of Energy, Office of River Protection
Dana Bryson, Deputy Designated Official, U.S. Department of Energy, Richland Operations Office
Dennis Faulk, U. S. Environmental Protection Agency
Catherine Alexander, U.S. Department of Energy, Headquarters
The Oregon and Washington Delegations

Attachment A

Minority Opinion
Jeffrey Luke
Hanford Workforce – Non-Union, Non-Management Employees
Hanford Advisory Board Advice #262 – Hanford Facility Dangerous Waste Permit
September 2012

Introduction

The following text attempts to address certain fundamental issues associated with the Hanford Advisory Board (Board) advice adopted September 7, 2012, relative to the Hanford Facility Dangerous Waste Permit, WA7890008967 (Permit). The following discussion considers only Part V, Closure Unit Group 4, Single Shell Tank System, assuming this part of the Permit to be representative of the balance of the Permit. This author is considering only one part of the Permit due to time limitations associated with reviewing the entire Permit, which, as the Board states in its majority opinion, is quite lengthy at over 16,000 pages, and because the author is most familiar with the realities and vagaries of the single-shell tank (SST) system.

Discussion

This author believes the Board reflexively adopted an extraordinarily myopic view during its review of the Permit by failing to consider certain fundamental questions. One such question is: How can the Washington State Department of Ecology (Ecology) issue an operating permit to a non-compliant unit, such as the SST System? Another question of considerable import to the Board should be: Does the Permit unilaterally revise the original relationship contemplated between the Hanford Federal Facility Agreement and Consent Order (HFFACO, a.k.a. the Tri-Party Agreement [TPA]) and the Permit?

The questions above were conceptualized after review of the Permit and review of a June 27, 2002 letter (letter 02-OMD-036) wherein the United States Department of Energy (DOE) Office of River Protection noted the following relative to the SST system:

> *In recognition of the inability to meet current regulatory leak integrity requirements, these tanks and ancillary systems should be considered* ***not fit for use*** *per 40 CFR 265.191. Notwithstanding this fitness determination, the U.S. Department of Energy (DOE) and* ***the State of Washington Department of Ecology (Ecology) have recognized since 1988 that the SSTs did not comply, and could not be brought into compliance, with the tank design and operation requirements of the Dangerous Waste regulations****. Consequently,* ***DOE and Ecology have negotiated and agreed to a comprehensive series of enforceable milestones in the HFFACO to allow temporary continued use of SSTs pending SST closure***. (Emphasis added)

Looking more closely at the TPA, specifically Article VII, "Work", the following is provided:

> *The RCRA permit, whether issued by Ecology and EPA, or Ecology alone after delegation of HSWA authority, shall reference the terms of this Agreement, and provide that* ***compliance with this Agreement*** *and corrective action permit conditions developed*

> *pursuant to this Agreement* ***shall satisfy all substantial corrective action requirements of RCRA/HSWA***. (Emphasis added)

The citations above reflect two facts: 1) Ecology recognized in 1988 that the SST system was noncompliant with certain tank system regulations and could not be brought into compliance with the operational requirements of the Dangerous Waste Regulations and, therefore, constructed the TPA to govern that tank system through closure; and 2) the Permit, when issued, would simply reference the TPA where the TPA already had strictures in place to regulate the operation of the Hanford Site.

Question

How, then, can Ecology now issue an operating permit to a unit understood, and agreed, to be non-compliant since 1988? This minority opinion requests a response to that question.

Discussion

The following is offered relative to the second point, noted above, concerning the possibility that the Permit changes the relationship originally contemplated between the TPA and a permit to be issued.

At V.4.B.3.c, of the Permit the following is found:

> ***By December 30, 2015****, the Permittees will provide Ecology with a schedule of permit modifications to be submitted to Ecology for review and approval for all WMA process information other than WMA C. The schedule will define how all WMA process information will be submitted to Ecology no later than December 30, 2025, with no more than one WMA submittal to Ecology per year. Permittees will submit the WMA process information permit modifications to Ecology in accordance with Permit Condition V.4.B.3.a following the approved schedule...* (Emphasis added)

At milestone M-045-84 the following is provided:

> *Complete negotiations of HFFACO interim milestones for closure of the second WMA (including a schedule for submittal of closure plans and a risk assessment and final closure).* ***Due Date January 31, 2017*** (emphasis added)

At milestone M-045-85 the following is provided:

> *Complete negotiations of HFFACO interim milestones for closure of the remaining WMAs (including a schedule for 200 West Area closures, the submittal of closure plans and risk assessments and final closure dates for each WMA).* ***Due Date January 31, 2022*** (emphasis added)

As can be seen by a comparison of the due dates above, the Permit has unilaterally modified the TPA without following the processes outlined in Chapter 12 of the TPA Action Plan.

Question

What is the basis, in the TPA, for modifying the TPA outside of the process outlined in Chapter 12 of the TPA Action Plan?

Discussion

Another, and understandably more complex, question the Board did not address was: Does the Permit unilaterally and, therefore, inappropriately, modify Consent Decree CV-05085 (the Decree) filed October 25, 2010?

The Decree at Section IV-D, "Regulatory Coordination" provides the following:

> *For the matters covered by this Decree, the Parties shall ensure,* ***to the maximum extent possible****, that any existing or required permit, order, or approval associated with constructing and operating the WTP, SST waste retrieval, and reporting it* ***is consistent with the requirements of this Consent Decree****.* (Emphasis added)

At Section VII-A, "Amendment Process", the Decree provides:

> ***This decree may be amended by mutual agreement of the State and DOE upon approval by the Court.*** *The party proposing the amendment shall provide the proposal in writing to the other party, along with a justification for the amendment. Proposals to amend the schedule shall be submitted in accordance with, and shall be evaluated under the criteria described in paragraphs B through G, below. Within ten (10) working days of receipt (except as provided in Section VI I-F), the other party shall notify the party proposing the amendment, whether or not the amendment is acceptable.* (Emphasis added)

The Decree, then, clearly identifies a process for modifying the Decree. This process involves approval by the court. However, at condition V.4.F.2.a, of the Permit the following is provided:

> *TWRWPs submitted to Ecology under the requirements of the Washington v. Chu Consent Decree, or the HFFACO, must ensure compliance with the requirements of Permit Conditions V.4.F.3 and V.4.F.5.*

The conditions listed at the cited sections of the Permit appear to constitute a somewhat lengthy addition to the requirements provided by the Decree.

Question

This minority opinion requests a response to the question: How can Ecology modify the requirements for a TWRWP without going through the process identified in the Decree?

Discussion

The final representative concern this author wishes to bring forward is that of conditions being unduly burdensome and/or onerous. This opinion will consider proposed Permit conditions as well as comments from the Board.

Relative to permit conditions, this author turns first to condition V.4.E.2.d.i, wherein the following is provided:

> *LDM is required for catch tanks and miscellaneous tanks…*

There are 36 miscellaneous tanks and an uncounted number of "catch tanks" (simply because that number far exceeds 36, I didn't want to count them all). Few of these tanks currently have leak detection and monitoring (LDM) in place. Few, if any, of these tanks are known to pose an immediate threat to human health or the environment. The cost of LDM for the risk associated with these tanks must certainly be considered before invoking a condition such as this. The money to pay for the LDM for these tanks will have to come out of the DOE budget. What other activity in the DOE budget will suffer to pay for this? For the societal benefit to be gained by this activity it is entirely too burdensome.

At V.4.E.2.f.ii, the following is provided:

> *In the event a leak, intrusion, or spill is validated for SSTs, the Permittees must, within twenty-four (24) hours after detection of the leak or release from a tank system, remove as much of the waste from the tank system as is necessary to prevent further release to the environment in accordance with WAC 173-303-640(7)(b)(i), incorporated by reference.*

The condition cited above is also relative to catch tanks and miscellaneous tanks. As noted above, most of these tanks do not have LDM in place. For those that do, frequently the path to enter a tank is so torturous that it may take weeks, possibly months, to develop a means to enter the tank and pump out the waste. Conceivably, then, it could cost DOE millions of dollars to come into compliance with this single requirement alone. Again, from where will that money come? And, again, this condition appears too burdensome and onerous.

Turning now to the Board's adopted advice, the first to be considered is the 14th advice bullet which states:

> *The Board advises Ecology to include a permit(s) condition(s) requiring demonstration of adequate soil characterization and remediation (including both the vertical and lateral extent of the vadose zone)…*

The conditions proposed by the Board, above, are such that they are almost impossible to comply with. Further, were DOE to attempt compliance, that attempt would certainly cost millions upon millions of dollars. C-Farm is used as an example in the following paragraph.

It is known there is contamination in the groundwater under C-Farm. That contamination appears to have the signature of the waste from C-Farm tanks. C-Farm is approximately 800 acres² in size. Approximately 150 boreholes have been drilled in C-Farm in attempts to characterize the vadose zone and find the contamination plume that is believed to have contributed to the contamination in the groundwater under the farm. Those 150 boreholes have cost DOE somewhere between two and $10 million. That C-Farm plume has not been found. One reason may be that the tools used to interrogate the vadose zone (drill boreholes) are between two and six inches in diameter. That means we are using tools between two and six inches in diameter to

interrogate over 800 acres[2]. For the Board to require that DOE be able to "demonstrate" "adequate" characterization and remediation of the vadose zone under such circumstances is to send DOE off on a quest admirable only in the eyes of Don Quixote and again at a cost that appears capable, by itself, of "breaking the bank."

Board Advice, 16th advice bullet:

> *The Board advises Ecology to provide within the permit(s) condition(s) requiring all RCRA regulated near- surface pipelines to be clean- closed per WAC 173-303-610.*

The Board may certainly advise Ecology that it desires that Ecology clean close. However, for the Board to "advise" Ecology that all near surface pipelines be clean-closed is for the Board to advise Ecology to ignore its process and procedures. Ecology must look at each WMA and consider the circumstances associated with closure of each WMA and determine whether clean closure is appropriate within that WMA or for that WMA. That is what the regulations require.

Board Advice, 17th advice bullet:

> *The Board advises Ecology to recognize that requiring placement of a barrier over the top of an area (e. g. a tank farm) for closing an area to industrial closure standards does not remove the obligations to complete the cleanup to the highest standards practicable, in accordance with WAC 173-303-610 & 665.*

In fact, and to the contrary of the Board Advice bullet above, if DOE were to go through the permitting process as defined and if Ecology were to permit "landfill closure," the placement of a barrier over the top of a WMA would indeed meet all appropriate regulatory obligations and the highest applicable standards, if a barrier was determined to be a component of final closure.

I now want to take a moment to thank the Board for this opportunity to express my minority opinion and to reaffirm the respect I have for the Board, its processes, and its members. I also want to express my gratitude to Ecology for this opportunity to inform Ecology of some of the concerns held by many members of the Hanford workforce.

Jeff Luke
Hanford Advisory Board
Hanford Workforce – Non-Union, Non-Management Employees

Attachment B

Minority Opinion
Mark Reavis
Hanford Workforce – Central Washington Building Trades Council
Hanford Advisory Board Advice #262 – Hanford Facility Dangerous Waste Permit
September 2012

The Hanford Advisory Board (HAB) September 6-7, 2012 meeting addressed what may or appear to be a complex set of additional recommended mandates to the U.S. Department of Energy (DOE) by advising additional revisions to the Washington State Department of Ecology (Ecology) current processes, which may or are in most cases already in place (Washington State Administrative Code [WAC], Tri-Party Agreement [TPA], Resource Conservation and Recovery Act [RCRA]). These additional recommendations could require substantial additional comment periods that could delay or detract from schedules, and could adversely affect costs, timelines and conflict with living documents such as the TPA.

The advice throughout the 31 recommendations asks for revisions of the current agreed to and followed processes currently in use relating to permitting (**HAB Advice #262, bullets 1, 7, 9, 14, 19, 20, 21, 26, 27, 29, 31).**

Additional advice recommended that could impact engineering and scientific design is found in **HAB Advice #262, bullets 11, 21, 29**. The processes at the Waste Treatment and Immobilization Plant (WTP) still being engineered and designed are complex and have many engineering and scientific challenges that will never have 100% consensus. Ecology admitted concerns with this recommendation when asked.

Additional advice recommended in regards to onsite or offsite waste, found in **HAB Advice #262, bullet 23** has legal implications relating to the court decisions. I would concur with Board members that argued this point of concern and the elimination of wording may have not been the answer or compromise. I also question that taking the position of no waste from other sites is supporting the Nevada court case which may impact and change where our high level waste may be stored.

The Board on September 7, after much deliberation and authoring on a majority of advice concerns, agreed to forward these recommendations with one other board member choosing to add a minority opinion. I have read and concur with Jeff Luke's Minority Opinion in full. I feel the action of the board was and is well intended, but goes too far. The amount of dialogue and conflicting concerns in regards to HAB Draft Advice version #2 Hanford Facility Dangerous Waste Permit took considerable time to address and I feel reflect my opinion and concerns.

I would like to thank you in advance for your consideration and time while reading this opinion. I do not consider this letter to be in total opposition to the Board's intent but another concerned point of view. The representatives from both DOE and Ecology were professional and informative to the many concerns asked to be addressed. This combined with the diverse members representing the HAB can only improve the cleanup process and safety concerns at the

Hanford site. On behalf of the Central Washington Building and Construction Trades I would like to once again thank you for your time and consideration of this response.

Respectfully,
Mark Reavis
Central Washington Building and construction Trades

Addendum 1 – Comments, Input, and Observations

9/7//12

Addendum 1 includes specific, detailed comments, input, and observations that may improve the permit's content and guidance to Ecology and DOE. Much like a Sounding Board, this addendum is not a consensus product and should not be considered Board advice. Instead, it represents an accumulation of the comments, input, and observations offered by individual Board members.

The following comments, inputs, and observations are organized using headings that mirror the structure of the Permit.

Definitions, abbreviations, and acronyms:

1. Include and clarify in the Definitions Section that piping and ancillary equipment that formed a component of/part of the tank systems (SSTs, DSTs, MUSTs, vaults, pits, valve boxes, etc.) as well as systems to which these disposed (cribs, trenches, etc.) are part of tank systems regulated under Dangerous Waste Regulations and subject to the WAC173-303-610 and WAC 173-303-640 tank closure process.

Attachments:

Hanford Emergency Management Plan:

1. Changes are needed to the Plan, applicable to many permitted units. See Addendum 2.
2. All permitted operating units should have Contingency Plans as required by WAC 173-303-350 and as designated in Appendix A, 'Crossover Matrix.' Include Contingency Plans in the unit-specific Permits.
3. Figure F1-1– inappropriately sets the public access limits.
4. Revise/include a Permit(s) condition(s) for Part III (operational) units to ensure the emergency plans include an assessment of various modes of systems failures and their impacts on the emergency plans (e.g. common, cascade, sequential, parallel and other modes; age-related failures through erosion, wear, corrosion, etc.).

Hanford Facility Personnel Training Program:

1. Ensure there is a **s**afety-conscious work environment.

Parts I and II Conditions:

1. Revise the II. Y Condition to the 2010 II. Y condition which better retains Ecology's ability for RCRA oversight of corrective action on the Hanford site and retains public involvement/review opportunities of documents relating to Hanford site cleanup.
2. Revise Part I and II Conditions to include oversight of groundwater for the Hanford site for all TSD units.
3. Revise Part I and II Conditions to include Performance Standards.

4. Revise Part I and II Conditions to include waste analysis/sampling analysis plan(s) criteria.

Part III: Operating Units:

Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facilities:

1. Identify in the Permit conditions the criteria for receiving new waste streams at ETF and whether or not the process includes a public participation process.
2. Include a Permit condition to require hazard identification and hazard mitigation in the Permit.
3. Include a Permit condition requiring the waste acceptance criteria to include identification of abnormal feed streams.
4. Take into consideration the uncertainty of characterization and volumes of waste streams primarily coming from WTP and going to ETF, ensure a robust and conservative waste acceptance criterion for ETF, and ensure that these criteria are reflected in the Permit conditions.

242-A Evaporator:

1. Include a Permit condition to ensure the 242-A Evaporator has necessary upgrades, including replacing equipment, to safely operate the additional campaigns to process WTP waste streams.
2. Include a Permit condition to address accumulation of organics in the facility's tanks.
3. Identify requirements for limiting volatile organics within the waste acceptance criteria condition.
4. Ensure Permit conditions address the dangers of ammonia, including flammability and corrosivity.

325 Hazardous Waste Treatment Units:

1. Include a Permit condition to ensure 325 facility has the necessary upgrades, including maintenance and replacement of equipment for safe operations (examples: plumbing, sumps, and associated piping to waste receiving tanks).
2. Include a Permit conditions to ensure the 325 Hazardous Waste Treatment Units identification of all waste codes for all waste processed in the facility.

Central Waste Complex:

1. Modify the Permit condition (III.6.0.4.b) to reflect compliance with Building and Structural Specialty and Fire Code requirements and Secondary Containment volumes.
2. Include necessary Permit conditions to bring the Central Waste Complex into compliance (e.g., RCRA requires dams, berms, and containment be present that equal the content of the drums)
3. Revise/include Permit conditions requiring all waste stored at the CWC to be cataloged and properly labeled.
4. Revise/include Permit conditions requiring all wastes properly characterized to ensure that explosive or flammable chemicals are properly stored.
5. Include a Permit condition requiring all wastes to be tested, characterized and properly designated and removed for treatment on an accelerated schedule which is incorporated into the Permit's compliance schedule.
6. Include a Permit condition requiring all waste stored outdoors to be removed from the facility and properly stored or shipped offsite.
7. Include a Permit condition limiting acceptance of any new waste until proper characterization/designation/and needed treatment of the existing waste has been done.

