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DEPARTMENT of  
NATURAL RESOURCES

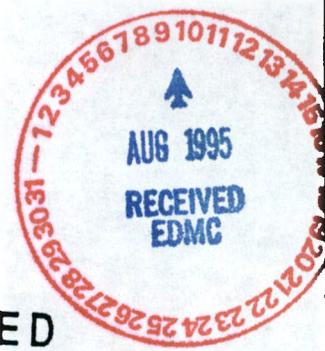
Special Sciences  
and Resources  
Program

018479



CONFEDERATED TRIBES  
of the  
*Umatilla Indian Reservation*

P.O. Box 638  
PENDLETON, OREGON 97801  
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21 July 1995

RECEIVED

Linda McClain  
Assistant Manager for Environmental Restoration  
U.S. Department of Energy  
P.O. Box 550  
Richland, Washington 99352

JUL 24 1995  
DOE-RL / DCC

Subject: CTUIR/DOE MEETING TO DISCUSS ISSUES, PROGRESS, AND CTUIR  
EVALUATION OF DOE'S COLUMBIA RIVER COMPREHENSIVE  
IMPACT ASSESSMENT (CRCIA)

THURSDAY, 27 JULY 1995, 10 AM, CTUIR/DNR CONFERENCE ROOM,  
MISSION, OREGON

Dear Ms. McClain:

Technical staff of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) welcome the opportunity to meet with you face to face to discuss issues of concern to the CTUIR associated with the Columbia River Comprehensive Impact Assessment (CRCIA). Through your secretary, we have scheduled the meeting for Thursday, 27 July 1995, at 10 am in the DNR Conference Room of the CTUIR Department of Natural Resources, here at Mission, Oregon (map available upon request).

By the first of next week, we will fax to you a tentative list of CTUIR attendees for the meeting and would appreciate if you would do the same for us. Our purpose will be to focus largely on those technical and process issues that have been major stumbling blocks to conducting a timely and truly comprehensive Columbia River assessment. Many of these issues also have important policy implications, which must be addressed at the appropriate government-to-government level.

As noted in your letter of 12 July 1995, "the CRCIA is an important indice [sic] of Tribal and DOE government-to-government interaction." We agree. In September 1993, the CTUIR Board of Trustees and DOE Secretary O'Leary agreed that the Columbia River Assessment would serve as a yardstick to measure improved government-to-government consultation

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between DOE and the CTUIR. While interactions started off positively, conditions since have deteriorated because of DOE's failure to make timely progress toward conducting a truly thorough assessment. Similar concerns voiced six months ago are little changed today.

*Over the past two years, CTUIR staff communications have clearly and thoroughly outlined tribal issues, concerns, and recommendations for completing a credible and truly comprehensive assessment. The bottom line, however, is that all our hard work has made little substantive change in the scope and purpose of the study, the breadth of issues addressed, or the openness and responsiveness of the process itself.*

In preparation for this meeting, CTUIR staff have compiled the enclosed listing of major documents and letters relating to the Columbia River which the CTUIR have submitted to DOE over the past two years, along with copies of the pertinent documents. We also have included several DOE response letters and a recent letter from the Yakama Indian Nation. These letters further highlight DOE's consistent failure to meaningfully address tribal issues. There are a number of common or recurrent themes that emerge from a review of the entire package, which should provide ample material for discussion in our upcoming meeting. This enclosure marks at least the third time many of these documents have been formally transmitted to DOE; most have never received any formal response. Unfortunately, many of the themes raised are still unresolved.

In response to your request to "discuss the criteria you [CTUIR staff] are using to measure DOE's performance on the CRCIA," we also have enclosed a copy of our Criteria document. This document was originally prepared by CTUIR staff in July 1993 and submitted to each of the Tri-Parties in advance of negotiating changes to the Tri-Party Agreement (TPA). It specifically addresses your request for evaluation 'criteria.' For two years, the framework outlined in the Criteria document has formed the principal basis for tribal staff analysis of DOE activities or proposed actions at Hanford and for the development of policy-level recommendations necessary to protect tribal rights and interests of the CTUIR. Unfortunately, DOE chose never to respond to this still important and widely employed guidance document.

Even a cursory review of this document collection and the breadth of issues raised will demonstrate that CTUIR staff have defined many critical issues and a range of approaches appropriate for characterizing DOE/Hanford impacts to the Columbia River ecosystem. Yet CTUIR staff remain highly concerned that many legitimate issues are being addressed no more seriously now than in the fatally flawed Columbia River Impact Evaluation Plan (CRIEP) of 1993. That highly selective and biased 'analysis' was widely perceived by diverse interests as a self-serving whitewash of even those few Hanford impacts it chose to examine.

Outrageously, the CRIEP whitewash cost U.S. taxpayers in excess of \$600,000. To add insult to taxpayer injury, it is now resulting in subsequent multi-year expenses for the CRCIA that

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exceed some \$2 million--3.5 times the originally budgeted amount--and a 2-3 year delay solely in order to redo what was so shoddily done in the first place. Now, DOE's failure to learn from the CRIEP experience--that is, *its failure to create an open and responsive process that fully recognizes and addresses all issues essential to a truly comprehensive Columbia River assessment*--is leading us down the same failed path, process, and approach that produced the discredited CRIEP.

This failure to comprehensively and objectively include and assess the concerns and issues of all affected parties (which is not limited to tribes, but also includes regulators and others) has been further compounded by the intolerant demeanor of some DOE staff involved in the assessment process. Key DOE staff have expressed attitudes that range from outright contempt to simple placating lip service. While giving the appearance of 'listening,' *their persistent intent has been a concerted effort to exclude meaningful tribal involvement at any cost*. This attitude was widespread at a recent DOE-sponsored risk assessment workshop, where DOE/contractor perspectives were consistently arrogant and paternalistic, expressing the attitude that "we 'experts' know what's best for you emotion-driven affected communities."

CTUIR staff repeatedly have reported to me that issues they have raised either in public meetings or in correspondence have been persistently ignored, mocked, or simply dismissed as inconsequential. None have altered DOE's predetermined scope and carefully controlled course of this study. This problem is still further compounded by the high turnover rate within DOE and the revolving door for CRCIA project managers that has led to a continuous need to 'reeducate' incoming staff on project history and tribal issues owing to a complete lack of institutional memory within DOE. Such distractions and "wheel spinning" contribute directly to a remarkable stagnation both in resolving longstanding issues of tribal concern and in creating a credible, technically defensible, and truly comprehensive project.

Another recent example of DOE's disingenuous attitude surrounds the offer to appoint a 'tribal' representative to the CRCIA Technical Review Panel (TRP). Recall that the TRP was conceived and (reluctantly) agreed to by DOE in order to offset widely perceived conflicts of interest by DOE and PNL, who would be conducting an 'assessment' of their own actions, and to avoid another CRIEP. DOE initially stumbled by insisting that all three tribes agree to a single representative--a remarkably insensitive government-to-government *faux pas* from an agency that knows better. DOE later backed down and an agreement was reached to permit each tribe to appoint a representative by 14 June 1995. CTUIR staff formally submitted a nominee on 17 May 1995. DOE released its list of nominees on 13 June 1995. Incredibly (or not), the initial list of panel members failed to include any tribally designated nominees. Moreover, the list included a putative 'Tribal and Cultural Resources' panel member unknown to us and with absolutely no familiarity whatsoever with the CTUIR and CTUIR issues. Ms. Erickson's letter further insulted tribes by noting that "tribes still have the option of selecting

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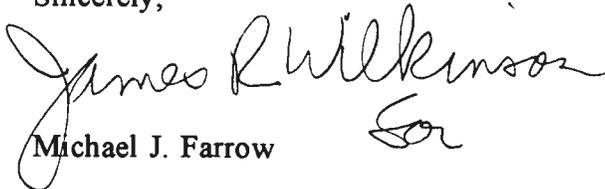
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a technical peer reviewer," when in fact *DOE had had the CTUIR nomination in hand for a month but inexplicably had failed to act.*

Our concerns are not a lone voice in the wind. Instead, they are part of a disturbingly consistent pattern. When DOE attempted to ramrod through its CRCIA "Public Involvement Workshop" concept and agenda this spring, both EPA and Ecology complained loudly that they had been deliberately excluded from the planning process for what seemed an important tribal/public involvement forum for an important and highly visible TPA milestone. Moreover, the DOE/PNL-dominated schedule was set up by DOE so as to severely limit any regulator, tribal, or public input. The forum since has been 'postponed.' In addition, regulators have not been routinely invited to meetings with tribes or other stakeholders, and have indicated to us on more than one occasion that their positions frequently have been misrepresented by DOE.

In summary, this letter briefly outlines examples of CTUIR concerns about the scope of issues that will be addressed in the Columbia River assessment and about the process itself. Critical to remediating ongoing contamination of the Columbia River, many of these issues also have important policy implications for both DOE and the CTUIR. CTUIR staff look forward to meeting with you on July 27, 1995, 10 am, in the CTUIR Tribal Government Complex, and hope that we will have a frank and open discussion of issues of importance to the Columbia River. Please do not hesitate to contact J.R. Wilkinson, SSRP Program Manager, at 503-276-0105 (phone) or 503-276-0540 (fax), if there are any further questions.

Sincerely,

  
Michael J. Farrow

Director  
CTUIR Department of Natural Resources

cc: William Burke, Treasurer, CTUIR Board of Trustees  
J.R. Wilkinson, Program Manager, CTUIR Special Sciences and Resources Program  
Special Sciences and Resources Program Staff  
Mary O'Brien, Environmental Research Foundation  
Larry Gadbois, EPA  
Dave Holland, Ecology  
Jerry Yokel, Ecology  
Ralph Patt, Oregon Department of Water Resources  
Kevin Clarke, DOE-RL, Indian Programs Manager

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**ATTACHMENT****MAJOR CTUIR DOCUMENTS ADDRESSING COLUMBIA RIVER ISSUES**

Criteria for the Evaluation of Proposed Changes to the Hanford Federal Facility Agreement  
and Consent Order July 21, 1993

Technical Comments on the Columbia River Impact Evaluation Plan September 3, 1993

Development of Draft Hanford Sitewide Groundwater Remediation Strategy and Perceived  
Impediments to its Effective Implementation May 11, 1994

Letter to Secretary O'Leary: Follow-up to Tour of Umatilla Indian Reservation  
July 1, 1994

Letter Urging Declassification of Department of Energy Records August 9, 1994

CTUIR Comments on Environmental Restoration Refocusing under the Tri-Party Agreement  
January 5, 1995

CTUIR Concerns about Progress on the Columbia River Comprehensive Impact Assessment  
January 6, 1995

CTUIR Concerns about DOE-Richland's Mishandling of Columbia River Studies and  
Consultation Regarding these with the CTUIR January 9, 1995

Scoping Report: Nuclear Risks in Tribal Communities March 30, 1995

CTUIR Comments on Proposed "Remedial" Plan for 200-BP-1 Operable Unit  
April 10, 1995

Submission of Abstract for Hydrogeology of Washington State Symposium, August 1995  
April 28, 1995

CTUIR Nominee for Columbia River Assessment Blue-Ribbon Technical Review Group  
May 17, 1995

Preliminary CTUIR Scoping of Species of Concern for Columbia River Comprehensive  
Impact Assessment May 26, 1995

Urgent Call for Expanded Pump-and-Treat Programs to Address Persistent and Uncontrolled  
Discharge of Contaminated Hanford Groundwater into the Columbia River June 5, 1995

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Tribal Staff Concerns about Technical Peer Reviewers for the CRCIA June 20, 1995

#### OTHER RELEVANT COLUMBIA RIVER CORRESPONDENCE

Letter from DOE to CTUIR: The Confederated Tribes of the Umatilla Indian Reservation's  
Concerns about Progress on the Columbia River Comprehensive Impact Assessment  
February 6, 1995

Letter from Yakama Indian Nation to DOE: Chromium Contamination in Ground Water  
Plumes Currently Poisoning Fish Spawning in the Columbia River's Hanford Reach; Request  
for Immediate Action to Remediate Condition and Eliminate Source of Chromium  
March 15, 1995

Letter from DOE to Yakama Indian Nation: 100 Area Chromium Contamination  
April 18, 1995

Letter from EPA to DOE: Hanford Cleanup Costs in Perspective: Pump-and-Treat for  
Hexavalent Chromium  
April 26, 1995

Letter from EPA/Ecology to DOE: 100 Area Groundwater Proposed Plans  
May 18, 1995



CONFEDERATED TRIBES  
of the

018479

*Umatilla Indian Reservation*

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July 21, 1993

Ms. Mary Riveland, Director  
State of Washington  
Department of Ecology  
P.O. Box 47600  
Olympia, Washington 98504-7600

Ms. Dana Rasmussen  
Regional Administrator  
U.S. Environmental Protection Agency  
Region 10  
1200 Sixth Avenue  
Seattle, Washington 98101

Mr. John D. Wagoner  
Manager  
U.S. Department of Energy  
Richland Field Office  
P.O. Box 550  
Richland, Washington 99352

RE: Criteria for Evaluation of Proposed Changes to the Hanford Federal Facility Agreement and Consent Order.

Dear Ms. Riveland, Ms. Rasmussen and Mr. Wagoner:

On April 23, 1993, representatives of the Washington Department of Ecology (Ecology) met with the Board of Trustees of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) to discuss proposed changes to the Hanford Federal Facility Agreement and Consent Order (the Tri-Party Agreement, or TPA). At this meeting, Ecology requested that the CTUIR prepare "criteria" which would represent the CTUIR's standards for reviewing proposed changes to the TPA. Ecology has solicited similar criteria from other interested governments, including the States of Washington and Oregon.

Enclosed is a document entitled Criteria for Evaluation of Proposed Changes to the Hanford Federal Facility Agreement and Consent Order (Criteria). The Criteria outlines the CTUIR's general concerns about Hanford issues; the basis of the CTUIR's interests in Hanford; specific CTUIR concerns about the TPA revision process; and specific criteria by which the CTUIR will measure proposed changes to the TPA. This document represents a good faith effort to respond to Ecology's request.

Please note that, as the TPA revision process is a fluid process, so are a government's needs to respond to new issues as they develop. Please be advised that the CTUIR may develop additional or revised criteria in the future as new issues present themselves.

Sincerely,



*for* Elwood H. Patawa  
Chairman  
Board of Trustees

Enclosure: Criteria for Evaluation of Proposed Changes to the Hanford Federal Facility Agreement and Consent Order

cc: Dan Silver, Ecology  
Paul Day, EPA

**Criteria for Evaluation of Proposed Changes**

to the

***Hanford Federal Facility Agreement  
and Consent Order***

July 21, 1993

Confederated Tribes of the Umatilla Indian Reservation  
Department of Natural Resources  
Environmental Planning and Rights Protection Program  
Hanford Environmental Restoration Project

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

### INTRODUCTION

In 1989, the State of Washington, the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Energy (DOE) entered into an agreement known as the "Hanford Federal Facility Agreement and Consent Order." This agreement is commonly referred to as the "Tri-Party Agreement," or TPA.

The TPA was created because the DOE was operating the Hanford Nuclear Reservation in violation of numerous federal and state environmental laws. The TPA set requirements and deadlines for DOE to bring Hanford into compliance with those laws. The current TPA's deadlines for the Hanford cleanup are arrayed along a 30 year timeline.

Now, the DOE has requested a revision of the agreement, including an extension of the timeline. The State of Washington and its cognizant agency, the Department of Ecology (Ecology), will be evaluating DOE's proposed changes by applying criteria the State has developed. Ecology has requested that other interested governments submit criteria of their own to aid Ecology in its analysis of DOE's proposed changes. One of the governments is the Confederated Tribes of the Umatilla Indian Reservation (CTUIR).

### THE CTUIR'S CONCERNS RELATING TO HANFORD

The CTUIR's concerns relating to Hanford fall into four general categories:

- I. Protection of Tribal sovereignty, including protection of tribal rights in CTUIR ceded territory and areas over which the CTUIR exercises off-reservation treaty rights.
- II. Protection and restoration of the environment, both on the Hanford site and in areas affected by Hanford over which the CTUIR exercises off-reservation treaty rights. Protecting the environment guards the resources upon which treaty rights are based, including Columbia River fisheries and related resources.
- III. Protection of cultural, religious and archeological resources and Tribal rights relating to them.
- IV. Protection of the Umatilla Indian Reservation and its members and residents from hazards caused by Hanford activities and from hazards caused by transportation of radioactive and hazardous materials to and from Hanford.

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

FOUNDATION OF THE CTUIR'S GOVERNMENTAL INTEREST IN HANFORD

Under the Tribes' Treaty of 1855, the Tribes ceded certain lands to the United States. The lands comprising the eastern portion of what is now the Hanford Nuclear Reservation are among the lands ceded by the Tribes. Under the treaty, the Tribes retained rights to perform certain activities on those lands. According to the Treaty:

[T]he exclusive right of taking fish in the streams running through and bordering said [Umatilla Indian] reservation is hereby secured to said Indians, and at all other usual and accustomed stations in common with citizens of the United States, and of erecting suitable buildings for curing the same; the privilege of hunting, gathering roots and berries and pasturing their stock on unclaimed lands in common with citizens, is also secured to them.<sup>1</sup>

The CTUIR has usual and accustomed fishing stations on the Columbia in and around Hanford. Moreover, prior to Hanford's becoming a secured area, the CTUIR members hunted and performed other treaty activities at the site. The CTUIR's jurisdiction at Hanford is based upon these treaty rights.

In addition, long-standing U.S. Supreme Court precedent holds that the federal government (including its executive agencies) has a trust responsibility to Indian tribes. This means that the U.S. has a fiduciary responsibility to protect the rights of Indian tribes, including tribes' property and treaty rights. Under this duty, agencies such as DOE and EPA have a legal duty to guarantee that their decisions do not harm tribal interests. According to the DOE Indian Policy, "The Department recognizes that some Tribes have treaty-protected interests in resources outside reservation boundaries."<sup>2</sup>

Third, a succession of U.S. Presidents, beginning with President Nixon, have affirmed a federal policy of upholding tribal sovereignty and dealing with tribal governments on a "government-to-government" basis. Both DOE and EPA have adopted Indian

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<sup>1</sup>Treaty with the Walla Walla, Cayuse and Umatilla 1855, June 9, 1855, art. I, 12 Stat. 945.

<sup>2</sup>DOE Indian Policy, Item one.

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

Policies which purport to apply this federal policy.<sup>3</sup> These agencies must comply with the terms of their own policies.

Fourth, federal laws protect tribes' cultural, religious and archeological sites. Hanford is rich in sites of great cultural, religious and archeological importance to the CTUIR. DOE and its regulators have a duty to comply with these laws in conducting their activities at Hanford, including "cleanup" activities.

Finally, environmental laws affecting Hanford decision-making confer rights upon Indian tribal governments. For instance, the CTUIR is a Trustee for Natural Resources under the Comprehensive Environmental Response, Compensation and Liability Act. Likewise, community safety statutes applicable to Hanford recognize the roles of tribal governments such as the CTUIR. As an example, the CTUIR's Tribal Hazardous Materials Safety Committee has been designated as an official "emergency response commission" as defined under the Emergency Planning and Community Right-to-Know Act.

### GOALS OF THE BOARD OF TRUSTEES

The Tribes ratified a Constitution and Bylaws on December 7, 1949, which created a governing body known as the Board of Trustees. The Board has adopted a Mission Statement and Goals. This statement and goals are the CTUIR's guiding principles for its interaction with all other governments.

#### Board of Trustees Tribal Mission Statement

In the best interest of the Confederated Tribes of the Umatilla Indian Reservation, the Board of Trustees shall exert the Tribe's sovereign authority to protect the rights reserved by the Treaty of 1855 and to promote the interests of the members and residents of the Umatilla Indian Reservation. The Board of Trustees shall exercise the authority of the Confederated Tribes so as to promote, enhance and achieve the maximum

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<sup>3</sup>Item one of the DOE Indian Policy states, in part: "1. THE DEPARTMENT RECOGNIZES AND COMMITS TO A GOVERNMENT-TO-GOVERNMENT RELATIONSHIP WITH AMERICAN INDIAN TRIBAL GOVERNMENTS." Item one of the EPA Indian Policy states, in part: "EPA will work directly with Tribal Governments as the independent authority for reservation affairs, and not as political subdivisions of States or other governmental units."

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

degree of self-government, self-sufficiency and self-determination in all Tribal affairs. Doing so objectively and ably is the abiding mission of the Board of Trustees of the Confederated Tribes of the Umatilla Indian Reservation.

