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**Groundwater Strategy for Hanford:  
A Contrast in Citizens' Vision and Goals With USDOE's and its Partner  
Tri-Party Agreement Agencies' Vision and Goals**

**Comments of Heart of America Northwest Research Center,  
and Heart of America Northwest  
on the Draft "Hanford Site Groundwater Strategy"; and,  
"Hanford's Groundwater Plan"  
U.S. Department of Energy (USDOE)  
March 2003 DOE-RL-2002-59; DOE-RL-2002-68**

**A Contrast in Visions:**

In 1994, Heart of America Northwest and other public interest groups called for the U.S. Department of Energy (USDOE), Washington Department of Ecology and U.S. Environmental Protection Agency (EPA) to adopt a vision, clear goals and plan to cleanup the Hanford Reach of the Columbia River to allow for use that was not restricted by residual contamination by 2011 ("unrestricted use" under state law). The Columbia River flows through the Hanford Nuclear Reservation for over fifty miles. Much of the shore and Columbia River corridor was designated by President Clinton as the Hanford Reach National Monument, preserving the ecological, geological, cultural and recreational treasures of the last free-flowing stretch of the Columbia River in the U.S., with the last large natural spawning grounds for Chinook (King) salmon on the River in the U.S..

The citizen groups issued a plan, which generated widespread public support at public hearings, calling for the Hanford Clean-Up Agreement to be changed to accelerate cleanup of the Hanford Columbia River Corridor to achieve safe, *unrestricted* public and Tribal use of the Hanford Reach by 2011.

At the time, USDOE was proposing to change the Hanford Clean-Up Agreement to delay vitrification of High-Level Nuclear Wastes. The agencies agreed that the cleanup of the Columbia River corridor should become the focus for near-term cleanup of Hanford, in keeping with the public value for protecting the River and preventing harm to the public and Tribes using the River. (The River Corridor includes the areas with contamination around the nine nuclear weapons production reactors along the River – designated the "100" Areas by USDOE; and, the heavily contaminated "300" area at the southern gateway to the Hanford Reach, just north of the City of Richland, which has over 100 heavily contaminated facilities used to produce nuclear fuel and test processes to extract Plutonium and Uranium, and an old test reactor). Essentially, a deal was struck: USDOE was allowed to delay construction of the massive plants needed to

vitrify (turn into glass) Hanford's deadly High-Level Nuclear Wastes, stored in 178 massive tanks, of which 68 have leaked over a million gallons of waste. Those leaks, and future leaks, are a major part of the concern over Hanford's groundwater and the threat it poses to the Columbia River. In exchange for delaying vitrification, USDOE agreed to new Hanford Clean-Up Agreement milestones for cleanup of the Columbia River Corridor. Hanford's top managers stated that they were committed to achieving the goal of unrestricted public use of the Columbia River corridor by 2011.

This, however, is a promise that has been forgotten and broken – like the treaty rights of the Yakama, Umatilla and Nez Perce Nations. All three tribes have guaranteed rights to live along the River, and fish at usual and accustomed fishing places, under the Treaties of 1855. Exposure to contamination from the soil and groundwater makes the exercise of these Treaty rights impossible today.

Nor is there any hope under the national “strategy” and “goals” adopted by the Bush Administration's Department of Energy that the Hanford Reach National Monument will be safe for public and Tribal use by 2018, much less 2011. (“A Review of the Department of Energy's Environmental Management Program”, February, 2002; and, implementation plans in the Hanford Performance Management Plan, “approved” by the Assistant Secretary of Energy for Environmental management, August, 2002). USDOE unilaterally changed the goal for soil cleanup along the Reach from 2011 to 2012, calling this an “accelerated cleanup plan” (or, “Hanford 2012 Plan”). USDOE left out of its “2012 plan” any goal or strategy for cleaning up the groundwater along the Hanford Reach. Rather, the USDOE's national goals and strategies, and Hanford specific plans call for:

- allowing the contaminated groundwater to spread from the Hanford Central Plateau's “200 Areas” (200 East and 200 West, where Plutonium and Uranium extraction occurred, and where the High-Level Waste tanks are located);
- changing the “points of compliance” from the edge of waste dumps and contaminated soil sites to the River shore<sup>1</sup>; and,
- using “natural attenuation” with monitoring to allow the contamination levels to grow before they eventually get diluted or the radionuclides decay over hundreds or thousands of years.

#### The Problem Exemplified by the Area of Greatest Public :

#### A summary of how bad the groundwater is along the Columbia River Corridor:

USDOE refused to stop dumping untreated liquid wastes into the soil through the early 1990's. USDOE was sued by Heart of America Northwest for dumping over 200 million gallons

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<sup>1</sup> USDOE, February, 2002, “A Review of the Environmental Management Program”, accompanying the Secretary of Energy's Congressional Budget Request for FY 2003. SEE Page V-10: “Cleanup of the sites is often further complicated by a lack of realistic future land-use assumptions.... In contrast, the cleanup of commercial industrial sites has assumed continued industrial use. ‘Brownfield’ cleanups are being pursued to support faster cleanups... Another major factor affecting DOE cleanups is points of compliance for groundwater contamination. ... located near areas unlikely ever to be released for public use, unrealistic goals for cleanup are established.” The Review has been followed by several USDOE-Richland plans and strategies (i.e., the Draft Hanford Solid Waste EIS, and Revised Draft Hanford Solid Waste EIS; the draft Central Plateau groundwater strategy and exposure scenario) which would move the point of compliance for groundwater away from the edge of regulated units all the way to the River or to a point one kilometer away from the boundary of the 200 Area.

of untreated waste a year from the 300 Area into half mile long ditches parallel to the Columbia River. USDOE's own documents admitted that even the dumping of pure water into the heavily contaminated soil in and around the 300 Area would "flush" Uranium contamination directly into the River. The soil was, essentially, like a filthy and saturated sponge: every additional drop of water on top caused a dirty drop from the bottom of the sponge to go into the River.

In the Central Plateau's 200 Areas, USDOE was dumping untreated liquid wastes from the Plutonium Finishing Plant and Uranium Oxide Plants into unlined soil ditches called "cribs" and "trenches". Heart of America Northwest also sued to halt this practice, and require USDOE to treat its waste and get waste discharge permits.

These were not ancient practices. Long after every other industry in Washington and the United States was subject to the requirements of federal and state clean water acts, requiring treatment and permits, and forbidding dumping of wastes in unlined ditches, USDOE claimed to be exempt. Many of the top managers of USDOE today were senior managers in the 1990's, while USDOE fought tooth and nail against being forced to end the dumping of untreated liquid waste into the soil.

In 1989, the U.S. General Accounting Office found that USDOE's claims that leaks from the High-Level Nuclear Waste Tanks had not migrated towards groundwater were known not to be true. USDOE, the GAO found, tried to keep up the pretext that the wastes were not migrating by only measuring wells for a radionuclide that had a half life of six months, and would be expected to have decayed before reaching groundwater 200 plus feet beneath the tanks. It was not until November, 1997 that USDOE admitted what everyone else had known for many years: that tank waste leaks had reached groundwater.

Fifty years of Plutonium production at Hanford and fifty years of claiming to be exempt from environmental laws produced a legacy summarized by Bob Alvarez, former Senior Environmental Policy Advisory to Energy Secretary Bill Richardson, as:

In the ensuing 50 years and after making nearly 60 tons of plutonium, some 440 billion gallons of contaminated liquids were directly disposed into the ground at Hanford-enough to create a poisonous lake the size of Manhattan 120 feet deep. Hexavalent chromium, a well-known carcinogen, is now being found to damage fish in the river, while radioactive contaminants have been carried into ocean sediments ranging as far as the southern tip of the Baja Peninsula in Mexico and as far north as Alaska. According to Timothy Jarvis, a scientist at DOE's Pacific North West National Laboratory enough dangerous materials were dumped at Hanford to have "the potential to induce cancer in every person currently on the planet, 208 million times over."<sup>2</sup>

USDOE admits that 80 square miles of Hanford's groundwater is contaminated above federal Drinking Water Standards, and 200 square miles contaminated to a lesser degree. A model of the spread of groundwater contamination, called the "System Assessment Capability" (SAC) has been produced by USDOE over several years, and costing tens of millions of dollars. While heavily criticized by external reviewers and some internal scientists for underestimating contamination, being too simplistic and ignoring known chemical or radionuclide contaminants, the model still shows incredibly disturbing spread of radionuclide contamination at levels 100 times the Drinking Water Standard from the Central Plateau to the Columbia River over the coming decades. The model also shows the contamination around the 300 Area at levels from ten

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<sup>2</sup> Alvarez, Robert; The Nation, June, 2003; quoted from pre-publication manuscript.

to 100 times the Drinking Water Standard spreading for decades along the River before shrinking under USDOE's "natural attenuation" plan.

**Strontium 90 contamination was measured in shoreline seeps along the 100-N Area of the River at 1,837 times the federal Drinking Water Standard in 2000.**

This level of contamination would be expected to cause fatal cancers in 18% of adults drinking this water – without taking into account any other contaminant in the groundwater or other exposure pathways (as from concentration of the contamination in fish or plants). Cancer risks to children from the same carcinogen dose are estimated to be three to ten times higher.

Hanford's Annual Groundwater Monitoring Report for 2000 reported that the highest concentration of the radioactive contaminant Strontium 90 was 1,837 times the federal Drinking Water Standard (DWS) in shoreline seeps in the Hanford 100-N Area (near the N-Reactor, which used half mile long trenches alongside the River for dumping its untreated, highly contaminated cooling water).<sup>3</sup> The federal Drinking Water Standard is set for most carcinogens, including radionuclides, at the level that would cause one additional fatal cancer for every ten thousand adults drinking the water (referred to as a risk of 1E-4, in scientific notation). USDOE is currently proposing to halt excavation of the "cribs" (trenches) at fifteen feet, because it says it is not practical to remove the high levels of contamination below that level. However, those contaminated soils will continue to spread contamination into the River, even if exposure at the surface is within acceptable limits, after clean soil is placed on top. Exposure will not meet those health based standards for unrestricted future site use, however, because the reasonably foreseeable future use of irrigation or sprinkler water use would drive contamination to groundwater, and the crops would be contaminated from use of groundwater.