Waste Receiving and Processing Facility (WRAP):

1. Modify the WRAP Permit condition (III.7.0.4.b) to reflect compliance with Building and Structural Specialty and Fire Code requirements and Secondary Containment volumes.
2. Include a Permit condition requiring characterization of all waste streams processed in the WRAP facility.
3. Include/revise a Permit condition to include the function of the WRAP facility is to package TRU waste for shipment to WIPP, and that mixed waste can have TRU components and be identified as mixed TRU waste or MTW.
4. Include a Permit condition or revise the WAP to include a detailed list/document of the criteria and the methodology for determination of the presence of liquids in the wastes.
5. Include/revise a Permit condition to include criteria on how to obtain representative samples from a drum containing multiple containers of waste which lack identified/associated process information.
6. Include/revise a Permit condition for the following concerns or revise the Sections B.1.1.1; B.1.1.1.2 ; B.1.1.1.2.2 ; B.2.1.3.1 ; B.2.1.1.3.1; B.2.1.3.3; B.7.3 (of the WRAP Facility Waste Analysis Plan:
    a. Clarify the range of dangerous chemicals and the various methods of chemical screening.
    b. Clarify how people on the evaluations committee determine what to sample and which sample methods to use.

c. Require the Permittee to clearly identify the range of dangerous chemicals and the various waste streams within the packages to be in compliance with the Dangerous Waste Regulations.

d. Clearly identify who has the responsibility to designate the waste to certify that it meets LDR standards.

e. Clarify that the "10% rule" should only be applied to where it is absolutely known that the material inside the drums is exactly the same.

f. Clarify the representativeness of the drum sampling from a package on the top of a drum and the packages located near the bottom of the drum.

g. Include treatment of peroxides, oxidizers, sulfides, cyanides, and halogenated organic carbon in addition to grouting.

222-S (Laboratory) Dangerous & Mixed Waste:

1. Include a Permit condition to ensure the 222-S identification of all waste codes for all waste processed in the facility.
2. Include a Permit condition to ensure 222-S facility has the necessary upgrades, including maintenance and replacement of equipment for safe operations (examples: plumbing, sumps, and associated piping to waste receiving tanks).

T-Plant Complex:

1. Modify the Permit condition (III.9.0.4.d) to reflect compliance with Building and Structural Specialty and Fire Code requirements and Secondary Containment volumes.

Waste Treatment and Immobilization Plant Unit:

1. Revise/include a Permit condition that defines the criteria and standards to be used to identify and evaluate chemical and radiological constituent hazards that could occur at the WTP facility. This could include writing a Permit condition requiring hazard analysis to be performed early in the process, rather than just prior to receipt of waste, to support necessary design change or mitigation.
2. Revise/include a Permit condition requiring response planning for criticality and natural phenomenon (e.g. Cascadia seismic events) that addresses both the direct and indirect effects from major events.
3. Revise/include a Permit condition requiring contingency planning for suffocating CO2 release events from the cooling systems. Ecology should revise/include a Permit condition with specific actions to ensure that CO2 fire extinguishers are not used on or near high voltage equipment, or in areas that are or may become "confined spaces".
4. Revise/include a Permit condition requiring contingency planning for response to the damages and difficulties associated with volcanic events (e.g., Highly abrasive ash infiltration into operating spaces resulting secondarily in failure of exit safety equipment to perform).

5. Revise the Emergency Management Plan to reflect and ensure compliance with new WTP conditions as described in the above advice points for the WTP facility. Ecology should revise Permit conditions requiring compliance with Waste Acceptance Criteria and Section 1 Introduction and Addendum B1 to more accurately reflect the NRC's provisional position on reclassification of ILAW waste as incidental to reprocessing. The NRC has yet to make a determination for Hanford.
6. Don't defer or delegate authority for RCRA actions to external processes and documents and to instead detail standards, requirements, methods and frequencies as permit conditions. Append all referenced versions of documents to the permit with active hyperlinks to the referenced section(s). Some referenced documents appear to be missing from the permit. Examples: Addendum B-1
    a. Waste Treatment Plant Quality Assurance Project Plan for the Waste Analysis Plan, Rev. 0.;
    b. 24590-WTP-RPT-MGT-04-001, Rev. 0,Regulatory Data Quality Objectives Optimization Report; and
    c. RPT-W375LV-EN00002, as amended, Approach to Immobilized Hanford Tank Waste Land Disposal Restrictions Compliance
7. Update Permit conditions III.10.C.2.n.i through .iv to reflect current dates/future dates.
8. Revise/include a Permit condition to ensure that Tank Wastes are immobilized in a durable waste form with performance at least equivalent to glass for the entire waste form, and to ensure proper characterization of tank wastes. The Board supports vitrification of wastes and opposes alternate waste forms unless their performances can be shown to be at least "as good as glass" (including secondary waste streams - see HAB Advice #258).
9. Revise/include a Permit condition to ensure the facility's design is based on sound engineering principles and according to applicable regulations. Include a Permit condition to ensure all necessary testing or studies are performed well in advance of when data is needed for design and construction (see HAB Advice #258).
10. Revise/include a Permit condition to ensure WTP supporting facilities operate as intended throughout the operational life of the WTP facility while also performing their respective operations of support for other Hanford facilities (e.g. 242-A Evaporator).
11. Include/revise a Permit(s) condition(s) to require that all engineering drawings included in the permit be stamped by a registered professional engineer [WAC173-303-640].
12. Include/revise a Permit(s) condition(s)to require the Permittee(DOE) to demonstrate that the plant design is technically functional, especially in the case of technical issues identified by the Defense Nuclear Facility Safety Board and/or by Ecology staff related to:
    a. Mixing (especially for non-Newtonian fluids)
    b. Particle settling (especially for criticality control, but also for heavy metals – lead, chromium, nickel …)
    c. Hydrogen gas generation and deflagration

d. Erosion and corrosion.

13. Include/revise a Permit(s) condition(s) to ensure that plant systems and all facility vessel designs contain provisions to accomplish clean closure in accordance with WAC 173-303-610 & WAC 173-303-640.
14. Revise/include a Permit(s) condition(s) to ensure the emergency plans include an assessment of various modes of systems failures and their impacts on the emergency plans (e.g. common, cascade, sequential, parallel and other modes; age related failures through erosion, wear, corrosion, etc.).
15. Include/revise a Permit(s) condition(s) to require equivalent capabilities for each "train of equipment (e.g. Melter off-gas treatment system)" whenever/where ever multiple parallel trains exist in the facilities.
16. The Board advises Ecology to include a Permit(s) condition(s) to ensure that effluent pollutant levels in stack exhaust meet human health exposure criteria at the point of emission.
17. The Board advises Ecology to include a permit(s) condition(s) to ensure that effluent pollutant levels in stack exhaust (emission points) meet NESHAPs and RCRA emission criteria; and further require identification and remediation of instance where risks to human health exposure fall outside the protective standards intended by NESHAPs and RCRA emissions criteria.

Integrated Disposal Facility:

1. Modify the waste acceptance criteria condition or include a Permit condition which ensures IDF only accepts wastes that have been vitrified or whose entire packages have performance equivalent to vitrification.
2. Delete all references to bulk vitrification in the IDF Permit.
3. Base the Risk Budget Tool evaluation on the sampling results of releases from the bottom of the trench, and not take credit for the soil column.
4. Include a Permit condition requiring submittal of a set of testing protocols to verify how waste will release from the waste packages in IDF.
5. Revise/include a Permit condition to ensure the process for creating the Risk Budget Tool & that this process considers the following parameters; the concentration of contaminants in the waste stream, the waste form leachability, whether or not the releases from that material will exceed groundwater or drinking water protection standards.
6. Include impacts from nearby waste sites/ trenches to bound cumulative impacts to groundwater in the model used in the Risk Budget Tool.

Double Shell Tank System and 204-AR:

1. Revise/include a Permit condition for sampling the DSTs to ensure tank wastes maintain their waste acceptance criteria chemistry.

2. Revise/include a Permit condition to address leaks from all waste transfer lines (including HIHT), diversion boxes, and other system components (including all ancillary equipment).
3. Revise/include a Permit condition to ensure that all waste which has escaped into the environment (including the Vadose Zone and outside the boundaries of Tank Farms) is identified, characterized such that the vertical and lateral extent of the contamination is identified, and that such releases are remediated in accordance with the Dangerous Waste Regulations under WAC 173-303-645.
4. Ecology should use its authority under the Resource Conservation Recovery Act (RCRA) to better regulate and protect Hanford workers from exposure to chemical vapors at Hanford, specifically with reference to those chemical vapors emanating from the high-level nuclear waste stored in Hanford's underground radioactive waste tanks.

Waste Encapsulating Storage Facility (WESF):

1. Bring WESF into RCRA compliance by moving the capsules into dry cask storage and close the facility.
2. Include a Permit condition bounding the acceptance of additional waste at WESF, due to the fact that WESF is currently at capacity and cannot handle additional waste volume.

400 Area Waste Management Unit:

1. Draft a Permit condition preventing acceptance of offsite waste at the 400 Area using its authority under WAC 173-303-815(2).
2. Draft a Permit condition preventing acceptance of incompatible waste by their waste acceptance criteria.
3. Draft a Permit condition with dates for the removal of all sodium-bearing materials and subsequent clean closure.
4. Review and revise the Part A form to limit storage capacity to the currently stored volumes of sodium-bearing mixed waste currently stored in the facility.

Low-Level Burial Grounds Trenches 31 & 34:

1. Revise the Part A form to include all trenches as subject to Dangerous Waste Regulations until such time that characterization (including actively digging up waste to be able to conduct sampling) demonstrates it is not RCRA waste.
2. Include permit conditions for the management of retrievably stored waste.
3. Include/revise a Permit condition requiring monitoring of the entire 40 miles of unlined trenches. The monitoring system should include contaminants of concern associated with nearby operable units and the associated groundwater unit(s).
4. Revise/delete text in the Permit conditions supporting 'in-trench treatment or placement of liquids within landfill'.

5. Revise/delete text in Permit conditions supporting placement of [storing] containers in a landfill.
6. Include a Permit condition requiring a new Container Storage facility for LLBG wastes subject to WAC 1783-303-630 regulations.
7. Inform the Waste Analysis Plan & Sampling and Analysis Plan and criteria for waste acceptance at the LLBG by the results of the Risk Budget Tool.
8. Utilize Ecology's omnibus authority under WAC 173-303-815 and revise/include a permit condition requiring on-going groundwater well evaluation and deepening of wells as the groundwater level drops.

Low-Level Burial Grounds Trenches 94:

1. Include a Permit condition identifying the groundwater protection standards that satisfy WAC 173-303-645(4), (5), (6), (7), (8), and (9).
2. Utilize its Omnibus Authority under WAC 173-303-815 and include a Permit condition requiring characterization of the vadose zone beneath the trench.
3. Revise the Inspection requirements to ensure that the Permittee can demonstrate its ability to maintain oversight of the trenches.
4. Revise/include a Permit condition to ensure that lead and mercury are included in the analyte list of Contaminants of Concern for the groundwater monitoring plan.
5. Revise/include a Permit condition requiring at a minimum, installation of four additional groundwater monitoring wells (two upstream and two downstream).
6. Utilize Ecology's Omnibus Authority under WAC 173-303-815 and revise/include a permit condition requiring on-going groundwater well evaluation and deepening of wells as the groundwater level drops.

Part IV: Corrective Action Units:

CA-1 Waste Management and CA-2 Groundwater Operable Unit:

1. It is inappropriate of Ecology to apply II.Y corrective action conditions to Closure and/or Post Closure Units in lieu of meeting the groundwater protection requirements of WAC 173-303-610.
2. It inappropriate to prospectively accept CERCLA work via the II.Y conditions as satisfying the Dangerous Waste WAC 173-303-645 corrective action permit requirements.
3. Include a Permit(s) condition(s) requiring submittal to Ecology of RCRA groundwater monitoring requirements from all CERCLA documents for incorporation into the units-specific Addenda housing the Groundwater Monitoring Plans. Ecology should require a crosswalk-table which identifies RCRA requirements in the CERCLA documents which are cited in the RCRA Permit and subject to WAC 173-303-830/840 process.

4. Until such time that Ecology has accepted the modeled results from the STOMP-1D code according to criteria in the Dangerous Waste Regulations, Ecology should require and incorporate unit-specific groundwater monitoring into the Permit(s) in compliance with WAC 173-303-610(2)(b)(i) requirements.
5. The statement that "Ecology, EPA, and DOE agree that past-practice authority may provide the most efficient means for addressing mixed waste groundwater contamination plumes originating from a combination of TSD and past-practice units" does not comply with the Dangerous Wastes regulations [WAC 173-303]; does not provide for RCRA groundwater monitoring, nor does it provide for public involvement in important groundwater decisions.
6. Include/revise a Permit(s) condition(s) to ensure the Permittee complies with WAC 173-303 requirements to characterize the vertical and horizontal extent of contamination.
7. While the Permit requires the Permittee to supply "a sufficient number of groundwater monitoring wells, and (to) add new wells as necessary to catch contaminants movement in the groundwater and identify compliance status," the number of usable wells on the Central Plateau is rapidly decreasing due to the dropping Water Table. Ecology should revise/include a Permit(s) condition that requires a sufficient number of monitoring wells be sited according to subsurface studies that identify suitable thick intervals of wetted aquifer to support groundwater monitoring into the future.
8. Revise/include a Permit(s) condition(s) in the Groundwater Monitoring Plan (s) to require identification of the number and location (and criteria for determining these) of groundwater and leaked waste monitoring wells.
9. The vadose zone is not present in the Permit(s) groundwater monitoring plans. Ecology should include Permit(s) conditions providing for Ecology's oversight of vadose zone characterization and remediation activities as an important segment of the overall Hanford clean-up schema.
10. Utilize its Omnibus Authority under WAC 173-303-815 and include a Permit(s) condition(s) requiring characterization (i.e., physical sampling) and monitoring of the vadose zone beneath the Tank Farms and other mixed waste sites.
11. Ecology is cautioned that the Central Plateau Water Table level decline is making "wet" monitoring wells much harder to find or sustain. Since the Permit states that "Wells that are no longer sampled due to water table decline (i.e., "dry groundwater monitoring wells"), and for which there is no future use, must be decommissioned," Ecology should review/ include a Permit(s) condition(s) requiring evaluation of the utility of using these dry groundwater monitoring wells for use in sampling, using pore water geochemical sampling, radiological or geophysical methods prior to decommissioning.
12. Include a Permit condition to ensure Ecology authority and oversight of all pump & treat systems including how groundwater monitoring wells are installed (WAC 173-160); utilized; and managed.

Part V: Closure Units: 1301-N Liquid Waste Disposal Facility, 216-A-29 Ditch, 216-A-36B Crib, 216-A-37-1 Crib, 216-S-10 Pond and Ditch, 216-B-63 Trench, 216-B-3 Pond

These advice points are in general applicable to most of the Part V unit permits listed above and are stated once only. Additional information is found in the Addendum 2.

1. Utilize the Closure Plans submitted in the Part B application and to write appropriate Closure Permit conditions to rectify any non-compliance with unit specific closure requirements under WAC 173-303.
2. Ensure the approved closure plan is consistent with unit-specific Dangerous Waste Regulations-WAC 173-303 (ex: Surface Impoundment regulations).
3. Include approved Closure Plans and/or Permit Conditions within the Permit(s) to ensure compliance with WAC 173-303-610 and unit specific closure requirements. Ecology should not presumptively approve plans that do not yet exist. There is a lack of requirements for submittal of closure plans in the new RCRA Permit(s). Reference to closure actions under non-existent CERCLA document violates DW closure regulation requirements to have these details in an approved Closure Plan. Required by WAC 173-303-610(3).
4. Include Ecology approved and Dangerous Waste WAC 173-303 compliant RCRA Groundwater Monitoring Plans as attachments to unit specific Permits within their Closure Plan Addendums.
5. All Addendums identified as "reserved" should include the WAC 173-303 required information in order to be in compliance with the regulations.
6. Require all unit-specific groundwater monitoring plans be consistent with Ecology Publication # 04-03-030, Guidelines for Preparing Quality Assurance Plans for Environmental Studies.
7. Include in each unit-specific Permit the full list of COCs as noted or identified in unit-associated draft RI/FS documents previously submitted to Ecology.
8. Require use of a methods-based approach in the unit-specific Sampling and Analysis Plans.
9. Require use of non-filtered sampling in the Sampling and Analysis. Ecology should require repairs and replacement of wells per WAC 173-160.
10. Require the unit-specific training plans are included directly within the Training Addenda.
11. Coordinate and incorporate RCRA inspection requirements for the unit-specific Permits with those for the associated CERCLA groundwater operable unit's.
12. Ensure that all unit-specific Closure Schedules are compliant with the Dangerous Waste WAC 173-303-610 requirements or 173-303-815(3)(b)
13. Review and revise Part V (closing) Permits to ensure compliance with Land Disposal Restrictions (LDRs).

14. Review and revise Part V (closing) Permits to ensure that non-existent Part II conditions are not cited (e.g.1301-N).
15. All RCRA TSDs closure performance standards must use MTCA Method B cleanup levels.
16. Permit(s) should include compliance schedules in accordance with WAC 173-303-610 closure regulations.
17. Include a Permit condition requiring submittal of all RD/RA work Plans to Ecology as subject to WAC 173-303-830/840 Permit modification process.