### Goals

1. To protect and exercise the sovereign, tribal and individual rights and to maintain the cultural integrity of the CTUIR.
2. To optimize the development of all tribal resources and opportunities within the Umatilla Indian Reservation and the ceded area of the Confederated Tribes as recognized and documented in the Treaty of 1855.
3. To provide, protect and maintain all service and entitlements to the CTUIR.
4. To responsibly assert and develop relationships and cooperate with those governments or governmental agencies - federal, state or tribal - that are willing and able to recognize and respect the sovereignty of the Confederated Tribes and which can assist the Tribe in protecting its rights and interests.

### THE CTUIR'S CONCERNS RELATING TO THE TPA PROCESS

As a sovereign government, the CTUIR is an entity with rights apart from the public. Activities such as public meetings and public education do not, alone, fulfill the responsibility to consult with the CTUIR on a government-to-government basis.

In order to facilitate such a relationship, the CTUIR believes that, at a minimum, TPA signatories should:

1. Formally commit to a government-to-government relationship with the CTUIR.
2. Hold regularly scheduled meetings with the CTUIR to exchange views on policy;
3. Exchange staff reviews of technical information and testimony;

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

4. Coordinate activities of their technical staff with technical staff of the CTUIR to maximize the efficient gathering and dissemination of information;
5. Actively seek CTUIR comments on proposed TPA revisions, on implementation of the revised TPA and on regulatory schemes associated with the TPA.
6. Consistently give timely notice of all TPA-related activities so that the CTUIR can meaningfully participate in the process.

It is vital to successful government-to-government relations that local representatives of federal agencies -- representatives who are familiar with CTUIR concerns from working with the tribes -- take concrete steps to educate their superiors in Washington, D.C. about CTUIR rights and concerns. It is equally vital that those Washington, D.C. managers respect arrangements made between knowledgeable local agency personnel and the CTUIR.

The CTUIR reserves the right to perform its own review of TPA revisions to ensure compliance with the Treaty of 1855 and other legal rights of the CTUIR.

The CTUIR reserves the right to coordinate its activities with other tribes, governmental units, concerned citizens, chartered organizations and other parties in a manner which fosters mutual benefits.

### THE CTUIR'S CRITERIA FOR ANALYZING PROPOSED CHANGES TO THE TPA

The CTUIR has begun a process of establishing criteria for reviewing proposed changes to the TPA from the perspective of the CTUIR's interests. The following is a list of criteria and supporting laws and regulations which address the concerns listed on page 1. This is not an all-inclusive list. Additional criteria may be developed in the future.

#### I. TRIBAL SOVEREIGNTY

##### Criteria

Much of the foregoing discussion has already dwelt at length with the issue of tribal sovereignty. Protection of tribal rights is the primary, all-inclusive goal of the CTUIR. All other issues are viewed with this principle foremost in mind. No resolution of other issues can take place where CTUIR rights are ignored.

# CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

## II. ENVIRONMENTAL PROTECTION AND RESTORATION

### Criteria:

Environmental protection and restoration is a primary purpose of the TPA. The meaningful exercise of tribal treaty rights to Hanford-affected resources is entirely dependent upon the health of the ecosystems upon which those resources depend. A treaty right to fish, wildlife or plants is hardly useful if the fish, wildlife or plants have vanished, or themselves threaten human health. A revised TPA must guarantee that treaty resources are protected or restored to a level which allows the CTUIR to fully exercise its rights to the resources without fear of injury to either the resource or to CTUIR members.

Treaty resources are significant to the CTUIR for a variety of reasons. Tribal members are subsistence hunters and gatherers. Wild game and fish form a major part of the diet of many tribal members. Likewise, plants collected from healthy wild ecosystems form an important feature of many tribal members' diets. Besides consumption as food, these treaty resources are collected for religious ceremonies, cultural uses such as decoration and traditional crafts, and recreational purposes. All indigenous plants and animals have religious significance to CTUIR members who practice traditional Indian religion. In addition, these treaty resources, such as Tribal salmon resources, can be of great economic importance to the CTUIR.

### Laws and Regulations Supporting Environmental Criteria:

Resource Conservation and Recovery Act - RCRA provides a "cradle-to-grave" framework for managing hazardous wastes. The Act, which was amended in 1992 by the Federal Facilities Compliance Act to make RCRA's provisions apply to Federal facilities, provides a regulatory decision-making process for cleaning up hazardous waste sites. This process includes soliciting public comments and incorporating them into the process. The CTUIR, although not regulators of the Hanford site, have treaty rights within the area which mandate the CTUIR's participation on a government-to-government basis in the restoration of Hanford.

Comprehensive Environmental Response, Compensation, and Liability Act - CERCLA creates regulatory decision-making processes for responding to hazardous substance releases. The Act also assigns liability and determines compensation for certain parties injured by hazardous substances releases. These processes also include measures for public and tribal participation in the decision-making process. Furthermore, the CERCLA Natural Resource Damage

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

Assessment (NRDA) process provides for payment of damages for unremediated injuries to natural resources. These payments are made to Trustees for Natural Resources (governments with interests in the injured natural resources). The CTUIR has been recognized as a Trustee for Natural Resources in the NRDA process established under CERCLA § 107(f) and § 301(c). Decisions made in the TPA revision process will largely determine the degree of unremediated injury to CTUIR natural resources.

National Environmental Policy Act - NEPA was passed by Congress to evaluate the effects that actions of the Federal government may have on the environment. NEPA requires that before the government takes any action, the environmental impacts of that action need to be studied and alternatives proposed. The law also contains explicit public involvement procedures. NEPA provides the framework within which proposed actions by DOE for Hanford restoration are integrated. The Act provides guidance on the level of analysis and requires an assessment of the cumulative effects of federal actions.

State Environmental Policy Act (Washington) - SEPA provides the State of Washington an integrative approach to environmental planning and managing natural resources. Similar to NEPA, the Act provides the framework within which the State involves citizens in the decision-making process and provides guidance on the level of analysis.

Wild and Scenic Rivers Act - The W&SRA was enacted to protect and preserve selected rivers which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, or cultural values. These rivers are to be preserved in their free-flowing condition for the benefit of present and future generations. The Hanford Reach of the Columbia River is the last free-flowing stretch of the mainstem Columbia and is being studied for protection under the Wild and Scenic Rivers Act. Protection of river-related values such as water quality, historic and cultural values, fisheries and wildlife resources is considered by the CTUIR to be of utmost importance, due to the loss of key habitat in the Columbia Basin from dam construction. Restoration actions at Hanford must protect and/or enhance Columbia River resources.

Clean Water Act - The goals and policy of the CWA are to restore and maintain the chemical, physical and biological integrity of the Nation's waters. The CWA establishes effluent limitations for pollutant discharges from point sources into navigable waters. Section 311 of the Act prohibits discharge of hazardous substances to the Nation's waters and creates a regulatory

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

framework for responding to such releases. Section 316 provides for limitation of thermal discharges. Nonpoint sources of water and groundwater pollution are also regulated by the Act. The CWA requires permits for discharge of pollutants into navigable waters and for dredging and filling activities. CWA permitting requirements and other standards apply to federal facilities. Moreover, CWA standards are important to the CERCLA process because they are Applicable or Relevant and Appropriate Requirements (ARARs).

Safe Drinking Water Act - This Act, enacted in 1974, is designed to protect drinking water supplies from contamination. This includes ground water used for public drinking water. The law requires EPA to establish chemical-specific Maximum Contaminant Levels (MCLs) for public drinking supplies. Federal facilities, such as DOE's Hanford site, are subject to the law where wellhead areas or single source aquifers are threatened with contamination such as those effluent to the Columbia River. The SDWA also restricts underground injection wells that may pose a threat to drinking water sources. There are numerous wells above MCL located along the Columbia River.

Clean Air Act - This Act was designed to protect and enhance the quality of the Nation's air resources. The law established the National Emission Standards for Hazardous Air Pollutants (NESHAPs) which have also been developed for radionuclide particulate emissions from DOE facilities. These standards are directly enforceable against DOE facilities such as Hanford and are considered under CERCLA to be Applicable or Relevant and Appropriate Requirements (ARARs).

Endangered Species Act - The purpose of the ESA is to insure that all Federal departments and agencies seek to conserve threatened and endangered plant, animal and fish species and utilize their authorities in furtherance of conservation of such threatened and endangered species, and to take such steps as may be appropriate to achieve the purposes of the international treaties and conventions set forth in the Act. The ESA imposes a duty on federal agencies to consult with wildlife agencies to insure that any action authorized by the agency is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of a species' critical habitat.<sup>4</sup>

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<sup>4</sup>Over 47 fish, wildlife and plant species considered rare (either sensitive, threatened or endangered) occur on or have habitat on the Hanford Reservation, including the Hanford Reach of the Columbia River. Currently,

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

### III. CULTURAL RESOURCES

#### Criteria

The CTUIR affirms its authority and commitment to preserve, protect and promote Tribal culture and heritage. Such authority is an inherent feature of Tribal sovereignty. This authority and commitment is embodied in various federal and state laws as well as the CTUIR's Comprehensive Plan, Board of Trustees Resolutions and the proposed CTUIR Cultural Resources Protection and Management Code (Cultural Resources Code). Changes to the TPA must recognize the CTUIR interest in protecting and preserving cultural resources.

Cultural sites and resources include those associated with traditional foods and other natural resources, sites of great religious importance such as Gable Mountain, habitations, and historical events and personalities. It is the intent of the Tribes to protect, preserve and manage cultural resources on the reservation and ceded lands by the use of policy, statutory prohibitions and regulations. At Hanford, cultural resources sites have not been effectively protected from pothunters. It is DOE's responsibility to ensure that these sites are effectively protected and that violators are fully punished. In addition, many cleanup activities (such as drilling new wells or constructing new facilities) can violate cultural resources sites. TPA signatories must integrate protection of cultural resources into their cleanup planning. The proposed Cultural Resources Code provides policy guidance and procedures for DOE's Hanford restoration and management which is complemented by the Federal Native American Graves and Repatriation Act.

#### Laws and Regulations Supporting Cultural Criteria:

Native American Graves Protection and Repatriation Act - The NAGPRA provides for the protection of Native American graves and for the return to Indian tribes of human remains, burial artifacts, sacred objects and objects of cultural patrimony, for

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DOE does not have a policy directed towards management of State Sensitive and Candidate Species such as the Ferruginous hawk, burrowing owl, common loon, great blue heron, shortface lanx, Columbia pebblesnail, Perisistentsepal yellowcress, southern mudwort, shining flatsedge, or dense sedge. It is imperative that a policy designed to enhance habitat and restore viable populations of fish, wildlife, and plant species be developed in consultation with CTUIR to insure that: (1) additional species do not become threatened or endangered, (2) Tribal Treaty resources are maintained, and (3) DOE fulfills its trust responsibility in managing natural resources.

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

the ultimate purpose of repatriation of such remains and objects. NAGPRA's provisions recognize the authority of traditional Indian religious leaders and provide a role for these leaders in carrying out the Act's functions. Inventories for the above artifacts must be conducted in consultation with Indian tribes. This Act protects cultural resources at the DOE Hanford facility.

American Indian Religious Freedom Act - This Act defines the policy of the United States to protect and preserve for American Indians their inherent right of freedom to believe, express and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to sites, use and possession of sacred objects and the freedom to worship through ceremonial and traditional rights. The Hanford site was used significantly by the Wallulapum band (now part of the CTUIR), as well as others.

National Historic Preservation Act - This Act requires federal agencies to assess the impacts of their activities on properties included in or eligible for the National Register of Historic Places. The Act requires such planning on actions as may be necessary to minimize harm to any National Historic Landmark that may be directly and adversely affected by an undertaking. Section 106 of the Act requires federal agencies to take into account the effect of their undertaking on important historic properties for all actions involving federal funds, approval or assistance that could affect archeological resources. The Hanford Reach could potentially be eligible for designation as a historic district on the National Register of Historic Places, and also as a traditional cultural property.<sup>5</sup>

Archaeological Resources Protection Act of 1979 - The Act imposes criminal and civil penalties upon persons without permits who excavate or remove archeological resources from public or Indian lands. ARPA provides for stronger protection for archeological sites through law enforcement monitoring. Over 400 archeological sites are documented by the CTUIR within the Hanford Reservation. Additional cultural resource surveys need to be completed to thoroughly document and re-record these resources. Protection of these resources is a significant concern of the CTUIR and may require additional security.

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<sup>5</sup>Under the Hanford Future Site Uses Working Group Final Report, Cleanup Scenario A for the Reactors Along the River includes removing all reactors and all other structures, contaminated and uncontaminated in the 100 area. To insure that Native American uses can continue, the CTUIR prefer this option over maintaining structures on site.

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

### IV. TRIBAL COMMUNITY HEALTH AND SAFETY

#### Criteria

As a Hanford downwind community, the CTUIR could be severely injured by a catastrophic event at Hanford. Moreover, radioactive and hazardous materials transported to and from Hanford regularly pass through the Umatilla Indian Reservation and along the tributaries of the Umatilla River. A transportation accident on the reservation or the river involving Hanford's radioactive or hazardous materials would pose a great danger to the Tribal community. Protection of the Umatilla Indian Reservation and its members and residents from these hazards must be considered in the TPA revision process.

TPA changes should accomplish several goals, including:

1. reducing the risk of a catastrophic event at Hanford,
2. reducing the volume of hazardous and radioactive materials to be transported off-site for disposal, and
3. reducing the total volume of hazardous materials used in the processing of Hanford waste.

#### Laws and Regulations Supporting Health and Safety Criteria:

Nuclear Waste Policy Act - This Act provides for the development of repositories for the disposal of high-level radioactive waste and spent nuclear fuel. In this process, the CTUIR was recognized as an "affected nation" which must be coordinated with on a government-to-government basis in the development of repositories and disposal of radioactive waste.

Emergency Planning and Community Right-to-Know Act - EPCRA establishes a duty for facilities containing extremely hazardous substances to participate with local communities in planning for emergency response in the event of releases of those substances. Hanford is a facility subject to EPCRA requirements. As a neighboring community, the CTUIR has a right to participate in Hanford-related emergency planning activities.

Hazardous Materials Transportation Uniform Safety Act - This Act regulates the labelling and transportation of hazardous materials. The Act provides for the training of Tribal public sector employees to respond to accidents involving hazardous materials. Transportation of hazardous and radioactive materials is a subject of particular importance to the CTUIR, as the main highway and rail routes for Hanford materials pass through the reservation.

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

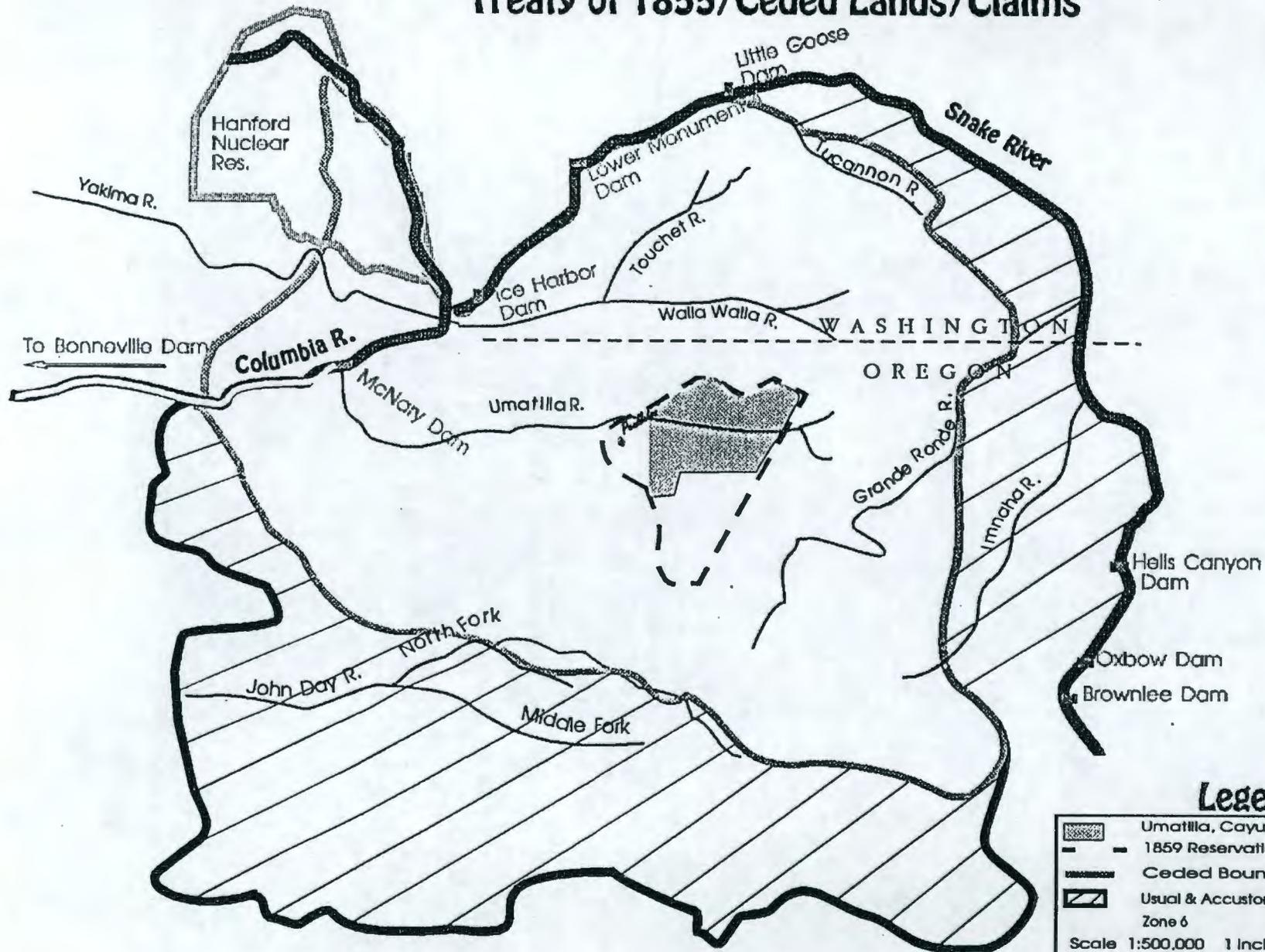
CTUIR Hazardous Materials Emergency Response Plan - Amended in November of 1991, this plan outlines the roles and responsibilities of various agencies involved in hazardous materials emergency response. The Plan contains a section dealing specifically with Hanford.

### CONCLUSION

The criteria and supporting laws and regulations listed above are tools the CTUIR will use to analyze revisions and implementation of the TPA. The CTUIR has numerous rights and interests in the Hanford Nuclear Reservation. These rights derive from the Treaty of 1855, the federal trust responsibility, federal statutes and federal policy. Moreover, the CTUIR has committed itself to preservation of its Tribal sovereignty and exercise of its authority over Tribal resources. The CTUIR desires to work on a formalized government-to-government basis with the TPA signatories on environmental restoration, waste management, and environmental enhancement of the Hanford Nuclear Reservation, including revision and implementation of the TPA.

# Confederated Tribes of the Umatilla Indian Reservation

## Treaty of 1855/Ceded Lands/Claims



### Legend

-  Umatilla, Cayuse & Walla Walla Res.
-  1859 Reservation Boundary Survey
-  Ceded Boundary
-  Usual & Accustomed Joint Use Area Zone 6
- Scale 1:500,000 1 Inch = Approx. 8 miles
- Boundaries taken from Indian Claims Commission Docket # 264 Cayuse, Umatilla & Walla Walla Tribes EPRCEDED.92/tw



CONFEDERATED TRIBES  
of the

*Umatilla Indian Reservation*

P.O. Box 638

PENDLETON, OREGON 97801

Area code 503 Phone 276-3447 FAX 276-3317

September 3, 1993

Mr. Larry Gadbois  
U.S. Environmental Protection Agency  
712 Swift Boulevard, Suite 5  
Richland, WA 99352

RE: Submission of Technical Comments on the Columbia River  
Impact Evaluation Plan

Dear Mr. Gadbois:

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) are pleased to submit the enclosed technical analysis of the Columbia River Impact Evaluation Plan, DOE/RL-92-28, Rev. 0.

Our technical evaluation reveals that the document is insufficient in several areas. For instance, the document fails to integrate a substantial amount of historical data and does not provide a comprehensive overview of the environmental and health impacts caused by Hanford operations.