Chromium VI is a toxic and carcinogenic form of chromium that contaminates groundwater in several of the 100 Areas. Chromium contamination levels in 2001 were reported as high as 5 times the Drinking Water Standard in shoreline seeps and 475 times as high as the standard in near shore wells in the 100 D Reactor Area. Levels of chromium in the 100 K Area were as high as 13 times the standard.<sup>4</sup> Chromium is particularly toxic to, and has serious impacts on development of, developing salmon fry. Chromium impacts the development and health of the salmon at much lower levels than the federal Drinking Water Standard. The salmon "redds", the area where the salmon eggs are laid in gravelly, shallow pools, are also where Hanford's contaminated groundwater either upwells into the River or where shoreline seeps feed the pools. Hanford officials frequently point to the great volume of water in the river as diluting the contamination and keeping levels of contaminants at very low levels. However, it is where the salmon eggs are laid and the young fry develop that the contamination is highest. Further, the

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<sup>3</sup> Hanford Site Groundwater Monitoring Report for Fiscal Year 2000; Table 2.1-1 at 2.9. The Drinking Water Standard for Strontium 90 is 8 pCi/L (picoCuries per Liter). Strontium 90 was measured in the seeps at 14,700 pCi/L. Levels in the near-shore wells were even higher at 17,700 pCi/L. In 2001, the shoreline and well contamination levels reported were both 9690 pCi/L. Hanford Site Groundwater Monitoring Report for Fiscal Year 2001; Table 2.1-3 at 2.11. No explanation appears to be given for the exact same result reported in the shoreline seeps, leading us to assume that the FY 2001 data was actually the same sample as the well. No sampling for Sr90 occurs in the 300 Area at all. Id.

<sup>4</sup> Levels were 4,750 ug/L in D wells and 521 ug/L in shoreline seeps. The Drinking Water Standard for Chromium (vi) is 100 ug/L.

Hanford Reach is subject to wide variations in water levels, particularly from the release or holding of water in upstream dams. The pools where the salmon eggs are laid and the fry develop are likely to be maintained by springs and seeps of highly contaminated groundwater – thus, those salmon that are not left dry at the River’s edge, are those that are likely to be impacted most from Hanford’s contaminated groundwater.

### A Conflict in Visions:

The public and citizen groups have a vision with specific goals for cleanup of the Columbia River Corridor to allow for safe use by the public, and the exercise of Treaty rights by the Tribes, by 2011. *To achieve this goal, the groundwater must be remediated as well as the soil.*

What is a “strategy” and how do we define “goals”?

Even as to the basic definition of strategy and goals, there are fundamental conflicts between the public vision and expectation, and the USDOE’s use of these same terms.

Goals are achievable outcomes that can be measured and have a completion date. The public expects that the agencies will be able to tell the public when “goals” have been met, and to measure progress towards those goals.

A Strategy is the specific means to achieve measurable goals by a certain date.

Compare these expectations, based on broadly accepted strategic planning principles, with the agencies’ description of the Groundwater Strategy’s “goals”.

USDOE’s Groundwater Strategy claims that it has “Goals” to:

- “Focus on reduction of risk – tailor characterization, monitoring, and other activities to risk reduction
- Minimize further spread of contamination
- Minimize further degradation of groundwater during remedial and closure activities
- An integrated groundwater program common to all regulatory programs”

From “Hanford Site Groundwater Strategy – Protection, Monitoring, and Remediation” PowerPoint presentation to the Hanford Advisory Board, December, 2002.

These are NOT “goals”. They are not measurable. There is no timeline. The public will never know if they are, indeed, accomplished. They are, in fact, strategies for reaching a set of totally undefined goals. If the agencies were to adopt goals, for example, of cleaning up groundwater to allow unrestricted public and Tribal use of the Hanford Reach by 2012, or a goal of having fully compliant groundwater monitoring at all soil units by 2006, then these might be a portion of an appropriate set of strategies towards reaching those goals.

It is possible to ascertain widely held public “values” on which goals should be based for cleanup of Hanford’s groundwater.

First and foremost is the goal for cleanup of groundwater at all contaminated hazardous waste sites established in the Washington State law governing the cleanup of hazardous waste sites, which was adopted by Washington’s voters, the Model Toxics Control Act, RCW Chapter 70.105D.

This law clearly sets a measurable goal for cleanup of groundwater to allow for all groundwater to have “beneficial use” as drinking water. Thus, NO groundwater is allowed under

the statute to be written off and sacrificed to contamination without attempting to meet this goal. Cleanup levels (for soil and groundwater) are required to be established to attempt to meet the goal of beneficial use for drinking water purposes. If the reasonably foreseeable maximum public exposure is from a beneficial use that results in greater risk or exposure than from drinking, then the cleanup levels are required to be established to attempt to meet the goal of that greater beneficial use:

WAC 173-340-720 (a)

Groundwater cleanup levels shall be based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and potential future site use conditions. The department has determined that at most sites use of ground water as a source of drinking water is the beneficial use requiring the highest quality of groundwater ... Unless a site qualifies under subsection (2) of this section for a different ground water beneficial use, ground water cleanup levels shall be established in accordance with subsection (3), (4) or (5) of this section.

(b) In the event of a release of a hazardous substance at a site, a cleanup action complying with this chapter shall be conducted to address all areas where the concentration of the hazardous substance in the ground water exceeds cleanup levels.

(c) Ground water cleanup levels shall be established at concentrations that do not directly or indirectly cause violations of surface water, sediments, soil or air cleanup standards...

(d) The department may require more stringent cleanup levels than specified in this section where necessary to protect other beneficial uses or otherwise protect human health and the environment.

(2) Ground water shall be classified as potable to protect drinking water beneficial uses unless the following can be demonstrated:...(b) The ground water is not a potential future source of drinking water..."

*Thus, the public vision and goal for safe, unrestricted use of the Hanford Reach of the Columbia River by 2012 is supported by a goal established in state law that requires cleanup actions to restore the groundwater to unrestricted use – especially in an area that has been designated as a National Monument and has foreseeable increasing public and Tribal usage, and unique, protected resource values.*

Incredibly, Washington's Model Toxics Control Act, and its regulations, are not even referenced or cited as a relevant standard in the Draft Groundwater Strategy.

The public expects that the Groundwater Strategy will attempt to meet the "goal" clearly established in State law. Rather than doing so, the Draft Groundwater Strategy is based on sacrificing the State's groundwater and not attempting to meet this vital goal.

The Mission Statement for the Hanford Groundwater Strategy and Goals need to be changed to reflect the legally applicable standard from the Model Toxics Control Act, and public values:

The mission of the Hanford Groundwater Protection Program is to restore groundwater to beneficial use, which is not restricted by contamination, and to cleanup groundwater so that health risk and environmental standards are met or exceeded. The strategy to achieve this will be the conduct of remedial actions to meet cleanup levels that are protective of human health and the environment, pursuant to relevant standards from the Model Toxics

Control Act, federal Superfund and Clean Water Acts, and other applicable or relevant standards.

The mission of the Hanford Groundwater Protection Program is also to protect the Columbia River from contaminated groundwater from past, present and future operations at the Hanford Site. The strategy to meet this goal is to remediate and restore groundwater to meet relevant standards, through the conduct of cleanup actions and development of technologies, where necessary to meet this goal.

The current draft Groundwater Strategy not only fails to adopt a goal that meets the requirements of the Model Toxics Control Act, it also selects weaker goals and adopts strategies that conflict with the legal mandate for active remediation:

The draft Mission Statement cites only the CERCLA (federal Superfund) standard that “EPA expects to return usable ground waters to their beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the site.”<sup>5</sup>

Washington State voters rejected the “practicality” standard of the federal Superfund, and applied a more stringent test for when groundwater and cleanup standards may be determined to be infeasible to be met. Of course, the practicality standard is a subjective one. At the Hanford Site, USDOE says that remediation is not practical, while spending just 10% of the entire Site Budget on Environmental Restoration, and a miniscule amount on groundwater remediation – while spending hundreds of millions annually on contractor overhead, “planning”, importing additional wastes, (and until this year, \$40+ million a year wasted keeping the FFTF Reactor on hot standby). *Bizarrely, this so-called “Groundwater Strategy” fails to make a single commitment to funding for remediation, installation of legally required groundwater monitoring wells, increasing well monitoring, characterization of the vadose zone and early detection of contaminants heading towards groundwater.*

**Conflict in Vision and Goals:**  
**Time to Eliminate Use of USDOE’s**  
**“Derived Concentration Guides”**

An example of this conflict between the public’s vision and goals and USDOE’s is shown in USDOE’s continued use of “Derived Concentration Guides” (DCGs). For each contaminant, USDOE has established its own ‘standard’, called a Derived Concentration Guide, for how much contamination can be present in the groundwater on site. These DCGs are set at levels between 15 and 500 times the federal Drinking Water Standard.<sup>6</sup> For years, USDOE claimed that it “owned” the groundwater beneath the Hanford site, and could contaminate it as it saw fit. However, well established federal law based on the Constitution recognizes that the States were given ownership of the groundwater, and that the groundwater beneath Hanford is a resource of the State of Washington.

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<sup>5</sup> Draft Groundwater Strategy at Page 1. Sec. 1 “Mission”, footnote citing 40 CFR 300.430(a)(1)(iii)(F).

<sup>6</sup> For example: The DWS for Cesium 137 is 200 pCi/L, while the DCG established by USDOE is 3,000. The DWS for Cobalt 60 is 100 pCi/L, while the USDOE DCG is set at 5,000. Strontium 90 DWS = 8, DCG = 1,000. SEE Hanford Site Annual Groundwater Monitoring Reports Tables 2.1-3 for FY 2001, and 2.1-1 for FY 2000.