Single Shell Tank Unit:

1. Revise Permit condition V.4.B.3.f (e) [refers to releases to the soils and groundwater] to include identification of specific methodology to be used in determining how releases are identified as occurring and the process for compliance with WAC 173-303-640(4) requirements.
2. Revise/include a Permit condition to address leaks from all waste transfer lines (including HIHT), diversion boxes, and other system components (including all ancillary equipment).
3. Revise/include a Permit condition to ensure that all waste which has escaped into the environment (including the Vadose Zone and outside the boundaries of Tank Farms) is identified, characterized such that the vertical and lateral extent of the contamination is identified, and that such releases are remediated in accordance with the Dangerous Waste Regulations under WAC 173-303-645.
4. Revise Permit condition V.4.B.3.f (h) [refers to tank integrity assessment]to include identification of the process for selection of the methodology/criteria for determining tank integrity citing also WAC 173-303-640(2) regulations and identify the requirements necessary to be in compliance.
5. Revise Permit condition V.4.G.2.c.i [refers to closure Performance Standards] to include all specific criteria which must be met in order meet the required “Impracticability Demonstration.”
6. Revise the V.4.C Conditions [refers to SST Groundwater Monitoring] to reflect and cite WAC 173-303-645(11) [Corrective Action Program for release from regulated units] requirements.
7. Include a Permit condition requiring submittal of all TSAPs (Tank or Component Specific Sampling and Analysis Plans) subject to WAC 173-303-830/840 permit modification requirements.
8. Revise Permit condition V.4.B.3.g. (k) & (l) [refers to maps and descriptions of tanks/ancillary equipment/piping distribution] to include specific criteria which must be met in order to determine integrity status and retrieval status. [see previous comment regarding Tank Assessments]

9. The Milestone Schedule for closure of SST does not support WAC 173-303-610 or 173-340-360(4) requirements. Ecology should negotiate a more realistic Closure Compliance Schedule with DOE.
10. Include/revise a Permit(s) condition(s) requiring the construction of new double shell tanks and emptying of the tanks known or suspected of leaking as expeditiously as possible.
11. Include/revise a Permit(s) condition(s) to require a priority basis when establishing plans for emptying tanks (i.e., the "Systems Plan") and the alternatives considered shall require that the tanks be emptied in RCRA priority (i.e., First priority - known leaking tanks, second priority - suspected leaking tanks, third priority - non-compliant single shell tanks, finally all remaining tank wastes).
12. Include/revise a Permit(s) condition(s) to ensure the Permittee (DOE) complies with WAC 173-303 requirements to characterize the vertical and horizontal extent of SST sites contamination.
13. Utilize its Omnibus Authority under WAC 173-303-815 and include a Permit(s) condition(s) requiring characterization (i.e., physical sampling) and monitoring of the vadose zone beneath the SST Tank Farms and other mixed waste sites.
14. Include/revise a Permit(s) condition(s) to ensure better validating leak detection methodology and capability and to establish the criteria for what constitutes acceptable leak detection capability.
15. Include/revise a Permit(s) condition(s) requiring the pumping of water or waste out of "dry wells" and requiring annual (or more frequent) gamma logging of the dry wells to depths >55 feet past the first wetted zone in the soil, and to the full well depth in most cases, to improve early tank waste leak detection.
16. Include/revise a Permit condition(s) requiring the Permittee (DOE) to extend dry wells that do not extend to at least 60 feet and to utilize these wells to perform gamma logging and detection or leaks or extension of contaminate plumes.
17. Include a Permit(s) condition(s) requiring all changes to groundwater monitoring to be incorporated into the RCRA Permit(s) per the WAC 173-303-830/840 process.
18. Revise/include a Permit(s) condition(s) to require annual submittal of a schedule for closure of tanks to meet Milestones M-045-70 & M-62-45 requirements.
19. Utilize Ecology's Omnibus authority under WAC 173-303-815 to include a Permit(s) condition(s) to require annual submittal of a budget report which identifies necessary increases in personnel, equipment, and costs to support compliance with Milestones M-045-70 & M-62-45 requirements.
20. Revise/include a Permit(s) condition(s) to ensure closure of the SST System and compliance with Performance Standards is subject to the WAC 173-303-830/840 process.
21. Revise/include a Permit(s) condition(s) to ensure there is a re-evaluation of the Post-Closure care period after 30 years with subsequent periodic reviews [decadal] throughout

the post-closure period (WAC 173-303-610(7) and WAC 173-303-610(8)). The post closure period should be at least 10 half lives of any isotope that is a COC (if it's plutonium that would be 240,000 years) or as long as there are potential health risks from any non-radioactive COCs.

22. Work closely with EPA Headquarters Region 10 RCRA staff to discuss what timeframes are acceptable for the State to allow for known or suspected leaking tanks to remain in that status pending development of treatment. The State should ensure they have written agreement with EPA about what is an acceptable time period to empty the known or suspected leaking tanks, and the non-compliant tanks.
23. Ecology should use its authority under the Resource Conservation Recovery Act (RCRA)[1] to better regulate and protect Hanford workers from exposure to chemical vapors at Hanford, specifically with reference to those chemical vapors emanating from the high-level nuclear waste stored in Hanford's underground radioactive waste tanks.
24. Ecology should revise/include a Permit(s) condition(s) to ensure IQRPE certifications to comply with WAC 173-303-640(2) requirements and include certification of the SST leak integrity.

241-CX Tank System:

1. Don't refer to closure actions in non-existent CERCLA documents [e.g. 200-IS-1OU]. Dangerous Wastes closure regulations require these details in an approved Closure Plan.
2. Include a Permit condition(s) citing use of MTCA Method B values to meet the Performance Standards requirements.
3. Revise the cleanup of associated ancillary facilities. Partial closure of facilities is not allowed under WAC -610 or -640

Hexone Storage and Treatment Facility:

1. Revise the Permit to require RTD for the Hexone Storage Tanks and all associated ancillary equipment.

Nonradioactive Dangerous Waste Landfill:

1. WAC 173-303-650 requires details and a complete cover design to be in compliance with the Dangerous Waste regulations.
2. Include a Permit condition requiring submittal within 30days of permit issuance, of a complete cover/barrier design and attachment of this design into the RCRA Permit for NRDWL.
3. Write a Permit condition that requires DOE to identify the source of soils and materials to be used for the construction of a landfill cap.

[1] 42 U.S.C. § 6973(a)

PUREX:

1. Write Permit conditions that requires secondary containment and leak detection and monitoring.
2. Write Permit conditions for characterization of the unidentified materials in the tunnels and their volumes.
3. Remove, treat, and dispose the materials in the PUREX tunnels as appropriate. Ecology should reconsider the reliance on water transport and electrical systems over a long period of time to maintain protections such as water doors.
4. Clean close the PUREX Tunnels.
5. Expand the contaminant of concern list to include lead.

Low-Level Burial Ground Closing Units (Green Islands):

1. Include Ecology approved RCRA groundwater monitoring plans as attachments to unit specific Permits within their closure plan addendums.
2. Include a Permit condition requiring characterization of all areas within the 1997 Part A boundary lines. (HAB Advice# 226) The assumption should be that it is all mixed waste until it is proven otherwise.

Part VI: Post-Closure Units:

300 Area Process Trenches:

1. It is inappropriate to prospectively accept CERCLA work via the II.Y conditions as satisfying the Dangerous Waste WAC 173-303-645/646 corrective action permit requirements while the remedy selected remains an unproven technology.
2. Include a Permit condition to ensure that natural attenuation is not "determined" by the Director of Ecology as meeting the corrective action Permit requirements of WAC 173-303-646.

183-H Solar Evaporation Basins:

1. Groundwater contamination and other issues associated with the evaporation basins suggest that they have not been closed appropriately under the regulations. Ecology should place this unit in Part V rather than Part VI and include Permit conditions to ensure compliance with WAC 173-303-610 and WAC 173-303-650.

1325-N Liquid Waste Disposal Facility:

1. Groundwater contamination and other issues associated with the facility suggest that they have not been closed appropriately under the regulations. Ecology should place this unit in Part V rather than Part VI and include Permit conditions to ensure compliance with WAC 173-303-610 and WAC 173-303-650.

1324-N Impoundment and 1324-NA Percolation Pond:

1. Groundwater contamination and other issues associated with the facility suggests that it has not been closed appropriately under the regulations. Ecology should place this unit in Part V rather than Part VI and include Permit conditions to ensure compliance with WAC 173-303-610 and WAC 173-303-650.

SEPA Determinations

1. Make the over-arching SEPA determination a Mitigated Determination of Non-Significance.
2. Utilize the SEPA checklists submitted with the Part B Applications and make Permit conditions to mitigate known impacts.
3. Withdraw its determination of non-significance regarding the current phase until it is known what all the Hanford Site mitigation plans will be.
4. Review all SEPA determinations for consistency with Washington State Dangerous Waste Permit Application; Part A Forms; the Unit-specific Permits; and the SEPA submitted with the Part B application of 9-2004.
5. Recognize that numerous units covered by the draft permit have significant potential impacts from current or projected conditions that are not eliminated by proposed permit conditions; therefore, the overall SEPA determination should be a Determination of Significance. For units with specific proposed conditions that prevent significant potential impacts, a Mitigated Determination of Non-Significance may be utilized.

Other

324 Building:

1. Add 324 Building to the Permit. Due to the B-Cell leak which requires extensive cleanup, this unit should be included in the Permit at the very least as a Part IV Corrective Action Unit.

Addendum 2 – Issue Manager Background Notes

September 7, 2012

Addendum 2 includes specific, detailed comments, input, and observations that provide additional context and background for the advice points and Addendum 1, and may improve the permit's content and guidance to Ecology and DOE. Much like a Sounding Board, this addendum is not a consensus product and should not be considered Board advice. Instead, it represents an accumulation of the comments, input, and observations offered by individual Board members.

Note: References to advice in this "Issue Manager Background Notes" document are obsolete. The sole purpose for this document is to facilitate Ecology's review of the Board's advice on the Site-Wide Permit.

Although the Hanford Advisory Board has not previously developed advice for the Hanford Site RCRA permit, indirectly the HAB has developed many pieces of advice pertaining to the Hanford site cleanup. The Board's first piece of advice in June 1994 to the Tri-Party agencies spoke of supporting the integration of characterization and cleanup. The Board has previously urged (#133) that DOE *"stop disposing of offsite wastes in the low level waste burial grounds (LLBG) until they are fully investigated for disposal of hazardous or dangerous wastes (including liquids, flammables, solvents, etc.) and for releases of hazardous substances (consensus advice # 98 and #103). It is vital that the groundwater monitoring around the burial grounds be substantially upgraded and vadose zone monitoring be instituted as part of this investigation. Many of the wells are dry, or soon will be, and the burial grounds lack any leachate monitoring and collection system."* Again, most recently regarding the 200-SW-2 Radioactive Solid Waste Burial Grounds (#243) with the statement *"the Permit should recognize that vadose zone monitoring is an early warning system which should trigger corrective action via enforceable contingency plan requirements in the permit. Monitoring should be shifted from interim indicators to specific regulatory standards for potential chemical and radionuclide releases.*" HAB advice (#s 173,174) also spoke to a preference of characterization & RTD with engineered barriers as a last resort with the need to monitor for failures. Advice also spoke to the need to include requirements for an analysis of likelihood and consequences of failure or imminent failure of barriers past active control of Institutional Controls.

NOTES SUPPORTING THE DIFFERENT SECTIONS OF THE DRAFT PERMIT:

GENERAL ADVICE:

Original Point 1: Ultimately deleted, included in this document to note the IM concerns : The Board advises Ecology to revise the Permit to address a general lack of clarity, rationale and logic presented in the document(s) The Board finds no rationale or logic presented in either the overarching or unit-specific Fact Sheets or the unit-specific Permits to support Ecology's decision-making process. (e.g. Modified/Partial closure of an individual unit is not authorized under WAC 173-303- regulations [*see* 1325-N]). More examples: Introduction page 6; Reorganization of tank farms reorganized into 7 WMAs

Point 1: TPA milestones referenced not the actual dates, include specific Mile Stone dates; listing of other applicable laws, etc.

Point 2: It is difficult to track permitting actions in referenced rather than attached/include documents.

- The training sections of the Permit refer reader to the Hanford Emergency Management Plan and/or a unit specific training plan. The latter is unavailable unless a Request for Public Information is filed with Ecology.
- Suggests use of a matrix approach whereas the applicable sections of the CERCLA documents are directly included in the permit is more transparent and publicly accessible. Concerns regarding "double jeopardy" are eliminated by including only those sections of the CERCLA documents needed to fulfill RCRA DW permitting requirements and modification process. CERCLA documents could contain a table of contents identifying these area and/or separate chapters for the permit requirements. This would also not be "duplication of efforts" as two separate documents are not necessary.

Point 3: SST draft permit was released after the initial beginnings of public review. It was difficult for the public to recognize there was another portion of the permit needing review.

Point 6: HAB advice # XXX previously addresses our concern of shift of RCRA authority responsibilities to CERCLA. CERCLA work activities will be ongoing and possibly completed before a closure plan is even submitted; there is uncertainty that these plans will contain all the required RCRA criteria.

Point 7:

- HAB advice # 133 addresses our concern of allowing off-site waste to be stored at Hanford.
- Concern that waste may come to Hanford in general and Permit could ban importation of mixed waste.
- Concern that Permit over-relies on Final TC&WM EIS to impose a moratorium on the importation of offsite waste until 2022 when the WTP is operational according to the TPA, and that this moratorium may change, and we won't be able to see the EIS until the end of the Permit comment period if it comes out in "late summer" 2012.
    - TC & WM EIS not finished
        - May allow GCC waste disposal
- Offsite waste coming here remains a possibility because there's no formal agreement.
    - Ecology states they are confident in the current language in the Permit in just the individual unit permits. They do not propose to add a condition barring offsite waste into the Part I & II conditions. Current waste moratorium till 2022. Whether DOE will allow it to come here again remains unknown. It will depend upon the level of total cumulative risks at Hanford and public into the permit needed permit modification.
    - If Permit conditions are to be based/established on results from the EIS [risk budget tool results, etc], then the EIS should be finalized prior to the permit conditions or finalization of the permit.

- Outstanding question remains on the classification of 'debris' since most wastes have not been characterized. Question remains on whether none of the solids actually contain liquids or not.

Point 8: Several of the Part A forms have incorrect process codes or volumes listed (D83 Surface impoundment vs. D84). Washington State Department of Ecology (Ecology) needs to review each unit's Part A form for compliance with unit(s) specific Dangerous Waste Regulations (WAC 173-303) requirements.
Permit Section: PART A Forms – is part of each unit

- Each unit permit should have an attached Part A form found with the link to that unit.
- Why do we need a Part A Form?: Any person seeking a final facility permit must complete, sign, and submit an application to the department (Ecology-NWP for the Hanford site). It must consist of a Part A permit form and the contents of Part B as specified in WAC 173-303-806(4). How much of Part A information is applicable or enforceable in a Permit? How is a Part A used to "finalize unit closures?" Volumes quoted: Do they make sense when compared to other information listed on the Part A form? Compare with the fact sheet.

Point 9: WAC 173-303-640(3)(a) text specifically uses the words '*must include'*.

Point 10: Ex: Changes in the ETF waste acceptance criteria is anticipated but there is no path for Public Involvement reviews provided in its Permit conditions.
Point 11: Ex: The 242-A Evaporator is anticipated to be running campaigns in excess of its current design functions in support of future WTP facility needs. The 242-A Evaporator's permit does not have a permit condition which addresses likelihood of equipment replacement needs.
Point 12: Both Ecology & the HAB recognize the need for a Risk Budget Tool and the necessary funding needs. The following was edited into advice points #12 with remain text placed in the Notes document: The Board advises Ecology to include a Permit condition requiring the use of a Risk Budget Tool to model cumulative effects to groundwater. The Board advises Ecology <u>not</u> to base the Risk Budget Tool on un-validated models. The Board advises Ecology to include impacts from nearby waste sites/ trenches to bound cumulative impacts to groundwater in the model used in the Risk Budget Tool. The Board advises this condition be included in the Part II conditions. This was subsequently edited during the COTW meeting as now drafted[8-8-2012 COTW]
Point 13: The Board notes that use of Method A and C to meet cleanup standards is inconsistent with previous commitments by DOE to unrestricted residential use along the River Corridor.
Point #19: For regulations, see WAC 173-303-806 and 810; tanks, containment systems, piping, drip pads, and many other units referenced throughout WAC 173-303 must be independently evaluated and certified by qualified, registered professional engineers attesting to structural integrity....
Point 20: Other clarification moved into Notes : (and that avoids plating, crud bursts and other phenomenon known to interfere in accurate air sampling).
Additional supporting information for advise point on Vadose Zone condition: Associated Risk to the Vadose Zone & groundwater:

- **All 12 single-shell tank farms have impacted groundwater**
- **Current plumes are 50-300ft deep which will be technically difficult to remediate. However the 50ft depth is not unmanageable using techniques similar to mining.**

- **One million gallons of tank waste has leaked to the soil, causing extensive soil contamination**

Discussions/Comments on the Fact Sheets:

Fact sheet should include an explanation of need for a Part A form: Any person seeking a final facility permit must complete, sign, and submit an application to the department (Ecology-NWP for the Hanford site). It must consist of a Part A permit form and the contents of Part B as specified in WAC 173-303-806(4). Each unit permit should have an attached Part A form found with the link to that unit.

Discussions/Comments on the Introduction:

Notes:

The IM Permit review team suggests to Ecology the need to rewrite the Introduction to clarify the following:

- who the regulatory agencies are,
- the process for incorporation of TPA schedule changes in the RCRA Permit,
- what portions of the Permit are 'enforceable'.

HAB member review comments on Introduction:

- Introduction should be re-written to clarify acronyms, and relationship of terminology of the work that needs to be done.
- Goose chase to find information.
- Lack of clarity – here is an example - Part 4 – rather than point reader to TPA, direct reader to Part 4 and edit this section to clearly identify which of the OU's are CPP's and R-CPP's for cleanup.
- TPA action plan is referenced, can't make comments on the action plan – have to comment on the Permit. It is a sign post pointing to other documents. Can't comment on and change the TPA action plan. We don't appreciate reviewing the Permit having to constantly go to other documents for information.
- Example of lack of clarity: Who the lead regulatory agency is not clear. Even agencies say it is difficult to understand.
- Suggestion that there is a permit that will be issued – but changes to schedules won't be publicly accessible.
- Schedule changes as they are made in the TPA are just assumed, incorporated in the permit without a formal process. Without public comment.
- Introduction is misleading to the public – public will not be able to comment in the future.

1. Comments on Introduction:

Comment #1: Section 1.2.1 Waste Site Categories listed 7 categories defined as RCRA facilities, TSD units, DWM units, SWM units, OUs, PP units and inactive portions of Hanford. Unless the reader deals with these acronyms every day, further understanding of these acronyms in this Category" when no waste was ever on the inactive portion.

2. Comment #2: I found the discussion of the two cleanup processes in Section 1.2.2 (Cleanup Processes) to be confusing and extremely difficult to follow. One suggestion is to provide examples of different kinds of waste sites and different kind of facilities rather than adhering to Ecology RCRA/CERCLA acronyms and Ecology jargon of which the

public may not be familiar. The CPP and R-CPP process discussion became difficult to follow.