Several CTUIR policy issues associated with the approach taken by the DOE in development of the Columbia River Impact Evaluation Plan have been identified. These will be submitted under separate cover to the TPA signatories for use in the TPA revision and negotiation process.

If you have any questions on the CTUIR's technical evaluation, please feel free to call me or the Tribes' Hanford Projects Coordinator, J.R. Wilkinson, at (503) 276 - 0105.

Sincerely,

Michael J. Farrow  
Director, Department of Natural Resources  
Confederated Tribes of the Umatilla Indian Reservation

Enclosure

cc: Kevin Clark

**COMMENTS ON THE**  
**COLUMBIA RIVER IMPACT EVALUATION PLAN**

**(DOE/RL-92-28)**

Confederated Tribes of the Umatilla Indian Reservation  
Department of Natural Resources  
Environmental Planning and Rights Protection Program  
Hanford Environmental Restoration Project

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

### Introduction

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) has reviewed the Columbia River Impact Evaluation Plan (CRIEP) and provides the following comments. Our comments are organized into the following sections:

- The Tribal Context
- Need For a Comprehensive Review of Impacts to the Columbia River Environment
- The CTUIR's Concerns Regarding the CRIEP
- Review of the Technical Completeness of the CRIEP
- Proposed Data Collection Activities
- Conclusions

### I. The Tribal Context

#### A. Historical Context

The Umatilla Indian Reservation is located near Pendleton, Oregon. It is occupied by descendants of three Columbia Plateau tribes: the Cayuse, Umatilla and Walla Walla. Together, the three tribes comprise the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). In historical times, the Wallulapum band, part of the Walla Walla Tribe, occupied a large area centered on the confluence of the Yakima, Snake and Columbia rivers. In addition, descendants of the Wanapum band, a band that resided along the Columbia River in the area now referred to as the Hanford Reach, are also members of the CTUIR. The eastern portion of the Hanford Nuclear Reservation, including the Hanford Reach, is located on these Tribes' traditional lands.

In 1855, the Cayuse, Umatilla and Walla Walla tribes entered into a treaty with the United States. As part of this treaty, the Tribes ceded 6.4 million acres to the United States in return for concessions by the United States. In particular, the Tribes retained the right to perform certain activities in their traditional lands. These rights include the rights to fish, hunt, pasture livestock and gather plants.

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

### B. CTUIR Hanford Context

Because of its strong governmental interest in Hanford, the CTUIR is actively participating in Hanford clean-up planning processes. These planning activities range from participation as a Trustee for Natural Resources<sup>1</sup> to participation on forums such as the Hanford Future Site Uses Working Group and the Tank Waste Task Force. The CTUIR is also providing comments on planning documents released for public review.

The CTUIR recently released a document that expresses the CTUIR's general concerns about Hanford cleanup activities. This document, Criteria for Evaluation of Proposed Changes to the Hanford Federal Facility Agreement and Consent Order, was developed for use in the TPA revision process. As a reference tool, it can be used by any party interested in learning the nature of the CTUIR's concerns at Hanford.

The Criteria provides the general framework for CTUIR's participation in Hanford cleanup under various environmental laws and regulations (CERCLA<sup>2</sup>, RCRA<sup>3</sup> and NEPA<sup>4</sup>).

Following is one of the key topics discussed in the CTUIR's Criteria document:

"Protection and restoration of the environment, both on the Hanford site and in areas affected by Hanford over which the CTUIR exercises off-reservation treaty rights. Protection of the environment guards the natural resources upon which treaty rights are based, including Columbia River fisheries and related resources."

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<sup>1</sup>See CERCLA, Section 107(f); 40 CFR § 300.5; 40 CFR § 300.610.

<sup>2</sup>The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) 42 U.S.C § 9601 - § 9675.

<sup>3</sup>The Resource Conservation and Recovery Act (RCRA) 42 U.S.C § 6901 - § 6992K.

<sup>4</sup>The National Environmental Policy Act (NEPA) 42 U.S.C § 4321 - 4370b.

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

C. Environmental Context, Importance of the Columbia River to the CTUIR

From salmon and sturgeon to tule reeds and eagle feathers, the ecosystem provides the very fabric of tribal culture. Any impact evaluation that considers the Columbia River environment should assist the CTUIR in understanding and evaluating the magnitude and future consequences of adverse impacts on natural resources.

The Columbia River and associated aquatic and terrestrial ecosystems are of great significance to the CTUIR. The meaningful exercise of tribal treaty rights within usual and accustomed areas is entirely dependent on the health of the ecosystem and its natural resources. A treaty right to fish, take wildlife or gather plants is hardly useful if individuals or populations of fish, wildlife or plants have been reduced in their abundance, become threatened with extinction or themselves become human health risks.

Natural resources are significant to the CTUIR for a variety of reasons. Tribal members are subsistence hunters and gatherers. Wild game and fish form a major part of the diet of many tribal members.<sup>5</sup> Likewise, plants collected from a healthy environment form an important feature of many tribal members' diets. Besides consumption as food, these resources are collected for religious ceremonies, cultural uses such as medicines, clothing, decoration and traditional crafts and recreational purposes.

All indigenous plants and animals have religious significance to CTUIR members who practice traditional Indian religion. In addition, these resources, such as chinook salmon, can be of great economic importance to the CTUIR.

The CTUIR's overall land management philosophy for Hanford is that environmental restoration must be considered the primary focus of activities. This ensures that timely and effective "clean-up" of contamination is conducted in a manner that optimizes sustained net flow of tribal benefit through the conservation, management and utilization of fish, wildlife, plant and cultural resources, while protecting the integrity, sustainability and diversity of the natural ecosystem.

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<sup>5</sup>CTUIR dietary data collected during the preliminary phase of the Hanford health studies confirm this conclusion.

## II. Need for a Comprehensive Review of Impacts to the Columbia River Environment

It is our understanding that the TPA M-30 milestones narrowly focus studies on impacts created by 100 Area activities. However, a true cumulative impact evaluations cannot be completed without a broader consideration of the collective effects of all contaminant-contributing Hanford operations on the river environment.

The CTUIR supports the development of a thorough environmental and human impact evaluation that considers the magnitude and effect of Hanford contamination and the fate and transport of contaminants throughout the natural ecosystem. An analysis such as this would culminate in a cumulative impact assessment documenting Hanford-induced effects on Tribal treaty-rights, natural resources and Tribal members. An assessment of the cumulative environmental effects both within the Hanford Reach and in downriver areas are critical components of remediation and environmental restoration at the Hanford Nuclear Facility.

A complete summary of the known information pertaining to contamination of the Columbia River environment should be provided. This summary would provide the framework for identifying data gaps, additional research needs, future remediation and environmental clean-up strategies and ecological and human dangers. The net result should broaden the understanding of historical, current and foreseeable impacts caused by Hanford to the Columbia River environment. This baseline information would assist the CTUIR in quantifying impacts to Treaty-reserved rights, natural resources and the health and welfare of the tribal community.

The analysis should provide pathway analysis, deposition rates, uptake rates and consumption factors in assessing human health impacts. These data would allow the CTUIR to assess the magnitude and extent of impacts on the tribal community.

As a baseline, this analysis should identify damages to natural resources and attendant Treaty rights and provide information for future use in the Natural Resource Damage Assessment process. The CTUIR, as a Trustee for Natural Resources affected by Hanford operations, is profoundly interested in the development of future activities at Hanford related to the Columbia River.

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

III. The CTUIR's Concerns Regarding the CRIEP

A. THE CRIEP FAILS TO PROVIDE A CUMULATIVE HEALTH AND ENVIRONMENTAL IMPACT EVALUATION

The CTUIR believes that any assessment of cumulative health and environmental impacts should include a complete overview of impacts resulting from historical, current and foreseeable sitewide Hanford operations. This type of assessment should provide a comprehensive view of the collective effects of Hanford activities as opposed to considering only portions of the impacts. The CTUIR contends that such an approach represents both the letter and spirit of the TPA M-30 milestones.

The following discussion points out the major shortfalls of the CRIEP in disclosing information on cumulative health and environmental impacts and in failing to meet the overall intent of the TPA M-30 milestones.

1. Human Health Impact Evaluation

The CTUIR believes the CRIEP is inadequate. The CTUIR questions its validity in thoroughly evaluating human health impacts. This conclusion is based on the CRIEP's exclusion of ongoing Technical Steering Panel (TSP) and the Native American Working Group (NAWG) activities, dependance on incomplete data sets or analyses, uncertainties associated with the conclusions contained in the CRIEP and the failure of the CRIEP to review and integrate other research.

The TSP oversees the Hanford Environmental Dose Reconstruction Project (HEDRP) that is researching the amount, dispersion paths, deposition and health affects associated with past operations at Hanford. Two pathways are under review by the TSP, the air pathway and the water pathway. This panel is also associated with the Hanford Thyroid Disease Study (HTDS).

The CTUIR is involved with TSP through NAWG. On a regular basis, representatives of eight Columbia Plateau tribes convene to discuss impacts to tribal communities from the two pathways. This aspect is critical to note: *tribal communities have increased exposure to environmental contamination because the use of fish, wildlife and plants for subsistence and cultural activities is at a much higher rate than the general population.*

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

One particular TSP document that considered the River pathway<sup>6</sup> notes that "Preliminary dose estimates were calculated to demonstrate the feasibility of reconstructing doses" [emphasis added]. The CRIEP however states that "In general, radionuclides are only evaluated with respect to the carcinogenic potential associated with ionizing radiation."<sup>7</sup>

The CTUIR concurs with the statement in the CRIEP that "Uncertainty with respect to the toxicity assessment is related to uncertainty in the toxicity values used and uncertainty in the overall toxicity assessment."<sup>8</sup> Research being conducted by the TSP is focused on identifying the correlation between human health impacts and Hanford-induced environmental contamination. Until this study and the model are completed, conclusions about health effects contained in the CRIEP are unsubstantiated and should be removed from the document.

### 2. Environmental Impact Evaluation

The DOE describes the CRIEP as a document that will provide the framework for determining cumulative health and environmental impacts to the Columbia River. It also states that the CRIEP will provide a characterization of river resources and valuable information for the 100 Area risk assessment<sup>9</sup>.

The CTUIR question the legitimacy of the CRIEP for use as the baseline for future natural resource and ecosystem risk assessments because the cumulative effects from all Hanford operations on the Columbia River environment are not integrated into a single assessment. Only 100 Area contamination is discussed; significant contributions and impacts from other contamination sources are disregarded.

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<sup>6</sup>Columbia River Pathway Report: Phase I of the Environmental Dose Reconstruction Project. HEDR Rev. 1, UC-707, Pacific Northwest Laboratory. July 1991, PNL-7411 .

<sup>7</sup>Columbia River Impact Evaluation Plan, DOE/RL-92-28, Revision 0, Page 68.

<sup>8</sup>Ibid., Page 72.

<sup>9</sup>Ibid., Pages 1 and 2

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

The CRIEP should integrate all relevant data and contain a summary of environmental monitoring information from the beginning of Hanford operations in 1943 through the present in order to allow an analysis of environmental impacts from Hanford activities. Transport of chemical and isotopic compounds throughout the Lower Columbia River system should also be discussed rather than focusing the analysis only on the Hanford Reach of the Columbia River.

The analysis needs to view the Columbia River as not only water, but as an interdependent ecological unit (including wetlands, riparian and upland components) where no one part can be separated from the other. The CRIEP fails to integrate these fundamental concepts.

### B. THE CRIEP IS AN EXAMPLE OF THE MANAGEMENT AND POLICY PROBLEMS PLAGUING HANFORD SITE RESTORATION

The recently released Schedule Optimization Study (SOS)<sup>10</sup> contains 57 recommendations regarding problems with management and policy at Hanford. These findings "indicate the most serious impediments to environmental cleanup of the Hanford Site are related to a series of management and policy issues that are within the control of the three parties managing and monitoring Hanford."<sup>11</sup>

Recommendation twenty-two of the SOS states that "Hanford should develop a comprehensive sampling and analysis strategy for the site, including providing appropriate staff training." The issue statement for this recommendation is the "Failure of DOE to generate necessary supporting data." The CRIEP is a clear example of this issue because it does not contain a comprehensive review of existing data.

The CTUIR's goal in participating in clean-up activities at Hanford is to ensure that cost effective, efficient and timely clean-up efforts protect Treaty rights and natural resources.

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<sup>10</sup>Schedule Optimization Study, Hanford RI/FS Program, Volume 2: Final Report, December 1992, EMO 1080 Vol. 2, AD-902A.

<sup>11</sup>SOS, Page xiii.

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

C. THE DOCUMENT FAILS TO ADDRESS EXISTING INFORMATION PERTAINING TO CONTAMINATION OF THE COLUMBIA RIVER CORRIDOR

A specific example of the CRIEP's failure to provide an overall view of the impacts resulting from Hanford operation is found on page 12 of the document, where it is noted that "groundwater is the primary pathway for environmental contamination and impact on the Columbia River." The CRIEP also acknowledges the concept of "skyshine" as an additional potential pathway of contamination. However, the plan fails to fully recognize the impacts caused from numerous other contaminant sources such as<sup>12</sup>:

1. Miscellaneous Radioactive liquid wastes.
2. Radioactive sludge/radioactive solid waste.
3. Sanitary liquid waste.
4. Nonradioactive liquid waste.
5. Nonradioactive sludge/nonradioactive solid waste.
6. Leaking underground storage tanks.

The CRIEP discounts historical contamination of the 100 areas and focuses only on groundwater plumes currently releasing contaminants to the Columbia River, ie., upgradient groundwater contamination. No information is provided that discusses the amount of contamination (chemical and radioactive) that has been deposited as liquids to ground nor is there any discussion disclosing information pertaining to contaminants stored as solids in the upland soil column. A large portion of this contamination has yet to leach into the groundwater but will eventually reach the Columbia River in the near future.

An additional example of the CRIEP's failure to fully consider all contaminants and existing information is illustrated by a recent presentation to the TSP by Battelle researchers. During the presentation, "Integrated River Pathway Activities/Scoping Studies,"<sup>13</sup> several technical approaches were identified that would be applied or included in their studies. One of these topics acknowledged the task of evaluating river effluents and the release of approximately two thousand fuel failures into the river environment.

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<sup>12</sup>DOE-RL, 9/92, Remedial Investigation/Feasibility Study Work Plan for the 100-KR-1 Operable Unit, Hanford Site, Richland, Washington; Revision 0, DOE/RL 90-21, U.S. Department of Energy, Richland Operations, Richland, Washington.

<sup>13</sup>Integrated River Pathway Activities/Scoping Studies. Bruce Napier, Presentation to the TSP, April 2, 1993.

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

These topics were also reported in a document<sup>14</sup> prepared by UNC Nuclear for DOE in 1986 that discusses significant radiation sources found along the D-Island shoreline, across from the D-Reactor.

The CRIEP fails to account for these fuel failures and contamination of islands and shorelines. Therefore, the cumulative impacts resulting from Hanford operations have not been comprehensively integrated. Any preliminary findings of the CRIEP are unsubstantiated without this information and there is no basis for judging the cumulative impacts, let alone concluding that no adverse impacts have occurred.

### D. THE DOCUMENT CONTAINS INADEQUATE TECHNICAL DATA AND PROTOCOL

Throughout the CRIEP, it is stated that only "readily available" data is used in this assessment. It is unclear what this term means. A complete review of over 50 years of information should be summarized in order to provide an overall view of the distribution and magnitude of past and present pollution of the Columbia River as a result of Hanford operations.

In addition, for purposes of assessing water quality and cumulative effects in the Hanford Reach and downstream areas on the Columbia system, other point and non-point source pollutants from sources other than Hanford operations should be fully considered.

Sampling and analysis at Hanford has been described as inadequate in the Schedule Optimization Study for the Hanford Site as previously described. An example supporting these findings is illustrated by the DOE's failure to incorporate EPA's comments on the document entitled "Sampling and Analysis of 100 Area Springs."<sup>15</sup> EPA's comment questions whether a one-time synoptic sampling of springs along the shore of the 100 Areas is adequate to characterize and evaluate the impact to the Columbia River.

This is a significant issue because it is unclear in the CRIEP whether additional sampling was completed as requested by the EPA. Information in the 100 Springs document (Milestone 30-01)

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<sup>14</sup>UNC Nuclear Industries, River Discharge Lines Characterization Report, Radiological Survey of "D" Island, Beckstrom, Steffes, 1986

<sup>15</sup>Sampling and Analysis of 100 Area Springs, February 1992, US DOE, DOE/RL-92-12.

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

was incorporated into the CRIEP as baseline information and it appears that this single data set was used to formulate the preliminary impact assessment for the CRIEP.

Furthermore, the CTUIR understands that the DOE is relying on water quality data collected from groundwater monitoring wells to predict water quality parameters from 100 Area shoreline seeps and springs. The data from groundwater monitoring wells is, in effect, being extrapolated to predict contaminant concentrations in seeps and springs in place of collecting water samples from these areas. In addition, offshore seeps and springs discharging to the Columbia River, which are potentially affecting the river system, have not been sampled.

The CTUIR believes that the monitoring well data used to predict contaminants in seeps and spring are inadequate for evaluating impacts to the Columbia River. The CRIEP should be designed with the most thorough set of data available and if conclusive data is not available, additional water quality sampling needs to be conducted. No conclusions should be made until the data gaps are filled and conclusive information gathered. The CRIEP should make it clear that the statements presented on environmental impacts are considered preliminary and inconclusive.

### E. THE CRIEP MAKES PREMATURE STATEMENTS ON ENVIRONMENTAL IMPACTS IN THE ABSENCE OF DEFENSIBLE EVIDENCE

The CRIEP contains numerous statements that no adverse impacts on the Columbia River environment have resulted from 100 Area operations. The TSP has convened a subcommittee that is reviewing historical reactor operating records to accurately determine the "source term."<sup>16</sup> Until the TSP has completed its activities, assumptions concerning environmental impacts from reactor operations are premature.

The CRIEP discounts adverse impacts on the Hanford Reach from spring discharges due to dilution with Columbia River water. However, the mixing process has not been evaluated and some contaminant releases may travel as a plume or slug for some distance before being dispersed. The CTUIR believes that localized impacts on natural resources must also be addressed and not simply dismissed based on DOE's questionable assumption that biological organisms will move away from these areas.

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<sup>16</sup>Source Term is defined by the TSP as the amount, type and location of radioactive materials released to the environment.

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

In addition, in the conclusion presented on page 24 of the CRIEP it is stated that contaminants of concern in surface water are not significantly different between upstream and downstream collection points. In fact, measured upriver and downriver Tritium concentrations differ by a factor of two in each of the six years between 1986 and 1991<sup>17</sup>. This conclusion is also inappropriate because there is no evidence in the report that the data were statistically evaluated to compare differences and variability between monthly sampling periods, nor is there any reference to conclusive evidence supporting these findings.

### F. THE CRIEP PROVIDES NO EXPLANATION ON HOW IT FITS INTO THE OVERALL HANFORD ENVIRONMENTAL "CLEAN-UP" PROCESS

A 1990 Tiger Team report<sup>18</sup> stated that "A single, cohesive plan for management of past practice activities performed under the TPA is necessary to ensure efficient planning, organization, coordination, budgeting, management, review and control of those activities."

This issue, identified by the Tiger Team, is clearly illustrated in the haphazard and piecemeal approach taken in the CRIEP. As such, this document falls substantially short of providing a comprehensive, integrated analysis that the CTUIR perceives to be the intent of TPA M-30.

Because the information summarized in the CRIEP will be used in the RI/FS process for establishing baseline information and in the subsequent development of remedial actions, the CRIEP should be rejected because it does not contain comprehensive and/or accurate information.

In terms of TPA language, the CRIEP is a "primary document representing final documentation of key data and reflects decisions on how to proceed."<sup>19</sup> The CRIEP will become a

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<sup>17</sup>Woodruff, R.H., and Hanf, R.W., 1992, Hanford Site Environmental Report for CY 1991, PNL-8148, p.91.

<sup>18</sup>Assessment Finding Number IWS/BMPF-1, Ambiguous Roles and Responsibilities for Management and Quality Assurance of Past Practice Activities Under the Tri-Party Agreement. Tiger Team Assessment Report of the Hanford Site. U.S. Department of Energy, Environment, Safety and Health. DOE/EH-0139, July 1990. Page 3-207.

<sup>19</sup>Hanford Federal Facility Agreement and Consent Order, Volume 1 of 2, Second and Third Amendments, September 1992, 89-10 Rev.2, Section 9.0.

*CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION*

reference document in the administrative record for 100 Area decisions and be incorporated by reference into CERCLA/RCRA decision making processes at face value as a representative description of 100 Area existing environmental conditions. The CRIEP is inadequate in fulfilling this important role.

Therefore, the CTUIR is deeply concerned with the CRIEP because missing and inaccurate information and erroneous or unwarranted conclusions in this analysis will carry through the CERCLA process, falling short of meeting the CTUIR's needs in adequately describing Hanford-induced cumulative effects.

The DOE has acknowledged its responsibilities in bringing management of the Hanford Nuclear Reservation into compliance with applicable environmental laws and regulations. In Section 4 of the CRIEP on page 4, it is stated that restoration activities are being conducted pursuant to multiple federal and state statutes, regulations and guidelines.

However, the National Environmental Policy Act (NEPA) is completely ignored in the CRIEP. It should be clearly stated in the document how it will be used for future reference in the CERCLA/RCRA and NEPA processes. As a primary document, the CRIEP should provide an overall view of how it will be used in future decision making processes.

In addition, numerous other laws and regulations that should be integrated into the CERCLA/RCRA process are omitted. For example, the entire Hanford Reach of the Columbia River has been found eligible for Wild and Scenic River designation under the Wild and Scenic Rivers Act<sup>20</sup>. However, no mention of the River's outstandingly remarkable resource values or river classification is mentioned.

In the purpose and objectives section of the CRIEP on pages 1 and 2, it is mentioned that M-30 milestones were developed to initiate a rescoping of the 100 operable unit work plans. The CTUIR requests that the Tribes be involved early in the scoping process which would begin the commitment of government-to-government relations. This would lead to the development of resolutions involving complex environmental issues surrounding Hanford clean-up in a facilitated manner.

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<sup>20</sup>Hanford Reach of the Columbia River, Comprehensive River Conservation Study and Environmental Impact Statement, Draft, June 1992.

#### IV. Review of the Technical Completeness of the CRIEP

##### A. Introduction

The following section provides detailed comments on specific deficiencies of the CRIEP. These comments relate to technical aspects of Chapters 2 and 3, "Characteristics and Nature of Contamination" and "Contaminant Fate and Transport" respectively. The following comments are organized consistent with the organization of the CRIEP. Although every issue is not explored in detail, the following remarks are representative of the major problems the CTUIR finds with the current CRIEP.

##### B. Chapter 2 Review

###### Section 2.1.3, Hydrological Characteristics

-- This section provides general information on the Columbia River, but fails to adequately define basic known Hanford Site hydrology. Site hydrology is an important component in evaluating contaminant interaction with the river environment.

-- The information provided is poorly summarized and overgeneralized. For example, the long term average annual flow rate at Priest Rapids Dam is stated to be 3,400 m<sup>3</sup>/s. This figure is an overall average from 68 years of record. However, the dam was constructed in 1959 and the hydrological regime of the river was substantially altered thereafter. It would be helpful to have a comparison of the flow rates prior to and following dam construction, rather than combining 68 years of record into one "averaged" measure. In addition, peak or maximum expectable flow rates from storm runoff, snowmelt or 100-year flood events should be reported.

-- The document fails to mention substantial daily fluctuations in flow rate caused by Priest Rapids Dam management. Water levels at islands and shorelines along the Hanford Reach can fluctuate as much as 2 meters in a day.<sup>21</sup> These fluctuations will have potential impacts on groundwater and sediment pathways, as well as contaminant fate and transport. The importance of these variations should be fully considered in this evaluation to adequately describe contaminant transport, deposition and bioaccumulation.

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<sup>21</sup>Sauer, Ronald H. and J. E. Leder. 1985. The Status of Persistentsepal Yellowcress in Washington. Northwest Science 59 (3): 198-203.

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-- Appendix B provides additional background on hydrologic and hydrogeological characteristics for the Hanford Site; this material should be referenced in the subject section.

### Section 2.1.4, Ecological Characteristics

-- This section fails to take an integrated ecosystem-level approach; the material presented is limited to the riverine and riparian zones along the Hanford Reach. At a minimum, the discussion should take into account all 100 Area habitats, adjacent upland sagebrush, steppe and bunch grass communities, as well as discussing the important wildlife areas north of the river.

-- The text or appendix should provide a complete listing of all State and Federal endangered, threatened and sensitive plant, fish and wildlife species found on-site. There are 24 listed plant species of special concern found at Hanford<sup>22</sup>; the report, however, lists only five. There are 57 wildlife species with endangered, threatened, sensitive or candidate status listed for Hanford<sup>23</sup>; the report lists only four species.

### Section 2.2, Nature and Extent of Contamination

-- Table 2-1 is described in the CRIEP as containing the mean, standard deviation and range for all determined contaminants of potential concern in groundwater plumes identified in Appendix B of the CRIEP. However, the table does not provide this information. This data forms the basis for all later discussion regarding contaminants of potential concern; its absence from the document makes a meaningful review of the CRIEP infeasible.

-- The methodology used for selecting the contaminants of potential concern in the evaluation is highly selective and therefore suspect. First, identification of contaminants of concern is based on selective sampling of wells during only one year, 1989, in spite of the existence of more than 50 years of analytical data. Second, the results reported in Table 2-1 are

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<sup>22</sup>Vascular Plants of the Hanford Site, Sackschewsky, Landeen, Baird, et al., 1992.

<sup>23</sup>Hanford Site National Environmental Policy Act (NEPA) Characterization, Cushing, C. E., December, 1991. Pacific Northwest Laboratory, Battelle Memorial Institute.

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only singular values that cannot be assumed to be necessarily representative of the full range of concentrations found in migrating contaminant plumes. In the absence of a more detailed sampling program, it is unlikely that the reported values represent meaningful data. There is no presentation of how this data compares to historical or TSP source term data.

-- In addition, no discussion of the rationale for the selection of "representative" wells to be used for such characterization is provided. The wide and irregular spacing of the selected wells (Figure 2-2 in the CRIEP) effectively precludes a systematic characterization of the nature, areal extent and concentration levels of constituents of interest and results in what are random measurements whose significance cannot be understood in the larger context. Nor is there any discussion in the CRIEP describing whether the monitoring wells used for data collection are in compliance with RCRA regulations.

-- Figure 2-5, showing "conceptual" flow directions from 100 Area facilities to the river, is so oversimplified that it is useless; it should be replaced with a more detailed, real-world representation based on measured water-levels and known historical plume migration pathways.

-- As stated on page 12 of the CRIEP, the contaminants selected for consideration were identified for groundwater plumes only, but are then applied, without further discussion or qualification, to other (ie., surface water and ecological) potential contaminant pathways. Such an approach not only ignores differences in transport mechanisms, but also differences in chemical interactions between contaminants and soil, water and biological systems and the much longer residence time expected in subsurface soils and groundwater.

### 2.2.2.1. Hanford Reach Surface Water Contamination

-- The text suggests that several radiological and chemical contaminants are discharged to the River under NPDES permits, but will not be considered in this document. These contaminants should be identified and included in this analysis.

-- The large amount of missing data provided in Table 2-5 makes the historical summary of Hanford Reach water quality unacceptable. Over 50% of the data are indicated as "Not Reported." This table does not include a review and comparison of TSP data nor does it account for PNL's Environmental Monitoring Program.

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-- Missing data are used to support the conclusion, "Except for <sup>3</sup>H and nitrate in 1987, levels of contaminants of potential concern measured downstream ... are not significantly different ... from levels measured upstream of the Hanford Site."<sup>24</sup>

-- Emphasis placed on conclusions from a 1954 study<sup>25</sup> are unfounded and totally disregard data and conclusions from more modern, current studies. Rather than providing quantitative data, only general statements are cited, e.g., "these isotopes accumulated in aquatic organisms" [which, how much?] and "measurable quantities of radioisotopes were entering the public drinking-water supply" [which, how much?].

### 2.2.2.2. Riverbank Springs

-- Geologic mapping of the seeps and springs on-site has not been carried out. This task was included in the preliminary agreement on scope for the M-30-01 milestone because of the inadequacy of available data, but was not completed.<sup>26</sup> As a result, we have no reliable data regarding the location and flow rates for the springs that have been sampled, and no assurance that samples currently available are representative of the overall hydrological regime for the Hanford Reach area.

-- Consequently, the CTUIR staff strongly disagree with the comment provided on pg. 33, "groundwater discharges to the river cause localized impacts on a small scale." No evidence regarding the type or size of the localized area or scale of the impact has been presented.

### Section 2.2.3, Ecological Contamination

-- The document states that environmental monitoring and scientific studies have been carried out for over 45 years, yet fails to provide an adequate summary of these data.<sup>27</sup> The Plan fails to provide summary information on ecological contamination in shellfish, benthic organisms, amphibians, reptiles, waterfowl or terrestrial organisms. Nor is there an analysis comparing the reported data with available historical data.

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<sup>24</sup>Ibid., Page 24.

<sup>25</sup>Ibid., Page 32.

<sup>26</sup>EPA correspondence, "Technical Review of DOE/RL-92-12", 4/2/92.

<sup>27</sup>Columbia River Impact Evaluation Plan, DOE/RL-92-28, Revision 0, Page 68.

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-- This section needs to present a more thorough and complete review in order to support the conclusion: "Environmental studies and monitoring to date have not shown, however, that the observed contaminant concentrations have resulted in any significant adverse impact to the Hanford Reach ecosystem."<sup>28</sup> This conclusion is unwarranted and cannot be substantiated on the basis of the information provided.

-- The CTUIR agrees with the following statement, "... it should be noted that fish are mobile within the Hanford Reach and the opportunistic sampling methods used by the Environmental Monitoring Program may be insufficient to detect impacts."<sup>29</sup>

C. Chapter 3 Review

This chapter provides a cursory analysis of fate and transport for the "contaminants of potential concern" identified in Chapter 2. As noted above, the CTUIR disagrees with the selection process used to determine contaminants of potential concern. The following additional deficiencies are noted for Chapter 3.

-- The computational model developed in the CRIEP fails to consider all potential contaminant pathways. As noted earlier there is no justification for not including the "skyshine"<sup>30</sup> exposure pathway.

-- The computational model fails to consider potential contaminant uptake and transport mechanisms by amphibians and reptiles.

-- The Plan needs to clearly state what criteria were used to assess the significance of the various pathways.<sup>31</sup> Of the 30 pathways presented in this model, only three are considered in the analysis.

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<sup>28</sup>Ibid., Page 38.

<sup>29</sup>Ibid., Page 37.

<sup>30</sup>Ibid., Page 12.

<sup>31</sup>There are a number of additional "direct exposure pathways" of importance to the CTUIR that are not discussed in the document. These include, but are not limited to, ingestion of contaminants via foraging and hunting activities, as well as the harvesting of food crops. If activities are assessed by the number of intermediate steps between contaminant and environmental receptor, these pathways are no less "direct" than those selected for discussion.

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-- The CTUIR staff disagree with the statement, "Potential impacts [from contaminated seeps and springs] would be limited to environmental receptors since human access to the 100 Area is limited by institutional controls. In addition, the seeps and springs are not always accessible, evident, or conducive to water collection."<sup>32</sup> River areas adjacent to 100 Area seeps and springs are easily accessible by boat. Although the springs and seeps may not always be "evident", this would seemingly increase future potential impact, rather than limit it. The conclusion regarding potential impact is unsubstantiated by the information presented.

-- The CTUIR disagrees with the conclusion, "it is not likely that any significant adverse downstream environmental or health impact associated with the river-water column would be extensive."<sup>33</sup> Statistical problems with the data used to support this conclusion are discussed in Chapter 2, above. Note also that the use of the term "extensive" is inappropriate, as no information relating to the extent of any significant adverse impact has been presented. Finally, the conclusion completely discounts localized effects associated with potential contamination from seeps and springs discharging contaminants to the surface-water pathway.

-- The document states, "potential environmental impacts were evaluated by considering contaminant uptake by fish and by comparing derived contaminant concentrations in the river to ambient water quality criteria."<sup>34</sup> It is unclear what data were used for the biotic pathway evaluation and there are no conclusions indicated as to the results of the research.

-- Regarding the white pelican study, it is stated in the CRIEP that because "recent environmental surveillance reports show no measurable influence on fish from radionuclides released to the Hanford Reach . . . Thus, it is unlikely that white pelicans are . . . adversely impacted."<sup>35</sup> What data support this conclusion?

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<sup>32</sup>Columbia River Impact Evaluation Plan, DOE/RL-92-28, Revision 0, Page 68.

<sup>33</sup>Ibid., Page 68

<sup>34</sup>Ibid., Page 42.

<sup>35</sup>Ibid., Page 42.

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-- There are a number of additional threatened, endangered and sensitive species that should be taken into account in evaluation of biotic pathways. These should include both animal and plant species of concern; the complete omission of terrestrial and aquatic plants as potential biotic pathways is not acceptable. Studies should be conducted on less mobile organisms such as those more likely to be permanent residents of the Hanford Reach and on those that live, feed or burrow in the bottom sediments.

-- Section 3.3 states, "Contaminant transport is addressed below by subsurface, surface-water, and biological considerations."<sup>36</sup> What follows, however, discusses subsurface transport only. The entire sections on surface-water and biological considerations are missing from the document.

-- Section 3.3.1 states "Table 2-3 shows the estimated groundwater flow rates and source concentrations derived from information in Appendix B."<sup>37</sup> This is incorrect; the referenced table appears as Table 2-2.

### V. Proposed Data Collection Activities

On page 82 of the CRIEP, it is stated that "the consideration of spatial, ecological, temporal and administrative factors for any investigation points to an eventual need for characterizing the river on a programmatic basis." The CTUIR agrees that a collective and comprehensive environmental impact evaluation cannot be completed without such an approach. However, the CRIEP fails to meet this need.

Although Chapter 5 contained in the CRIEP attempts to provide guidance for future studies, the background information reported in the CRIEP is incomplete and the conclusions are selective at best. Therefore, the future study designs are suspect.

The tasks and activities planned for data collection should be designed to include an in-depth study into the impacts of historical Hanford operations on an ecosystem basis. As described earlier, additional indicator species such as amphibians need to be evaluated to better represent species and habitats that may be the most ecologically sensitive.

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<sup>36</sup>Ibid., Page 43.

<sup>37</sup>Ibid., Page 21.

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Amphibians are excellent candidates for bioassay because, due to their biphasic life history (ie., aquatic larvae and terrestrial adults), are exposed to contaminants in more than one media.

Additional studies are needed to fully understand implications of pathways other than those described in the CRIEP. It is insufficient to assess only the impact to fish. These studies would include human ingestion of waterfowl, venison, plants, irrigated crops, domestic livestock and other animal products.

Other studies need to be completed on the radiobiology of important fisheries resources. An understanding of interactions between contaminated sediments and the effects on both spawning and rearing juvenile fall chinook salmon, for example, is crucial in protecting and enhancing this tremendous natural resource.

The CTUIR recommends that the following studies be incorporated into or added to the tasks contained in the CRIEP to further define biological impacts of Hanford on the Columbia River environment:

1. Activity 1A-3 - Studies should include an assessment of sediment partitioning to determine impacts of ambient sediment conditions. Studies should be completed on whole sediment and interstitial water in conjunction with chemical/radiological analysis.

Bioassays should include a variety of plant and animal indicator species to determine lethal and non-lethal end points and to define the link between contaminant uptake and concentration factors. These studies should also determine human exposure risk.

Long-term studies on the effects of nuclear waste materials that migrate from present storage sites and enter the Columbia River on fall chinook salmon and other salmonid species as well as sturgeon, whitefish, bass etc., need to be thoroughly studied.

Potential exposure scenarios need to be evaluated and data collected to determine effects of contamination on embryonic development, egg to fry survival and effects on juvenile fish species.

Evaluations need to be completed to determine the potential for contaminants to intersect and impact key fall chinook spawning areas in the Hanford Reach and downriver areas on

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the Columbia River. An example for the need of these studies is the previously described fuel rod failures and the rod fragments located in the Columbia River.

2. Activity 4-1 - data needs to be collected on the uptake, elimination and bioaccumulation in resident as well as migratory species. These types of assessments should include shorebirds, neotropical migrants, raptors and waterfowl such as the Canada goose as well as plant species.
3. Activity 4-2 - these activities should include studies to determine impacts on benthic communities as well as on organisms such as amphibians and reptiles.
4. Activity 4-3 - The CTUIR request that riparian species as well as upland and other terrestrial organisms be included in this activity.

## VI. Conclusions

The CTUIR has a direct governmental interest in the environmental health of the Hanford Nuclear Reservation and in off-site resources affected by Hanford as well as Tribal community health and safety. Environmental restoration at Hanford and in downriver areas of the Columbia River is CTUIR's top priority for protecting treaty rights and in protecting and restoring the natural resources upon which the CTUIR's treaty-rights are based.

Concern exists with the CRIEP because it does not adequately provide a comprehensive overview of the impacts on the natural environment. Concerning the contaminant pathway analysis, the CTUIR believes that DOE's assessment of the environmental impacts contained in the CRIEP are incomplete. The CRIEP falls short of evaluating the ecological data gaps because the study fails to integrate other research activities and focuses on only the surface water pathway. The CRIEP presents a narrowly defined human receptor pathway and does not adequately evaluate other pathways.

The exclusion of other pathways does not fulfill the requirements of a comprehensive cumulative impact evaluation nor does it set the stage for future impact evaluations.

Chinook salmon are used as the primary indicator in evaluating human exposure to contamination in the CRIEP. Tribal members of the CTUIR utilize a variety of aquatic and upland terrestrial

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organisms and numerous vascular plants for subsistence. These resources represent pathways of potential contamination and should be considered in any cumulative impact assessment.

Many organisms indigenous to the Hanford area that are extremely sensitive to contaminants are ignored. For example, amphibians, macroinvertebrates and vascular plants associated with wetlands and backwater sloughs may be subject to higher concentrations of contaminants due to deposition of contaminated river sediments. Organisms residing in these areas may be more representative of the impact caused by Hanford than more mobile organisms and are generally considered more appropriate biological indicator species. These species would more accurately represent the magnitude and extent of contamination from Hanford operations, yet they receive only a cursory examination in the CRIEP.

In summary, simply evaluating the surface water of the Columbia River and predicting environmental impacts based solely on this information is inappropriate. The TPA itself states that a comprehensive evaluation of the Columbia River is the intent of this CRIEP. Clearly, this CRIEP does not fulfill these goals.



DEPARTMENT of  
NATURAL RESOURCES

Environmental  
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11 May 1994

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Subject: Development of Draft Hanford Sitewide Groundwater Remediation Strategy  
and Perceived Impediments to its Effective Implementation

Dear Sitewide Groundwater Remediation Strategy Developers:

On Thursday, 14 April 1994, on behalf of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), I attended a briefing in Richland by DOE and WHC staff on the development of a sitewide groundwater remediation strategy, which is currently in the draft stage. Development of this document is mandated in the Tri-Party Agreement (TPA) as part of the M-13 milestones for the Comprehensive Columbia River Evaluation, and is scheduled for completion by August 1994. The CTUIR's knowledge about and attendance at this meeting was at the invitation of a representative of the Oregon Department of Energy, and not the U.S. Department of Energy.

The purpose of this letter is to outline several issues raised at the meeting (and elsewhere) that have broad-scale or policy implications related to groundwater remediation and protection for the Tribes, even though many are primarily technical in nature. This letter, along with the attached CTUIR comments on the proposed N-Springs ERA, will serve to identify a number of major issues of concern to the Tribes with respect to both sitewide and site-specific groundwater remediation programs. Other issues likely will arise as our analyses progress.

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### CONSULTATION AND GOVERNMENT-TO-GOVERNMENT RELATIONS

CTUIR representatives were not specifically invited to participate in this meeting nor in the development of the draft strategy by DOE or its representatives, and this does not represent effective coordination and consultation with sovereign Tribal governments. The CTUIR has been at the center of involvement in the Comprehensive Columbia River Evaluation program--an issue that by mutual agreement is being used as a yardstick to measure effective government-to-government relations between Secretary of Energy Hazel O'Leary and the CTUIR Board of Trustees. Both in meetings with DOE representatives and in writing, CTUIR staff have repeatedly expressed interest in, requested, and generally received specific involvement with DOE and other representatives, from the beginning, in all aspects of the Columbia River evaluations. We further believe that comprehensive characterization and protection of Tribal interests in the river ecosystem requires our intimate involvement in development of the TPA milestone-mandated sitewide groundwater remediation strategy and groundwater protection management plan.