The Derived Concentration Guide (DCG) is set by USDOE at Hanford based on the principle that these levels of contamination in the groundwater are acceptable, despite being magnitudes higher than the federal Drinking Water Standards, or Maximum Concentration Limits set under federal and State laws. USDOE based these DCGs on a model predicting that these levels would decrease to the MCL or DWS by the time that the groundwater flowed to the River. Putting aside the clear failure of those models, use of the DCG clearly violates all values and legal standards for preventing contamination above Drinking Water Standards. *The use of Derived Concentration Guide levels is in total conflict with the standard cited in Washington State law<sup>7</sup> that all groundwater shall be assumed to be usable for drinking water and restored for that purpose.*

*A legally compliant Groundwater Strategy would forever abandon the use of USDOE's Derived Concentration Guide values.*

**Conflict With Public Vision and Goals to Clean-Up the  
Columbia River Corridor to Allow for Safe, Unrestricted Public and  
Tribal Use by 2011:**

In 2000, USDOE Hanford managers produced a new plan for Hanford cleanup, in which they adopted a goal to clean up the River corridor by 2012, and release it for public use. (Hanford 2012 Plan). This Plan did not meet the previous promised goal of cleaning up the River Corridor by 2011. However, a delay in meeting a Hanford Clean-Up goal by one year would have been cause for disappointment, but it would not have caused the outcry that his plan caused. The 2012 Plan continued to base cleanup of the 300 Area and a swath of land outside the 300 Area along the River on an "industrial cleanup standard" for the contaminated soil. This weaker standard would only clean up the soil to a level that will be "safe" for an adult worker to be exposed in the affected area based on a 2000 hour work year, with much of their time indoors, and with NO general public access, NO recreation, NO Tribal use of cultural and ecological resources, NO Treaty use of the River shore, and NO children. And, there would be NO cleanup of the groundwater for the 300 Area and the areas surrounding it. USDOE referred to its groundwater strategy as "natural attenuation."<sup>8</sup>

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<sup>7</sup> WAC 173-340-720

<sup>8</sup> Heart of America NW has commented extensively on the illegal use of the industrial cleanup standard for the Hanford 300 Area, and incorporates those comments herein. SEE comments on 300-FF2 Cleanup Plan (RIFS), 2002; and, Comments on 100 and 300 Areas TPA Changes, 2002. Washington's Model Toxics Control Act (RCW 70.105D and regulations) requires that all hazardous waste sites be cleaned up to meet the unrestricted future public use standard, which is based on no residual contamination precluding safe use by children or other reasonably foreseeable exposed portions of the public. The cancer risk from all sources of contamination remaining at the site after cleanup can not exceed one additional cancer in one hundred thousand persons exposed under this standard. The industrial use standard is limited by law to areas that were traditionally used for industry, are zoned and expected to continue to be used exclusively for industrial use (as shown by fencing, pavement, and restrictions that preclude general public or commercial use), and where the contamination will not spread to adjacent non-industrial areas or any surface water body. The 300 Area and the areas outside it that USDOE is limiting cleanup to an industrial standard are contaminating the Columbia River with Uranium and other contamination. Furthermore, it is clear that the lands outside the fence of the 300 area are already used for recreation, and are not even likely to be industrial. In fact, to limit their use to industry would conflict with the Executive Order designating the Hanford Reach National Monument and with the established Native American Nations' Treaty Rights, likely requiring compensation as well as natural resource damages under CERCLA.

Use of the “industrial cleanup standard”, instead of the unrestricted use cleanup standard, is forbidden by the Model Toxics Control Act and its implementing regulations where, as in and around the 300 Areas, groundwater transports contaminants offsite to the River shoreline or River:

Washington Administrative Code 173-340-745 (1)(a)(iii) “Hazardous substances remaining at the property after remedial action would not pose a threat to human health or the environment at the site or in adjacent nonindustrial areas. In evaluating compliance with this criterion, at a minimum the following factors shall be considered:

(C) The potential for transport of residual hazardous substances to off-property areas,...;  
(D) The potential for significant adverse effects on wildlife caused by residual hazardous substances...

(1)(c) Industrial soil cleanup levels shall be established at levels that do not directly or indirectly cause violations of ground water, surface water, sediment, or air cleanup standards established under this chapter or under applicable state and federal laws.

WAC 173-340-720 (a)

Groundwater cleanup levels shall be based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and potential future site use conditions. The department has determined that at most sites use of ground water as a source of drinking water is the beneficial use requiring the highest quality of groundwater ... Unless a site qualifies under subsection (2) of this section for a different ground water beneficial use, ground water cleanup levels shall be established in accordance with subsection (3), (4) or (5) of this section.

(b) In the event of a release of a hazardous substance at a site, a cleanup action complying with this chapter shall be conducted to address all areas where the concentration of the hazardous substance in the ground water exceeds cleanup levels.

(c) Ground water cleanup levels shall be established at concentrations that do not directly or indirectly cause violations of surface water, sediments, soil or air cleanup standards...

(d) The department may require more stringent cleanup levels than specified in this section where necessary to protect other beneficial uses or otherwise protect human health and the environment.

(2) Ground water shall be classified as potable to protect drinking water beneficial uses unless the following can be demonstrated:...(b) The ground water is not a potential future source of drinking water...”

USDOE’s subsequent plans (Review of February 2002 and Hanford Performance Management Plan and this current Groundwater Strategy) all continue to follow this strategy of not cleaning up the 300 Area groundwater, and not meeting unrestricted future use goals for the Southern Gateway to the Hanford Reach.

**A Public Interest Blueprint to Reach the  
Goal of Safe, Unrestricted Public Use of the Hanford Reach:**

In 2002<sup>9</sup>, Heart of America Northwest proposed a new blueprint and strategy to reach the goal of unrestricted public use of the Hanford Reach by 2012:

**The onset of remedial action for groundwater in each area of the River Corridor** (i.e., 100-B; 100-N; 300 Area) **should be included in the TPA at this time, with a start date of one year after completion of the proposed soil remedial action for that area.** This provides ample time for monitoring and assessment, and would show an effort to be consistent with requirements of CERCLA, RCRA and MTCA for the onset of characterization and remediation of units.

**We urge the agencies to join with us in moving towards a vision of a safe, publicly usable Hanford Reach National Monument by 2011.** The Treaties of 1855 guarantee Native Americans the right to fish and, live along, the River Corridor. Once the areas are no longer required for Atomic Energy Defense purposes, additional rights to utilize the lands for food and cultural purposes will be in full effect. The federal agencies have a fiduciary duty to protect and accommodate these rights. Failing to cleanup groundwater - preventing unrestricted access to the River shorelines (including areas of contaminated discharges that are not owned by the United States, but, rather by the State of Washington) - violates that fiduciary duty and those rights.

Failing to include an enforceable schedule for remediation of groundwater, with requirements for technology development and demonstrations for certain contaminants, makes claims that there will be unrestricted access to the Hanford Reach National Monument and “delisting” of the area, a sham.

Only by including milestones for the start and completion of groundwater remedies, will this TPA package not appear to be a cruel hoax when it is discussed as accelerating cleanup along the River Corridor leading to unrestricted public access by 2012.

This proposal was strongly supported by scores of public commentators at annual State of the Site meetings, Hanford Clean-Up Priorities hearings and in comments on the TPA changes; and, by numerous other citizen groups.

The strong support for this blueprint exists because it is a real “strategy” to achieve the vision of safe, unrestricted use of the Columbia River, with realistic goals.

The Hanford Advisory Board endorsed this strategy and blueprint in February of 2002, while criticizing the lack of milestones to start groundwater cleanup along the River Corridor after 2013, and on a timeline that could never meet the TPA milestone for completion of cleanup of soil and groundwater by 2018 (with exception for the Central Plateau tank farms):

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<sup>9</sup> “Proposed Agreement on Tri-Party Agreement Schedules for Clean Up of Waste Sites and Facilities Along the Columbia River”; Comments of Heart of America Northwest, and Heart of America Northwest Research Center (Columbia River Corridor 100 and 300 Area Tri-Party Agreement Change Package) March, 2002.

“While the Board supports the development of enforceable milestones aimed at river corridor cleanup, this support is tempered by the following concerns and recommendations:

Groundwater

“Groundwater remains of foremost concern to the Board. The Board encourages the agencies to maintain ongoing successful groundwater remediation actions and pursue more aggressive technology development and treatment activities.

“Currently the change package would establish milestones that require initiation of groundwater restoration activities only after all 100 Area soil removal actions are complete. The Board recommends that actions be expedited by initiating groundwater actions in each remedial unit upon completion of soil removal in that unit.”<sup>10</sup>

The USDOE “Hanford Site Groundwater Strategy” has no vision of unrestricted use of the Columbia River, nor any “strategy” or goals for achieving cleanup (remediation) of groundwater.

The contrast could not be more clear between the public’s vision and the proposal to call the document out for review a “Strategy”, when it has NO Goals for when groundwater will be cleaned up, when the Hanford Reach will be safely usable without exposure to groundwater contamination pathways during unrestricted future use, and no blueprint or strategy for cleaning up groundwater in the Columbia River Corridor. We urge the Tri-Party Agreement agencies to adopt a specific vision and blueprint for cleanup of contaminated groundwater in the Columbia River corridor, as called for by the public and the Hanford Advisory Board.

**The USDOE Groundwater Strategy Fails to Live Up to the Claimed Commitment to Prevent Additional Harm; and, Has NO Strategy and Schedule for Bringing the Groundwater Monitoring at Burial Grounds Into Compliance With RCRA and State Standards:**

**Burial Grounds:**

Any strategy that claims it will prevent additional harm to groundwater must start with ending dumping of radioactive wastes in unlined soil trenches.

Incredibly, USDOE fails to make a commitment to end the dumping of radioactive wastes in unlined trenches in this Strategy, and fails to make ending of dumping in unlined trenches a Preferred Alternative in the Revised Draft Hanford Solid Waste EIS (RD-HSWEIS, April, 2003). In fact, not one alternative in the RD-HSWEIS would end dumping of waste in unlined trenches in the near future, and all alternatives would continue to use unlined trenches for several years. Three of the six alternatives would use unlined trenches forever.

Washington State law forbade expansion of landfills or creation of new trenches without liners and leachate collection systems after 1992. Yet, as explained below, USDOE has repeatedly expanded and added massive new trenches without liners or leachate collection – some longer than three football fields. Three of six alternatives in the RD-HSWEIS would illegally expand the Low-Level Burial Grounds without liners and leachate collection systems. USDOE does not even note that this is illegal or note any conflict with the claimed goals of its “Groundwater Strategy”. Seven million cubic feet of the new capacity would be solely for

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<sup>10</sup> Hanford Advisory Board Consensus Advice #125: “100/300 Area TPA Change Package”; February, 2002.

offsite radioactive wastes, which clearly shows that the Hanford soil and groundwater are being sacrificed, rather than cleaned up.

Any “Groundwater Strategy” that is not violated by the illegal massive expansion of new unlined soil trench burial grounds is not worth the dirt it is written with.

While USDOE proposes to add massive new burial ground capacity, the Groundwater Strategy and the RD-HSWEIS fail to have any schedule or goal to bring the Low-Level Burial Grounds into compliance with groundwater monitoring standards.

Ironically, the Draft Groundwater Strategy at Sec. 5.1.1 says that operation of waste storage and disposal facilities “must reflect basic minimum technology (double liner, leachate collection, etc.) and groundwater monitoring requirements of RCRA.” The section cites WAC 173-303-645 requirements for groundwater monitoring as applicable to all waste disposal units. This statement of the law, however, is not followed through with any schedule or commitment to meet the cited standard, and NO GOAL is set for achieving compliance.

There is a massive compliance deficit for groundwater monitoring at the Low-Level Burial Grounds (these five large areas are spread across the 200 East and West Areas).