3. Comment #3: Sections 1.2.2.1 (OUs subject to CPP process) and 1.2.2.2 (OUs subject to the R-CPP process) both tell the reader that he/she must go to Appendix C of the HFFACO Action Plan to find out which OUs are included. .This permit ought to be able to save the reader and permittee time by listing those OUs without referring to the HFFACO Action Plan. In addition, the HFFACO Action Plan is not subject to review in this exercise. That means if the reader has problems with how the OUs have been organized, this permit is not the agenda to comment. This leads to the larger concern that the permit is dependent on other documents outside the scope of this review. That is frustrating because it isolates the permit from critical review. The permit is essentially a signpost containing signs pointing to other documents which cannot be reviewed or changed.
4. Comment #4: Section 1.2.3 on the Lead Regulatory Agency was difficult to understand. Since the criteria for assigning the lead agency came from the HFFACO Action Plan, the criteria appears to be off-limits for comment and revision.
5. Comment #5: Section 2.1.1 (Purpose) states that the draft permit must work in coordination with the HFFACO (which is not subject to public review at this time). This future coordination does not appear to be subject to public review. That suggests that while the public is allowed to comment on certain aspects of the draft permit at THIS time, the public is NOT allowed to comment on the implementation of the permit as the permit is "coordinated with the HFFACO." Such language in Section 2.1.1 seems to further distance the public from the process of cleanup at Hanford.
6. Comment #6: Section 2.1.2.1 (Conditions) elaborates on Section 2.1.1. The statement is made that "Some conditions establish compliance schedules or use information from other documents," and "Schedule changes are incorporated into the permit without a formal process." Both statements allude to the point that the permit contains information NOT SUBJECT TO PUBLIC REVIEW. Such information pours into the permit and cannot be challenged by reviewers because it is from a source that is not open for public comment.
7. Comment #7: Near the end of the Introduction, after the overview of the permit contents, the statement is made, "Permittee will comply with enforceable portions of the Permit's attachments, addendums and appendices." The question then arises as to how the Permittee will know which portions are enforceable.

Notes:

- Reviewer did not find anything that had to be changed.
- Section 1.2.1 lists seven waste categories. RCRA, TDS, etc. Inactive portion of Hanford is not an active waste unit, is it? Orchards count even though no waste sites.
- RCRA Facilities – is that different than TSD units? Jean says – they overstate it. Good to ask for clarification.
- Language about what each unit is, is unclear. Members of the public will be confused. Clarify acronyms.
- Section 1.22.1 – Why can't permit list which operable unit is which.
- Section 1,2,3 two cleanup processes, lead reg authority comes from TPA action plan, copying criteria, very difficult to understand.

- 2.11 – Purpose – Permit working in coordination with TPA. Public is not able to comment on implementation of the permit.
- Section 2.2.1 – Conditions – Ecology doesn't have authority to do this.

Discussions/Comments on the Hanford Emergency Management Plan:

- Ecology needs to review advice points under the WTP Facility as many are relevant to the editing needs of the Hanford Emergency Management Plan.
- Fig. F1-1: Places portions of SR 240 and the B Reactor museum INSIDE the public access limit; Places one arm of LIGO almost fully INSIDE the public access limit; Places the Gable Mountain and Gable Butte sacred sites INSIDE the public access limit; Places the Dunes monument area INSIDE the public access limit.

Discussions/Comments on the Parts I and II Conditions: Self-explanatory. Also review over-arching advice points.
Discussions/Comments on the Part III: Operating Units: Also review over-arching advice points.
LERF & 200 Area Effluent Treatment Facility: Self-explanatory. Also review over-arching advice points.
Other notes:
Issues:

- What agreements are in place for sending effluents to ETF? If WTP is going to send effluents to ETF does its waste acceptance criteria allow this?
- What other WTP interface agreements exist? (DOE & Contractor interface control document # 19 was cited by Ecology as the answer to the ETF effluent question).
- ETF will also need upgrades for the volumes received and how/when its puts this waste stream into a 2nd waste form acceptable for disposal [probably in ERDF].
- What's the "Pre" to Pre-Treatment Facility going to look like if there's one in the planning? What type of permit will this facility have if built?
- How is the waste acceptance criteria enforced for ETF?
- Public review issue.
- Not clear that receiving facility is able to accept new waste streams – assumptions that facilities are able to accommodate those new waste streams.
- Example: garnet in tanks

Notes:

- Need to get more information from Ecology – answers to these questions.

HAB reviewer notes & comments:

- the failure for hazard identification and hazard mitigation in the permit.
- Comment: The Permit claims to protect human health. Regarding LERF and ETF, there is no definition of the hazards which must be controlled to protect human health.
- The Permit fails to describe the abnormal feed streams which would threaten human health. Therefore, the actions necessary to deal with abnormal feed streams are not documented.
- The Permit is written like both the LERF and ETF always receive non-hazardous waste and that no precautions are required for safe operation of LERF and ETF.

- For example, if organics from the 242-A Evaporator are dangerous wastes which must be carefully controlled, the Permit does not acknowledge the need for special controls.
- The permit is oblivious of any hazardous materials which may enter LERF and ETF and eventually cause damage to human health.

Other HAB reviewer comments:

- Comment: The Permit claims to protect human health. Regarding LERF and ETF, there is no definition of the hazards which must be controlled to protect human health.
- The Permit fails to describe the abnormal feed streams which would threaten human health. Therefore, the actions necessary to deal with abnormal feed streams are not documented.
- The Permit is written like both the LERF and ETF always receive non-hazardous waste and that no precautions are required for safe operation of LERF and ETF.
- For example, if organics from the 242-A Evaporator are dangerous wastes which must be carefully controlled, the Permit does not acknowledge the need for special controls.
- The permit is oblivious of any hazardous materials which may enter LERF and ETF and eventually cause damage to human health.

242-A Evaporator: Also review over-arching advice points.

Other notes:

Issues:

- How is the evaporator going to handle all the extra campaigns when WTP comes on line?
- Did the TC&WM EIS address this question?
- Is there a replacement facility for the 242 Evaporator?
- Fact Sheet: Does not address major upgrades recently made with stimulus money, new off gas system
- Conditions: Ignore the ammonia issue – not addressed. Ammonia has been sent to evaporator in excess of feed criteria limits. Is that going to continue? That is not at all reflected in this permit. The impact of ammonia – off gas.
- Unit description should have included new information.
- Part A should include new upgrades.
- Fact Sheet: Does not address need for equipment replacement. 35 yr old evaporator has had equipment failures on established frequency which will continue into the future. Needs to work for another 20 years. Key is the boiler system. Loss of the main boiler unit will put it down – 1-2 years to replace it.
- HAB is concerned about the reliability of facilities that have to operate on an interconnected schedule.
- Accumulation of organics in condensate tank, potential explosion. This was not recognized as a safety issue in the permit. Have recognized the need to overflow the condensate tank at the end of each campaign, BUT if organics keep going back to the tank, then you have a major build up of organics in the underground tank.
- Is there State concurrence for changing procedures for organics?

Additional Notes:

- If WTP starts in 2019 there is a pinch point in 2022 evaporator running more campaigns than it has ever run in its history. Manager says, we don't think it can do that. If main boiler unit goes down, WTP shuts down.
- 3.7.1 Tank Waste Acceptance Criteria – requirements for limiting volatile organics. Inaccurate samples to reflect organics in the waste. Organics stay at top, don't get pumped to evaporator. Sampling doesn't reflect true organic levels in the tanks.
- LERF issue too – can't take organics. Before were pumping to ETF from the bottom of the tank including organics. Surprised that there were so many organics. They are supposed to overflow back to the underground tank.

HAB reviewer notes & comments:

- The fact sheets omits an important aspect of the evaporator which is that the evaporator is 35 years old and requires continual maintenance. The fact sheet omits the fact that the evaporator has a frequency of equipment failures (pumps fail etc) which have not been carefully tracked and are not carefully planned for in the future.
- The fact sheet omits the fact that the 35-yr old control systems were gutted and replaced with up to date systems in the past 5 years. The fact sheet omits the fact that stimulus money was used to make several other upgrades to the system.
- The fact sheet omits the fact that ammonia specifications for evaporator feed have been routinely ignored resulting in corrosion in the off-gas system, and replacement of those pieces of equipment using stimulus money. The projected failure into the future is a certainty but has not been planned for.
- The fact sheet omits any of the events which have yielded unplanned contamination. In other words, the permit pretends that there are no events to be concerned about…because, perhaps, the state is not aware of past events where contamination and hazardous waste have been unconfined inside the evaporator building.
- The most important element which is needed for the fact sheet is that historical equipment failures need to be placed on a timeline and projected into the future, so that equipment replacement can be planned using historical failure frequency.
- The biggest concern is failure of the primary evaporation vessel which would require a major shutdown with a long duration. A shutdown with a long duration would adversely affect the WTP.
- If you had a 35-yr old car and expected to drive the car hard every year for another 50 years, you would be expecting to replace the transmission and the engine periodically. The fact sheet does not reflect the fact that the evaporator needs to be operated another 50 years and will have many mechanical breakdowns in that time period.

325 Hazardous Waste Treatment Units: Also review over-arching advice points.

Central Waste Complex: Also review over-arching advice points.
Other Notes:
Issues:

- Non-compliant facility – what is being done to address this?
- Why have the upgrades needed to bring it into compliance with the Dangerous Waste Regulations not been included as Permit Conditions?

- Ignitable wastes maybe stored next to corrosive wastes; what are the applicable regulations? Do the Dangerous Waste Container regulations apply?
- Ignoring waste treatment requirements
- Compliance schedule???
- Worker safety issues.
- When will CWC close? Unknown; will operate until all wastes are done. Also unknown is whether it will include anything from the closure of WTP…to far into the future.

Notes:

- Are they going to require building a new facility?

Additionally received comments on the CWC:

- Waste stored at the CWC should be cataloged and properly labeled. The drums are currently labeled as debris, which has a legal definition of "dry" waste.
- There have been multiple, documented leaks of toxic liquid from "dry" drums.
- We urge Ecology to issue an order to have all wastes properly characterized to ensure that explosive or flammable chemicals are properly stored, and that all the wastes are removed for treatment on an aggressive schedule in an enforceable permit.
- RCRA requires:
    - Dams, berms, and containment be present that equal the content of the drums
    - That there be segregated and designated storage areas
    - No outside storage
    - Characterization and designation of what waste is actually being stored in the CWC
    - Corrosive, incompatible wastes not be stacked on top of one another.
    - Any new permit should include this language and make sure that existing conditions are brought into compliance with RCRA
    - A new permit needs to include a strict schedule to remove all wastes to be tested, characterized and properly designated
    - Strict schedule to remove waste for treatment.
    - A HAB advised plan to fund removal and treatment as important compliance activity
    - All outside waste needs to be removed and properly stored.
    - Must either close the current facility or bring it up to compliance with the law.
    - Waste currently on site needs to be characterized
    - No new waste should be admitted

Refers to Over-arching advice point #24 –IM -G Pollet :

There are formally documented exceedances of standards for groundwater contamination from existing wastes, existing waste site contamination release projections; and, on-site cleanup generated projected waste disposal releases, including cumulative impacts from all units in the Central Plateau, which SEPA requires Ecology to consider and mitigate.

1) Apply the principle of "Clean-Up first", if the wastes already at Hanford are projected to cause contamination in excess of groundwater and health standards, then the permit must bar adding any more offsite waste.

2) It is not adequate to apply a bar on offsite waste solely on a unit by unit basis utilizing a risk budget for that unit, without considering the cumulative impacts from releases to groundwater from all units and contamination sources in the area. 3) The failure of existing storage facilities to be compliant makes it important to have a general condition barring offsite waste additions. Barring waste additions to the existing facility is not adequate to prevent USDOE from adding new facilities which could accept offsite waste while failing to have the existing wastes and facilities brought into compliance.

Waste Receiving and Processing Facility (WRAP): Also review over-arching advice points. HAB reviewer notes & comments:

- The WRAP facility was designed to package TRU waste to meet waste acceptance criteria at WIPP. The permit does not discuss this function with TRU even though mixed waste can contain plutonium. ADVICE: Edit this section of the permit to point out the function of the WRAP is to package TRU waste for shipment to WIPP, and that mixed waste can have TRU components and be called mixed TRU waste or MTW.
- Given the various sections of the permit for the WRAP facility, the operative part is the Waste Analysis Plan (compared to the Fact Sheet and other sections which say very little). No guidance is given to sampling a waste drum with unknown and different waste in each package. Many drums were filled over a period of operating shifts and various people put various waste into the waste drums. The permit acts like this waste is described perfectly, but usually there is no information available, and the WRAP operator has to exercise personal judgment as what to sample and what not to sample. When there are many different containers in a drum, the prudent step is to sample each container. However, the Waste Analysis Plan appears to avoid providing insight as how to sample every bottle in the waste drum. ADVICE: Provide guidance on how to obtain representative samples from a drum when the drum contains multiple containers of waste, with no process information which shows the waste is linked (typical of most drums produced in the 1970s, 1980s and 1990s.)
- MISCELLANEOUS COMMENTS ON WRAP SECTION OF PERMIT:
  1. The Part A Form is too complex to decipher. The coded information should be provided in plain English so that the public understands what is going on.
  2. The FACT SHEET, UNIT DESCRIPTION Lines 13-15 describes the wastes to be handled as dangerous or mixed waste. Transuranic waste is not specifically mentioned leaving the reader wondering how TRU waste fits into the WRAP function. Line 20 says that WRAP treats mixed LLW or mixed TRU. Suggestion: Add a sentence or two to explain how TRU within the WRAP facility fits into the permit.
  3. Page 2 of the FACT SHEET states that waste is sorted at WRAP. There is no clue as to what dangerous chemicals might be present in the waste. Suggestion: provide insight into the kinds of dangerous chemicals that are found in TRU drums being handled in the WRAP. This should be consistent with the information in the Waste Analysis Plan.
  4. In the FACT SHEET, the General Waste Management Requirements are defined by WAC 173-303-300(2) which requires a detailed chemical, physical or, if necessary, a

biological analysis of the dangerous waste BEFORE such wastes are stored, treated or disposed in WRAP. At Hanford, WRAP receives waste drums from the 1970s, 1980s and 1990s without knowing much about what is inside. SUGGESTION: Add sentences which explain how WRAP can accept unknown wastes without violating WAC 173-303-300(2).

5. In the CONDITIONS SECTION, page 5, lines 6&7 state that WRAP provides storage and treatment for DW and/or MW. Nothing is said about TRU. Suggestion: Add an explanation of how TRU is handled under the heading of mixed waste.
6. The CONDITIONS SECTION point to some other document for every single condition. By failing to provide conditions, this section raises a policy question of how the authoring agency can be trapped into writing a CONDITIONS SECTION which does not contain any conditions. SUGGESTION: Put the conditions in the CONDITIONS SECTION.
7. The Waste Analysis Plan contains 40 pages of which the singular most important activity is to determine if liquids are present. If no liquids are present, it appears the waste can be repackaged for WIPP without further thought. If liquids are present, the need for sampling is left to the operator except that one in ten drums, or one in ten bottles, need to be sampled. Suggestion: Provide clearer instructions for the operators.
8. Section B.1.1.1.2 of the WAP, entitled the Waste Acceptance Process: Line 24 states that a percentage of waste containers will be subject to chemical screening as spelled out in B.2.4.3. How does one know what dangerous chemicals will be there given the wide range of possibilities?
9. Section B.1.1.1.2.2 of the WAP states there is a committee of people who perform evaluations for each waste. Suggestion: Explain how the people on this committee determine what to sample and what to sample for.
10. Section B.2.1.1.1, the WASTE STREAM APPROVAL PROCESS depends on WRAP operators conducting a review of the waste information provided by the permittee. This information can be vague and general with no specifics. Most of the time the permittee will guess what went into the drums, especially if the drums were filled over different shifts performing different activities. SUGGESTION: The permit must be more realistic and realize that specific information is not available on all drums of waste, and that operators will have to "wing it" regarding the sorting of waste and sampling of waste, especially when no liquids are present. The permit must be more realistic regarding the questions facing operators as they pull out packages of waste with unknown chemical contamination.
11. SAP Section B.2.1.1.3.1 GENERAL KNOWLEDGE REQUIREMENTS: This requires the waste generator to use on-site labs to obtain data that will be used as a basis to certify that the waste meets LDR standards. This shifts the responsibility for characterizing the dangerous waste from the WRAP facility to the Waste Generator. SUGGESTION: There seems to be an inconsistency in different parts of the permit as to whom is responsible for characterizing the waste as DW or MW. This responsibility should be made clear throughout the permit.
12. Section B.2.1.3.1 of the Waste Analysis Plan states that 10% of the containers need to be verified by physical screening and chemical screening. Sampling only 10% of the containers when each container is different will not provide an accurate

characterization of the waste. Suggestion: This requirement should be made clear if it applies to 1 in every 10 drums, or 1 in every 10 waste packages inside a drum. The 10% rule should only be applied to where it is absolutely known that the material inside the drums is exactly the same.

13. Section B.2.1.3.3 of the Waste Analysis Plan recognizes that a sample from one package on top of a drum may not represent the 15 other packages located near the bottom of the drum. The Analysis Plan does not tell the reader exactly how to proceed. SUGGESTION: The Plan should provide more guidance to the WRAP operator.
14. Section B.7.3 Waste Treatment, discusses a single treatment of neutralizing a liquid and then mixing the liquid with cement, forming a grout for burial as a mixed waste. SUGGESTION: The treatment of DW and MW should allow for some flexibility such as outlined for treating peroxides, oxidizers, sulfides, cyanides and halogenated organic carbon.

WTP:

Issues:

- WTP concerns – How will the Permit ensure that the WTP will work?
- Stack Emissions
- Characterization of Waste
- Air Permitting – separate for Hanford Site with DOH and Benton Clean Air Authority. It is listed as another permit that they have to have. Part A form. Need someone to look at this. When WTP operates, will have big air release concerns. Make sure that the conditions are adequately addressing those issues.
    - WTP: Technical info not easily found. Technical issues will require decisions to be made in a very short time period. How do the Permit conditions address this concern?
        - Examples: WTP Pulse jet mixers are a problem not yet resolved; Equipment (tanks, etc) are already being purchased; Corrosion is an issue; Criticality issues not understood.)
    - Waste Incidental to Processing Reclassification (WIR): Solely a DOE responsibility, the tank farm soils would still be under RCRA whatever the WIR process determines.
    - Tank Farm Vadose Zone is being handled under the RCRA Corrective Action process. A RIF/CMS report is required.

Notes:

- When's the natural gas pipeline going to be installed? [Ecology response: Not in the WTP baseline. Steam boilers are for 'comfort heating.' They are designed to use diesel. They are a part of the Balance of Facilities. They are not considering it. When the EIS comes out, they will have to consider it. However, the 'safety & authority' basis is a very big deal; all designs will need review because of nuclear safety concerns.]
- What agreements are in place for sending effluents to ETF?
- Concern that the design is still being changed.
- How do you permit a facility that is still being designed.
- Not sure what the requirement is, the diagrams in the permit, engineering docs are not stamped by a registered engineer. Not sure what these drawings really are. Flows coming

in from low level waste, high level waste, condensate, all join together and go to a common tank, there is no valve. Exhaust headers issue.