Even though the remediation strategy document is in the draft stage, the DOE Indian Policy requires that DOE "will [coordinate and] consult with tribal governments to assure that tribal rights and concerns are considered prior to DOE taking actions, making decisions, or implementing programs that may affect tribes," and this has not occurred. In addition, DOE has failed to live up to its federal trust responsibility to the CTUIR. The fiduciary trust relationship between DOE and Indian tribes means that DOE has corresponding duties to tribes that exceed DOE's duties to the public, such as early inclusion and participation in planning activities. Aside from DOE's considerable duties to the CTUIR under the federal trust responsibility and the DOE Indian policy, DOE also has a statutory duty to coordinate and consult with the CTUIR because the CTUIR is a designated natural resource trustee under CERCLA § 107. Provisions of these statutes (CERCLA § 104 (b) (2)) obligate DOE to coordinate its remediation planning with natural resource trustees early in the process. Hence, DOE has the duty to notify the CTUIR of critical activities that may impact Tribal interests, such as drafting of a sitewide groundwater remediation strategy and protection management plan, and to include CTUIR representatives in scoping, planning, and formulation activities.

### TRIBAL POLICY IMPLICATIONS OF SITEWIDE GROUNDWATER PROGRAMS

Many of the issues listed below will affect the basic way in which groundwater remediation and protection will be approached by both DOE-RL and DOE-HQ decision makers and integrated with other site activities. The approaches adopted will have serious implications and very different results related to protection and restoration of Tribal resources and the exercise of, or ability to exercise, treaty-reserved rights--a fundamental issue that is not now being adequately considered in the definition of remediation goals and development of field

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programs or in the analyses of their potential impacts. Successful or not, the results of groundwater remediation efforts at Hanford will range well beyond Hanford boundaries proper. These results will directly influence other efforts of long standing interest to the Tribes, including a broad range of natural resource issues within the Columbia Basin as a whole, such as pollution control and improvements in water quality, salmon recovery efforts, and restoration of the overall health of the Columbia River ecosystem.

### OBJECTIVES OF THE STRATEGY

Following the failure and public rejection of the "Columbia River Impact Evaluation Plan" (DOE/RL-92-28) last fall, the CTUIR have been instrumental in advocating and developing specific recommendations for a truly sitewide and comprehensive ecosystem-scale evaluation of historical, current, and foreseeable impacts that contamination releases from Hanford operations have had on the Columbia River system. Our efforts, along with those of others, resulted in development of the M-13 milestones in the recently renegotiated TPA to outline and schedule a timetable for the completion of major components of such a comprehensive evaluation program. These milestones include, as an integral part, the development of both a sitewide groundwater remediation strategy and sitewide groundwater protection management plan. It remains the Tribes' intent is that these milestones: 1) be truly sitewide, 2) be truly comprehensive, that is, inclusive of all Hanford facilities, operations, and activities, and 3) provide the basis for sufficiently detailed analyses to fully assess historical, existing, and foreseeable environmental impacts and cumulative impacts of Hanford contamination on Columbia River resources and the ecosystem. In particular, the groundwater remediation strategy and protection plan together would be instrumental in achieving meaningful improvements in Columbia River water quality and in improving the health of the ecosystem as a whole. Such fundamental programmatic direction would be both enforceable and applicable to all Hanford activities.

Several of the objectives outlined in the draft strategy are directly in line with points the Tribes have repeatedly made in both meetings and document comments:

- 1) "recognition that groundwater is connected on the reservation,"
- 2) "a sitewide perspective [would] allow better integration of other program activities into groundwater remediation,"
- 3) integrating sitewide groundwater protection by "recogniz[ing] the primary emphasis is on *stopping contamination in the first place*" [my emphasis],
- 4) "provide broad direction to guide decisions,"
- 5) "establish achievable interim remediation goals" directed toward long-term solutions, and
- 6) "incorporate [tribal and] public values."

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Thorough and effective incorporation of the stated public values may be difficult to achieve if, as was repeatedly emphasized, cost minimization is a principal decision making tool. Nevertheless, the public values cited by strategy developers are worth repeating here because they are, with one exception (4), an almost verbatim listing of values that the Tribes have repeatedly stated [with my additions]:

- 1) "be protective of human health and the environment,"
- 2) "be protective of the Columbia River,"
- 3) "reduce [and eliminate] the mobility, toxicity, and quantity of contaminants,"
- 4) "facilitate DOE's efforts to relinquish control of parts of the site,"
- 5) "do nothing to exacerbate groundwater protection and remediation efforts," and
- 6) "meet [or exceed] applicable DOE orders, federal, state, and local requirements."

Note that "respect Tribal treaty rights" is visibly absent from this list. The draft strategy was developed based on the following four elements: 1) cost minimization--there's only so much money available, 2) social and political priorities, 3) technical practicability, and 4) regulatory approval. These four criteria alone are most probably not sufficient to fully protect human health, the environment, and the Columbia River, or to fully, or even adequately, meet or satisfy any of the other "tribal and public values." It could be argued that if (and it would appear to be a big if) all of the above objectives were in fact attained or attainable, then at least some restoration and protection of Tribal resources and treaty rights could result.

### IMPEDIMENTS TO EFFECTIVE IMPLEMENTATION OF A SITEWIDE STRATEGY

Although virtually all of the above values and purposes are laudable and, I believe, fully supportable by the Tribes, there appear to be major impediments to full and effective implementation of these otherwise desirable objectives. Impediments stem from: 1) technical difficulties, both real and perceived, 2) internal programmatic or organizational obstacles within DOE and/or its contractors, and 3) overly pessimistic, "can't do" attitudes by some DOE and/or contractor staff.

#### Pessimistic Attitudes

For example, the recent meeting started off with a few general observations about groundwater contamination and current treatment projects across the site by the WHC geoscientists: it's an "intractable" problem; there is little public support for treatment of widespread groundwater contamination; it's a waste of money; there are too many technical difficulties; it costs too much for what we get in return, the money can be better spent elsewhere; tradeoffs are necessary because of limited funding; it's going to require a long-term commitment and funding, and we need to see some results fast.

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The stated intent of developing a sitewide strategy was not only to meet the TPA milestone, but to "get the biggest bang for the buck" by "marrying" the technical realities, regulatory guidelines, and public values. Use of the term "technical realities" by WHC staff was meant to convey to us that contamination by many dangerous chemicals is so widespread as to defy "total" clean-up, that capable treatment systems for many contaminants were so limited and expensive, or otherwise unable to accomplish desired clean-up goals, and that funding available for the large-scale efforts that would be required were limited and would probably become more so. Of course, this short-sighted, let's-give-up-before-we-start view totally ignores the vast differences expectable in true, long-term restoration costs, which would fully include costs associated with residual injuries to natural resources following "remediation" that would be subject to natural resource damage claims by trustees under CERCLA.

All in all, it seemed that strategy developers were far too willing to give up before even starting. It seemed very clear throughout the meeting that groundwater clean-up is a political hot potato, and, in spite of statements to the contrary, there is a very high degree of public visibility and interest and a strong political need, if not will, to accomplish results fast. The Tribes and the public have long been demanding meaningful remedial actions to counter 50 years of indiscriminate and irresponsible pollution of air, soil, and water resources by DOE and its contractors. Responsible parties must now begin to seriously and effectively address remediation of widespread groundwater contamination, even though initially the task may appear daunting or overwhelming. The point repeatedly emphasized at the meeting--and elsewhere--is that you must at least try. And in order to try, you must begin.

### Lack of Coordination and Communication between DOE Programs

One of the most serious deficiencies is that this strategy applies only to activities of the ER program; it does not apply to WM activities, tank waste management, or other sitewide programs such as environmental surveillance. It is rather astounding that the principal source of groundwater contamination, i.e., WM activities and their liquid effluent discharges, are specifically excluded from a "sitewide" groundwater remediation strategy. When I made this seemingly obvious point at the meeting, staff responded that DOE funding for each program was separate and, therefore, that ER actions could not control or influence WM activities. Refusing to cross invisible and artificially constructed bureaucratic barriers within DOE is a problem that the Tribes have encountered again and again; however, the Tribes also have seen that different internal programs can surmount these invisible barriers and work together quite successfully, as with the Environmental Restoration Disposal Facility (ERDF).

The groundwater remediation strategy is being supported by ER; the groundwater protection management plan is being supported by WM; the same person (Mat Johansen, detailed to DOE from USACOE) is in charge of developing both. Although these efforts comprise an

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integral part of the M-13 TPA milestones, it was not readily apparent how (if) these efforts were being coordinated and integrated with the Columbia River evaluations that Mike Thompson's group is conducting. CTUIR consultation with Mike's group has been ongoing, but thus far has not included any discussion of sitewide groundwater efforts, even though a working group has been created to develop a draft strategy.

Several recent Hanford publications specifically demonstrate that major portions of this work have already been done, but were never implemented, and now are being redone. For example, WHC itself has already prepared documents outlining sitewide approaches to groundwater remediation, in particular, the "Hanford Groundwater Cleanup and Restoration Conceptual Study," WHC-EP-0458, published in July 1992. This report outlines several alternative sitewide groundwater remediation scenarios that comprehensively assess: 1) groundwater use options, 2) potential sitewide groundwater restoration technologies and field programs applicable to Hanford conditions, 3) sitewide engineering systems recommendations, and 4) emerging technologies with potential application(s) at Hanford. Not all identified scenarios or options considered in this study would satisfy Tribal objectives, but this two-year-old report illustrates how much of the necessary work has already been done, but was never taken seriously enough by decision makers to move ahead and actually be implemented.

Furthermore, from a recent list of new publications, I have ordered a copy of "Hanford Site Groundwater Protection Management Program: Revision 1 (DOE/RL-89-12), an 82-page document again authored by Westinghouse Hanford Company. The brief summary provided suggests that this document may provide the desired comprehensive framework and other provisions for addressing sitewide groundwater remediation and protection needs. Was this document prepared in fulfillment or partial fulfillment of the TPA milestone(s) or is it otherwise being coordinated with the Comprehensive Columbia River Evaluation program?

Groundwater remediation and protection must be universally recognized and aggressively implemented as central to Hanford site restoration, and this must occur equally by DOE management, staff, and contractors at all levels. Now, at least some already completed efforts are again being duplicated, and the above cited studies are only readily identifiable examples of the wheel being unnecessarily reinvented. *In order to comprehensively address sitewide groundwater remediation issues, there is a critical need for all DOE programs:*

- 1) to have common goals,*
- 2) to dissolve the artificial bureaucratic separation between programs and staff,*
- 3) to recognize the interrelation of all their activities,*
- 4) to review the many existing studies and implement their recommendations, and*
- 5) to coordinate and integrate funding for and communication between all related programs.*

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### Internal Resistance to New Technologies or New Ideas

There also appears to be significant internal resistance to development and use of new or innovative technologies for contaminant removal and treatment, even though this is supposed to be an important part of DOE's new stated mission. Thomas Grumbly, Assistant Secretary of Energy for Environmental Management, has repeatedly emphasized the need for new technology development and application, and did so again in an interview in the April 1, 1994 issue of *Defense Cleanup*:

"First, I think the proportion of the program we devote to technology development is too low. I would like to see it increased from about the 6.5% of the program it is now, up to 8% in two years, with an ultimate target somewhere down the road of maybe 10% of the program being in technology development.

"Second, *we want to reward the programs who are actually doing on-the-ground environmental remediation* [my emphasis]. Feed more money into the environmental restoration program, but only in those places where we think we have major opportunities to get on-the-ground action. . . .

"We also want to make sure we do everything we can to fund the tri-partite agreements we made in Washington [for the Hanford site], *so we really do deliver on our commitments* [my emphasis]."

Mr. Grumbly's support for new technology development is undeniably very clear and strong; however, support for such efforts at the staff level appears less than enthusiastic. I heard such efforts to develop and apply new approaches quickly dismissed because "they would not work under Hanford-specific soil and hydrologic conditions," because "plumes were too large" and included "too many different contaminants," and because of "regulator resistance." As the Tribes have already seen in the N-Springs strontium removal action (see attached comments), the deck appeared to be stacked against further consideration of any new technologies from the beginning because in order for a technology to be considered, the screening process required that it have a history of use, proven effectiveness, have been used in similar circumstances or conditions, involved treatment of similar contaminants, and be commercially available--all criteria that no new technology could possibly satisfy. This built-in bias makes it appear that resistance to new ideas or approaches is pervasive among DOE, its contractors, and its regulators, and this is seriously inconsistent with both DOE-HQ direction and Tribal recommendations. It also points out a critical need for the Tribes to establish closer relations with regulators at EPA and Ecology with the goal of emphasizing the urgent need for innovation and action in the field, and not just strict adherence to the voluminous rules and regulations or adopting only the most conservative and "proven" approach.

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

### OTHER IMPEDIMENTS TO ACTION

The above are just a couple of examples of the types of impediments to action that are both unnecessary and artificial, but are sufficiently broad, programmatic, or pervasive in nature to exert a disproportionately large--and totally unnecessary--braking effect. Other problems or impediments are summarized into the two lists below, without a lot of detailed additional discussion. The first summarizes organizational impediments to moving forward with a sitewide groundwater remediation strategy. The second summarizes perceived deficiencies, primarily technical in nature, with specific treatment programs now ongoing or planned. Tribal comments on the proposed N-Springs ERA removal action (see attached) independently highlighted some of these same deficiencies, along with others, and discussed some of the relevant technical issues in considerably more detail.

#### Organizational or Mind-Set Impediments

The first list summarizes those issues and concerns that comprise organizational or mind-set impediments to moving forward aggressively with development and implementation of an integrated and proactive sitewide approach to groundwater remediation and protection:

- 1) Lack of a serious commitment by WHC to tackle the complex and difficult technical and political issues necessary to move forward aggressively with timely and proactive groundwater remediation and protection programs in the field,
- 2) Prioritization of funding and field activities appears directed primarily at maximizing near-term political benefits and public relations efforts,
- 3) Need for integration, communication, and coordination of funding and site activities between all sitewide DOE programs: programs need to have common goals,
- 4) Cost is the ultimate and primary decision making tool,
- 5) There is widespread, if unstated, confusion about DOE's role as natural resource trustee (steward) versus polluter and how this impacts its clean-up and site management responsibilities, and
- 6) The groundwater remediation strategy and groundwater protection plan are "revenue-neutral" and "decision-neutral;" that is, they may not impact costs of remediation programs and comprise advice only--a toothless beast. Tribal staff do not believe that this reflects the true intent of establishing the M-13 milestones.

#### Impediments or Problems Associated with Technical Issues

The following list summarizes deficiencies associated with current site-specific or plume-specific remediation approaches:

*CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION*

- 1) Current approaches appear directed primarily at containment and reduction in the further spread of contamination (e.g., barriers) and only secondarily at contaminant mass reduction and contamination removal,
- 2) Barriers, as currently envisioned by DOE, are not environmentally benign,
- 3) NRDA implications of these different approaches are significant--*and totally unrecognized or underappreciated*--in terms of residual injuries, liability, and/or irretrievable and irreversible commitments of resources,
- 4) Current treatment programs focus only on selected contaminants,
- 5) A blanket statement that remediation to MCLs is "not attainable," without reference to either specific contaminants, treatment approaches, future land use options, or Tribal and other stakeholder values,
- 6) Disposition of treated/partially treated groundwater currently is to existing wells, resulting in direct reinjection of residual contamination at or near the groundwater table--an unacceptable past practice that Tribal staff thought had ended in the mid 1950s,
- 7) Discharge of "treated" water to the ground is OK because intense public pressure to "do something" makes it acceptable,
- 8) A concerted and integrated sitewide effort to control liquid effluent discharges to the ground and to coordinate with sitewide groundwater protection planning is lacking,
- 9) Prioritization of site-specific remediation projects is based as much or more on public or political pressure than on scientific evaluations or risk assessments, and
- 10) Serious efforts to address widespread tritium, nitrate, and iodine contamination--now technically difficult--are needed, rather than simply making blanket statements that it can't be done or is too expensive. For example, areally widespread nitrate pollution should not be dismissed simply because "it's barely above MCLs" or "it's a far bigger problem in agricultural areas." Historical Hanford operations discharged vast quantities of nitric acid mixed with a variety of other chemicals and radionuclides directly to the ground. Similarly, efforts to control, reduce, and eliminate tritium discharge to the river should not be written off because "there is no (cost-) effective treatment" process or "it would cost \$30 billion just for the Hanford townsite area alone." Although such statements were portrayed as reflecting "hard reality," these sorts of pervasively negative attitudes give the impression--rightly or wrongly--that DOE and WHC don't consider groundwater remediation as a critical priority and don't even believe that it is worthwhile trying, let alone that meaningful results can actually be attained. You won't even know what can be done if you don't try.

Several of the above issues--specifically 1, 2, 3, 6, and 7--do not appear to be consistent with the stated objectives, that is, to do no additional harm, nor would they seem to reflect the meaningful incorporation of public values. These deficiencies also reflect the dire need for DOE and its contractors to proactively implement effective natural resource stewardship over

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

the long term, in fulfillment of its legally mandated trust responsibility, and to place less emphasis on short-term public relations campaigns directed toward "problem minimization" or altering its deeply entrenched public image as uncaring polluter.

### SUMMARY

In summary, development of a truly sitewide and comprehensive groundwater remediation strategy and groundwater protection management plan are desirable and necessary components of the Comprehensive Columbia River Evaluation program. There have been at least several efforts to develop sitewide approaches to some degree in the past, but, once developed, these have consistently failed to be effectively implemented. Given some of the discouraging attitudes we repeatedly encounter, how can the Tribes be assured that such failure will not happen yet again, particularly if such strategies or plans constitute advice only?

Even should a "revenue-neutral" and "decision-neutral" strategy be developed, there remain several potentially serious impediments to effective and successful implementation of comprehensive sitewide groundwater efforts. These include not only the "technical reality" and associated difficulties related to the sheer magnitude and complexity of the problems that DOE and contractor actions have created in the field, but seem to stem primarily from artificial internal organizational barriers and overly pessimistic, it's-too-big-a-problem-so-why-even-try attitudes that are still firmly entrenched within DOE and its contractors.

In addition, the developers of the strategy indicated their intent to take the strategy to the Hanford Advisory Board (HAB) in an attempt to promote its widespread support and adoption. It would be far more appropriate from both a legal and natural resource perspective for these efforts to be brought before the Natural Resource Trustee Council, where statutorily designated natural resource trustees, including DOE and the tribes, have both direct and specific legal interests and responsibilities in remediating, restoring, and protecting Hanford resources such as groundwater and the Columbia River. Moreover, natural resource trustees have the legal right to participate in remediation decision making and have powerful incentives to ensure that remediation programs maximally contribute to site restoration--the ultimate goal and endpoint of CERCLA activities--and to seek compensation for residual injuries that remain following remediation. Thus, it is in the best and long-term interests of all trustees--including DOE--to maximize remediation objectives and opportunities so as to minimize residual injuries. Interest in and support for sitewide groundwater remediation strategies and protection plans necessarily will be both much stronger and more firmly founded within the trustee council and less likely to be diluted or manipulated by narrow special interests or internal political rancor and posturing than at the HAB.

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

*The Tribes wish to see substantive efforts directed at remediating contaminated groundwater, on preventing its further contamination, and on reducing and eliminating impacts to the Columbia River ecosystem from such discharges.* Recommendations are being formulated for Tribal policy maker actions directed at dismantling some of the remaining obstacles to accomplishments at Hanford, particularly those of a programmatic nature. Some of the issues above will be most appropriately addressed at the DOE Secretary/HQ level, particularly with respect to program funding and activity prioritization, and effective communication and integration of activities from now separate DOE programs. Others will be best dealt with locally at both the staff and policy levels, as they relate to more site-specific Hanford issues. However, the extra push from above and a new site operations contractor that together result in some turnover of the old guard may provide some of the additional incentive necessary at RL to fully embrace Hanford's new mission--at all levels, to more seriously address Tribal concerns, and to at long last actually and constructively address the serious and long recognized contamination of land and water resources.