Most of the groundwater monitoring wells around the Low-Level Burial Grounds have either gone dry, or are going dry (as the water table dropped, wells no longer reached the water. The number of wells was never adequate, and became more inadequate as the water table dropped and the direction of groundwater movement changed).

Ecology issued an extensive Notice of Deficiency for USDOE’s RCRA permit (Part B) application for these burial grounds, in January 2003. Yet, the Groundwater Strategy fails to mention the issues by Ecology for the LLBG Part B Permit Application which included groundwater monitoring program deficiencies. The number of wells that are required around the Low-Level Burial Grounds, as cited in Ecology’s Notice of Deficiency analyses based on statistical sampling requirements, is over 100.

USDOE only proposes to install 3 RCRA groundwater wells in FY 2004 for DOE-Richland, and 6 for the Office of River Protection (at the High-Level Waste Tanks farms). In 2005, this is supposed to increase to 14 wells. Again, these will not all be at the LLBGs, or few will be. USDOE cites the cost (at \$200,000 to \$250,000 per new RCRA well) as the reason for not setting more aggressive goals to come into compliance with groundwater monitoring requirements. Yet, USDOE will spend \$43 million on “Planning and Integration” in FY 2003, while refusing to detail how it spends funds across the board, and refuses to disclose the level of funding for Hanford contractors’ overhead accounts (which exceeded \$300 million for FY 2000). That “Planning and Integration” funding would pay for over 160 new groundwater monitoring wells to be installed.

A real Groundwater Strategy would:

- set enforceable goals for achieving compliance with groundwater monitoring requirements
  - that should be no later than 1/1/2006 for the Low-Level Burial Grounds
- adopt an enforceable schedule for initiation and completion of a full investigation of all releases of hazardous substances from the Low-Level Burial Grounds, beginning within 90 days.
  - Further groundwater protection and remediation actions would be determined by the results of an investigation of all potential releases in all burial grounds (i.e., all likely solvents co-disposed with the TRU wastes that are releasing Carbon-Tetrachloride to the vapor space in the LLWMA4 burial grounds at levels that are nearly twice those that are

fatal to humans [measured at 1,760 ppm]), including evidence that the organic chemicals have reached groundwater already.

- Adopt an enforceable deadline, by the end of this year, to end USDOE's dumping of wastes in unlined burial grounds without leachate collection.
  - Not allow USDOE to issue a Revised Draft Hanford Solid Waste EIS that has all alternatives continuing to use unlined burial grounds for low-level Waste for, at least, several years; and, half of whose alternatives would never eliminate use of unlined burial grounds.
- Require use of an accurate inventory of the chemical, as well as radioactive, wastes in the burial grounds for use in models predicting the degree of groundwater contamination and cumulative impacts from additional disposal.
- Require consideration of impacts to groundwater at the edge of burial grounds and other disposal site units, as the legally applicable point of compliance. Bar USDOE from only analyzing groundwater contamination impacts at a kilometer away from the boundary, as it does in the Revise Draft HSWEIS. Require USDOE to also analyze and consider the maximum concentration in groundwater under the unit.
- Recognize in the Groundwater Strategy and RDHSWEIS that RCRA closure, post closure monitoring and corrective action requirements apply to the entire Low-Level Burial Grounds.
  - USDOE has repeatedly stated that it believes it had interim status for these Low-Level Burial grounds and submitted a Part B application for the entire areas.
  - The Groundwater Strategy and USDOE's Groundwater Plan now attempt to evade RCRA requirements by claiming that only isolated islands in the burial grounds have Mixed Waste and only those islands are subject to RCRA and the State Hazardous Waste Management Act. Yet, it has been repeatedly documented that USDOE did not meet waste characterization, designation and segregation requirements, which led to repeated illegal disposal of Mixed Wastes in the unlined burial grounds. Absent full characterization and records that are adequate to meet rCRA requirements, all waste in the burial grounds must be managed as if it is suspect Mixed Waste. In any event, the entire burial grounds are subject to RCRA and HSWMA requirements because of these documented problems.

Some of these unlined burial ground trenches are immense. In 1997, USDOE expanded a trench that is 1,160 feet long – without seeking a permit and without attempting compliance with either RCRA or RCW Chapter 70.105 – with a capacity for USDOE to dump 700,000 cubic feet of waste.<sup>11</sup> In 1999, USDOE again approved another massive trench expansion for a 900 foot long trench, in order to increase capacity for bulk disposal of LLW in the trench to 223,000 cubic feet.<sup>12</sup> In recent years, disposal of waste in the unlined trenches has ranged from 200,000 cubic feet to 600,000 cubic feet.

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<sup>11</sup> 1997 EA, Expansion of Trench 33 in the W-5 Burial Ground, May, 1997; USDOE; Section 2.1.

<sup>12</sup> EA for proposed expansion of Trench 36 Within the 218-E-12B Low-Level Burial Ground; USDOE, 1999. See Table 1 regarding forecast for FY 1999 Waste Disposal. *DOE/EA-12*

**The Strategy Must Acknowledge Releases of Hazardous Substances from, and Violation of Non-Discretionary Duties For Operation of, the Burial Grounds as Interim Status Facilities Under RCRA:**

The burial grounds are alleged by USDOE officials to have interim status under RCRA, 42 USC 6925. USDOE and its contractors applied for a Part B permit for these unlined burial grounds a decade ago – without providing characterization data; without identifying the nature, sources, and quantities of wastes; without providing a closure plan; without characterizing releases; without meeting groundwater and vadose zone monitoring requirements; and, without even updating the SEPA threshold analyses. It is clear that no permit could be issued without an environmental impact statement, yet the USDOE and contractor have failed to perform an adequate EIS for the processing of a permit.

USDOE has willfully operated and expanded the unlined Low-Level Burial Grounds in violation of the provisions of RCRA and Washington’s Hazardous Waste Management Act, Chapter 70.105 RCW. These expansions have illegally occurred without a permit.<sup>13</sup>

Some of these unlined burial ground trenches are immense. The expansion approved in 1997 by USDOE – without seeking a permit and without attempting compliance with either RCRA or RCW Chapter 70.105 – was for a 1,160 foot long trench, with a capacity for USDOE to dump 700,000 cubic feet of waste.<sup>14</sup> In 1999, USDOE again approved another massive trench expansion for a 900 foot long trench, in order to increase capacity for bulk disposal of LLW in the trench to 223,000 cubic feet.<sup>15</sup>

42 USSC 6925(i) requires that interim status facility landfills receiving hazardous waste after July 26, 1982 must meet the standards for ground water monitoring, unsaturated zone monitoring and corrective action, which are applicable to new landfills.

Two of Hanford’s active burial ground areas were opened for service after 1982.<sup>16</sup> Neither one has liners and leachate collection, nor does either one meet standards for groundwater monitoring and unsaturated zone monitoring. Indeed, a massive trench expansion in

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<sup>13</sup> In 1997, for example, USDOE expanded and began to operate disposal Trench 33 within the 218-W-5 Burial Ground in the 200 West Area. The base of this trench was widened to 20.4 meters (67 feet) for the entire 354 meter (1160 foot) length of the trench. USDOE documents (EA, 1997) stated: “Existing capacity would be expanded from approximately 12,000 cubic meters (428,000 cubic feet) to 20,300 cubic meters (717,000 cubic feet).” In 2000, USDOE stated that it was again running out of disposal space in the unlined burial grounds, and proposed another expansion, this one for the W-4 burial grounds. Another EA was issued, but the action was not taken pending the issuance of the Hanford SWEIS. However, there are questions as to whether new trenches were placed in operation and / or expanded since 1997. In 1999, USDOE proposed to expand Trench 36 within the 218-E-12B Low-Level Burial Ground for disposal of LLW. The EA described the proposed action to widen the base of this trench from approximately 1.5 meters (5 feet) to 9.1 meters (30 feet) along the entire 275 meter (900 foot) length of the trench. “Existing bulk LLW disposal capacity in Trench 36 would increase almost six times from approximately 1,050 cubic meters (37,200 cubic feet) to 6,320 cubic meters (223,000 cubic feet).” The forecast for FY 1999 waste disposal for which this action was predicated showed a forecast of approximately 100,000 cubic feet of bulk LLW disposal, with 45% from offsite generators. EA for proposed expansion of Trench 36 Within the 218-E-12B Low-Level Burial Ground; USDOE, 1999. See Table 1 regarding forecast for FY 1999 Waste Disposal.

<sup>14</sup> 1997 EA, Expansion of Trench 33 in the W-5 Burial Ground, May, 1997; USDOE; Section 2.1.

<sup>15</sup> EA for proposed expansion of Trench 36 Within the 218-E-12B Low-Level Burial Ground; USDOE, 1999. See Table 1 regarding forecast for FY 1999 Waste Disposal. *DOE/EA-12*

<sup>16</sup> Burial Ground 218-W-3AE “Service Date” was 1983, and the 218-W-5 Burial Ground start of Service date was 1986. Source: USDOE “Low-Level Burial Grounds Fact Sheet” ; REG-0271; 1/02. Available on line as of January, 2003.

one of these burial grounds occurred in 1997 in the 218-W-5 Burial Ground, adding nearly 300,000 cubic feet of capacity for disposal in Trench 33. No effort was made to comply with these requirements of RCRA, no effort was made to obtain a permit for the expansion.<sup>17</sup>

It is undisputed that USDOE has placed hazardous wastes, including Mixed Waste, in the unlined burial grounds since 1982. Indeed, it continues to place Mixed Wastes, or wastes which are suspected of being Mixed Wastes and which are not fully characterized, in these burial grounds, and other unpermitted facilities.<sup>18</sup>

Washington State has given USDOE repeated notice of the violation of groundwater monitoring requirements for the Low-Level Burial Grounds. USDOE documents note that the groundwater monitoring fails to meet applicable legal requirements, and that there is no vadose zone or unsaturated zone monitoring. Further, USDOE documents reveal that more groundwater monitoring wells around the LLBG are going dry, further exacerbating the harm and degree of violation.<sup>19</sup>

USDOE's Hanford Low-Level Burial Grounds do not qualify for interim status. Interim status terminated, if it was ever grantable, no later than 1992, when USDOE failed to apply for final facility permits for land disposal facilities by November 1988. Even if USDOE had met that deadline, the status would have terminated, and the Administrator and Director have mandatory duties to deny any permit application for the burial grounds.<sup>20</sup> To continue in interim status required certification that the land disposal facility is in compliance with all applicable groundwater monitoring requirements. 42 USC 6925(e)(2) and (3).<sup>21</sup> If USDOE or any contractor has made such certification, or makes such certification, USDOE's own documents show such certification to be false. Further, USDOE and Hanford contractors have clearly failed to provide information required to process an application, which would include full compliance with SEPA and characterization of both dangerous wastes present in the landfills and hazardous substances released.