- Lots of valves and control system absent from drawings and may be absent from design. Not clear until see where they are going with the plant.
- Secondary containment on piping from tank farms. Disclaim that they didn't look at corrosion resistance on pipes. In Oregon, if you look at a system you look at it all, can't be selective.
- Emergency Plan as relationship to this – these are rough thoughts:
    - Don't set standards or criteria for incidents and events.
    - Everything is deferred to emergency management plan which is outside the permit.
    - Include a few new things – B-Reactor museum etc. inside public exclusion area
    - Natural phenomena is talked about – but not many modes of failure. For example losing offsite power for a month at the WTP.
    - Do talk about volcanic stuff. Didn't look at lessons learned about doors being taped shut and people trapped inside from mt. saint Helens.
    - CO2 fires, deadly near high voltage equipment – didn't look at this in the emergency plan
- Wastes that are too difficult to treat: Need to be designed for now.
- Off-gas melters – removed systems to save cost, but changes operator training requirements.
- Pulse Jet Mixer Design: using stellite 12 for alloy for metal, looked for renolds number in the parameter of something to turbulent. Stellite is good for…..
- Nothing in diagrams that warrants them not being in the publicly released version. Nothing that seems like it is top secret.
- How can you have a permit for review that you can't see?
- Can't read the documents in paper copy – diagrams – Part 3 Operating Unit 10-C-1-24 – taken a big diagram and shrank it – impossible to see the details. Need to look at the electronic copy to see it.

Additional HAB reviewer notes & comments:

- Reviewer suggests to Ecology to link to documents III.F…
- Reviewer suggests to Ecology to revise the Emergency Management Plan in the following ways:
    -

1) Part III, Section F – defers to Hanford Site Emergency Plan.

a) Does not set standards or criteria. (F1 Section F5.0 FACILITY HAZARDS). These are deferred to later. (Chemical and radiological constituent hazards that could occur at the WTP will be identified and evaluated in the hazards assessment required by the Hanford Emergency Management Plan (DOE-RL 4 94-02, 2006), Section 1.3.3.2.)

b) Does not require early identification to allow for design change or mitigation

2) Part III F1, Emergency Response - Figure F1-1 – inappropriately sets the public access limit

a) Places portions of SR 240 and the B Reactor museum INSIDE the public access limit

b) Places one arm of LIGO almost fully INSIDE the public access limit

c) Places the Gable Mountain and Gable Butte sacred sites INSIDE the public access limit
d) Places the Dunes monument area INSIDE the public access limit
3) Part III F1, Emergency Response - Section F1 - F5.4, F6.1.9 and F7.2.7 Criticality
a) Inaccurately assert that criticality events are not credible. Based on plutonium particles and mixing issues, these are now known to be credible events. (Analyses have shown that there is no credible criticality event that can be postulated to occur at the WTP (BNI 2001b).)
b) Even were no credible events postulated, the emergency plan is derelict if it doesn't plan for response to such events.
4) Natural phenomenon (e.g. Cascadia seismic events) need not severely damage the plant to result in severe releases within the plant. The emergency plan would be derelict not to plan for response to potential events.
5) The Emergency Plan does not reference, postulate or plan for suffocating CO2 release events from the cooling systems.
6) As evidenced by the eruption of Mt. St. Helens, the damages and difficulties associated with volcanic events go far beyond those identified in F6.2.2 Volcanic Eruption/Ash fall. These include highly abrasive ash infiltration into operating spaces, equipment failures from polishing, added entry controls to minimize ash entry resulting secondarily in failure of exit safety equipment to perform (e.g. exit doors being so taped shut as to be unusable in an emergency).
7) The emergency plans should include an assessment of various modes of failures and their impacts on the emergency plans (e.g. common, cascade, sequential, parallel and other modes; age related failures through erosion, wear, corrosion, etc…)
8) Section 9.2 should include specific actions to ensure that CO2 fire extinguishers are not used on or near high voltage equipment, nor in areas that are or may become "confined spaces".

Other notes on the review of WTP

1) ADDENDUM B1 WASTE TREATMENT PLANT WASTE ANALYSIS PLAN
a) Section I Introduction, Part III, Operating Unit Group 10-B1.1, Paragraph at line 31. NRC has not agreed to classify the ILAW waste as incidental to reprocessing. They said they will likely agree provided a set of conditions are met (removing key radionuclide to the maximum degree practicable, meeting Class C waste limits and conditions, etc…), but that if they are not met, the reclassification may not be allowed.
2) Though the Appendix makes extensive reference to several documents, they are not included in the permit as attachments.

9.1 Project Documents

Waste Treatment Plant Quality Assurance Project Plan for the Waste Analysis Plan, Rev. 0.

26 24590-WTP-RPT-MGT-04-001, Rev. 0, *Regulatory Data Quality Objectives Optimization Report* RPT-W375LV-EN00002, as amended. *Approach to Immobilized Hanford Tank Waste Land Disposal Restrictions Compliance*.

3) The appendix defers requirements for analysis and frequency to these documents and fails to set or require standards for these requirements or frequencies. The required analytes, methods, frequencies, and locations should be detailed as permit conditions as is partly done in III.10.C.e.ii

4) Permit conditions III.10.C.2.n.i through .iv detail requirements that must be completed in the past (June 30, 2010). These should either be changed to future dates, or should detail the results reported and the actions required that flow from these.
5) Permit Conditions III.10.C.2.o.i and later require compliance with the Waste Acceptance Criteria and should be amended to include the NRC provisional criteria for delisting of the ILAW as other than HLW. If the wastes fail to meet these criteria, they are not subject to near surface disposal at Hanford.

Additional Reviewer Notes:

1. Refers to Advice Point # 27: Following the eruption of Mt. St. Helens many industrial facilities protected critical equipment and occupied spaces by taping doors. Only later when they went to remove the tape did they realize that the emergency exits could not be opened from the inside. Similarly, emergency systems no longer worked as expected in some cases.
2. Refers to Advice Point # 32: The NRC provisionally identified three criteria they would use to evaluate whether ILAW waste could escape being classified as High Level Waste requiring disposal in a deep geologic repository. Among these were requirements to remove key radionuclides to the greatest degree practicable, and to meet NRC LLW performance criteria. Various DOE decisions about how the waste treatment plant is designed (e.g. removing technetium removal capability) may cause the ILAW waste to fail to meet the NRC criteria.
3. Refers to Advice Point # 1: These either should be changed to future dates, or should detail the results reported and the actions required that flow from these events.

Refers to Advise point #27: *Notes: Failures can occur from single direct sources, or from more complex means, such as Cascadia seismic events or coronal mass ejections resulting in massive electrical grid and electronics failures. Complex systems are particularly vulnerable to cascading failures where single mode failures propagate causing later failures (e.g. explosions causing shrapnel to damage or destroy other systems leading to additional failures). Parallel trains of equipment if operated equally in parallel tend to reach end of life failures at nearly the same times. Failure of one such system leads to reliance on the next which in turn fails under pressure.*

4. Refers to Addenda with comments on the WTP unit permit: *Note:* Addendum B-1 the *Waste Treatment Plant Quality Assurance Project Plan for the Waste Analysis Plan, Rev. 0*.,24590-WTP-RPT-MGT-04-001, Rev. 0, *Regulatory Data Quality Objectives Optimization Report* RPT-W375LV-EN00002, as amended *Approach to Immobilized Hanford Tank Waste Land Disposal Restrictions Compliance* defers requirements for analys*is and frequency to these documents and fails to set or require standards for these requ*irements or frequencies.

   Refers to Addenda with comments on the WTP unit permit: With reference to… Addendum B-1 to the Waste Treatment Plant Quality Assurance Project Plan for the Waste Analysis Plan, Rev. 0.,24590-WTP-RPT-MGT-04-001, Rev. 0, Regulatory Data Quality Objectives Optimization Report RPT-W375LV-EN00002, as amended Approach

to Immobilized Hanford Tank Waste Land Disposal Restrictions Compliance defers requirements for analysis and frequency to these documents and fails to set or require standards for these requirements or frequencies. Reviewer suggests to Ecology these required analyses, methods, frequencies, and locations should be detailed as permit conditions as is partly done in III.10.C.e.ii .

IDF:

Issues:

- Risk Budget Tool; IDF Risk Budget will model cumulative affects to GW but it doesn't include impacts from nearby waste sites/trenches. [Ecology-good comment; need for a risk budget tool to be developed, utilized & funded.] Ecology further stated that they would expect modeling from the EIS would be rolled into modeling for permitted unit's risk budget. Parameters from the EIS modeling will be taken into account. Ecology is happy with the modeling approach in the EIS]. Is HAB satisfied with the EIS modeling?
    - IDF =landfill and final disposal of waste. Ecology needs to know impact of waste streams to HH & E. If close to exceeding the risk budget for any COC, the Permit would have a condition to limit/restrict disposal.
    - HAB needs to understand how cumulative risks from the EIS may have impact on RCRA permitted units.
- What will it take to have IDF accept 2nd waste from WTP?

Notes:

- Pretty straight forward – conditions for behavior are simple. Leachate system.
- Disturbed that materials permitted in the trench are 50 cans of bulk vit from the so-called demonstration program that hasn't happened. Should be taken out – shouldn't be allowed to have those cans in the trench.
- Risk Budget Tool – program and mechanisms to produce values so the input is acceptable. This is a long ways from being available as far as Dick can tell. Should apply to currently open burial trenches. Anywhere you are going to plant waste in the ground, the risk budget tool should be active. Didn't see it anywhere. Risk Budget Tool needs to be in place before we start putting anything in IDF.
- Anything they plan to put into IDF, put in allowable inventory of things, not sure how that process is played out. Propose a nominal amount of stuff over period of time and show through risk budget tool that it is acceptable.
- That facility is designed for offsite waste, primarily it is designed for LAW. Current problem is fixation on finding ways to solidify secondary waste in a non-glass form, not acceptable. Haven't proposed that yet or change permit yet to incorporate that material. Likely to rear its ugly head.
- Tools they use to develop tank waste EIS, best we have in hand, use the best you can get a hold of, may want to upgrade it over time. Have a lot of work and effort in developing methodology used in EIS. Still doesn't represent reality. Better than guessing.
- Trenches and risk budget tool?

More notes from Ecology PP presentation to the HAB: The HAB supports use of a Risk Budget Tool and conditions requiring them. The HAB wants a validated model used for the Risk Budget Tool.

Integrated Disposal Facility Permit; Waste acceptance criteria tools are built into Permit conditions

III.11.C.8 ILAW Waste Form Technical Requirements Document (IWTRD) For any ILAW glass form(s) that the Permittees intend to dispose of in IDF, the Permittees will provide to Ecology for review an IWTRD.

III.11.C.6 Modeling – Risk Budget Tool The Permittees must create and maintain a modeling - risk budget tool, which models the future impacts of the planned IDF waste forms including input from analysis performed as specified in Permit Condition III.11.C.8 (IWTRD) and their impact to underlying vadose and groundwater.

DST & 204-AR:

Issues:

- Tank Waste Retrievals and Closure Schedule
- Vadose Zone
- Characterization of Waste
- Non-compliant tanks
- Technical issues affecting design and safety basis are not acknowledged.
- Lack of budget to maintain instruments and working conditions is not acknowledged.

Notes:

- No hazard analysis for WTP for example.
- Lots of systems non-functional.

Additional reviewer notes & comments:

- The DST permit requires that wastes meet specifications or it would be a violation of the permit. Since radiolysis destroys hydroxide, the hydroxide level of certain tanks has dropped to levels below providing the corrosion protection required by specifications. Hanford contractors have left tanks out of specification for years due to lack of budget. POLICY CHANGE REQUIRED: The permit needs to address waste going out of specification due to changes in chemistry.
- The permit deals with the DSTs and radioactive waste like we live in a perfect world. Occasionally there are leaks to the ground from transfer lines and leaks inside diversion boxes. The Permit is silent on radioactive mixed waste that gets outside of tanks or pipes. POLICY CHANGE REQUIRED: The permit needs to address waste that has escaped into the environment from tanks and transfer lines.
- Condition III.12.D.3 requires the Permittees to submit a report annually to Ecology identifying changes in the compliance status of DST System noncompliant components as indentified in H-14-107346. POLICY CHANGE REQUIRED: DOE should change their policy and provide copies of the DST system noncompliant components to the Hanford Advisory Board and to the public.

Additional notes edited from advice points:

- The Board is concerned with dropping levels of hydroxide and the resulting jeopardy of tank corrosion protection. The Board supports Ecology's efforts to deal with corrosion protection here and at the WTP

Additional notes referring to DST #5: Part of the cleanup plan involves transferring the waste from the leaky tanks into other more reliable vessels. As they transfer the waste, workers face the risk of exposure to chemicals that may harm their health. Exposure to radioactive waste can lead to nausea, vomiting, diarrhea, fever, hemorrhage, increased risk of several types of cancer, and, in cases of high dosage, death.[1] The tanks also contain nonradioactive substances (i.e. silica, heavy metals, beryllium, acids) that come with a host of other health risks, including lung disease, decreased cell function in kidneys and nervous system, sensitized immune system, and burns.[2]

Certain conditions at the Tank Farms make worker exposure more likely than it should be. Much of the tank waste is uncharacterized, making it almost impossible to know to what workers have been exposed when an exposure incident does occur. The monitoring equipment currently used tests only a small amount of the more than 1200 potential chemicals coming out of the tanks, and this monitoring only occurs a small amount of the time that the workers are out there potentially exposed to the vapors.[3]

On September 29, 2008, the Hanford Concerns Council released an independent review report[4] prepared by an expert panel selected by the Council. The expert panel was asked to evaluate the tank farm contractor's Industrial Hygiene Chemical Vapor Technical Basis. The evaluation was commissioned at the joint request of CH2M HILL and Hanford Challenge. The expert panel concluded, "The committee is unable to conclude that the protective measures are sufficiently conservative to protect worker health."

The Hanford Advisory Board advises the Department of Ecology to use its authority under the Resource Conservation Recovery Act (RCRA)[5] to better regulate and protect Hanford workers from exposure to chemical vapors at Hanford, specifically with reference to those chemical vapors emanating from the high-level nuclear waste stored in Hanford's underground radioactive waste tanks.

[1] National Economic Council, "Occupational Illness Compensation for DOE Contractor Personnel," (2000).

[2] Sumner, D., H. Hu, and A. Woodward, "Chapter 4: Health Hazards of Nuclear Weapons Production," *Nuclear Wastelands*, (MIT Press, 1995).

[3] Government Accountability Project, *Knowing Endangerment: Worker Exposure to Toxic Vapors at the Hanford Tank Farms* (Sept. 2003), 7. [hereinafter, *Knowing Endangerment*]

[4] "The Industrial Hygiene Chemical Vapor Technical Basis Review," June 2008, J.N. Breysse, PhD,

Franzblau, MD, H. Witschi, MD, available at
http://www.hanfordconcernscouncil.org/download/report_techreviewfinal_20080929.pdf

[5] 42 U.S.C. § 6973(a)

400 Area Waste Management Unit:
Notes:

- Sodium hydroxide issues

LLBG & Trenches 31 & 34 & 94:
Issues:

- Risk Budget Tool
- What characterization was done of nearby trenches?
- Why not call it all mixed waste since it's all within the boundary of the unit?
    - Categorizing trenches within the unit boundary as RCRA and elimination other trenches. Question posed as to why all trenches are not called RCRA until characterized as non-RCRA ? Are these trenches to be characterized and if RCRA, will they be included in the permit through a modification? [Ecology's response was "no" they won't be modified into the permit because they can be RTD under CERCLA.]
    - No closure plans; deferred to a compliance schedule. Some of the Milestones for submittal of closure plans for some of the burial ground units in the Central Plateau have dates that are very far out into the future.
    - Barrier/Cap designs are not yet finalized.
    - Have Waste and Analysis & Sampling and Analysis Plans be informed by results of a Risk Budget Tool? Risk Budget Tool is a permit condition; however it has not been developed. It will probably use the modeling & parameters from the TC&WM EIS risk budget.
    - Land Disposal Regulations are applicable; they prevent placements of liquids in landfills-grout contains liquids. Permit wants to allow in-trench treatment of wastes using grout.
    - Container regulations: Permit wants to allow containers to be stored next to trenches. Permit wants to allow these on a non-compliant RCRA design in-lieu of building a compliant facility.
    - Waiver of liner requirements at Trench 94-reactor burial area.
    - GW: unclear how current interim monitoring plan meets final status permit requirements; needed new RCRA well installation is out in FY 2015. Use of 200-PO-1 OU rather than RCRA –the application of alternative standards is unclear.
    - Part A form information is questionable [vols.]
    - SEPA: ?
    - Modeling: Ecology has approved the 'codes for STOMP-1D' but not the application of the results but say they have approved the Graded Approach which does use these results. How can Ecology not really be agreeing?

Notes:

- LLBG permit condition states this unit will have a Risk Budget Tool developed. This tool is anticipated to be developed from the parameters & modeling approach used in the TC-WM EIS.

- Additional information and reference to 200-SW-2 OU document included in permit but these documents are not finalized. Permit is based on results of as of yet finalized document(s). Workplan draft for 200-SW-2 OU is not due for submittal to Ecology until sometime in 2014.
- Where do the alpha caissons and PFP fit?

Additional reviewer's comments:

- Reviewer suggests to Ecology to revise the Permit Part A Forms and Permit conditions to reflect current operational needs and the waste volumes and appropriate waste codes for currently stored in these units.
- Moved up to be included in the over-arching general advise points but it remains a concern. Reviewer suggests this as an advice point: The Board advises Ecology to revise/include a Permit condition requiring continued use of the Risk Budget Tool. Furthermore the Board advises Ecology require in a Permit condition submittal of the parameters used in the Risk Budget Tool and their basis subject to the WAC 173-303-830 process
- Reviewer suggests as an advice point: The Board advises Ecology to revise the Permit Part A Forms and Permit conditions to reflect current operational needs and the waste volumes and appropriate waste codes for currently stored in these units
- Reviewer suggests as an advice point: The Board advises Ecology to include a Permit condition requiring demonstration of adequate characterization of all trenches/cribs/and ponds. The Board advises Ecology this condition to include/revise a permit condition for statistically based sampling design.