Sincerely,



Tom Gilmore

Hydrogeologist  
Hanford Environmental Restoration Project  
Department of Natural Resources

cc: William Burke, Treasurer, CTUIR Board of Trustees  
John Bevis, Member, CTUIR Board of Trustees  
Michael Farrow, Director, CTUIR Department of Natural Resources  
Rick George, Program Manager, CTUIR, DNR, EP/RP  
Kevin Clarke, DOE Indian Programs Manager  
Robert Stewart, DOE, Chief, Geotechnical Support Branch  
Bryan Foley, DOE, Environmental Remediation Branch  
Anthony Knepp, Westinghouse Geosciences Division  
Dan Tyler, Westinghouse Geosciences Division  
Doug Sherwood, EPA Hanford Project Manager  
Larry Gadbois, EPA  
Roger Stanley, Ecology  
Ralph Patt, Oregon Department of Energy/Water Resources



CONFEDERATED TRIBES  
of the

018479

*Umatilla Indian Reservation*

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1 July 1994

Honorable Hazel O'Leary, Secretary  
U.S. Department of Energy  
1000 Independence Avenue SW  
Washington, D.C. 20585

Dear Secretary O'Leary:

On behalf of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), I wish to express our sincere thanks and appreciation to you and your staff for your visit to our reservation on Friday, 17 June 1994. We especially appreciate your willingness to take the time to tour our reservation and to personally speak with us about our culture, our government, and our interests in activities at the Hanford Nuclear Reservation. Your initiative, openness, and sense of responsibility represent a refreshing change from administrations past. You demonstrate a recognition of the valuable role that tribes and our unique world view can play in assisting the DOE with the largest environmental remediation and restoration project in the nation.

Tribes have successfully and sustainably managed natural and cultural resources in our homeland for at least 13,000 years. We provide an important and independent service to both you and the Department of Energy so as to ensure that environmental remediation and restoration of the Hanford site and protection of the Columbia River ecosystem--the heart and lifeblood of our culture and community--remain at the forefront of DOE efforts.

I would like to take this opportunity to echo several major concerns of the CTUIR that we discussed both at the Summit and on our reservation tour related to DOE activities, programs, and direction. These topics, along with others, will be among our principal concerns in ongoing discussions and consultation with you and your staff, both at Headquarters and at Richland, in the coming months. At the risk of oversimplifying what are in fact highly complex issues or of not including a comprehensive list of our concerns, I have condensed and summarized our concerns in bullet form below. Attached to this letter is a more detailed discussion, which is probably best directed to your staff, outlining specific CTUIR requests and recommended DOE actions to begin to address and resolve our concerns.

1) Meeting of Assistant Secretary Grumbly with tribal representatives in Nez Perce country

- Historic and positive meeting of DOE management and 6 STGWG tribal representatives

- Discussed three broad areas/issues of tribal concern:
  - Establishing effective government-to-government relations
  - Provision of adequate funding to support required level of tribal involvement
  - Natural and cultural resources protection and management
- DOE commitment and support for a national-level steering committee of STGWG tribal representatives to review above concerns and issue report to DOE
- Strong desire to continue STGWG forum because of valuable and positive accomplishments and interaction, both among affected tribes and DOE-Headquarters

## 2) Revisit initiatives developed by Hanford Summit Steering Committee

- Tribal representatives chose not to participate in discussions leading to formulation of Summit II initiatives and recommendations because of:
  - Steering Committee refusal to include Tribal perspective and impacts to treaty rights
  - Focus exclusively on growth and diversification of Tri-Cities economy
- Environmental remediation and restoration of Hanford site and Columbia River are highest priorities
- Tribes will coordinate efforts and evaluate recommendations now contained in the Summit II Report, particularly with respect to impacts to treaty-reserved rights, federal government's trust responsibility, and opportunities for CTUIR participation in appropriate initiatives
- Tribes will report back to you within 45 days (1 August 1994)

## 3) Columbia River Comprehensive Impact Assessment (CRCIA)

- CTUIR and DOE agreed to use CRCIA as a "yardstick" to measure improved consultation
- DOE-Richland staff since have shown new willingness and made sincere efforts to consult
- Both technical and policy level relationships are still developing and expanding
- Need for immediate DOE declassification of 2500 documents about contamination effects to Columbia River ecosystem
- Need to fully integrate sitewide and comprehensive groundwater protection and remediation
- Need to evaluate application and limitations of risk assessment for remediation decisions and to identify alternatives to risk assessment

4) Columbia River Systems Operation Review Environmental Impact Statement

- Deepening crisis over continued decline of salmon and steelhead stocks throughout Columbia and Snake River basins
- Salmon are fundamental element of Tribal culture, economy, religious ceremonies, and treaty-reserved rights
- Many causes of degraded Columbia River water quality and quantity, but salmon mortality is primarily associated with hydropower dam operations
- Tribal review of draft EIS identified many deficiencies in analysis
- Tribal proposal for detailed technical review now in limbo; current federal agencies' funding commitment to tribes is inadequate
- Request Secretary O'Leary break stalemate by federal agencies (BPA), facilitate meaningful Tribal involvement, advance restoration of declining salmon stocks as key issue driving alternative development and preferred alternative selection

5) Tribal co-management of land, natural, and cultural resources

- Tribes have successfully and sustainably managed land, natural, and cultural resources for thousands of years
- DOE can learn much from holistic and respectful Tribal stewardship of the environment
- Tribes are the experts on land, natural, and cultural resources protection and management
- Need to establish DOE/Department of Natural Resources in Richland to support and coordinate DOE's natural and cultural resource trustee/steward responsibilities
- Tribes should be principal regulator for environmental and cultural resource compliance

6) Native American Employment Program and educational opportunities

- CTUIR commend Secretary O'Leary for restoring Native American Employment Program
- Need to provide educational opportunities and scholarships to young Tribal members
- Request establishment of CTUIR scholarship fund and internship program

7) Cultural awareness and sensitivity training

- CTUIR appreciate opportunity to provide such training for you and your staff
- Louie Dick (Board of Trustees Member), J.R. Wilkinson (Hanford Projects/Program Manager) will travel to D.C. during 19-21 July 1994 timeframe for presentation
- CTUIR support assignment of 2 additional FTEs for currently overworked and understaffed DOE-Richland Indian Program

8) Transportation of hazardous chemical and radioactive materials across the Umatilla Indian Reservation

- Heartfelt appreciation for DOE gift of \$100,000 to purchase much needed emergency response equipment and supplies for Tribal Fire Department
- Reservation tour directly emphasized vulnerability of Umatilla Reservation and its residents to effects of any transportation accident releasing hazardous/radioactive materials
- Minimize transportation of hazardous chemical or radiologic materials to the greatest extent possible, and evaluate existing uses for less hazardous material or process substitutes
- DOE commitment to develop standardized transportation planning protocol that establishes advance consultation, coordination, and notification of Tribal emergency responders

Key areas in need of improvement

- Funding for implementation of natural/cultural resources management and protection plan
- Aggressive and proactive implementation of groundwater remediation in the field
- Declassification of 2500 documents in conjunction with Comprehensive Columbia River Impact Assessment
- Protection and preservation of tribally sacred areas such as Arid Lands Ecology Reserve

In conclusion, Madame Secretary, we are impressed with and wish to congratulate you on the rather dramatic changes that you have accomplished within the Department of Energy during only your first year in office. We recognize that you have been the principal driving force behind many of the much needed and long overdue improvements in the DOE. These changes, along with your promise to

Confederated Tribes of the Umatilla Indian Reservation  
Letter of Appreciation and Outline of Major Issues for Secretary Hazel O'Leary  
1 July 1994  
Page 5

honor CTUIR treaty rights and fulfill the federal government's trust responsibility to tribes, make a dramatic improvement in our daily struggle to address and resolve issues of mutual concern to both the CTUIR and DOE.

Yet we also recognize that much work remains to be done. We intend to work with you and your staff closely in the future to address our concerns--about moving forward aggressively with environmental remediation and restoration of the Hanford site, about protecting the Columbia River ecosystem, the salmon, and our cultural resources, and about government-to-government cooperation--because the CTUIR believe that you have the necessary commitment to Indian people and to the salmon to bring about these much needed changes. The CTUIR look forward to further discussions with you and your staff about these issues. Please communicate back to us concerning specific staff contacts for designated projects or areas of concern for future follow-up and coordination.

I wish to personally thank you for taking the time to visit our reservation, to speak with us about our culture and concerns, and to see first hand the earth, the water, and the sky of which we are but one part. I warmly welcome your return to our reservation at any time.

Sincerely,



Donald Sampson

Chairman  
Board of Trustees

Enclosure

cc: Thomas Grumbly, DOE-HQ, Assistant Secretary for Environmental Management  
Cindy Kelly, DOE-HQ, Director, Office of Public Accountability  
John Wagoner, DOE-RL, Site Manager  
Kevin Clarke, DOE-RL, Indian Programs Manager  
William H. Burke, Treasurer, CTUIR Board of Trustees  
Michael J. Farrow, Director, CTUIR Department of Natural Resources



GENERAL COUNCIL  
and  
BOARD OF TRUSTEES

CONFEDERATED TRIBES

of the

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**DETAILED PRESENTATION OF CTUIR CONCERNS ABOUT  
DOE ACTIVITIES AT THE HANFORD NUCLEAR RESERVATION**

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An Attachment to Accompany  
Letter of Appreciation to Secretary Hazel O'Leary  
In Honor of Her Visit to the Umatilla Indian Reservation

Confederated Tribes of the Umatilla Indian Reservation

Prepared Under the Direction of the CTUIR Board of Trustees

Department of Natural Resources  
Hanford Program  
Hanford Environmental Restoration Project

July 1, 1994

Confederated Tribes of the Umatilla Indian Reservation

BASIS OF TRIBAL CONCERNS AND INTERESTS IN DOE ACTIVITIES

The Walla Walla, Cayuse, and Umatilla Tribes (Tribes) have used the lands and waters within and surrounding the Hanford Nuclear Reservation for fishing, hunting, plant gathering, medicinal, religious, ceremonial, and other cultural uses since time immemorial. These lands and waters provided the Tribes' home as well as their way of life. When the Tribes signed the Treaty of 1855 with the United States, the Tribes protected their rights to practice traditional activities on lands covering 6.4 million acres of what was to become northeastern Oregon and southeastern Washington, commonly referred to as the "ceded lands." The Treaty of 1855, which was formally adopted by the United States government, protects the exercise of these rights and these rights have been upheld by subsequent court decisions.

Effective exercise of these treaty rights, however, depends upon the health of the resources upon which these rights are based. Since 1943, many activities at Hanford have injured land, natural, and cultural resources both on the Nuclear Reservation and off-site, including the full length of the lower Columbia River downstream from Hanford. Hanford's ongoing waste management, remediation, and restoration activities must provide for the protection of the Tribe's natural and cultural resources which are, or have been, affected by Hanford operations. The Confederated Tribes of the Umatilla Indian Reservation (CTUIR), as a sovereign and constitutional government for the Tribes, are determined to protect and restore natural and cultural resources and to provide opportunities for Tribal members to exercise treaty-reserved rights throughout traditionally occupied lands, including the Hanford Nuclear Reservation.

The CTUIR desire to address, with the signatories to the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement or TPA), such critical issues as waste management, environmental remediation and restoration, enhancement activities, and implementation of the revised TPA. However, the CTUIR recognize the limited scope of the TPA and, as such, request that the DOE and other TPA signatories examine their Summit II commitment to treat the CTUIR in a manner equivalent to a Hanford regulator. This action both will allow a more thorough appreciation on the part of the signatories of the full range of Tribal interests, and will allow the CTUIR an appreciation of the limits imposed by the daunting task of "cleaning-up" Hanford.

In July, 1993, the CTUIR presented to the TPA signatories a document which outlines the Tribes' treaty-reserved rights and the U.S. government's responsibilities to protect Tribal interests (please refer to blue book). In the Tribes' Criteria for Evaluation of Proposed Changes to the Hanford Federal Facility Agreement and Consent Order (Criteria), the CTUIR outlines its concerns and interests relating to Hanford within the context of the following four general categories:

Confederated Tribes of the Umatilla Indian Reservation

- I. Protection of Tribal Sovereignty, including protection of Tribal rights in CTUIR ceded territory and areas over which the CTUIR exercises off-reservation treaty rights.
- II. Protection and Restoration of the Environment, both on the Hanford site and in areas affected by Hanford over which the CTUIR exercises off-reservation treaty rights. Protection of the environment guards the resources upon which treaty rights are based, including Columbia River fisheries and related resources.
- III. Protection of Cultural, Religious, and Archeological resources and related Tribal rights.
- IV. Protection of the Umatilla Indian Reservation and its members and residents from hazards caused by Hanford activities and from hazards caused by transportation of radioactive and hazardous materials to and from Hanford (Health and Safety).

These four categories provide the framework within which both Tribal policy makers and its staff assess the effects of DOE activities at Hanford on the interests and rights of the CTUIR, and for developing technical and policy level recommendations for protecting these interests.

In this Outline of Major CTUIR Concerns About DOE Activities at Hanford, the topics are ordered so as to reflect these categories of concern. Specifically, the first two topics fall within concerns about Tribal Sovereignty; the third and fourth topics address Environmental Protection and Restoration concerns, specifically associated with the Columbia River; the fifth, sixth, and seventh topics address concerns surrounding Cultural Resources Protection and Tribal Community needs; and the eighth topic addresses Health and Safety concerns associated with transportation of hazardous chemical and radiologic materials across the Umatilla Indian Reservation. The last two sections address several key areas in need of improvement and concluding remarks.

I. PROTECTION OF TRIBAL SOVEREIGNTY, INCLUDING PROTECTION OF TRIBAL RIGHTS IN CTUIR CEDED TERRITORY AND AREAS OVER WHICH THE CTUIR EXERCISE OFF-RESERVATION TREATY RIGHTS

A. Meeting of Assistant Secretary Grumbly with Tribal Representatives in Nez Perce Country

To prepare for a June 15, 1994, meeting between member tribes of the State and Tribal Government Working Group (STGWG) and Assistant DOE Secretary Thomas Grumbly, the

### Confederated Tribes of the Umatilla Indian Reservation

tribes met the day prior to outline common issues facing each tribe. The technique used was a "concepts-problems-recommendations" array. This technique examined three broad areas of concern. First, representatives defined, by "concept," the area of concern. This transformed site-specific concerns into complex-wide issues. Following this was an effort to outline specific problems with each concern. Lastly, representatives developed recommendations.

It was these universal areas of tribal concerns or issues which were presented to Mr. Grumbly during the meeting on the Nez Perce Reservation in Lapwai, Idaho, the day before Hanford Summit II. CTUIR representatives believe that this historic meeting had several highly positive results and that additional follow-up is both desirable and necessary.

Three broad areas of tribal concern were discussed at the meeting, including:

- 1) Opening, establishing, and maintaining effective government-to-government relations and communications,
- 2) Providing adequate DOE funding to support the required level of tribal involvement in DOE planning and decision making activities affecting or potentially affecting tribal interests, and
- 3) Developing and implementing comprehensive land, natural, and cultural resources protection and management plans.

The following comments about each of the three areas of concern reflect the understanding of the CTUIR, and does not necessarily reflect the other STGWG tribal representatives' views.

Effective government-to-government relations depend on U.S. government fulfillment of its trust responsibility, which includes concepts of environmental justice, recognition of tribal sovereignty (tribes are not the public), and tribal rights. Recommendations agreed to during this meeting for improving federal/tribal relations include: reviewing the position and authority of government-to-government liaisons; administratively reviewing the tribes' role in the DOE-HQ Office of Public Accountability; facilitating further meetings between tribal representatives, DOE-Headquarters, and site staff; and increasing efforts by DOE to contact and involve tribes before decisions are made.

Issues surrounding funding include: defining adequate levels of funding to affected tribes; refining the structure of funding to eliminate fractionalization and piecemealing; increasing the recognition that tribes can *and want* to provide DOE an oversight service at the sites; linking tribal funding to parallel increasing DOE activity levels or providing funding to tribes with no funding; controlling and reducing excessive contractor indirect rates; and exploring alternative funding mechanisms which allow tribes to do long-range project forecasting.

### Confederated Tribes of the Umatilla Indian Reservation

Recommendations developed for addressing these issues include: institutionalizing adequate tribal funding so as to avoid year-to-year budget uncertainties; identifying the individual needs for funding expressed by individual tribes with differing interests; and reducing contractor overhead rates with some savings going to support increased tribal involvement.

The last area of concern involves the protection and management of land, natural, and cultural resources. These resources are viewed very differently by the tribes than by DOE. The change in DOE's mission to environmental restoration has brought forth many historical deficiencies in DOE approaches that need to be recognized and corrected. For example, tribes recognize that humans are an integral part of their environment and cannot be arbitrarily separated from it. DOE now must begin to respect the tribes' "world view," and must recognize that tribes have other legal authorities, or drivers, to achieve effective land, natural, and cultural resources protection and management.

Major resource management problems include: the current lack of a cultural and natural resources department or program within DOE, especially at Hanford; a widespread lack of respect for cultural resources by non-Indians, which frequently results in the irretrievable loss of the cultural record (e.g., EMSL); a lack of DOE understanding of the social and cultural impacts of its actions in tribal communities; and a limited DOE understanding of protocol and regulations regarding cultural resources protection. Recommendations for rectifying these problems include: giving tribes the authority to manage natural and cultural resources at DOE facilities; providing cultural awareness and sensitivity training to DOE representatives by tribes; and establishing "cultural accountability" for DOE decisions and actions.

These Issues and Recommendations constitute an ambitious undertaking to resolve. CTUIR representatives very much appreciate Assistant Secretary Grumbly's commitment to establish a national-level steering committee of STGWG tribal representatives to review the above concerns and prepare a report to DOE on further actions. In addition, the CTUIR also have a strong desire to continue the STGWG because it has proven highly valuable and resulted in many positive accomplishments and interactions, both among affected tribes, affected states, DOE-Headquarters, and site representatives.

#### B. Revisiting Initiatives Developed by the Hanford Summit Steering Committee

As a matter for the record, the CTUIR were invited to participate on the Summit II Steering Committee. However, an unfortunate event during the first Summit left an indelible mark in the minds of Tribal representatives. During the Summit I session that Treasurer and Chief William H. Burke attended, the moderator demonstrated a profound lack of understanding

Confederated Tribes of the Umatilla Indian Reservation

when a "federal trust responsibility" comment from Chief Burke was misunderstood and incorrectly translated to a "what about this lack of trust in DOE" question for other interests. This indicated to Chief Burke and to Tribal staff that Summit planners did not understand this fundamental aspect of federal/tribal relationships. When Chief Burke was invited to participate on the Summit II Steering Committee, he declined because of such lack of recognition on the part of planners of this very important and critical aspect.

As a direct result of this exclusion and as was indicated to the Secretary at the Summit, Tribal interests, rights, and responsibilities were not considered in the formulation of any of the recommendations. In fact, it appears that these initiatives were developed solely to promote the narrow economic interests of the Tri-Cities region. However, the Tribes were once the principal economic power of the mid-Columbia Plateau region because of the salmon, which was highly valued by many tribes and widely traded for other resources. This traditional economy is now threatened by accelerating declines in Columbia Basin salmon runs; the health and sustainability of the traditional tribal economy was not addressed by the Steering Committee. Moreover, the recommendations now contained within this report may critically impact the treaty-reserved rights of this and other tribes--a fundamental, if grossly underappreciated, consideration. The CTUIR plan to closely evaluate such impacts and will report back to the Secretary within 45 days, by August 1, 1994. The CTUIR appreciate the Secretary's desire to revisit initiatives put forth by the Hanford Summit Steering Committee.

Meanwhile, environmental remediation and restoration of the vast problems existing at the Hanford site--the real priority--are being downplayed. Proactively and aggressively addressing environmental issues must be the principal focus of any initiatives that truly represent the interests of all entities interested in Hanford restoration. The CTUIR believe any DOE endorsement of initiatives that support diversification and growth of the Tri-Cities economy must first address and resolve critical environmental issues and then address the economic needs of the Tribes. Both must be implemented to uphold Tribal treaty rights and to comply with the federal government's trust responsibility.

II. PROTECTION AND RESTORATION OF THE ENVIRONMENT, BOTH ON THE HANFORD SITE AND IN AREAS AFFECTED BY HANFORD OVER WHICH THE CTUIR EXERCISES OFF-RESERVATION TREATY RIGHTS. PROTECTION OF THE ENVIRONMENT GUARDS THE RESOURCES UPON WHICH TREATY RIGHTS ARE BASED, INCLUDING COLUMBIA RIVER FISHERIES AND RELATED RESOURCES

## Confederated Tribes of the Umatilla Indian Reservation

### A. Columbia River Comprehensive Impact Assessment

In November 1993, the CTUIR's governing Board of Trustees selected the Columbia River Comprehensive Impact Assessment (CRCIA) to be used as a "yardstick" to measure DOE's progress toward improved consultation with the CTUIR. To date, two technical meetings between CTUIR and DOE, Ecology, and EPA staff have been held on the Umatilla Indian Reservation, one on January 21, 1994, and the other on May 9th. DOE-Richland staff, EPA, and Ecology have shown a new willingness and made sincere efforts to consult with the CTUIR, and we wish to commend these DOE efforts. Both policy and technical level relationships continue to develop and expand in a very positive manner.