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<sup>17</sup> 1997 EA, Expansion of Trench 33 in the W-5 Burial Ground, May, 1997; USDOE. In the EA, the provisions of RCRA and Washington's Hazardous Waste Management Act were not even mentioned, even in the section for required permits and regulatory approvals.

<sup>18</sup> E.g.: See Notice of Violation for disposal of hazardous wastes from Lawrence Berkeley National Lab, 1995 and 1996. Also see "Acceptable Knowledge" packages for Remote-Handled and Contact-Handled Transuranic wastes shipped to Hanford, December 2002, from ETEC and Battelle Columbus Lab. These documents show that wastes being placed in the LLBG Waste Management Area 4 for indefinite "storage" contain hazardous wastes, have RCRA Waste Codes, and include numerous potential uncharacterized hazardous wastes under RCRA and Washington State definitions. The documents also reveal that large quantities of TRU with suspect Mixed Wastes were disposed of at Hanford's LLBG since 1982.

<sup>19</sup> SEE Hanford Site Groundwater Monitoring Reports for Fiscal Years 1999, 2000, 2001. See comments of Heart of America Northwest, Washington Ecology and USEPA on the Hanford Site Solid Waste EIS.

<sup>20</sup> 42 USC 6925(c). See (c)(2)(C) for the duty of the Director of Ecology, administering an authorized hazardous waste program to make a final decision.

<sup>21</sup> Furthermore, the facility had to be in existence and operating as of November 19, 1980, and for land disposal facilities, the facility would have had to be granted interim status prior to November, 1984 and applied for a final permit within twelve months, in order to qualify of interim status. (42 USC 6925(e)(1), (2) and (3)). As noted herein, two of the Burial Ground Areas were not even in existence or in service as of 1982, and were opened for service in 1983 and 1986. Interim status was not available for land disposal facilities that were not in existence and operational before the statutory date granting interim status. Final permits were not applied for as required by November, 1985. Even if the land disposal facilities had been granted interim status at that time, it would have expired after twelve months after becoming subject to the permit requirements of RCRA because USDOE could not certify compliance with all applicable groundwater monitoring requirements. (42 USC 6925(e)(3)).



Both the Administrator and Director have nondiscretionary duties to deny issuance of final permits for these burial grounds for failing to meet the requirements for interim status and failure to provide adequate permit applications. The mandatory duty to deny the permit is clearly stated in 42 USC 6925 (c)

Repeated expansions, including new land disposal facility trenches, of the Low-Level Burial Grounds have occurred without USDOE and its contractors applying for, or receiving, RCRA and Washington State Hazardous Waste Management Act permits. Such expansions violated interim status requirements, permit requirements and other applicable laws.

Washington State law was repeatedly and knowingly violated by USDOE and its contractors by expanding the unlined soil trenches of the burial grounds:

Washington Administrative Code (WAC) Section 173-303-665 (Landfills) required liners and leachate collection systems for each new landfill unit or lateral expansion of a landfill unit and each replacement of a landfill unit, on which construction commenced after July 29, 1992. USDOE has knowingly and repeatedly violated this requirement. These violations have increased the quantities of hazardous substances that threaten the State's groundwater, Columbia River, and the health of persons and the environment due to releases. Indeed, all disposal of waste in unlined ditches after 1992 must be considered a release to the environment, since there is no effective barrier between the waste and the environment. Large quantities of Carbon Tetrachloride were undoubtedly disposed to the soil since the provisions of RCRA and WAC 173-303 barred expansion or creation of new unlined trenches for disposal of hazardous wastes. The Carbon Tetrachloride that was disposed in these illegal expansions has likely contributed substantially to the ongoing release of this toxic substance that poses a current imminent and substantial endangerment.

WAC 173-303-665(9) requires a "response plan", which must be approved by Ecology "before receipt of waste". The response plan must detail what action will be taken and how promptly when a leak is detected. USDOE can not detect leaks at all from the LLBG, because it failed to have liners and leachate collection systems with leak detection as required by law. USDOE has also failed to monitor the vadose or unsaturated zone to detect releases *before* they reach groundwater. However, these violations can not excuse USDOE and the contractors for the ongoing violation of the requirement to have a response plan for the LLBGs.

If there was a response plan that met legal requirements, then Heart of America NW would not be forced to seek an order of mandamus to require Ecology to initiate an investigation of the releases from the LLBG under the Model Toxics Control Act, RCW Chapter 70.105D.

**An enforceable timeline to apply the following standards at USDOE's Low-Level Burial Grounds, and any new landfills, must be part of any meaningful Groundwater Strategy:**

- liners for all new use of soil disposal units (milestone should be as of 1/1/04);<sup>22</sup>
- leachate collection systems;<sup>23</sup>
- leak detection systems;<sup>24</sup>

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<sup>22</sup> WAC 173-303-665(2)(h)

<sup>23</sup> WAC 173-303-665(2)

<sup>24</sup> WAC 173-303-665(2)

- groundwater and unsaturated (vadose) zone monitoring – (milestone should require fully compliant groundwater monitoring meeting the spacing, testing and data requirements by 1/1/2006);<sup>25</sup>
- response action plans;<sup>26</sup>
- notification of releases from landfills;<sup>27</sup>
- mapping the exact location of landfill cells with the contents of each dangerous waste type<sup>28</sup>;
- weekly and post-storm inspections of operating landfills to detect run-on, run-off and prevent wind dispersion of waste, and to ensure proper operation of leachate collection systems;<sup>29</sup>
- preventing the disposal of potentially incompatible hazardous substances and wastes in the same landfill cell;<sup>30</sup>
- prohibitions against expansions or new trenches without meeting all of the above;
- having a permit under RCRA or Washington’s Hazardous Waste Management Act for the operation of the unlined Low-Level Burial Grounds and for their continued acceptance of wastes – only after all standards have been met;
- A compliance schedule with investigation for receipt of uncharacterized wastes for disposal without meeting the requirements of WAC 173-303 for waste identification, characterization, analysis and notification of waste types, and receipt of wastes in a facility without a permit; where releases of hazardous substances are occurring (e.g., Carbon Tetrachloride from LLWMA4; and, for operation of landfill facilities for which interim status legally expired.

Comments on Appendix A.1.: The appendix erroneously identifies the only portions of the Low-Level Burial Grounds (Low Level Waste Management Areas 1-4) subject to 173-303-645 requirements as **only** mixed waste trenches 31 and 34.

As shown above, USDOE has repeatedly been found to have failed to properly characterize, segregate, track and designate hazardous Mixed Wastes that have been co-mingled and buried throughout the burial grounds. This was hardly limited to these few “islands” where USDOE deliberately stored or buried Mixed Wastes. Incredibly, even as we face releases of Carbon Tetrachloride from WMA4 at levels that are immediately dangerous to human health, USDOE does not acknowledge that hazardous wastes are present; and, does not recognize that RCRA and WA Hazardous Waste Management Act requirements are applicable.

This is not consistent with the Part A interim status permit (revisions 0-9), nor with the Part B Permit Application and the Notice of Deficiency issued by Ecology in 2003. It is appropriate that Ecology require a RCRA and WA HWMA closure plan for the entire LLWMA 1-4 units.

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<sup>25</sup> 42 USSC 6925(i) and WAC Chapter 173-303-645

<sup>26</sup> WAC 173-303-665(9)

<sup>27</sup> E.g.: WAC 173-303-665(9)(b). USDOE’s failure to have liners and leachate collection systems capable of detecting a release can not excuse its violation for failure to report releases that would have been detectable if USDOE had not failed to comply with the regulatory requirements.

<sup>28</sup> WAC 173-303-665(5)

<sup>29</sup> WAC 173-303-665(4)(b)

<sup>30</sup> WAC 173-303-665(7)

Furthermore, it is vital that WAC 173-303-645 groundwater requirements be identified in this strategy as applicable. If these requirements are not recognized as applicable in this Strategy, it will not be credible.

Ecology can not issue a final status operating permit for the non-compliant portions of LLWMAs 1-4 (i.e., unlined, inventory unknown, etc.), and must require a closure plan for the non-compliant portions or approve a plan that combines closure and corrective action. The first legally required step is a full investigation of releases and characterization of wastes present and released pursuant to MOTCA. Section A.1 appears to have been either crafted to evade groundwater requirements for the Low-Level Burial Grounds (LLWMAs 1-4).

Appendix A.3. : As noted above with great detail, it is not legally permissible for “Ecology to permit the active regulated portions of the LLBG...”

The LLBGs, as described above, can not meet minimum requirements, and must be closed and investigated. They do not have interim status, as described in detail above.

Ecology may only permit new landfills that have liners and leachate collection.....

To achieve the stated objective of ascertaining the degree of release (not whether there are any) Ecology must have a schedule for USDOE to meet the monitoring and response plan requirements.

The appendix appears to imply that LLWMAs 1-4 can be segregated “inactive past-practice units” and adjacent trenches that are “active”. (Appendix A.3 and A.1: At A.1, the Strategy implies that the only MW units in burial grounds are trenches 31 and 34.) This is impossible and not legally viable. As shown in the limited monitoring done for Carbon Tetrachloride in the LLWMA4 burial ground, the trenches are so close that the active trenches are clearly impacted by the inactive trenches. Further, many of the trenches are claimed to have inactive portions within an active, open trench. Finally, none of these trenches have been legally closed, so there is no way that this artificial distinction can be drawn. This Appendix appears to have been designed to evade groundwater, closure and characterization requirements for the Low-Level Burial Grounds (LLWMAs 1-4).

The Appendix should have a clearly delineated schedule to achieve compliance with groundwater monitoring requirements and closure requirements.

The Strategy in footnote 4 to Appendix A wrongly implies that corrective action and monitoring requirements for radionuclides can not be issued by Ecology. This position is not supportable by law and is unacceptable for Ecology to agree to. First: clearly these releases are essentially “Mixed Wastes”, comprised of both radioactive and hazardous constituents, and it is necessary to monitor both. Secondly, MOTCA clearly requires monitoring and remediation of all released carcinogens. EPA has long recognized that radionuclides are subject to the cleanup levels required under the National Contingency Plan and meeting the CERCLA regulation’s cancer risk standards. SEE OSWER 9200.4-18: Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination”, U.S. EPA August, 1997.)