Additional reviewer comments & notes on Trenches 31 & 34

- The waste needs to be dug up and characterized
- Monitoring of the entire 40 miles of unlined trenches needs to take place
- Simply building a dirt cover does not solve the problem and makes it significantly harder to remedy the problem in the future
- It is noted that there is mixed opinions on allowing expansion of Trenches 31&34.
- It is noted that there is mixed opinions on whether there is an incorrect application of WAC 173-303-815(3)(b)

Trench 94:
HAB reviewer comments & notes:
Trench 94 permit should clearly identify the groundwater protection standards that satisfy WAC 173-303-645(4), (5), (6), (7), (8), and (9). Permits are supposed to clearly identify dangerous constituents (yes, lead and mercury should be included), concentration limits, point of compliance, compliance period (at a minimum, it should be specified to be the entire time the permit is in effect – 10 years), and general groundwater monitoring requirements.

Additional HAB reviewer comments and notes:

Comment #1:Trench 94 is included in the RCRA Site-Wide Permit because it contains defueled, decommissioned, nuclear submarine reactor compartments each sealed in containers filled with over 91 metric tons of lead for shielding purposes. Lead is a dangerous waste and the dangerous waste is pure, not diluted with debris or other chemicals. The permit states there are at least 55 reactors (The first 55 reactors are mentioned in Section C.1.2, but the actual number is not provided) for a minimum amount of lead of 5,000 metric tons of lead. This is the greatest weight of pure, undiluted dangerous waste in any site at Hanford, and perhaps anywhere in the State of Washington. This huge amount of lead should be on everybody's radar screen, considering that these reactors are expected to be at Hanford forever. And the amount of lead will increase to between 10,000 to 20,000 metric tons or more once the actual number of reactors is obtained.

Addendum C of the Trench 94 Permit, Section 3.2.1, Containment, states that the lifetime of the outer container holding the lead is 500 years for the older reactors, 750 for the newer reactors and an estimated 1,500 to 2,000 years for the newest reactors (These numbers are rounded off for general discussion purposes.) The obvious conclusion is that between 500 and 2,000 years, at least 5,000 metric tons of lead will be exposed to the environment and will be subject to movement into the vadose zone and into the groundwater beneath Trench 94.

Section C.2, "Releases From Trench 94," projects there will be no lead leachate until 600 to 2,000 years. The projection is that it will take hundreds of thousands of years for the lead to reach the Columbia River.

> POTENTIAL ADVICE: Ecology must explain which model was used to determine how it arrived at "hundreds of thousands of years." Ecology needs data to project movement through the vadose zone and predict when lead will reach the groundwater. Ecology needs to clarify when drinking water standards for lead in the groundwater will be exceeded. Ecology needs to clarify when groundwater entering the Columbia river exceeds the drinking water standards. Ecology is taking credit for protecting human health, so it must explain what it intends to do now, while the reactor compartments are uncovered to ensure that human health BEFORE lead reaches the groundwater and BEFORE lead reaches the Columbia River. The permit needs to explain what Ecology is doing to protect human health regarding the lead shielding around the naval reactors.

Comment #2: The fact sheet talks about inspection requirements in Addendum I (follows Addendum H) which are merely look-see at the surface of closed Trench 94. There is a requirement to drive by and assess run-on and run-off after rainstorms exceeding 0.5 inch of rain. There is a requirement to drive by and assess wind-blown damage every time the wind exceeds 35 mph. There is a requirement to ensure there is a fire extinguisher located at Trench 94.These are Ecology requirements that are supposed to continue for how long? Hundreds of thousands of years? While most of the inspection requirements seem reasonable, the weekly (routine inspections) and 24-hr time requirements (after wind or rain) will likely be ignored.

POTENTIAL ADVICE: Review the drive-by requirements to assess if they are reasonable to be maintained for thousands of years.

Comment #3: Groundwater monitoring beneath the largest collection of lead at Hanford in Trench 94 is non-existent. Existing wells have gone dry as the water table drops, meaning there is no monitoring of Trench 94**. And lead and mercury** were removed from the analyte list of analytical requirements of the remaining wells around the 218-E-12B Burial Ground which includes Trench 94. DOE was supposed to respond with four new wells in 2010 and 2011, but the permit does not make it clear if they were installed. Furthermore, only two of the four wells are downstream from Trench 94. There are no wells upstream from Trench 94 as required. According to Addendum D, Groundwater, there is a debate over which way the groundwater flows under Trench 94. The Trench 94 Fact Sheet, page 5, line 7 states: "Wells have gone dry. Past groundwater characterization may no longer be valid for a groundwater monitoring program ensuring compliance with WAC 173-303-645." Line 18 goes on to explain that Ecology requires DOE to complete geophysical investigation activities by Sept 30, 2014. DOE has been asked whether new groundwater monitoring wells are feasible.

POTENTIAL ADVICE: The permit should explain whether new wells have been installed. The permit should clarify why the simple requirement of two wells upstream and two wells downstream of trench 94 cannot be implemented.

FURTHER POTENTIAL ADVICE: The permit should contain language about deepening wells as the groundwater drops. DOE should have an on-going process of well evaluation and well renewal such that Ecology will not have to force DOE to put in a well here and a well there to stay in compliance. In other words, DOE should be deepening wells without the threat by Ecology of enforcement action.

POTENTIAL ADVICE: The permit should explain why lead and mercury were removed from the analyte list for groundwater samples beneath the 218-E-12B burial ground. Lead should be analyzed in every groundwater sample near Trench 94 to establish a baseline for the time that lead reaches the groundwater.

POTENTIAL ADVICE: The permit admits that lead from Trench 94 is expected to contaminate the Columbia River. The permit also states that the purpose of the permit is to protect human health. The permit thus needs an explanation of how Ecology plans to protect human health from lead leaching from Trench 94 into the groundwater and into the Columbia River. Ecology needs to take action now, not after lead has reached the groundwater.

Part IV Corrective Action Units:
HAB reviewer comments & notes:

- Are upgradient wells and their COCs included in the GW SAPs for RCRA permitted units?
- Not paying much concern to other than primary COCs.

- Plumes overlap; treated by 200-ZP-1 OU. However not all COCs get treated
- Corrective Action permitting details for GW OUs (and soil units) Part IV units are not there, but deferred the II.Y. Conditions. Appendix C of the TPA lists the GW OUs as RPPs/CPPs however, this was from an early permit, and this designation was eliminated, and now included.
    - Unclear & question posed as to how II.Y. conditions are applicable to GW OUs
    - CERCLA process and actions will be used to do all RCRA corrective actions for units in Part IV. However needed documents have not been approved yet Ecology is agreeing these will meet the needs/requirements of CA for RCRA. See WAS 173-303-645.
    - GW wells are dry or will go dry. Many not useful resulting in less and less monitoring wells for typical RCRA monitoring needs particularly around the Surface Impoundments/Liquid Waste Disposal sites [crib/trenches].
    - Lack of characterization; unclear as to what was the method used to characterize either the COCS in soils or in the GW.
        - How are permit changes made to GW SAPs. [Modifications are allowed to be made to SAPs during project manager level meetings outside of the regular RCRA modification process outlined in WAC 173-303-830/840]
            - Ex. Use of injection wells vs. monitoring well. This issue is covered through the RD/RD Workplan and Ecology would first ask EPA to take care of it.
- Groundwater is very simple – needs to be spelled out better in the permit, how they are dealing with it.
- Wish they were taking a more active role – not letting CERCLA take care of groundwater.
- At workshop there are monitoring wells going dry, how will they monitor groundwater if the wells are dry? Not spelled out in the Permit. Could be in the permit as something to think about. RCRA Monitoring wells for groundwater could be sent.
- Changes on injection wells. Can change the plan, contaminants of concern, wells. Doesn't have to go out for public comment and review anymore.

Background: Under the Dangerous Waste closure regulations (WAC 173-303-610), alternative requirements are allowed. However, the director (Jane-Ecology) has to have, 1) determined that the proposed approach will protect human health and the environment, and 2) also determined that both the dangerous waste unit and one or more of the solid waste management units or areas of concern are likely to have contributed to the release.

1) Ecology has not provided this determination, and Jane has actually said "Ecology, while recognizing and approving the use of this code [STOMP-1D], has not specifically approved the modeling results of the current STOMP-1D application as an alternative fate and transport model as described under MTCA 173.340.747(8). This is because Ecology has yet to receive the actual data for the parameters used in the model and other documentation required by MTCA. The Tri-Parties agreed to start the model approval process with the parameters used in the Technical Guidance Document from the TCWM EIS, but allow use of other parameters with adequate documentation. Cleanup levels for Ecology sites may be different for the same COC than at EPA

lead sites due to site-specific modeling." STOMP-1D has not yet been evaluated by Ecology per the regulatory criteria.

2) If Ecology cannot show that this criteria is met, the RCRA Permit can be legally challenged for making a capricious & arbitrary decision as it cannot be applied to the whole site's groundwater.

Additional HAB reviewer notes on Waste Management Units:
Issues:

- Use of CERCLA, II Y Condition; Ecology is using CERCLA documents and associated cleanup actions to meet many RCRA permit requirements. Question: Who is making the choices in these CERCLA documents? Ecology or EPA or DOE?
- Leaves reader with no actual information about how corrective action decisions are going to be done.

Notes:

- See previous HAB advice on II.Y
- Are all RCRA corrective actions under CERCLA
- II.Y.2.a: CA for releases to the environment. GW decisions are under CERCLA actions. Ecology will review and approve of these actions to see if they meet the Dangerous Waste Requirements. Ecology should also 'sign off' on EPA RODs
- Refers to Advise Point 1 of the Part IV: The BOARD does concur with the statement that the majority of CERCLA work actions [in theory] will fulfill the Dangerous Waste Regulations – WAC 173-303-645 requirements.
- Refers to Advise Point 4 of the Part IV: The Board does not support the groundwater recharge value DOE uses (~ 4 to 8 mm/y range) or some Kd values utilized in the Model.
- Refers to Advise Point 4 of the Part IV: **T**he Board suggests this condition be included in Part II of the Permit
- Refers to Advise Point 3 of the Part IV units comments in the addendum which have all been turned into comments and not advice points: The Board notes that a majority of the groundwater corrective action conditions and monitoring plans and much of the rest of the Permit refers to other (CERCLA, DOE or Contractor-generated) management as satisfying RCRA requirements. The Board advises Ecology to simply remove the RCRA portions from the CERCLA documents, to write their own Groundwater Monitoring Plan, and include this in the RCRA Permit.
- Refers to Advise Point 9 of the Part IV: The Board advises Ecology that vadose zone contamination is the direct link between disposed waste and groundwater plumes.
- Refers to Advise Point 10 of the Part IV: The Permit states that "Wells that are no longer sampled due to water table decline (i.e., "dry wells"), and for which there is no future use, must be decommissioned" (e.g., V.4.C.4.d).

Discussions/Comments on the Part V: Closure Units:

- Refers to Advise Point 4 of the 'in general applicable' Part V advise points: Inconsistency is evident throughout the Permit(s) Conditions and Addendums; some units contain references to 'interim status' regulations. Hanford is permitted as 'final status' facility.

- Refers to Advise Point 4 of the 'in general applicable' Part V advise points The Board advises Ecology that EPA memorandum on compliance schedules state a compliance schedule cannot be used to allow a facility additional time to provide Part B application information after the permit is issued.
- Refers to Advise Point 7 of the 'in general applicable' Part V advise points: The BOARD has previously stated a preference for use of the methods-based approach.
- Refers to Advise Point 8 of the 'in general applicable' Part V advise points: Any new wells need to be RCRA compliant wells.
- In some permits, there is an incorrect application of MTCA [173-340-410]. If alternative requirements are to be applied, then an enforceable action issued pursuant to MTCA must be done and Ecology is required to incorporate these into the permit at the time of permit issuance [WAC 173-303-646(3)(b) & (c)]. This has not been done. See general over-arching advise points.
- The Board advises Ecology that some Permits cite use of a wavier [variance] to regulations (WAC 173-303-645(11) identified without justifications [no references to supporting documentation]). See general over-arching advise points.
- Refers to original Advise Point 17 of the 'in general applicable' Part V advise points :When the SEPA checklist was submitted with the permit application, this should have been a part of the submittal. If not, Ecology should have indicated so in their decision and called out a MDNS

HAB reviewer comments & notes:

- No closure plans in the new RCRA permit; use of the CAD/ROD approach to integrate TSD closure with CERCLA for the Central Plateau TSD units and delay of development of closure plan/contingency plans/post-closure plans until after remedy selections. That's out to ~2020.
- Application (implied) of use of alternative requirements for cleanup of releases to soils rather than the default/modified parameters under MTCA without identification of an 'enforceable document' or demonstration of meeting RCRA requirements to do so.
- Comments by Ecology on the draft A RFI/CMS/RI/FS workplan on limited data on potential pipeline contaminates for the 200-IS-1 OU. Lack of details of how RCRA closure requirements will be met & documented, use of incorrect method C for groundwater and for biota/plants. SEPA determinations yet to be made.
- Use of 'plug-in' ROD approach (not clear what this means) stated in WP draft A.
- No proposal to do additional pre-CAD/ROD characterization included in draft A of the workplan for the 200-IS-1OU
- Use of confirmatory sampling post-CAD/ROD as one of the remedy components (good) but not so good to refute or confirm the assumptions used in the BRA and FS (assumptions should have already had a solid basis)
- Inclusion of federal WIR determination and citation process in the critical path of the Work Plan schedule. Unclear why this is a concern for known contaminated soils.
- Incorporation of future SST Permit updates in the 200-IS-I WP (not clear what this means)

- The Board advises Ecology to remove the permit condition [e.g.V.11.B.1.a.] – requirement for a cultural and biological report as this would have been a part of the SEPA checklist submittal.

Additional HAB reviewer comments & notes:
Example of Part IV Surface Impoundment Unit-Permit issues. All Closure units which are Surface Impoundments have the same or similar issues as these are 'cookie-cutter' permits:

1301-N Liquid Waste Disposal Facility:

The Board advises Ecology to do something about the fact that the permit is empty.

Fact Sheet:

- Basis for permit conditions rather than identified as requirements under the Dangerous Waste regulations is incorrectly stated as coming from CERCLA & TPA Milestone requirements
- Facility identified by what occurred at the site rather than by the appropriate Dangerous Waste Regulatory basis. Unit is subject to regulations under WAC 173-303-650 for Surface Impoundments.
- Statements in the Fact Sheet inconsistent with the Dangerous Waste Regulations. Partial closure of an individual unit is not authorized under WAC 173-303- regulations. Implication that there's been an approved Closure Plan without the public review process.
- Wavier [variance] to regulations (WAC 173-303-645(11) identified without justifications [no references to supporting documentation]).
- No list of other applicable laws.
- Nothing addresses or references cleanup of PCBs.
- Incorrect reference to other parts within the permit [e.g. Saying Post Closure will be done under the Addendum for Closure rather than the appropriate addendum containing the plan].

Permit Conditions:

- Description of unit as a liquid waste disposal unit instead of a Surface Impoundment per the applicable WAC 173-303- Dangerous Waste Regulations.
- No Performance Standards included in permit. Required by WAC 173-303-283
- Conditions for submittal of documents which were or should have been included in the Permit Application in accordance with DW closure requirements [*see* Attachment #41 of 2004 submittal]. Required by WAC 173-303-806.
- Conditions directing closure actions to be done under a CERCLA work plan authority rather than the RCRA permit.
- Reference to closure actions under non-existent CERCLA document violates DW closure regulation requirements to have these details in an approved Closure Plan. Required by WAC 173-303-610(3).
- Incorrect application of MTCA [173-340-410]. If alternative requirements are to be applied, then an enforceable action issued pursuant to MTCA must be done and Ecology is required to incorporate these into the permit at the time of permit issuance [WAC 173-303-646(3)(b) & (c)]. This has not been done.

- No compliance schedule.
- No list of other applicable laws.
- Focused Feasibility Study needed to deal with hexavalent chromium concerns
- Nothing addresses or references cleanup of PCBs
- Difficult to track permitting actions in referenced rather than attached/include documents.

A matrix approach whereas the applicable sections of the CERCLA documents are directly included in the permit is more transparent and publicly accessible. Concerns regarding "double jeopardy" are eliminated by including only those sections of the CERCLA documents needed to fulfill RCRA DW permitting requirements and modification process. CERCLA documents could contain a table of contents identifying these area and/or separate chapters for the permit requirements. This would also not be "duplication of efforts" as two separate documents are not necessary.

Addendums: All required information should have been submitted with Permit Application in 2004. Ecology deemed the application complete when in fact the draft permit contradicts this determination. Inconsistency is evident throughout the permit conditions and the addendums.

- B: Addendum H cites a Sampling and Analysis Plan outside the permit; regulations require inclusion of this within the permit while permit says "Reserved".
- C: Reserved but information was submitted with application and should be included.
- D: Discussion within this addendum does not meet the requirements of WAC 173-303 for groundwater monitoring. As presented, this is for an interim status permitted facility; Hanford is permitted as a final status facility.
    - Statements made that Ecology has accepted data from non-RCRA compliant wells for years does not make it acceptable in this permit.
    - Submittal dates for required GW monitoring plan activities not included.
    - The groundwater monitoring plan referenced cites very old QA/QC documents instead of Ecology's more direction [Ecology Publication # 04-03-030, Guidelines for Preparing Quality Assurance Plans for Environmental Studies.].
    - List of wells for groundwater monitoring is short & with 3 out of 5 wells not RCRA compliant and should also include 119-N-002, 199-N-017,199-N-018,199-N-021,199-N-027,199-N-028,199-N-31, 199-N-041,199-N-054, ,199-N-059,199-N-064,199-N-067,199-N-070,199-N-072,199-N-073,199-N-075,199-N-076,199-N-077,199-N-080,,199-N-092A,199-N-096A, 199-N-099A ,199-N-103A, and 199-N-106A 199-N-16, 199-N-19, 199-N-21,199-N-26, 199-N-56, 199-N-57, and 199-N-64.
    - List of Contaminants of Concern is short and should also include antimony, arsenic, barium, beryllium, boron, cadmium, carbon tetrachloride, (a rad concern-cobalt-60), gross alpha, gross beta, hydrazine, iron, lead, manganese, magnesium, nickel, nitrate, phosphates ruthenium-106, sulfate, tetrachloroethene, tin, tritium, uranium-235, vanadium, and zinc (and those from the expanded ICP Metals list not previously listed).
    - Methods based approach is not used.
    - Filtered sampling is use instead of non-filtered per regulations.