Several issues associated with the CRCIA and closely related groundwater remediation and protection planning have been identified by the CTUIR. *Because the CRCIA is still in the very formative stages, it is imperative that all documents concerning Columbia River contamination be made available for tribal review.* These include classified or otherwise inaccessible documents as well as non-classified documents. Recognizing the sheer magnitude of documentation available for Hanford, this will not be an easy task. The DOE should recognize the unique ability of CTUIR staff to review and identify critical documents for immediate release. Nonetheless, these documents form the starting point for assessing known information and for identification of data gaps concerning Columbia River ecosystem contamination, fate, effects on biological systems, and human health effects. Making available all relevant information could potentially reduce the number of data gaps and the subsequent need for additional data collection for use in the human health and ecological risk assessment planned for the CRCIA.

In addition, there is a need in the CRCIA to critically evaluate the application and limitations of quantitative risk assessment for remediation decisions at Hanford. The CTUIR's world view recognizes that humankind is an integral component of the natural world and not separate from it. All things are interrelated and inseparable from one another in an interdependent world. The world view of the Tribes requires integration of natural resource integrity, ecosystem health, cultural health, human health, and socioeconomic well-being. Unfortunately, current human health and ecological risk assessment methodologies, outlined for example in EPA's "Risk Assessment Guidance for Superfund-Volume 1" (RAGS, 1989), focus on typical suburban activity patterns and exposure pathways for non-Indians.

In addressing non-suburban lifestyles, such as traditional Indian lifestyles and their world view or ecological principles, risk assessment methodology is usually deficient when the debate involves Tribal communities exhibiting:

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- 1) Greater than average exposure rates via standard pathways (for example, significantly greater fish consumption), and
- 2) Additional or multiple exposure pathways that are not, and indeed cannot, be considered in standard methodology (for example, traditional use of aromatic herbs for flavoring, extracts, infusions, smoke, steam, and incense).

Therefore, it is imperative to address critical questions such as: Is risk assessment an appropriate tool for remediation decision-making? What are the appropriate uses and limitations of risk assessment? What is the potential for misuse when making remediation decisions or defining "acceptable" clean-up standards? What are the alternatives, both quantitative and qualitative?

Given these concerns and other identified problems, the moral and ethical dilemmas presented by reliance on risk assessment methodology casts a shadow on its ability to act as the principal tool for remediation decision-making and in establishing "clean-up" standards. Remedial action decision makers must clearly account for and incorporate the rights, interests, and responsibilities of a sovereign tribal government to preserve and protect its future.

#### B. Columbia River Systems Operation Review Environmental Impact Statement

In direct connection with tribal concerns over land and resource management is the deepening crisis over the continued decline of salmon and steelhead fish stocks and the real threat of their extinction from the Columbia River basin, historically the producer of the largest salmon runs in the world. For thousands of years, salmon have comprised the fundamental basis and core of tribal culture, of the tribal economy, of many tribal religious ceremonies, and of tribal treaty-reserved rights. The CTUIR recognize that many complex and often interrelated factors have contributed to this crisis, including degradation of water quality and quantity, ever increasing discharges of contamination, improper farming and logging activities, and other unsustainable land management practices--all of which have accelerated dramatically in recent decades. We also recognize that many of these issues are outside the scope and power of the Secretary of Energy.

However, one of the CTUIR's principal concerns has long centered on the virtually exclusive existence and operation of the Columbia and Snake River dams for hydropower production, with little regard for its effects on salmon mortality and ecosystem health, including the *de facto* abrogation of Tribal treaty rights. Salmonid smolts migrating to sea from the Hanford Reach of the Columbia River or the Umatilla River basin must pass through, respectively, four and three dams safely in order to reach the ocean. Estimates are that up to 90% of all

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smolts that pass through *each dam* are killed simply because they are ground up in unscreened turbines. Others never reach the sea because the natural flow of the river is so slowed by lengthy impoundments behind the dams that fish become confused and/or are subjected to increased predation.

Earlier this year, CTUIR/DNR staff reviewed a draft Environmental Impact Statement (EIS) for the Columbia River Systems Operation Review, which is being coordinated by the Bonneville Power Administration, a Department of Energy agency, and other federal agencies. The CTUIR found it highly deficient in terms of consultation with Indian tribes in its scoping and formulation, in the key issues identified, the screening criteria used, and in the limited range of system-operation alternatives being considered. The CTUIR also submitted a proposal, at the request of the coordinating agencies, for a more detailed Tribal review of the EIS, but federal agency efforts to facilitate and fund Tribal involvement in the review process since have stagnated, even though the critical need remains.

*We respectfully request the Secretary's formal involvement in this process to help facilitate meaningful tribal involvement, to overcome the current stalemate, and to advance preservation and restoration of the declining salmon stocks as one of the key issues that should drive system-operation alternative development and selection.*

III. PROTECTION OF CULTURAL, RELIGIOUS, AND ARCHEOLOGICAL RESOURCES  
AND RELATED TRIBAL RIGHTS

A. Tribal Co-Management of Land, Natural, and Cultural Resources

Several recent DOE activities have pointed to the critical and essential role that tribes can play in the co-management of land, natural, and cultural resources at Hanford. The DOE can learn much from the tribes with respect to sustainable and holistic stewardship of the environment.

The best illustration of the tribe's abilities is the unfortunate incident involving disturbance of Native American burials at the site of the new Hanford Environmental and Molecular Laboratory (EMSL). DOE rightfully stopped construction at that site upon discovery of the burials, and is cooperating fully to facilitate Tribal planning and restoration of the former EMSL site. The results of this co-management effort have been and continue to be instrumental in fostering increased awareness of the tribes' management capabilities and the key role that tribes can play in restoration activities across the Hanford site, both now and in

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the future. The CTUIR applaud DOE's efforts to give the tribes a more important and central role in Hanford decision making and activities, as demonstrated by the EMSL incident. These Tribes have long sought greater involvement in the protection and management of land and resources everywhere within the ceded lands, including the Hanford area. In fact, these lands are just as important to the Tribes, as they were to tribal ancestors, as the lands within the reservation proper that the Secretary recently visited.

Unfortunately, the EMSL incident is not an isolated example of poor cultural resources management on the Hanford site. Five years ago, the CTUIR negotiated a Cultural Resources Management Plan (Plan) in good faith with the DOE. Yet just this spring--only two months before the EMSL incident--DOE-Richland representatives told us that they had never implemented that Plan. In the past, DOE representatives have told us that they did not receive enough cultural resources budget monies to adequately obey cultural resources protection laws already on the books, that all their money was being spent just for National Historic Preservation Act, Section 106, project-specific compliance. No additional funding was left over to begin the comprehensive sitewide surveys that are required under the Plan at the rate of 10 percent of the site per year. Had the Plan been implemented, the EMSL fiasco could have been avoided.

There is one other critically important point to emphasize concerning resource protection and management at the Hanford site. DOE cannot hire any contractor who can provide more knowledge about land, natural, and cultural resources at the Hanford site than the tribes. The tribes are the experts on resources across the Columbia Plateau, and have been for thousands of years. Contractors such as Battelle cannot manage these resources with the depth and breadth of knowledge and the respect that the Tribes can provide.

With DOE's change in mission, the new challenges of land, natural, and cultural resource stewardship points to an ever-increasing need to establish a DOE-RL Department of Natural and Cultural Resources. This department would support, coordinate, and implement DOE's resource trustee and stewardship responsibilities.

#### B. Native American Employment Program and Educational Opportunities

The CTUIR commend Secretary O'Leary as the principal driving force behind restoration of the Native American Employment Program at Hanford, and the CTUIR wish to formally acknowledge those efforts. Tribal members represent one of the CTUIR's greatest--and most underutilized--resources. The CTUIR deeply value the educational and work experience opportunities that programs such as this offer. Through such opportunities, Tribal members

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can directly obtain the types of education and professional experience that are needed for essential services and expertise in the Tribal community, for the CTUIR to become more self-sufficient as a sovereign government, and for the Tribes to plan for and thrive in the future. The CTUIR request that Secretary O'Leary expand the scope of the Native American Employment Program to provide these much needed educational and scholarship opportunities by establishing a CTUIR scholarship fund and internship program.

### C. Cultural Awareness and Sensitivity Training

The CTUIR appreciate the Secretary's invitation for CTUIR representatives to travel to Washington, D.C., to provide tribal cultural awareness and sensitivity training to the Secretary's and DOE-HQ staff. Chairman Sampson has asked Louie Dick, a member of the Board of Trustees, and J.R. Wilkinson, Hanford Projects/Program Manager, both of whom the Secretary met on the tour, to coordinate and present a cultural awareness training for DOE staff during the July 19-21, 1994, timeframe. Mr. Dick has made a number of such presentations to local and civic groups and federal and state agency representatives over the years. His unique presentation and style are well received and he is honored to accept the Secretary's invitation.

We also very much appreciate Kevin Clarke, Indian Programs Manager for DOE-Richland, for committing the DOE Graphics Department to update and redraft the slides that Mr. Dick uses for his presentations. In addition, CTUIR policy makers and technical staff both have good working relationships with Mr. Clarke; however, the work load has increased to the point that a single person can no longer adequately manage the full range of DOE/Tribal issues and activities now ongoing, nor address the issues presented in this Outline. The CTUIR fully support the provision of two additional FTEs to enhance the Richland Office's essential, but currently overworked and understaffed, Indian Program.

## IV. PROTECTION OF THE UMATILLA INDIAN RESERVATION AND ITS MEMBERS AND RESIDENTS FROM HAZARDS CAUSED BY HANFORD ACTIVITIES AND FROM HAZARDS CAUSED BY TRANSPORTATION OF RADIOACTIVE AND HAZARDOUS MATERIALS TO/FROM HANFORD (HEALTH AND SAFETY)

*First, the CTUIR wish to express to DOE our deepest and most heartfelt appreciation for the Department of Energy's generous gift of \$100,000 to the CTUIR for the purchase of much needed equipment and emergency supplies to outfit our recently acquired hazardous materials emergency response vehicle.*

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A. Transportation of Hazardous Chemical and Radioactive Materials Across the Umatilla Indian Reservation

The CTUIR believe that this gift reflects the Secretary's genuine commitment to actively fulfill the federal government's trust responsibility to tribes and represents the ideal of what government-to-government relations are supposed to be. On our tour of the reservation Friday morning, it was easy to directly see how any transportation accident releasing hazardous chemical or radioactive materials to the environment could directly affect the Tribal community in Mission, Oregon. In addition to this direct effect, the Interstate-84 (I-84) route and the Union Pacific Railroad traverse several major rivers in the Tribes' ceded lands and an accident within these lands could drastically and directly affect this reservation's residents, its environment and natural resources, its water courses, and the very culture of this Tribal community.

This money will further aid the Tribes in conducting a comprehensive transportation exercise on the reservation this fall in order to assess the emergency response capabilities of the Tribal Fire Department. The explicit purpose of this exercise is to test the emergency preparedness of various federal, state, and local agencies, their ability to coordinate efforts, and to identify mitigation efforts and plans needed to reduce environmental impacts. The CTUIR acknowledge and appreciate the involvement and financial support that DOE has provided for this critical effort.

The Tribal Fire Department recently completed a hazard assessment, which concluded in part that "the geographic location and environmental characteristics of the Umatilla Indian Reservation make it particularly vulnerable to accidents involving the transportation of HAZMAT [hazardous materials]," and that HAZMAT "shipments will continue to be subjected to the hazardous terrain and frequent inclement weather along transportation corridors [such as I-84] which increase the likelihood of accidents." The hazard assessment further concludes that transportation accidents along either I-84 or the Union Pacific rail line pose the greatest risk to the reservation and its residents.

In addition, CTUIR's Hanford staff have developed detailed comments on recent DOE transportation campaigns associated with:

- 1) Spent Navy nuclear fuel shipments to INEL (Idaho),
- 2) Return of cesium isotope capsules from commercial facilities to Hanford, and
- 3) Shipment of contaminated nitric acid remaining from previous PUREX operations.

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Within these comments (please refer to blue book), staff outlined the range of natural hazards existing along both the highway and railroad routes, primarily associated with rugged terrain and adverse weather conditions in the Blue Mountains. These comments also quantitatively document the unusually high accident rates along these routes, particularly for trucks, elevated levels of injuries and fatalities, and accidents attributable to inclement weather conditions.

The vulnerability of the Umatilla Indian Reservation and its people to any transportation accident is the chief reason that we ask DOE to ensure that transportation of hazardous or radioactive materials or waste to and from Hanford is minimized to the greatest extent possible. The CTUIR request that DOE conduct an analysis of existing chemical uses to evaluate each for the possibility of substituting less hazardous materials or processes.

Because the CTUIR also believe that advance planning and preparedness are key to any effective emergency response, the CTUIR recognize the DOE's commitment to develop a standardized transportation planning protocol at Hanford to serve as a national model for DOE transportation campaigns involving hazardous chemical and radiologic materials. As a basis for initiating such discussion, CTUIR staff have outlined several desirable components of such a protocol in the above cited nitric acid shipping campaign comments. We look forward to meeting with appropriate DOE staff to further discuss, develop, and implement a model transportation planning protocol.

#### KEY AREAS IN NEED OF IMPROVEMENT

Finally, and in spite of all the Secretary's good efforts, the CTUIR also recognize that there remain substantial problems to overcome and that further culture change within DOE is necessary in order to fully embrace Hanford's environmental remediation and restoration mission. For example, and without going into additional detail at this time, the CTUIR outline here only a couple of major areas where we believe that improvements or more aggressive approaches are needed by the DOE.

Key areas needing improvement include:

- 1) Adequate provision of funding for implementation of effective land, natural, and cultural resource planning and management at Hanford.
- 2) Aggressive support and a long-term funding commitment for implementation of groundwater remediation programs of sufficient scale and scope to treat and remove all expectable contaminants, reduce or eliminate contamination extent and levels, and to

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control and reduce the further spread of contaminant plumes and discharge into the Columbia River.

- 3) There is also an urgent need to identify, protect, and preserve tribally sacred and culturally significant areas such as the Arid Lands Ecology Reserve, Gable Mountain and Gable Butte, and the entire length of the Columbia River corridor along the Hanford Reach, including the former EMSL site.

**CONCLUDING REMARKS**

In conclusion, the CTUIR are impressed with and wish to congratulate Secretary O'Leary and her staff on the dramatic changes accomplished within the Department of Energy during her first year in office. The CTUIR recognize that the Secretary is the principal driving force behind many of the much needed and long overdue improvements in the DOE. These changes, along with both President Clinton's promise and Secretary O'Leary's proactive commitment to honor Tribal treaty rights and the government's trust responsibility to tribes, make a dramatic improvement in our daily struggle to address and resolve issues of mutual concern to both the CTUIR and the DOE.

Yet the CTUIR also recognize that much work remains to be done and we are committed to the government-to-government partnership that this demands. The CTUIR intend to work closely with the Secretary and her staff in the future to address tribal concerns--about moving forward aggressively with environmental remediation and restoration of the Hanford site, about protecting the Columbia River ecosystem, the salmon, and our cultural resources, and about government-to-government cooperation--because the CTUIR believe that Secretary O'Leary has the necessary commitment to Indian people and to the salmon to bring about these much needed changes. The CTUIR look forward to further discussions with the Secretary and her staff about these issues. Please communicate back with us concerning specific staff contacts for designated projects or areas of concern for future follow-up coordination and discussions.



CONFEDERATED TRIBES  
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January 5, 1995

Annette Carlson  
Westinghouse Hanford Company  
P.O. Box 1970, M/S B3-35  
Richland, Washington 99352

Subject: CTUIR COMMENTS ON ENVIRONMENTAL RESTORATION PROGRAM  
REFOCUSING UNDER THE TRI-PARTY AGREEMENT

Dear Tri-Party Representatives:

Hanford Program staff of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) are pleased to comment on the Tentative Agreement reached between Washington Department of Ecology, the U. S. Environmental Protection Agency, and the U. S. Department of Energy (the Tri-Parties) on the terms of a fifth amendment to the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement, or TPA).

This proposed (fifth) amendment to the TPA is composed largely of issues that were not resolved during the fourth amendment to the TPA, which was negotiated in 1993, and signed on January 25, 1994. Because the fifth and fourth amendments are so closely linked, our discussion will refer often to the fourth amendment and to the negotiations which produced it.

**I. CONSULTATION BETWEEN THE CTUIR AND THE TRI-PARTIES**

**A. BACKGROUND -- CONSULTATION DURING AMENDMENT FOUR**

The fourth amendment to the TPA was negotiated exclusively between the Tri-Parties from March through September, 1993. In July of 1993, the CTUIR sent the Tri-Party negotiators a guidance document, entitled "Criteria for Evaluation of Proposed Changes to the Hanford Federal Facility Agreement and Consent Order" (Criteria). This document outlined the basis and interests of CTUIR involvement in planning and decision making at Hanford. The document also presented a series of criteria that CTUIR staff and policy makers would use to assess the impacts of proposed TPA changes on CTUIR interests, rights, and responsibilities. Although our Criteria document specifically requested responses from the Tri-Parties on a number of key points, neither DOE nor EPA responded to the document.

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When the Tentative Agreement on the fourth amendment to the TPA was released to the public in October 1993, CTUIR staff performed an exhaustive review of the proposed changes, culminating in a 34-page comment letter to the Tri-Parties. Our letter, dated December 15, 1993, raised a number of overarching tribal concerns framed around the Criteria. It also specifically commented on most issues within each enclosure of the Tentative Agreement.

During Amendment Four, the Tri-Party negotiators only allowed themselves a little more than a month's time to respond to comments and make changes in the Tentative Agreement based upon these comments. This was far too little time for the Tri-Parties to thoughtfully respond to comments on such a comprehensive amendment. As a result, the Tri-Parties' response to comments and adoption of changes to the Tentative Agreement based upon those comments was quite deficient. The Tri-Parties did not release a response to comments document until nearly a month after the agreement was signed (although it was back-dated so as to appear to have been released at the same time as the signing).

Our greatest frustration, however, was inspired by a hastily arranged consultation meeting between CTUIR staff and the Tri-Party negotiators. This meeting was held only a week before the scheduled signing of the new amendment. When CTUIR staff asked what impact the meeting would have on the amendment, Dru Butler of Ecology (as well as other representatives) told us that the meeting could have *no* impact on the language of the amendment. This was because the signing date was only a week away, so there was too little time to make changes (the document was already being sent to the printers) and the Tri-Parties were unwilling to delay the signature date. While, in retrospect, CTUIR staff suppose Ms. Butler and the other representatives should perhaps be complimented for their candor, they were essentially admitting that this consultation meeting was a sham. CTUIR staff left this meeting feeling used. CTUIR staff concluded that, despite our hard work and earnest attempts to be included, we had been shut out of the amendment process.

Our frustration was magnified because this was not the first time that CTUIR staff had been shut out of Hanford decision making. For most of the preceding six months, CTUIR staff had been struggling to gain access to planning documents that DOE and the regulators were releasing to the public. As a minimum requirement of the federal trust responsibility to Indian tribes, and as a merest requirement of government-to-government relations, the Tri-Parties should have been sending the CTUIR every document that was released to the public. Moreover, the CTUIR should have been receiving these documents (at the very latest) at the same time the documents were sent to the regulators. Instead, CTUIR staff were only receiving a tiny percentage of the documents being released, and those we did get were being sent at the same time they were being released to the public. Despite our many attempts to call DOE's attention to this threshold consultation issue, CTUIR staff saw little change in the quantity or timing of the documents we were receiving.

B. CONSULTATION DURING AMENDMENT FIVE

It is against this background that CTUIR staff contrast the performance of the Tri-Parties during the recent negotiations over the ER Refocusing amendments to the TPA.