The Strategy claims that “remediation” of waste sites will primarily be by use of surface “barriers”. (Previously in draft as A.4 This illegally adopts a plan to avoid full remediation, without even attempting to go through the MOTCA and CERCLA investigation and feasibility study processes, and to determine if retrieval and treatment are not practicable and preferred to meet relevant health based standards. Again, the conflict is between fundamental visions: whether these sites will ever be safe for reasonably foreseeable public use and from reasonably foreseeable intrusion and subsurface spread of contamination.

### **Additional Specific Comments on Draft Groundwater Strategy:**

1. Throughout the document, the strategy needs to reflect a commitment to early detection, via leachate collection, and soil (vadose zone) monitoring, rather than emphasizing only groundwater monitoring. This is a significant shortcoming. By the time that contamination hits groundwater, it is too late for protection. Early detection is also required as a strategy with specific plans under WAC 173-303-645.
2. There needs to be a specific trigger for action when vadose zone or groundwater monitoring show a statistically significant increase in a contaminant. By failing to agree on such an action level, the strategy will be doomed to the same type of dispute over action and inaction as has marked leaks from Single Shell Tanks.
3. The title should add “detection”. The word detection is a more meaningful word in relation to “protection” and “remediation”. It should be noted that “monitoring” may occur without “detection”. As such, before remediation or protection can occur, detection must first occur.
4. Section 1.0, Page 1. The first sentence of the Mission Section states: “...and to protect and remediate groundwater”. The Model Toxics Control Act (MTCA) requires remediation of groundwater to its highest beneficial use. As Ecology is authorized to implement MTCA to satisfy Resource Conservation and Recovery Act (RCRA) corrective action requirements, the wording should be consistent with MTCA requirements. Recommended wording: “...and to restore groundwater to its highest beneficial use.”
5. Section 2.0, Page 1. The 2<sup>nd</sup> bullet does not include MTCA, the Clean Water Act (CWA), or applicable well management regulations. The strategy is incomplete without describing how MTCA, CWA, and well management regulations will be satisfied.
6. Section 2.0, Page 1. The 2<sup>nd</sup> bullet should include an identification of where in the strategy the various regulatory roles are included. For example, the second bullet should identify that Appendix A includes the role of RCRA corrective action for groundwater. Similarly, the bullet should specify where in the strategy the role of the CWA is explained/described. Similarly, the bullet should specify where in the strategy the role of MTCA is explained/described. Similarly, the bullet should specify where in the strategy well management is described.
7. Section 2.0, Page 1. The 3<sup>rd</sup> bullet implies that duplication and inconsistencies arise from multiple regulations. The bullet is written in such a way as to carry a “tone” and reflects an attitude that even the regulatory agencies consider groundwater regulations to require duplication and result in inconsistencies. If this bullet is to remain, it is recommended that it be re-written to drop the “tone”. Also, if the bullet is to remain, the document should include specific examples of “duplication” and “inconsistencies” that are occurring due to compliance. It could easily be argued that “duplication” and “inconsistencies” are not a product of regulatory requirements, but rather a function of how regulations are implemented. Furthermore, it could be argued that when groundwater decisions are not made in a defensible fashion “inconsistencies” happen. Furthermore, it could be argued that duplication could be a function of a lack of communication between Ecology, EPA, and USDOE rather than the fault of regulations. Lastly, if examples of duplication and inconsistencies are legitimate, it is recommended that Ecology, EPA, and USDOE contact Congress and request appropriate changes to regulations be made to address the issues of “inconsistencies” and “duplications”.

8. Section 2.0, Page 1. The 4<sup>th</sup> bullet identifies an objective of supporting vadose and groundwater cleanup decisions in a “timely, effective, and efficient manner”. The standing record at the Hanford Site for supporting the vadose zone objective is dismal. For example, vadose zone monitoring is needed at several active RCRA TSDs (the Single-Shell Tanks [SSTs], the Liquid Effluent Retention Facility [LERF], certain Low-Level Burial Grounds [LLBGs], etc.) and the CERCLA Environmental Remediation Disposal Facility [ERDF]. However, SSTs will very likely initiate closure activities without vadose zone monitoring. Similarly, LERF and certain LLBGs are out of compliance with RCRA groundwater monitoring requirements due to wells going dry. Currently, there is no documented indication that USDOE or EPA support vadose zone monitoring to address groundwater monitoring network deficiencies at SSTs, LERF, LLBGs, and ERDF. This bullet should be deleted as it does not honestly reflect the lack of support for vadose zone monitoring.
9. Section 2.0, Page 1. The 4<sup>th</sup> bullet identifies an objective of supporting vadose and groundwater cleanup decisions in a “timely, effective, and efficient manner”. The standing record at the Hanford Site for supporting groundwater cleanup decisions in a timely, effective, and efficient manner is dismal. For example, under CERCLA, EPA has yet to issue the first final groundwater Record of Decision (ROD). As another example, Ecology has not, to date, formally and administratively exercised its RCRA and/or MTCA corrective action authority at the Hanford Site. While Ecology may claim that RCRA corrective action is occurring at the N Area, the process is so grossly deficient, it is non-defensible as a RCRA corrective action (note: RCRA corrective action is purported to be occurring via an interim CERCLA groundwater ROD). Similarly, the RCRA corrective action and CERCLA remedy selected (and purported to be occurring) via an interim CERCLA groundwater ROD in the 300 Area to address uranium (half-life 4+ billion years) groundwater contamination is monitored natural attenuation. This remedy is non-defensible and should never have been considered a viable option for selection. As another example, technetium-99 groundwater concentrations at well 299-W23-19 have reached 187,900 pCi/L and have exceeded the “10X” CERCLA ROD “action” level for years without RCRA or CERCLA corrective action. As another example, the CERCLA 200 West Area carbon tetrachloride groundwater pump-and-treat system could be described as anything other than “efficient”. Repeated evaluations of the efficiency of the carbon tetrachloride have indicated that the characterization is so grossly deficient that the effort may actually be causing more harm than good. There are more examples of non-defensible, non-timely, ineffective, and inefficient groundwater cleanup decisions. To state that “timely, effective, and efficient” groundwater cleanup decisions are an objective is nothing short of disingenuous. This bullet should be deleted as it does not honestly reflect the true lack of support for making “timely, effective, and efficient” groundwater cleanup decisions.
10. Section 3.0, Page 2, 1<sup>st</sup> Bullet. It is recommended that the first bullet read as: “...to detect, remediate, and protect”.
11. Section 3.0, Page 2, 2<sup>nd</sup> Bullet. The strategy does not appear to include “the mission of the Hanford Groundwater Program”. Perhaps an additional goal would be to meet the EPA’s mission for protecting groundwater. Similarly, an additional goal would be to meet Ecology’s mission for protecting groundwater. Without providing an identification of “the mission of the

Hanford Groundwater Program”, the reader does not know what USDOE’s mission is or if it is even consistent with Ecology’s and EPA’s missions.

12. Section 3.0, Page 2, 2<sup>nd</sup> Bullet. The bullet does not include identification of MTCA, CWA, and well management requirements. As such, the bullet is incomplete.
13. Section 3.0, Page 2, Bullets. It is noted with interest that none of the stated goals include “compliance” with regulatory requirements to protect groundwater and to restore groundwater to its highest beneficial use. By this omission, it appears that Ecology and EPA have agreed with USDOE that regulations do not have to be met.
14. Section 3.0, Page 2. It is recommended that a bullet be included which identifies the goal of “doing no harm” to the groundwater. Technically, it may be argued that the 200 West Area carbon tetrachloride groundwater remediation may currently be doing more harm than good (i.e., the core plume is growing – possibly due to the design of the pump-and-treat system) due to lack of contaminant fate and transport characterization to support remediation design. Technically and legally, it may also be argued that the selection of monitored natural attenuation as an “interim” groundwater and surface water remedy for the 300 Area uranium contamination is “doing harm”. Technically and legally, it may also be argued that the lack of groundwater remediation in the N Area allows “harm” to the river and recipient ecosystems to occur.
15. Section 3.0, Page 2, 10<sup>th</sup> bullet. The 10<sup>th</sup> bullet identifies a goal to minimize further degradation of groundwater during remedial and closure activities. In light of groundwater remediation decisions made thus far via the CERCLA interim RODs and the lack of formal implementation of RCRA groundwater corrective action, this bullet could be argued to be disingenuous. Interestingly, the tank waste retrieval is offered as an example. It is very apparent that SST closure actions will very likely proceed on a fast track **without** vadose zone leak detection capabilities. In addition, it is very apparent that SST waste retrieval will advance **without** vadose zone leak detection capabilities with the logic that the action of removing waste will “minimize further degradation of groundwater during remedial and closure activities”. In fact, even though it is assumed that an average of 8,000 gallons of tank waste may be leaked from every SST during retrieval actions, the retrieval actions will very likely proceed **without** vadose zone leak detection. In other words, in context of what is occurring on the Hanford Site, this bullet does not add value to the stated goals. It is recommended the bullet be deleted.
16. Section 4.0, Page 2. MTCA, CWA, and well management statutory requirements are not included. Of particular significance, since USDOE steadfastly maintains they have sole and complete authority over radionuclides, Ecology should recognize the authorities associated with water quality standards (which include radionuclide indicator standards). By the omission of broad statutory authorities associated with CWA and MTCA, it appears Ecology is unwilling to uphold the environmental protection programs for which they are authorized. If so, Ecology should identify that it formally forfeits its authority to ensure groundwater quality protection.
17. Section 4.1, Page 3, 1<sup>st</sup> Bullet and Appendix A. The 1<sup>st</sup> bullet is unclear. The word “active” is used in relation to “RCRA land-based waste management units ‘regulated units’ (such as, landfills and surface impoundments that receive dangerous wastes)”. The wording is unclear and

is inconsistent with RCRA definitions provided by WAC 173-303-040. Specifically, the WAC 173-303-040 definition of “active life” of a facility means “the period from the initial receipt of dangerous waste at the facility until the department receives certification of final closure”. In addition, the -040 definition of “active portion” means that portion of a facility which is not a closed portion...”. In addition, the -040 definition of “closed portion” means “that portion of a facility which an owner or operator has closed, in accordance with the approved facility closure plan and all applicable closure requirements”. In addition, the -040 definition of “closure” means “the requirements placed upon all TSD facilities to ensure that all facilities are closed in acceptable manner”. In addition, the -040 definition of “final closure” means “the closure of all dangerous waste management units at the facility in accordance with all applicable closure requirements so that dangerous waste management activities under WAC 173-303-400 and 173-303-600 through 173-303-670 are no longer conducted at the facility”. Perhaps most importantly, the -040 definition of “regulated unit” is “any new or existing surface impoundment, landfill, land treatment area or waste pile that receives any dangerous waste...”. Clearly, the wording used in the strategy is inconsistent with RCRA authorities that Ecology is authorized to implement. In addition, the wording lacks transparency (i.e., definitions of phrases are not provided). It is recommended that either the entire document be re-written to be consistent with regulations or that Ecology identify it is waiving its RCRA authority.