  - Repairs & replacement of monitoring wells is per 'approved contractor procedures' rather than WAC 173-160-. Any new wells need to be RCRA compliant wells.
  - Lack of Ecology oversight is evident.
- E: Reserved but information was submitted with application and should be included. Required by WAC 173-303-310
- F: Reserved but information was submitted with application and should be included. Required by WAC 173-303-340
- G: References an unavailable document rather than including it within this addendum. Information was submitted with application and should be included. Unit specific training requirements are not sufficient for Samplers and should include an annual review in the following areas.
  - Collecting groundwater level data (training will include pump description and operation of the three types of pumps (used by the field personnel), operational procedures for the generators and the pumps used to gather groundwater samples)
  - Collecting packaging, and shipping groundwater samples to field and offsite laboratories, including special requirements for collecting and packaging samples containing volatile organic materials that require acid preservatives or special filtering
  - Sampling and monitoring equipment operation and maintenance
  - Monitoring and reporting on groundwater well security and maintenance
  - Providing sample chain of custody to the laboratory
  - Location, integrity, and inspection of groundwater wells (to include inspection of the cap and casing of each well to ensure that it is locked, pulling and inspecting the pump, brushing the inner walls of the casing and screen, and conducting a down-hole television survey)
  - Erosion damage (around wells and obvious signs of erosion, proper drainage, settlement, and sedimentation)
  - Surface inspections (as necessary to identify and correct the effects of settling, subsidence, erosion or other events)
  - Vegetative cover condition
  - Procedures regarding emergency and monitoring equipment (to include procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment).
- H: Statement that the Closure Plan presents the physical remedial activities and sampling and analysis required to comply with WAC 173-303-610 but there is no Closure Plan for public review included in Addendum H which meets these requirements. Addendum H text is outdated and incomplete and needs extensive revision. 1325-N and other discussion regarding 'Alternatives' should be deleted.
  - Modified Closure option discussed. This is not allowed per DW regulations.
  - Document cites use of Method C instead of Method B cleanup levels.
  - Closure Schedule is old and non-compliant with closure requirements.

- References an unavailable document which is to direct RCRA closure activities rather than permit conditions which require unit specific closure actions to be performed. Statement made that the Permit will need to be consistent with CERCLA remedial actions instead of direction to CERCLA as to what specific actions/ARARs are to be included in the ROD for these actions.
- Incomplete list of constituents of concerns (COCs) and should include antimony, arsenic, barium, beryllium, boron, cadmium, carbon tetrachloride, gross alpha, gross beta, hydrazine, iron, lead, manganese, magnesium, nickel, nitrate, phosphates ruthenium-106, sulfate, tetrachloroethene, tin, tritium, uranium-235, vanadium, and zinc (and those from the expanded ICP Metals list not previously listed).
- Sampling and analysis plan identified [DOE 2000a] should be included and sent out for public review. Document is currently not available; incorrect citation or reference to a non-existent document.
- Statements made that verification sampling to determine MTCA compliance for direct soil contact will not be required is inconsistent with the requirements for RCRA closure. Statements made that ancillary equipment [i.e. piping] may be left in place is neither acceptable nor correct and must be removed/treated/disposed. Soils underneath piping must also be sampled in addition to being surveyed.
- Reference is made to non-compliance with Land Disposal Restrictions. If must first be determined that the sites will need to closure under the Landfill regulations [WAC 173-303-665].
- Very old QA/QC documents instead of Ecology Publication # 04-03-030, Guidelines for Preparing Quality Assurance Plans for Environmental Studies.

- I: Okay but should also coordinate and incorporate requirements listed for the 100-NR-2 OU inspection requirements. Suggest following:
-

Inspection Schedule for the 1301-N Ditch Operable Unit	
Surface Inspections	Quarterly
Security control devices: well caps, and locks	Quarterly
Well condition	Quarterly
Subsurface well condition	3 to 5 years

- J: Reserved but information was submitted with application and should be included. Required by WAC 173-303-310
- K: Identified as Recordkeeping and Reporting but draft permit identifies it as Appendix K-Post Closure Plan.
  - As a Post-Closure Plan, it discusses Modified Postclosure/Institutional Controls and Periodic Assessments and cites several non-existent Part II conditions.
  - Document refers and includes discussion of the 1325-N unit.

- Postclosure groundwater monitoring program cited does not consistent with nor reflect use of alternative requirements.
- Incorrect application of MTCA [173-340-410].
- Some of information within this document on personnel training, inspection, security, etc belongs in this draft permit's Addendums.

Single Shell Tank System:
The Board supports Ecology's efforts to have leak detection during retrievals.
HAB reviewer notes & comments:
General Comment: In order to be understandable to the interested parties, especially the general public, the documents and addenda should be hyperlinked so that instead of having to search for item referred to but not necessarily found by putting the reference into Google, one is directed automatically to the information required to make sense of the permit section in question. In its present form the permit is a nightmare of complexity completely inaccessible to the public at large.
The Single-Shell Tank System Closure Unit Group 4 (CUG-4) addenda include D: through J: that are reserved. These reserved documents will contain information (D- Groundwater monitoring plans, E- Security, F- Tank Waste Retrieval work plans, etc.) that will impact public evaluation of CUG-4. The public comment period should not begin until these documents are completed and published.

Why were the tank farms reorganized into 7 WMAs? An explanation of the reasons for the additional level of classification might contribute to understanding of the document.

THE FOLLOWING IS FROM SST "CONDITIONS"
V.4.B.3.f The process information for each WMA, including 200-IS-1 OU in accordance with Permit Condition V.4.G.5.c, will include, at a minimum, and as known at the time of submission, the following:
e) A description of releases to soil and groundwater through overflows, spills, releases, and leaks
f) A detailed diagram of piping, and process flow for each tank and related waste transfer lines, vaults, pits, diversion boxes, waste plies, and miscellaneous structures and other components located inside the WMAs; WMA specific tank system instrumentation;
g) Inventory or source contaminant concentrations of activities associated with each item listed in f) above and m) below, including references to sampling data or process knowledge
h) A summary of tank integrity assessment and tank integrity status for each tank
i) Description of the marking and labeling of the tanks
j) Topographical maps with sufficient scales to show components included. Insert or call-out maps may be used if necessary
m) Identification of all non-tank system structures (e.g. septic systems, utilities, groundwater wells, dry wells, buildings) that are located within the WMA boundary and must be decommissioned before WMA closure.
Comment**:** with respect to e) and h) above, this section of the permit should specify methodology to be used in determining how releases and tank integrity are detected.

V.4.G.5.b All SST components located within 200-IS-1 OU will be closed to meet the clean closure performance standards specified in Permit Condition V.4.G.2.b., unless Permittees

demonstrate that such components cannot be practicably removed or decontaminated under the "Impracticability Demonstration" outlined in Permit Condition V.4.G.2.c.i, in which case the components must be closed in compliance with the landfill closure performance standards of Permit Condition V.4.G.2.c.
Comment: The potential loophole embodied in the "unless Permittees demonstrate that such components cannot be practicably removed or decontaminated under the "Impracticability Demonstration" outlined in Permit Condition V.4.G.2.c.i" provision needs to be spelled out in detail. I was not able to find the practicability definition alluded to in the document.

V.4.B.3.g The process information for each component listed for a WMA will include the following items, if applicable (components may be grouped, with justification):

j) Release history (spills, leaks, overflows, or other incidents) including information available through historic records regarding: the date, location, duration, type of waste, and quantity of the release and mitigation measures and remedial actions taken, if any. More detailed information will be provided by the deliverables associated with HFFACO milestones M-045-61 and new deliverables established by M-045-84 and M-045-85;
k) Integrity status
l) Retrieval status
Comment: It is necessary to specify how k) and l) will be determined

Issues:

- Tank Waste Retrievals and Closure Schedule: Also: Are a tank retrieval documents included in the SST permit? How does the SST permit integrate closing with operations? What's the permitting structure look like?
- Are there still drainable liquids in the SST?
- C-farm closure due in 2015; it will be used as a template for rest of tank farm closures.
- "Not pumpable" is still leakable
- Where's all the leaks gone? The permit should have a Condition to deal with events like the ST-tank farm spill, is there one?
- Better characterization of wastes needed for WTP acceptance and systems function.
- Can DOE actual meet the MS for all tanks in 31 yrs.? [New consent decree violations will require DOE to go to court and present case to a judge. $ penalties can be imposed by Ecology.]
- Tank retrieval schedule isn't realistic. Permit needs a condition to specify tanks/year to meet the TPA schedule.
- Is Ecology going to let DOE leave more than 360 gals in the tanks? Do Tank Farm closures need review by the Nuclear Regulatory Commission before a tank is closed?
- Do we need to remove any tanks to get to the vadose zone cleanup?
- Vadose Zone: Is there a Permit Condition dealing with the vadose zone remediation?
- Characterization of Waste
- Non-compliant tanks
- Monitoring: Are SST retrievals being monitored for leaks during retrievals? How is the SST vadose zone being monitored? How are the tanks being monitored for leaks?
- Failed instrumentation not being replaced.

- Lack of instrumentation – be specific about what is important for safety.

Notes:

- How are retrievals monitored for leaks?
- Tank retrievals/'closures' are proceeding outside of permitting closure requirements. Have the documents which are guiding the retrievals/closures of tanks meeting all the requirements of tank closure under the Dangerous Waste regulations of WAC 173-303 for tanks?
- How are tanks monitored for leaks?
- Although considered meeting the "360 gals. removal of liquids" fluids are still being noted in month reports.
- What are the operating conditions & the closing conditions and do they meet WAC -173-303 regs?
- Is there a permit condition which deals with the SST vadose zone?
- Refers to Advise Point 2 of the SST: The Board is concerned as the SST system [including all components & ancillary equipment) is not equipped with secondary containment leak detection capabilities.
- Refers to original Advise Point which was incorporated into over-arching point on use of performance standards and method B: The Hanford site is a complex site and does not qualify for use of Method A standards.
- Refers to original Advise Point which was incorporated into over-arching point: The Board notes the SST are so designed that they would be unable to comply with Landfill Regulations without waivers. The Board is concerned that such waivers as currently identified in the Permit, allow for continued and future releases of hazardous substances into the environment while doing nothing to reduce their toxicity or volume. See general over-arching advise on use of waivers.
- Refers to original Advise Point incorporated into over-arching point requiring PI: The Board is concerned that Ecology will make changes to the Corrective Action Performance Monitoring by-passing Public Involvement opportunities afford by WAC 173-303-830/840.
- Refers to an original Advise Point which was incorporated into an over-arching point: The Board advises Ecology to review previously identified over-arching general concerns as many apply to the SST Permit [Examples: Links to referenced documents; lack of required documents which should have been submitted with the Part B application and ought to be included within this Permit's addenda; Tier 2 Closure Plans should be included within this Permit

Additional comments on the SST permit: Some made into advice points; other text is info:

- V.4.C.2.a The following permit conditions are premised on HFFACO Action Plan Section 5.5, which provides: "Ecology, EPA, and DOE agree that past-practice authority may provide the most efficient means for addressing mixed waste groundwater contamination plumes originating from a combination of TSD and past-practice units." Ecology reserves the authority to impose additional conditions through permit modification if groundwater monitoring specified in RD/RA Work Plans incorporated through the following conditions is found to be inadequate to meet corrective action

performance monitoring requirements.

- Comment: What does this mean?
- From TPA milestone M-045-91I: DOE shall provide, to Ecology, an IQRPE certification of SSTs structural integrity for the remainder of the mission, or for such time as the IQRPE believes he/she can reasonably certify. The analysis supporting the certification shall be performed in accordance with the requirements identified for analysis in WAC 173-303-640(2) and will include a due diligence review of RPP-10435. IQRPE certification of the SST leak integrity is not required. A work plan and schedule for additional integrity assessment activities will be submitted as a change package to cover any time period between the end date of the IQRPE certification and the end date of the mission.
- **Comment:** Highlighted sentence needs clarification – seems to conflict with earlier requirement for IQRPE certification.
  V.4.F TANK WASTE RETRIEVAL REQUIREMENTS
- V.4.F.1.a.i
- c) Sections 2.1.4, 2.1.5, and 2.1.6 of HFFACO Appendix I, as they are defined to be applicable under Appendix C, Part 3, of the Washington v. Chu Consent Decree, which are incorporated by reference under the terms of Permit Condition I.A.4, and
- Comment: above is too convoluted to be understandable – should be re-written so that an intelligent citizen can make sense of it.
- M-045-70 Lead Agency: Ecology
- Complete waste retrieval from all remaining single-shell tanks. Retrieval standards and completion definitions are provided in milestone M-045-00.
- The schedule reflects retrieval activities on a farm-by-farm basis. It also allows flexibility to retrieve tanks from various farms if desired to support safety issue resolution, pretreatment or disposal feed requirements, or other priorities.
- 12/31/2040 Or Earlier As Established By M-62-45
- Comment: Need to specify a year by year schedule that will achieve this goal. We know that DOE plans to empty 3 tanks this year and 3 next year, but an average of 5 tanks per year emptied would be required in order to achieve the goal set in the milestone. The permit should require DOE to set a year by year schedule that complies with the milestone and specifies the increases in personnel equipment and budget that will be necessary to accomplish this work.

Additional comments on the SST permit: Some made into advice points; other text is info:
V.4.F.3.d.i
Under following conditions, liquid level measurement may be used for leak detection and monitoring during waste retrieval:

. a) The tank level gauge must be an ENRAFTM gauge or equivalent of the type normally used in tank farms;
. b) There must be a liquid surface under the ENRAFTM gauge or equivalent plummet or tape;
. c) There are no active retrieval operations being performed;
. d) The tank is not being actively exhausted;

. e) The measured waste level is not increasing.
Comment: Does any of this apply since the pumpable liquids have been removed from the SSTs? If not, what requirements are now appropriate?
V.4.G.2.a.i
The Permittees must close SST System in a manner that achieves the following closure objectives, in accordance with WAC 173-303-610(2)(a):
a) Minimizes the need for further maintenance.
b) Controls, minimizes or eliminates to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere.
c) Returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity.
Comment: The determination of "the extent necessary" and "the degree possible" should be determined by ECY based on health risk data and consultation with stakeholders.
V.4.G.2.c.ii ……..
a) exceptions (second bullet)
. The post-closure care period under WAC 173-303-610(7)(a) is designated as 500 years.
Comment:
1) The time specified is arbitrary. Some contaminant may still be a risk after 500 years. Re-evaluation after 500 y would be appropriate.
2) WAC 173-303-610(7)(a) actually specifies 30 years as the required period of post closure care. This discrepancy should be addressed.

Additional comments on the SST permit: Some made into advice points; other text is info-maybe duplicates:
V.4.F TANK WASTE RETRIEVAL REQUIREMENTS
V.4.F.1.a.i
c) Sections 2.1.4, 2.1.5, and 2.1.6 of HFFACO Appendix I, as they are defined to be applicable under Appendix C, Part 3, of the Washington v. Chu Consent Decree, which are incorporated by reference under the terms of Permit Condition I.A.4, and
Comment: above is too convoluted to be understandable – should be re-written so that an intelligent citizen can make sense of it.
M-045-70 Lead Agency: Ecology
Complete waste retrieval from all remaining single-shell tanks. Retrieval standards and completion definitions are provided in milestone M-045-00.
The schedule reflects retrieval activities on a farm-by-farm basis. It also allows flexibility to retrieve tanks from various farms if desired to support safety issue resolution, pretreatment or disposal feed requirements, or other priorities.
12/31/2040 Or Earlier As Established By M-62-45

Comment: Need to specify a year by year schedule that will achieve this goal. We know that DOE plans to empty 3 tanks this year and 3 next year, but an average of 5 tanks per year emptied would be required in order to achieve the goal set in the milestone. The permit should require DOE to set a year by year schedule that complies with the milestone and specifies the increases

in personnel equipment and budget that will be necessary to accomplish this work.

V.4.F.3.d.i
Under following conditions, liquid level measurement may be used for leak detection and monitoring during waste retrieval:
. a) The tank level gauge must be an ENRAFTM gauge or equivalent of the type normally used in tank farms;
. b) There must be a liquid surface under the ENRAFTM gauge or equivalent plummet or tape;
. c) There are no active retrieval operations being performed;
. d) The tank is not being actively exhausted;
. e) The measured waste level is not increasing.
Comment: Does any of this apply since the pumpable liquids have been removed from the SSTs? If not, what requirements are now appropriate?

V.4.G.2.a.i
The Permittees must close SST System in a manner that achieves the following closure objectives, in accordance with WAC 173-303-610(2)(a):
a) Minimizes the need for further maintenance.
b) Controls, minimizes or eliminates to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere.
c) Returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity.
Comment: The determination of "the extent necessary" and "the degree possible" should be determined by ECY based on health risk data and consultation with stakeholders.
V.4.G.2.c.ii ……..
a) exceptions (second bullet)
. The post-closure care period under WAC 173-303-610(7)(a) is designated as 500 years.
Comment:
1) The time specified is arbitrary. Some contaminant may still be a risk after 500 years. Re-evaluation after 500 y would be appropriate.
2) WAC 173-303-610(7)(a) actually specifies 30 years as the required period of post closure care. This discrepancy should be addressed.

Notes; from emails on the SST advise points:

Jean, My concerns were 1) I thought there was a conflict between the 500 year post closure period in the permit and the 30 year period in the law. I later realized that the law allowed ECY to select a longer post closure period. 2) the 500 year post closure period in the permit seemed to imply that there would be no further requirement after that time. I think that what would be appropriate is that there should be some kind of periodic (perhaps decadal) re-check on the adequacy of the post closure arrangement (protections?) and that the post closure period should be at least 10 half lives of any isotope that is a COC (if it's plutonium that would be 240,000 years) or as long as there are potential health risks from any non-radioactive COCs.

P.S. If your suggested edits are are "require an additional review at 30 years as well as throughout the future 500 years on a decade by decade basis" I'm in agreement but I think an every decade review from the git-go would be better and I would still prefer the total post closure period to be as stated above.
On Aug 3, 2012, at 1:48 PM, Jean Vanni wrote:
John, could you take a look at my suggested edits below and let me know what you think? I copied Dale because this is a groundwater issue too.
John, Let's talk about this tomorrow. We could edit it to require an additional review at 30 years as well as throughout the future 500 years
V.4.G.4.a.i The Permittees will develop and submit closure plans (also called Closure Action Plans under the HFFACO) in a timely manner to support the closure schedules specified in Permit Condition V.4.G.3.
Comment: "Timely manner" is not good enough – should specify how many days – maybe this should be added to the overarching advice that suggests changing "should" and "may" to "shall" and "must".