18. Section 4.1, Page 3, 1<sup>st</sup> Bullet and Appendix A. It is recommended that the bullet reference a location in the strategy where an identification of all units that are required to have groundwater monitoring under WAC 173-303-645 may be found. In addition, by the wording, it is unclear whether or not the bullet includes units at which unremediated releases have occurred (i.e., SSTs). Clearly, the SSTs will be “active” for decades. Similarly, as final closure certifications have not been received for many of the RCRA units subject to -645 requirements, the list of “active” units is anticipated to consist of approximately two dozen RCRA TSD units (i.e., 1) 1301-N Liquid Waste Disposal Facility [LWDF], 2) 1324-N/NA LWDF, 3) 1325-N LWDF, 4) 183-H Solar Evaporation Basins, 5) 216-A-29 Ditch, 6) 216-B-63 Trench, 7) 216-B-3 Pond, 8) LERF, 9) 216-A-10 Crib, 10) Waste Management Area [WMA] A-AX, 11) WMA B-BX-BY, 12) WMA C, 13) Low Level Waste Management Area [LLWMA] 1, 14) LLWMA 2, 15) 216-S-10 Pond and Ditch, 16) 216-U-12 Crib, 17) WMA S-SX, 18) WMA T, 19) WMA TX-TY, 20) WMA U, 21) LLWMA 3, 22) LLWMA 4, 23) 316-5 Process Trenches, 24) Nonradioactive Dangerous Waste Landfill [NRDWL], and 25) LLWMA 5 (if used)).
19. Section 4.1, Page 3, 1<sup>st</sup> Bullet and Appendix A. Due to the lack of clarity of the first bullet and Appendix A, it is also recommended that Appendix A provide an identification of all units for which closure certifications have been received by Ecology. In addition, it is also recommended that Appendix A provide a status of Ecology’s verification and approval of those closure certifications.
20. Section 4.1, Page 3, 2<sup>nd</sup> Bullet. The bullet identifies verification of closure performance standards for cleanup of groundwater and monitoring of groundwater for closed/closing land-based units as a “key” area of focus. As an example of “focus failure”, the closure plan entitled *100-NR-1 Treatment, Storage, and Disposal Units Corrective Measures Study/Closure Plan* (DOE/RL-96-39, Rev. 0) states that RCRA monitoring during and after closure activities will continue, according to the existing interim status monitoring plan. A review of *Groundwater*

*Monitoring Plan for the 1301-N, 1325-N, and 1324-N/NA Sites* (WHC-SD-EN-AP-038, Rev. 2) indicates groundwater is being monitored without an adequate number of groundwater monitoring wells to “immediately detect any statistically significant amounts of hazardous waste or hazardous waste constituents that migrate from the waste management area to the uppermost aquifer” as required by 40 CFR 265.91 and WAC 173-303-400. Clearly, for 1325-N Crib [116-N-3 Trench] and 1301-N Crib [116-N-1 Trench], there are an inadequate number of RCRA groundwater monitoring wells to satisfy applicable interim status regulatory requirements (much less final status requirements that are applicable via the TPA for RCRA closure). It should be noted that the existing groundwater monitoring network is grossly deficient and could require the installation of over 100 additional RCRA groundwater monitoring wells at the point of compliance to “immediately detect any statistically significant amounts of hazardous waste or hazardous waste constituents that migrate from the waste management area to the uppermost aquifer”. Furthermore, the 1325-N Crib [116-N-3 Trench] and 1301-N Crib [116-N-1 Trench] units are currently in a state of open excavations (i.e., closure activities have been halted). Currently, the units remain quite “active” and -645 groundwater monitoring requirements are applicable. Furthermore, -645 groundwater monitoring requirements will be applicable during post-closure for both units. It is recommended that the second bullet reference an appendix where a description of the lengthy Hanford Site RCRA TSD closure process may be found. It is also recommended that the second bullet reference an appendix where a schedule **and** status of all Hanford Site RCRA TSD units subject to -645 monitoring requirements may be found.

21. Section 4.1, Page 3, 2<sup>nd</sup> Bullet. The bullet identifies verification of closure performance standards for cleanup of groundwater and monitoring of groundwater for closed/closing land-based units as a “key” area of focus. The 300 Area Process Trenches also represent an example of “focus failure”. Fundamental groundwater quality standards are ignored by the CERCLA interim ROD remedy of monitored natural attenuation. It should be noted that the existing groundwater monitoring network is so deficient that conceptual models of uranium contamination fate and transport cannot be validated. As such, it may be concluded that not only are groundwater quality standards are being ignored but that there is a considerable lack of contaminant characterization and a significantly deficient monitoring capability.
22. Section 4.1, Page 3, 2<sup>nd</sup> and 3<sup>rd</sup> Bullets. Due to the lack of clarity associated with remediation processes followed at the Hanford Site, it is recommended that the second and third bullets reference an appendix where clear descriptions and statuses of closure and corrective action processes that have been “integrated” with CERCLA be included. There are significant examples of units subject to RCRA closure and corrective action that have been “integrated” with CERCLA which lack transparency as to which applicable regulatory requirements are satisfied. For example, a recent Explanation of Significant Differences referenced *Interim Remedial Action Record of Decision for the 100-NR-1 Operable Unit of the Hanford 100-N Area, Hanford Site, Benton County, Washington* and *Interim Remedial Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units of the Hanford 100-N Area, Hanford Site, Benton County, Washington* as the administrative decision-making process. However, the referenced document does not clearly identify how RCRA-specific applicable regulatory requirements will be addressed. Similarly, it appears RCRA closure decisions are currently be made using an **interim** CERCLA administrative process. It can be argued that use of interim CERCLA administrative process which separates the RCRA unit from the contaminated



groundwater (note: EPA guidance considers contaminated groundwater to be part of the TSD unit) is inappropriate and represents little more than a shell game designed to confuse, divide, and conquer. Neither is the decision-making process clear nor does it allow an identification of which applicable regulations are being satisfied. Clearly, under the guise of this Hanford-unique, convoluted, maze-like administrative process, applicable ARARs are not being addressed by CERCLA and fundamental RCRA requirements are not being satisfied by RCRA and there is absolute silence regarding the MTCA corrective action requirements and fundamental CWA groundwater protection requirements.

23. Section 4.1, Page 3, 2<sup>nd</sup> and 3<sup>rd</sup> Bullets. Due to the lack of clarity associated with remediation processes followed at the Hanford Site, it is recommended that the second and third bullets reference an appendix where clear descriptions and statuses of RCRA groundwater monitoring programs may be found. It should be noted that there are significant examples of incorrect monitoring programs currently being implemented. For example, and in relation to the 1325-N Crib [116-N-3 Trench] and 1301-N Crib [116-N-1 Trench] units, repeatedly, specific conductance has exceeded the calculated critical mean in wells located downgradient from the regulated units, but the RCRA TSD units remain in an “indicator parameter” monitoring program. Apparently, it has been erroneously concluded that the exceedance was due to “non-hazardous constituents”. Waste constituents being released from the 1325-N Crib [116-N-3 Trench] and 1301-N Crib [116-N-1 Trench] that are influencing specific conductance **are** indications of releases from the regulated units that are negatively impacting groundwater. Waste constituents **are** regulated and do impact water quality. Therefore, the correct groundwater monitoring program should be that of “compliance monitoring” under -645. As such, the identification of which monitoring programs are currently being performed should include an identification of whether the unit is interim or final status. If the unit is performing interim status monitoring, an identification of whether the monitoring program is “indicator parameter” or “assessment” should be made. Similarly, if the unit is performing final status monitoring, an identification of whether the monitoring program is “detection”, “compliance”, or “corrective action” should be made.
24. Section 4.1, Page 3, 2<sup>nd</sup> and 3<sup>rd</sup> Bullets. Due to the lack of clarity associated with remediation processes followed at the Hanford Site, it is recommended that the second and third bullets reference an appendix where clear descriptions and statuses of RCRA groundwater monitoring compliance determinations may be found. The Federal Facility Compliance Act (FFCA) amended the Solid Waste Disposal Act (SWDA) and clarifies provisions regarding application of certain requirements to Federal Facilities. The SWDA/FFCA requirements include facility environmental assessments. Specifically, the SWDA, amended by FFCA, addresses Federal Facility Inspections at Section 6927(c). Section 6927(c) includes the requirement for the Federal Administrator to conduct a groundwater monitoring evaluation at the facility when it is first inspected under the FFCA, unless a groundwater monitoring evaluation had been done in the previous 12 months. Clearly, there are applicable inspection requirements that are not being upheld. EPA and/or Ecology should demonstrate that the required RCRA groundwater compliance evaluations have been performed.
25. Section 4.1, Page 3. The text indicates that as action decisions are “developed” as per the TPA Milestone M-20 schedule, “associated groundwater monitoring requirements will be based

on satisfaction of the cited regulatory requirements”. As such, it is requested that an appendix include an identification of each of the RCRA TSD units subject to -645 groundwater monitoring and the corresponding Milestone M-20 schedule. The significance of this request is that considerable resources may be required to support the Milestone M-20 schedule. For example, to include groundwater monitoring information in the closure decision-making efforts, compliant groundwater monitoring should occur at least one year prior to closure actions. Therefore, it is assumed that compliant groundwater monitoring networks and programs should be in place prior to Ecology’s approval of closure plans (i.e., 216-S-10 Pond and Ditch, 216-U-12 Crib, WMA S-SX, WMA T, WMA TX-TY, WMA U, WMA A-AX, WMA B-BX-BY, WMA C, LLWMAs 1-5, etc.).

26. Section 4.1, Page 3. The text uses words and phrases that are inconsistent with WAC 173-303. It is recommended that the phrase “regulated unit” not be used. Also, as the majority of the RCRA TSD units have not submitted final closure certifications and groundwater monitoring is required during post-closure, it is recommended that wording such as “RCRA TSD units subject to -645 groundwater monitoring requirements” be used instead of words and phrases that are not consistent with WAC 173-303.
27. Section 4.1, Page 3. The following sentence is unclear: “Groundwater monitoring for closed/closing RCRA land-based units ‘regulated units’ may either be on a unit-specific basis or part of a broader groundwater operable unit monitoring system.” The sentence is unclear because it does not use terminology consistent with WAC 173-303. In addition, the sentence is unclear because it does not provide assurance that WAC 173-303 groundwater monitoring requirements will be upheld. For example, the strategy proposes to “integrate” RCRA, CERCLA, and AEA requirements. During the last TPA Milestone M-24 negotiations, Ecology and EPA agreed to install a well south of TX-TY WMA. The well is not located at the unit’s RCRA point of compliance and may be concluded to not satisfy RCRA groundwater monitoring requirements of WAC 173-303. Similarly, it may be concluded that WAC 173-303 groundwater requirements are being waived for the 1325-N Crib [116-N-3 Trench] and 1301-N Crib [116-N-1 Trench] units. Therefore, there is concern the approach being described in this strategy may not satisfy regulatory requirements for which Ecology is authorized to uphold. Again, the strategy should clearly identify **how, when, and which** WAC 173-303 groundwater requirements will be satisfied. At the very least, the sentence should be deleted as it is unclear and may be interpreted to mean Ecology is willing to not uphold RCRA regulatory requirements.
28. Section 4.1, Page 3. The text describes the SSTs as “non-compliant...systems with documented releases to the environment...”. The same words could be used to describe all Hanford Site unlined surface impoundments. Furthermore, due to the use of groundwater monitoring networks at unlined surface impoundments, the units are non-compliant with WAC 173-303 groundwater monitoring requirements. Again, it is recommended that the compliance status of all RCRA TSDs subject to WAC 173-303 groundwater monitoring requirements be described in the document.
29. Section 4.1, Page 3. The text describes the approach for the SSTs. It is recommended that an appendix include a status and schedule of the RCRA Subpart S corrective action process being followed for the SSTs. Also, it is recommended that the appendix identify that the U WMA is

not formally being addressed by Milestone M-45. Similarly, it is recommended that the appendix identify that the C and A-AX WMAs are not considered subject to RCRA corrective action merely because their grossly deficient groundwater monitoring networks have not “detected” releases from C and A-AX WMAs impact to groundwater. Similarly, it is recommended that the appendix identify when (by year) each RCRA Facility Investigation (RFI) is anticipated to be complete. Similarly, it is recommended that the appendix identify when (by calendar year) each RCRA SST WMA Field Investigation Reports will be complete. Similarly, it is recommended that the appendix identify when (by calendar year) any Phase 2 field investigations will be conducted (i.e., for S-SX WMA).

30. Section 4.1, Page 4. The last paragraph indicates that monitoring for radionuclides “shall be in accordance with DOE Orders dealing with radiation protection of the public and the environment and radioactive waste management”. Clearly, Ecology is exercising no authority over radionuclides. The section should identify that Ecology has chosen not to uphold CWA authorities to protect Washington State groundwaters in relation to radioactive constituent contamination.
31. Section 4. The section omits identification of additional applicable statutory authorities, specifically, MTCA and CWA. As such, the section is incomplete.
32. Section 5.0, Page 5. It is recommended that the following bullets be used and in the following order: “Contamination detection”, “Remediation of contaminated groundwater”, “Groundwater protection”. The use of the word “monitoring” may be interpreted as “selectively looking” which could result in non-detection. Clearly, the goal to protect can only occur by support of a goal to “detect”.
33. Section 5.1.1, Page 6. A sentence in the first paragraph states: “Design and operation of waste management units currently accepting RCRA regulated waste (including new or expanded units) must reflect the minimum technology and groundwater monitoring requirements of RCRA.” This statement is very troubling. It appears to mean that Ecology does not recognize unlined surface impoundments as units which compliance will be obtained. This statement does not reflect the “cradle-to-grave” waste management model of RCRA nor the requirements of RCW 70.105. If this statement is to remain, very clear identification that Ecology is waiving its RCRA authorization should be included. In addition, if this statement is to remain, an identification that Ecology may not require SST groundwater monitoring networks to comply with WAC 173-303-645 requirements due to the fact that the SSTs do not “currently accept RCRA regulated waste”. Either the sentence should be deleted or the section should clearly identify that Ecology will not require numerous RCRA TSD units that are subject to groundwater monitoring requirements (i.e., LLWMAs 1-4 excluding mixed waste trenches 31 and 34, SST WMAs, 1301-N LWDF, 1324-N/NA LWDF, 1325-N LWDF, 216-A-29 Ditch, 216-A-10 Crib, 216-S-10 Pond and Ditch, 216-U-12 Crib, etc.) to comply with those requirements. This strategy appears to be more about evading regulatory requirements than protecting Washington State groundwaters.
34. Section 5.1.2, Page 7. The text describes how agreements regarding a “core zone” will guide “considerations for near-term action”. As such agreements are not appropriate application of

RCRA, MTCA, or CWA, the text should clearly identify that use of “core zone” or “alternate compliance points” at this time as described in this strategy does not satisfy RCRA or MTCA groundwater and corrective action decision-making requirements. Again, if Ecology is not going to implement the RCRA or MTCA programs as authorized, Ecology should waive identify that it is waiving its statutory authorities to protect Washington State groundwaters.

35. Section 5.2, Page 10, 1<sup>st</sup> Bullet. It is recommended that the words: “by use of compliant groundwater monitoring networks” be added to the end of the first bullet. There are numerous examples of where “detection” is simply not occurring due to the general state of non-compliance.
36. Section 5.2, Page 10, 4<sup>th</sup> Bullet. The bullet states: “Verify that Hanford contaminants are not present in offsite groundwater”. As the strategy identifies the use of alternate compliance points (i.e., “core zone”) and numerous examples exist where inadequate groundwater monitoring is occurring (i.e., SST WMAs, LLWMAs 1-4, LERF, 216-S-10 Pond and Ditch, 216-U-12 Crib, 316-5 Process Trenches, etc.), there is concern that the fourth bullet implies the active use of a “buffer zone” consisting of groundwater between waste sites and the Hanford Site boundary or the Columbia River. In general, the groundwater strategy does not provide adequate assurances of intent to detect contamination or a willingness to protect Washington State groundwaters.
37. Section 5.2, Page 10. It is recommended that an additional bullet be added which states: “Verify which Hanford contaminants are being released to the Columbia River”.
38. Section 5.2.1, Page 10. The data quality objectives (DQO) process is described. What is not indicated is that, to-date, the Tri-Parties have not acknowledged the boundaries of groundwater monitoring needs. In other words, an identification of a total number of groundwater monitoring wells that could be required to satisfy each statute (i.e., RCRA, CERCLA, MTCA, CWA, AEA, etc.) has not been generated. Without an acknowledgement that the “need” is tremendously larger than the “supply”, the DQO process fails by virtue of not “defining the boundaries of the study area” (i.e., how many wells are needed at the Hanford Site, when are wells needed at the Hanford Site, etc.). Without an acknowledgement of the “needs” (or the boundaries), the resulting DQO is non-defensible. The DQO process described to have been followed is fatally flawed due to what appears an inadequate basis. Furthermore, the description indicates a priority of addressing contamination **after** it has been detected rather than detecting contamination.
39. Section 5.2.1, Page 12. The first bullet on the page indicates that the use of vadose zone monitoring will be considered “when practicable”. Considering the lack of agreement to install vadose zone monitoring at the new ERDF cells, this bullet does not appear to accurately reflect EPA’s and USDOE’s lack of willingness to monitor the vadose zone. Of course, vadose zone monitoring is “practicable” at new ERDF cells. Similarly, vadose zone monitoring would be “practicable” at new surface impoundments. However, there is currently no USDOE commitment or CERCLA ROD requirement to install simple access tubes beneath unconstructed ERDF cells. It is recommended that the bullet be either re-written or deleted.
40. Figure 2, Page 13. The second diamond on the figure uses the word “trigger”. This word is not defined or supported by regulation. Also, it is not identifies where these “triggers” would be

found. It is recommended that a more meaningful phrase be used (i.e., “corrective action level”). It should be noted the “10X” action levels included in interim CERCLA RODs for the 200 West Area are not supported by adequate basis as being “protective”. As such, considering the tank waste contamination emanating from the SST WMAs, “1X” may be more appropriate as an action level. It should also be noted that although well 299-W23-19 has reached a technetium-99 concentration of 187,900, to-date, the CERCLA interim ROD does not address the SST contamination. Clearly, the action level selected for permits/RODs, etc. must be based on an evaluation of protectiveness and remediation goals (i.e., containment at concentrated source).

41. Figure 2, Page 13. The third diamond on the figure indicates there is a decision to be made ONLY if the maximum contaminant level could leave the Central Plateau. If this were a MTCA process, this would be synonymous to selecting an alternate compliance point. Selection of the Central Plateau as an alternate compliance point is premature, without technical basis, without regulatory basis, and inappropriate. Considering the decision process depicted by Figure 2, the only time an action would occur is when “there is a potential for the plume to leave the Central Plateau above Maximum Contaminant Level”. This renders the second diamond on the figure unnecessary. As such, this implies no necessity to monitor specific waste units, but rather to only monitor at the perceived Central Plateau point of compliance. This is inappropriate and does not satisfy RCRA, MTCA or CWA groundwater protection standards. Again, if this figure is to be followed, Ecology should identify it is waiving its statutory authorities to protect Washington State groundwaters.
42. Section 5.2.2, Page 14. The section omits identification of additional applicable statutory authorities, specifically, MTCA and CWA. As such, the section is incomplete.
43. Section 5.3.5, Page 18. In general, the expectations, of compliance with RCRA and HWMA, identified in this section, are not supported by the strategy.
44. Section 6.1, Pages 18-19. It is noted with interest, that none of the supporting documents were generated by Ecology or EPA. It appears this strategy is that of USDOE’s.
45. Section 6.1, Page 19. It is stated: “Strategies set forth in this document.....may be reflected as appropriate in final enforceable decision documents and Tri-Party Agreement milestones and requirements.” As the strategy is not consistent with regulatory requirements or intent, it is strongly recommended that the strategy **not** be reflected in any final enforceable decision document. Furthermore, the strategy completely **lacks** decision-making transparency and is therefore, nonenforceable. Again, it is strongly recommended that the strategy **not** be reflected in any final enforceable decision document.
46. Appendix A. The appendix needs to be re-written to be consistent with WAC 173-303 regulations. The use of the term “regulated unit” in quotation marks is not understood. Therefore, as the document appears to attempt to use definitions that are included in -040, it is recommended that the appendix include an identification of when the words mean the same definitions as those of -040. Without such indications and identification, the appendix lacks transparency. Also, the appendix needs to be re-written to identify how MTCA requirements are being satisfied.