Additional notes referring to SST#23:
Part of the cleanup plan involves transferring the waste from the leaky tanks into other more reliable vessels. As they transfer the waste, workers face the risk of exposure to chemicals that may harm their health. Exposure to radioactive waste can lead to nausea, vomiting, diarrhea, fever, hemorrhage, increased risk of several types of cancer, and, in cases of high dosage, death.[6] The tanks also contain nonradioactive substances (i.e. silica, heavy metals, beryllium, acids) that come with a host of other health risks, including lung disease, decreased cell function in kidneys and nervous system, sensitized immune system, and burns.[7]

Certain conditions at the Tank Farms make worker exposure more likely than it should be. Much of the tank waste is uncharacterized, making it almost impossible to know to what workers have been exposed when an exposure incident does occur. The monitoring equipment currently used tests only a small amount of the more than 1200 potential chemicals coming out of the tanks, and this monitoring only occurs a small amount of the time that the workers are out there potentially exposed to the vapors.[8]

On September 29, 2008, the Hanford Concerns Council released an independent review report[9] prepared by an expert panel selected by the Council. The expert panel was asked to evaluate the

[6] National Economic Council, "Occupational Illness Compensation for DOE Contractor Personnel," (2000).

[7] Sumner, D., H. Hu, and A. Woodward, "Chapter 4: Health Hazards of Nuclear Weapons Production," *Nuclear Wastelands*, (MIT Press, 1995).

[8] Government Accountability Project, *Knowing Endangerment: Worker Exposure to Toxic Vapors at the Hanford Tank Farms* (Sept. 2003), 7. [hereinafter, *Knowing Endangerment*]

[9] "The Industrial Hygiene Chemical Vapor Technical Basis Review," June 2008, J.N. Breysse, PhD,

tank farm contractor's Industrial Hygiene Chemical Vapor Technical Basis. The evaluation was commissioned at the joint request of CH2M HILL and Hanford Challenge. The expert panel concluded, "The committee is unable to conclude that the protective measures are sufficiently conservative to protect worker health."

216-A-29; 216-B-36B; 216-A-37-1; 216-S-10 P&D; 216-B-63; 216-B-3 Pond:
Notes:
There are several permits which are "cookie cutter copies" (i.e., the trenches & cribs & pond & basin)
Additional HAB reviewer notes & comments; many applicable to the Permits for all the these Part IV closure units:

Hexone Storage & Treatment Facility:

- The Board advises Ecology to review the advice points noted for the Surface Impoundments as several are applicable concerns for the Hexone Storage and Treatment Facility.
- It is noted that the Fact Sheet contains confusing and inconsistent with SEPA, the part A form or the DW regs information.
- It is noted that the Part A contains inconsistencies.

241-CX Tank System:

- Reviewer suggests Ecology that SEPA says continuing management of waste and clean closure and permit says otherwise; No performance standards
- Refers to Advise Point 3 of the 241-CX in the addendum: The Permittee must first attempt to clean close the unit; then proceed to (b) and (c). The permittee must demonstrate that clean closure can't be done per the requirements, submit this information to Ecology, Ecology must review it & concur prior to any modifications to either the closure plan or the contingency plan or the post-closure plan. Ecology makes the permitting decisions in accordance with WAC 173-303-830 regs
- Refers to Advise Point 2 of the 241-CX in the addendum: The attached SAP contains inappropriate text citing use of Method C rather than Method B and Ecological protection values are missing. Performance Standards are missing
- Refers to Advise Point 1 7 3 of the 241-CX in the addendum: The Board notes SAP [DOE/RL-2002-14, Appendix C], does not meet the WAC 173-303-300.
- Reviewer suggests that the Part A contains inconsistencies (volumes and codes).
- Reviewer suggests to Ecology the Permit Conditions do not accurately reflect WAC 173-303-640(8)(a) or (b) or (c).
- Reviewer notes that the DW regulations do not allow partial closure of a tank system as indicated with cleanup of ancillary facilities [piping, etc] for the 241-CX-72 tank and deferment of the tank closure.

Franzblau, MD, H. Witschi, MD, available at
http://www.hanfordconcernscouncil.org/download/report_techreviewfinal_20080929.pdf

NRDWL:

Issues:

- Lack of complete cover/barrier designs; Closure conditions reflect approval of only a conceptual design and the lack of complete cover design
- No approved source of soils for use in the construction of landfill cap
- What is the source of "landfill caps" or barrier cover soils?

B Plant Complex:

Notes:

- In Situ vit – never proven to work anywhere. Tanks in a canyon facility. In Part A form.
- One quarter acre will undergo in-situ vitrification….hm. This is in all of the canyon facilities.
- North of 300 area had a demonstration and had a fire. Electrodes into the ground.

Just because it is in the Part A Form, doesn't mean Ecology is allowing it.

PUREX:

Issues:

- Presumption that since the discarded process vessels were designed to manage whatever was in them, so now they are assuming they are still capable of managing residual waste that is in them forever.
- Assumption that all containers amenable to flushing were sufficiently flushed such that final rinse did not exhibit signs of corrosivity. Did not verify in records that anyone ever did that.
- Adequate characterization. If it was rinsed out and cleaned why did it need to go into PUREX tunnel?
- No secondary containment, no leak detection
- What is the stability of acid absorber?
- No reevaluation of waste in tunnels will occur – or in the canyon containment and there are 21 rail cars in tunnels, but room for up to 40 rail cars.
- Institutional controls issue – electrical system, water in doors, pumping system
- Unquantified volumes of mercury, chromium, cadmium, barium, silver, silver salt, mineral oil. Without knowing those volumes, can't figure out site wide load limits.
- Not planning to remove any of this, planning to leave it. Do walk around.
- Lead is not mentioned in the permit as hazard.
- Failure to observe closure best practices.
- Plutonium recoverable. Need to get at it.

Notes:

- Huge questions about tunnels. Unidentified materials in the tunnels
- PUREX received a bunch of waste out of 300 area, non-compliant waste with RCRA, now it is being considered RCRA past practice
- Tunnel system is dependent on a water source. Water filled doors. Electrical system and pumping system. Have to pump the water in the door out before you can open the door.
- Tunnels don't run in only one direction.
- Only planning visual inspection.

- Only two tunnels, they have water shield doors in front because dose is so high. Have to drain water because doors are too heavy. These have lots of lead in them for shielding.
- They have an inventory, rail car by rail car. Drawings exist.
- Weather problem when they were building tunnels, actually collapsed the tunnels.

Notes from the advice points for PUREX:

- Refers to Advise Point 3 of PUREX in the addendum: Reviewer suggests does not believe grouting in place is appropriate given that this is not a RCRA compliant engineered disposal facility. (it is hard to put a liner under it)

LLBG Green Islands:
Issues:

- Characterization
- Does the CERCLA 5-Year Review have any affects on the RCRA permit?
- Closures & closure plan submittals dependent upon TPA Milestone documents and actions under CERCLA
- Why not call it all mixed waste?
- Where do the alpha caissons and PFP fit?
    - In certain section. Request from DOE to Ecology to remove portions of Low level burial grounds from the permit. Where caissons are is something they want to remove.

Notes:

1. Caissons are super hot.
2. Have to expect there are pieces of spent fuel in the burial grounds.

Discussions/Comments on the Part VI: Post Closure Units:
300 Area Process Trenches:
Issues:

- Groundwater monitoring plan is inadequate. Only indicates parameters. Not sure if it is in the Permit or not.

Notes from the advice points for 300 APT:

- The Board has advised Ecology that the remedy selected for groundwater remediation at the 300 Areas is not a proven technology. The BOARD advises Ecology that is it inappropriate to prospectively accept CERCLA work via the II.Y conditions as satisfying the Dangerous Waste WAC 173-303-645 corrective action permit requirements

183-H Solar Evaporation Basins:
Issues:

- Groundwater issue - chromium

Notes from the advice points for 183-H:

- Supports advice point 17: It is noted that there Permit conditions requiring submittal of updated post-closure plan to include placement of a cover; placement of a cover should

have been a closure action. There is also uncertainty regarding Ecology's acceptance of closure certification in question as there doesn't seem to be an approved closure plan.

1325-N:
Issues: Groundwater issues.
Notes: Closure was cited per Method C standards which are in conflict with Dangerous Waste regulations & Ecology has not accepted the closure certification submitted by DOE as meeting the Performance Standards under WAC 173-303-610 & no determination has been made by Ecology for the use of Landfill regulations.

1324-N & NA:
Issues:

- No post-closure groundwater monitoring plan in accordance with WAC 173-303.
- Groundwater issues.
- Have to look at CERCLA to see what they are doing. Interim status monitoring plan to see.

Discussions and comments on Other Permit related documents or issues:
SEPA:
Issues:

- How determinations are made
- Availability of SEPA Checklists
- Eventual use of TC&WM EIS as SEPA coverage
- Determinations need to be made new, shouldn't be looking at old determinations and carrying them forward.
- Mitigation should be in the Permit, not just the SEPA determinations.

Notes:

- Why is there one determination for the entire permit that is "Determination of Non-Significance" even though there are significant impacts for some units and DMNS for other units?
- Concern that SEPA determinations for units say DNS when there are issues for those units. All the units need to be mitigated.
- The methodology of using a phased approach is not clear.
- Supporting SEPA checklist documents not readily available.
- SEPA: Ecology can adopt a NEPA document as fulfilling SEPA needs [an EA or EIS] but it does not adopt a CERCLA document like an RI/FS. If a CERCLA action is being done, there are some aspects which are considered 'functionally equivalent' to what's being required under a DOE NEPA evaluation, so DOE's NEPA needs are met by CERCLA work.
- NEPA: Triggered either by RCRA or if it is a proposal that costs over a certain $ amount.
- Compliance Schedules: If these don't satisfy HAB priorities, then we should tell the Tri-Party Agencies [Ecology].
- The SEPA Checklists are old – they are from the 90's and early 2000.

Additionally received review comments:

- Until Ecology knows what the mitigation plans will be, they need to withdraw their determination of non-significance regarding the current phase.
- Ecology can't truly know what the impacts of these sites will be until they take the time to characterize the waste at each site.
- Ecology also misuse "Phased Review." They seem to think that it allows them to give sites a determination of non-significance before mitigation plans have come in. A more accurate description would be that phased review may allow them to leave certain units out of the current permit. However, it does not allow them to make determinations that aren't supported by a plan. Also, under WAC 197-11-060, SEPA specifically says that phased review can't be used if it would just split up units and allow an agency to ignore the cumulative impacts of the units.

Additionally received comments from Gerry Pollet:
And as to SEPA comments on the permit--I recall strong divisions at the HAB meeting over whether the HAB should "advise" or "encourage", and you raised the concern about whether the HAB could give legal advice. I am not very familiar with the HAB's role. But to my mind, recommending a particular threshold determination, such as one of mitigated-significance, is close to legal advice. So is a recommendation that Ecology clearly identify opportunities for public involvement, which is required by law. Or that ecology use enforceable words such as "shall" and "must," because by law they are required to have an enforceable document. It seems as though the majority of HAB recommendations have a basis in RCRA, the State Dangerous Waste Act, and SEPA/NEPA.

But perhaps re-wording the bullet to summarize the NEPA and SEPA requirements, and explain what the alternatives there are when there are documented and significant environmental impacts, such as those documented at the Hanford site, is softer than legal advice. It provides permit applicants the necessary information about relevant regulations to guide their decisions, but doesn't direct them. I realize that's a fine line. But I think it could be pursued even with concerns about criticism and advice

I have one final follow-up to the comment I made at yesterday's meeting regarding the SEPA determinations. I really think the HAB is correct in stating a site-wide determination of non-significance is inappropriate. But I understand the HAB's concerns that the larger board may not be willing to demand an EIS. A mitigated determination of significance is certainly better than a determination of non-significance, because it would require actual mitigation plans to be researched and developed. But there are a few flaws that I see. 1) This determination assumes units, such as the SST unit, can be completely mitigated so there is no environmental impact during the closure process, but the permit applicants have provided no such evidence. 2) Any mitigation plans would have no EIS to confirm the extent or nature of the damage they purport to address, and would be stabs in the dark. 3) A mitigated determination can be slightly deceptive: it assumes that once a permit in place, there is no environmental impact, while at the same time it does not require mitigation plans be implemented.

So my suggestion: First, state that as things stand, a determination of significance is warranted. Second, citing NEPA and SEPA, explain that Hanford has two legal options open to it: either to research and develop mitigation plans that eliminate the present and significant environmental impacts from *individual* units and the *cumulative* environmental impacts from all units, to satisfy a determination of mitigated significance, or conduct a comprehensive EIS.

This way, you lay out their legal alternatives. You hit the point that there are significant impacts, and this should be the determination. You hit the point that as things stand, an EIS is warranted. But you also give them a third option, of proving there are mitigation measures to eliminate the environmental impacts of units, individually and cumulatively.

324 Building:
Additional comments from CTUIR HAB representative:

Attached is the list of COCs for the B-cell sampling and analysis plan. In addition to the radionuclides, it contains the metals barium, cadmium, chromium and lead, as well as pH. Ecology's main objection may be that the 324 building waste site contains only radionuclides, thus it need not be included in the RCRA. However, the list of COCs says otherwise. Additionally, according to DOE, the 324 facility will reopened to remediate the spill under B-cell, and as part of the oversight for operating this facility, which presumably will generate hazardous waste as well as radioactive waste, it should be included in the RCRA permit.

The statements below are excerpts from PNNL-21214.pdf:
In October 1986, a spill of a highly radioactive waste stream containing cesium (137Cs) and strontium(90Sr) occurred in the B-Cell of the 324 Building in the 300 Area of the Hanford Site. The spill is estimated to have contained approximately 1.3 million curies of radioactivity. An unknown fraction of this spill was lost to the subsurface through a leak in the sump in the floor of B-Cell. To characterize the extent of contamination under the 324 Building, a pit was excavated on the north side of the building in 2010 by Washington Closure Hanford LLC (WCH). Horizontal closed-end steel access pipes were installed under the foundation of the building from this pit and were used for measuring temperatures and exposure rates under the B-Cell. The deployed sensors measured elevated temperatures of up to 61 °C (142 °F) and exposure rates of up to 8,900 R/hr Field data and simulation results suggest that the pit excavated on the north side of the 324 Building to provide access for direct-push sampling efforts is resulting in increased moisture under the building, due to exposure to natural precipitation that is infiltrating into the subsurface. If excavation of the contaminated sediments under the B-Cell proceeds relatively quickly, say within 1-2 years, then this increasing moisture may be of little or no consequence. However, if the excavation and removal of contaminated sediments under the B-Cell takes longer, then the increased moisture could eventually resulting mobilization and transport of contaminants to groundwater. There are currently no groundwater monitoring wells near and downgradient of the 324 Building.

In general, site decommissioning and demolition activities in the 300 Area and elsewhere at Hanford have the potential for increasing natural groundwater recharge rates due to surface

disturbance. Recharge is the primary driving force for transporting contaminants in the vadose zone to the underlying aquifer.

Attached COC listing for the 324 Building:

Table 1-1. 300-296 Waste Site Contaminants of Potential Concern List.

Contaminants of Potential Concern	
Radiological Constituents	
Isotopic americium	Am-241
Isotopic cesium	Cs-135, Cs-137
Isotopic uranium	U-234, U-235, U-238
Isotopic plutonium	Pu-238, Pu-239, Pu-240
Total radiostrontium	Sr-90
Nonradiological Constituents, Metals	
ICP metals	Barium, cadmium, chromium, lead
Nonradiological, Physical	
pH	

ICP = inductively coupled plasma

1.4 DATA QUALITY OBJECTIVES

A DQO process was performed for the intrusive characterization of the 300-296 waste site (WCH 2011). The project team felt it prudent to develop a sampling strategy supported by a DQO to improve the understanding of the radiological and nonradiological constituents and the extent of contamination prior to selection of the remediation methodology for the highly contaminated portion of the plume. The data and information collected by use of this SAP, coupled with data collected during the nonintrusive characterization phase, will be used to develop the final decision logic for the removal of the 300-296 waste site contamination. This section includes the key results of the DQO completed to support the intrusive sampling of the 300-296 waste site.

Planning for remediation requires a better understanding of the type, quantity, and condition of the contaminated materials associated with the 300-296 waste site. Record searches about projects and therefore materials that may have been present within B-Cell have been performed. However, because the breach in the liner of B-Cell was unknown until November 2009 there is no literature that defines what materials may have migrated through the breach into the subsurface.

1.4.1 Statement of the Problem

The exact nature, condition, and retrievability of highly radioactive contamination below B-Cell is unknown and requires characterization by physical sampling. The risks and expenses associated with retrieval, transportation, analysis, and disposal of highly radioactive samples

More Notes Regarding the 324 building - from a recent Tri-city Herald article:
Washington Closure had been expected to issue a request for bids this spring for a major project on the 324 Building, which sits over contaminated soil just north of Richland. Radioactive cesium and strontium leaked from a hot cell in the building to the soil below. Radioactivity in the soil, which is about 1,000 feet from the Columbia River, has been measured at 8,900 rad per hour. Direct exposure for a few minutes would be fatal, according to Washington Closure. The request for bids now is on hold, McKenna said.

It would have sought a subcontractor to design remotely operated equipment to be installed inside the hot cell where the leak occurred. Using the equipment, the subcontractor then would take out the hot cell's floor, dig up the contaminated soil beneath it and transfer the contaminated soil to nearby hot cells to be grouted in place.

Clean up of the building is required to be completed by the end of this year under the legally binding Tri-Party Agreement. However, DOE and the Washington State Department of Ecology, the regulator on the project, already have been in negotiations for new deadlines because of the leaked waste beneath the building, which was discovered in late 2010.

From a recent PNNL report (PNNL-21214):

Finally, field-measured water content distributions and simulation results suggest that the pit excavated on the north side of the 324 Building to provide access to the subsurface is resulting in increased water contents under the building due to infiltration of natural precipitation. If the contaminated sediments underlying the B-Cell are excavated and removed relatively soon (1–2 years) ,then this increasing moisture will likely have little or no consequence. However, if the remediation effort is delayed, the increasing moisture could eventually result in mobilization of contaminants under the B-Cell and transport to groundwater.