- During the most recent TPA negotiations, the Tri-Parties have done a very good job of consulting with CTUIR staff. CTUIR and other tribal representatives were invited to attend regular briefings by the Tri-Parties on major issues and progress throughout the negotiations. The views of CTUIR and other tribal staff were discussed during these meetings. CTUIR staff had access to change packages as the packages' terms were being drafted and redrafted. *The Tri-Parties are to be commended for doing an excellent job in openly communicating with the CTUIR concerning this amendment.*
- The schedule the Tri-Parties have adopted for this amendment provides them with considerably more time to thoughtfully respond to comments. It seems likely that, this time, the Tri-Parties might actually have allowed enough time to thoroughly consider comments submitted, and to modify the Tentative Agreement in response to tribal comments, should such modifications be necessary.
- DOE has improved considerably at providing documents to the CTUIR in a timely manner, and providing briefings to CTUIR staff on projects of key concern. Generally speaking, DOE is now providing documents to the CTUIR at the same time that DOE provides them to the regulators. There are still occasions when major planning documents are received by regulators months before they are received by CTUIR staff, but these instances appear to be less frequent as DOE staff become better informed of their trust duty to tribes. As a whole, the Tri-Parties have made a tremendous improvement, which has greatly facilitated improved understanding and early involvement in projects of interest to the CTUIR.
- DOE has also shown a new willingness to brief CTUIR staff when projects arise that are of great concern to the CTUIR. Because of DOE's new willingness to provide these face to face briefings, CTUIR staff now are able to identify and address many issues at an early enough stage to actually have a hope of influencing the outcome. These briefings are not always a success -- we still occasionally have to endure DOE or contractor representatives who belittle or ignore legitimate tribal concerns -- but as a whole these briefings are very valuable.
- DOE and the regulators deserve credit for instituting real reforms during the Amendment Five negotiations. CTUIR staff are sincerely grateful that the Tri-Parties have taken concrete measures to respond to these Tribal concerns.
- Finally, CTUIR staff recognize that Amendment Five to the TPA addresses considerably less sweeping and less contentious issues than were contained in Amendment Four.

Amendment Five was a comparatively "safe" setting in which the Tri-Parties could experiment with providing broader tribal participation. *CTUIR staff are encouraged by this experience, and by the obvious good faith and openness displayed on this occasion by Tri-Party representatives.* CTUIR staff further recognize, however, that the proof of the Tri-Parties' new ways will come when the time comes to grapple with much more divisive issues. When such a time of testing comes, the Tri-Parties should follow the positive example of tribal consultation established in Amendment Five. Open and early tribal consultation will result in a more sound project being adopted more quickly with greater support of interested parties.

## II. COMMENTS ON THE ER REFOCUSING AMENDMENTS

CTUIR staff offer the following comments and observations about both the ER Refocusing amendments overall and specific issues within individual milestone change packages.

- By comparison to Amendment Four, the ER Refocusing amendments to the TPA are rather narrowly framed, focused primarily on ER program integration and internal TPA consistency. As a result, CTUIR staff have found these Amendments to be quite uncontroversial and focused primarily on tying up loose ends and better integration of last year's Amendment Four. The key issues behind these current Amendments were already debated and agreed to in 1993 and early 1994. Moreover, where CTUIR staff have had concerns about these amendments, these concerns were voiced during our negotiation sessions with the Tri-Parties.
- In general, CTUIR staff find the currently proposed ER Refocusing changes to be desirable and positive changes that better integrate and coordinate compliant waste management and sitewide environmental remediation and restoration planning and actions. CTUIR staff also recognize that these changes contribute to greater efficiency and effectiveness of remedial actions with increasingly limited funds, and avoid unnecessarily duplicative efforts associated with variations in regulatory compliance with multiple statutes. CTUIR staff support the coordination and potential cost savings that will result from an integrated approach to RCRA hazardous waste management practices and CERCLA/RCRA past-practice site remediation.
- *More specifically, CTUIR staff greatly appreciate the Tri-Parties' recognition of the fundamental importance of the Columbia River system to tribes, and that the essence of ER Refocusing is to concentrate remediation and restoration efforts along the immediate Columbia River corridor.* CTUIR staff believe that meeting higher priority goals near the Columbia River justifies the *temporary* delays in completing investigations and RCRA closure planning in the 200 Areas. Nevertheless, CTUIR staff also recognize the importance of fully completing the 200 Area "clean-ups" immediately following the near-river remedial actions, as the threat to the river posed by 200 Areas contamination is no less significant, only delayed

because of travel times.

- The focus on expedited control of N-Springs discharges and on a coordinated, model planning effort for N-Area deactivation and decontamination and decommissioning that may ultimately be applied at other Hanford facilities also is a highly positive change. It is particularly important that formal processes be created to facilitate a smooth and *continuous* transition from deactivation to full-scale decontamination and decommissioning--*and especially that the sufficient and long-term commitment of funding be made to ensure that this transition actually occurs* (a concern already raised in connection with the ongoing Facility Transition negotiations). The N-Area is an appropriate location to initiate such efforts, particularly in light of the hazards and source control challenges posed by the 1301 and 1325 cribs. CTUIR staff already have been involved in and commented on N-Springs discharge control efforts and will continue to follow N-Area issues closely. CTUIR staff also expect to review and comment on the N Reactor Deactivation Program Plan during 1995.
- CTUIR staff recognize the need to remove the timing inconsistencies remaining from the Amendment Four negotiations regarding the M-16 and M-45 milestones for closure of the single-shell tank farms. Although any continued delay in addressing the serious hazards posed by the tank farms and especially the older, often leaking single-shell tanks is generally to be avoided, CTUIR staff recognize that this change provides for a more realistic and achievable schedule. *CTUIR staff also applaud further reinforcing the Tri-Parties' commitment in M-16 to complete all 100 Area remedial actions by 2018. Moreover, CTUIR staff strongly support the expansion of the M-16 milestones to include full decontamination and decommissioning of all facilities and structures (except reactor cores) in the 100 Areas.* This highly proactive and positive commitment by the Tri-Parties goes a long way in attempting to meet both the spirit and specifics of tribal goals and objectives for the Columbia River corridor.

### III. KEY ISSUES STILL TO BE ADDRESSED

#### A. FORMALIZING THE DOCUMENT ACCESS POLICY

During one TPA negotiation session, the issue was raised of when tribes should receive documents. At that time, DOE representative Pat Willison stated that DOE's policy is that any time a document goes to a regulator it also goes to the tribes. He also stated that tribes can participate at any decision point, and that tribes will be provided documents at any point before a decision that allows them time enough to review the documents and participate in the decision. Upon hearing this, Dave Conrad, of the Nez Perce Tribe's ERWM Program, requested that the DOE policy be put into writing. *In the ensuing discussion, all those present, including negotiators for all three parties, agreed to a specific language change to § 10.10 of the Action Plan which would formally record this DOE policy.*

CTUIR staff were disappointed to find no reference to this change in the Tentative Agreement on Amendment Five to the TPA. The issue of tribes' access to documents and participation in decision making is extremely important to tribes, and as such, should not be left to customary practices alone. CTUIR experience is that institutions have short memories as personnel come and go, a practice that has exploded at DOE this past year. *CTUIR staff formally request that this addition be made to the Action Plan as soon as possible, preferably during this current amendment.*

**B. GRAVE CONCERNS OVER DOE'S MISHANDLING OF THE COLUMBIA RIVER ASSESSMENT**

CTUIR staff have prepared a separate letter to John Wagoner, copied to the Tri-Party representatives, outlining three principal concerns regarding progress--or lack thereof--being made in the Columbia River Comprehensive Impact Assessment. These concerns focus on: 1) the increasing failure since mid 1994 of DOE to consult with the CTUIR on substantive issues associated with completion of the Assessment, 2) confusion or misunderstanding by some DOE representatives about the true purpose, scope, and objectives of the Assessment, as clearly defined by tribes, regulators, and stakeholders over the past year, and as outlined in the latest M-15-80 change package, and 3) the excessive discretion of some DOE managers in irresponsibly juggling or diverting funding away from this widely supported and agreed upon project. *The obsfucation of the Columbia River Assessment by some DOE and/or contractor staff stands in stark contrast to the comprehensive scope and refreshing openness of the ER Program Refocusing efforts.*

*The proposed M-15-80 change package drafted by Ecology and EPA (12-14-94), outlining an appropriately comprehensive scope and goals and including a detailed outline and specific schedules for completion of all major and interim milestones, must be fully supported by DOE and formally adopted in the ER Refocusing amendments.*

**IV. CONCLUDING REMARKS**

CTUIR staff commend the Tri-Parties for negotiating a set of TPA change packages that better integrate Hanford's Environmental Restoration program and that seriously address and resolve issues or inconsistencies remaining from last year's Amendment Four negotiations. Many of these changes also address specific tribal comments to these issues provided last year, along with more general concerns associated with big-picture program integration and direction shared by tribes, regulators, and other interested parties. Dramatic improvements have been made in involving tribes throughout the process this time, which has resulted directly in a more sound and widely supportable package. CTUIR staff wish to commend the Tri-Parties for the dramatic improvements they have made with regards to meaningful tribal consultation over the past year. CTUIR staff sincerely hope this trend will continue.

Nevertheless, CTUIR staff and policy makers are deeply concerned about the increasing budget cuts--euphemistically referred to as "productivity challenges"--that are being singularly focused on the Environmental Restoration program, when both the largest Hanford expenditures and most widespread waste and fraud are concentrated in the Waste Management and Operations areas. Environmental restoration is the chief mission of the Hanford site now; it is no longer defense production, although this is often hard to discern from the increasing diversion of already limited ER program funding to other purposes.

CTUIR staff do not see concrete evidence that cost and management inefficiencies are being systematically eliminated. Rather, decreased funding is being used as an excuse to simply cut or defer the scope of remedial efforts agreed to by all three parties in the TPA. This deceitful approach does not enhance the credibility of DOE and its contractors to actually complete the actions agreed to in the TPA.

At a bare minimum, commitments agreed to in the TPA must receive sufficient funding to permit their satisfactory completion. Moreover, more serious efforts to achieve real efficiency improvements must be accomplished in order to meet both the spirit and expectations of Amendment Four's Cost and Management Efficiency Initiative. Funding reallocation decisions thus far appear to have occurred so quickly as to represent nothing more than knee-jerk reactions. Such "decisions" do not--and indeed cannot--reflect thoughtful consideration of where specific cuts could be most effective or how the consequences of such cuts may impact other (desirable) programs or activities across the site, either now or in the future.

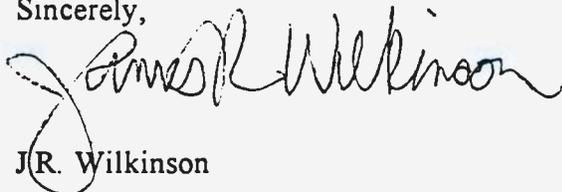
CTUIR staff are further concerned that the current approach--blanket cuts of some given percentage across the board--will most critically impact just those on-the-ground remedial programs that are the most important and action-oriented, rather than directly confronting the more difficult task of identifying and then focusing specifically on eliminating the real waste, excessive management, and other bureaucratic inefficiencies. All such reallocation decisions must be first and foremost directed at achievement of more "clean-up" progress in the field and less "clean-up" delay and review in the office. For example, how can DOE justify to tribes, regulators, and U.S. taxpayers the siphoning off of millions of dollars from the ER program to support economic diversification of the Tri-Cities when there are clearly not enough funds to meet even the minimum commitments of actual environmental restoration??

CTUIR staff also are aware that regulators share these concerns about haphazard funding reallocations and the impacts that will necessarily occur to meaningful and timely remediation and restoration of the Hanford site. CTUIR staff sincerely hope and expect that DOE will carefully and broadly consider the impacts that such reallocation will have in fulfilling good faith commitments made in the TPA. Staff further expect that such decisions will be based on sound and defensible technical or programmatic policy, planning, and realistic cost estimates that are not inflated by contractor padding, excessive indirect costs, redundant

Confederated Tribes of the Umatilla Indian Reservation  
Letter to Tri-Parties on Environmental Restoration Program Refocusing  
January 5, 1995  
Page 8

oversight, or unrealistic work scope. All resulting decisions must facilitate both timely and substantive accomplishment of all TPA commitments.

Sincerely,



J.R. Wilkinson

Hanford Projects/Program Manager  
CTUIR Department of Natural Resources

cc: William Burke, Treasurer, CTUIR Board of Trustees  
Michael Farrow, Director, CTUIR Department of Natural Resources  
CTUIR Hanford Projects Staff  
Mary Harmon, DOE-HQ  
Pat Willison, DOE-RL  
Steve Wisness, DOE-RL  
Mike Thompson, DOE-RL  
Kevin Clarke, DOE-RL, Indian Programs Manager  
Doug Sherwood, EPA, Hanford Project Manager  
Roger Stanley, Ecology  
Chuck Cline, Ecology  
Russell Jim, Yakama Nation  
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GENERAL COUNCIL  
and  
BOARD OF TRUSTEES



CONFEDERATED TRIBES  
of the  
*Umatilla Indian Reservation*

018479

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FAX 276-3095

6 January 1995

John Wagoner, Site Manager  
U.S. Department of Energy  
P.O. Box 550  
Richland, Washington 99352

Subject: CTUIR CONCERNS ABOUT PROGRESS ON COLUMBIA RIVER  
COMPREHENSIVE IMPACT ASSESSMENT

Dear Mr. Wagoner:

Technical staff of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) recently brought to my attention that they are increasingly concerned about the lack of meaningful progress being made on the Columbia River Comprehensive Impact Assessment (CRCIA). I shouldn't have to remind you that this is an extremely high visibility issue with critical implications to the Tribes' interests, rights, and responsibilities, in addition to comprising an important symbol of DOE's fulfillment of its trust responsibility to tribes. Not only is this project on the fast track in terms of needing to meet a whole series of near-term Tri-Party Agreement (TPA) milestones, but its completion in a comprehensive and objective manner is of paramount importance to the CTUIR.

The purpose of this letter is to outline three principal concerns associated with the extremely limited progress being made in the Assessment, which is largely a result of confusion, misunderstanding, and inaction on the part of DOE and contractor staff now controlling the process. We also transmit copies of previous CTUIR documents that summarize our involvement and interests in the Columbia River Assessment process and outcome, of which some DOE staff are not aware. These documents provide a basic overview of the history of CTUIR involvement in Columbia River issues, and should comprise a useful summary of tribal issues and goals for the many new DOE and contractor staff now involved in the Assessment process--a process originally envisioned to be open and interactive. Please distribute these documents to those staff involved with the Columbia River Assessment as a reminder to your staff of CTUIR interests and efforts on the Assessment over the past year.

Confederated Tribes of the Umatilla Indian Reservation  
Letter to John Wagoner/DOE-RL  
6 January 1995  
Page 2

The focus of our concerns centers on three principal considerations.

- First, consultation with Tribal representatives concerning progress on the Assessment has become less frequent and less effective throughout 1994.
- Second, some critical DOE representatives have an unrealistic and inaccurate perspective on the nature, scope, and intended purpose of the Assessment, as it was defined by tribes, regulators, stakeholders, and other interested parties following failure of the 1993 Columbia River Impact Evaluation Plan (CRIEP), almost exactly one year ago. EPA and Ecology have recently drafted an appropriately comprehensive scope and goals for the Assessment that further defines and clarifies each major and interim milestone, and includes a rigorous and specific schedule for completion of all phases of the Assessment by September 1996. The CTUIR believe that this proposed change package must be fully integrated into the TPA--and that the proposed project must be fully funded so that it can meet the proposed schedule.
- Third, sufficient funding to satisfactorily complete a comprehensive assessment within the designated time frame is being haphazardly juggled and diverted to other projects by middle-level DOE managers, or is not being managed efficiently and applied to the most direct issues at hand by contractors. This excessive discretion and misdirection of funding is thwarting a widely supported and agreed upon project and represents a direct violation of previous DOE commitments, TPA commitments, and commitments to tribes.

## CONSULTATION

The importance of cultural and natural resources of the Columbia River ecosystem to tribes cannot be overestimated. Our 1855 treaty preserves and protects our intimate historical and cultural relationships with this ecosystem, and imposes trustee responsibilities upon the U.S. government. In numerous meetings and comment documents over the past two years, CTUIR staff have consistently identified the integrity and health of the Columbia River system as of the utmost importance to tribes. *In fact, recall that the Columbia River Assessment was chosen as the issue that would serve as a yardstick to measure the effectiveness of government-to-government consultation between Secretary of Energy Hazel O'Leary, DOE-Richland, and the CTUIR Board of Trustees.*

The CTUIR recognized a considerable improvement in DOE's consultation efforts in late 1993 and early 1994, to the point that Chairman Sampson publicly commended DOE's efforts to Secretary O'Leary at the Hanford Summit II in June. *Since that high point, however, DOE has increasingly failed to coordinate and consult with the Tribes on any substantive issues associated with the Columbia River Assessment.* A contributing factor has been the high turnover and transfer rate within DOE, which has led directly to a loss of institutional

Confederated Tribes of the Umatilla Indian Reservation  
Letter to John Wagoner/DOE-RL  
6 January 1995  
Page 3

memory, failure to follow through on previous commitments made by departing staff, and has created a continuing need to reeducate a steady flow of incoming DOE staff. Moreover, those DOE (and especially PNL) staff who have been around since last winter's reformulation of the Assessment have shown little receptivity to then-agreed upon tribal involvement in the process. In the interests of cost effectiveness and avoiding unnecessary duplication of efforts and backtracking, internal mechanisms must be devised to create the necessary outreach, memory, and tracking ability within DOE and its contractors.

The release of the Data Compendium (PNL-9785) in May, 1994, marks the last time DOE consulted with CTUIR technical staff on the progress being made in the Assessment. Has nothing else occurred since May?? DOE and its contractors engaged in the completion of the Assessment have an obligation to proactively consult with the Tribes on all issues of concern to the Tribes *throughout* the Assessment process. This includes issues such as the ongoing (is it?) evaluation of thousands of pertinent or potentially pertinent documents and the development of a list and screening criteria for contaminants and species of concern. It is simply not possible for CTUIR staff to ask for consultations if we are not informed about what activities are being conducted upon what schedule. CTUIR staff have repeatedly stated that it is inappropriate for DOE or its contractors to produce a document and then expect us simply to comment on it. From the beginning and in proactive fulfillment of the DOE Indian Policy, the Tribes' intent consistently has been that this Assessment be an *interactive process* that includes discussions and information exchange all along the way, not just at the end.

A single example illustrates the seriousness of the increasing consultation problems that CTUIR staff have faced in recent months. In numerous documents (see Attachments), CTUIR staff repeatedly have expressed the desire to be closely involved in sediment and spring/seep sampling programs along the Reach, issues which may critically impact important tribal resources. Despite this ongoing effort, CTUIR staff were given only two days notice to "participate" in this past fall's sediment sampling program--and this invitation came from a representative of the Washington State Department of Health, *not* DOE or PNL.

Furthermore, even though a sediment sampling plan outlining protocol and sampling locations had been developed in advance and CTUIR staff had specifically requested input to this plan, we received only a few pages of the plan by fax just two days before the sampling was scheduled to begin--and that only after several requests. PNL staff eventually faxed us a map, but not until several days after the sampling began. The table describing proposed sampling locations was so generalized that it was of little use to us in assessing the technical merits and "representativeness" of the proposed sampling plan. But the point was already moot: CTUIR staff were told by a DOE representative that any comments we provided would not be incorporated into the plan given the impending start of sampling. Finally, and again in spite of repeated requests, CTUIR staff have yet to receive any of the results of this sampling, even though regulators already have received and are evaluating some results.

Confederated Tribes of the Umatilla Indian Reservation  
Letter to John Wagoner/DOE-RL  
6 January 1995  
Page 4

## PURPOSE AND SCOPE

The Columbia River Assessment must be truly "comprehensive" in both time and space in order to fulfill its intended purpose. It is emphatically *not*, as stated by some DOE representatives in a recent public meeting, only a "snapshot" of the current condition of the river alone, which could be summarized from only the most recent monitoring data. In fact, such an interpretation is in direct conflict with the stated goals and scope attached to the proposed draft (12-14-94) M-15-80 milestone change package (see Attachment). This list emphasizes the breadth, depth, and wide ranging scope and goals of the Assessment, which are fully consistent with tribal, stakeholder, and regulator direction and fully inconsistent with what is apparently DOE's much more narrow and limited interpretation. Because of DOE's critical role in coordinating completion of the Assessment, it is essential that DOE (and PNL) understanding of the scope, purpose, and goals of the Assessment be fully consistent and in synch with that of tribes, natural resource trustees, and regulators.

## NECESSARY FUNDING COMMITMENT

Where has all the money gone and what does DOE have to show for it?? About \$600,000 was spent in FY93 to complete the totally flawed CRIEP. Another approximately \$500,000 was spent in FY94 and, so far as we can tell, the only real product was the Data Compendium. Now we're told that only about \$300,000 is available for FY95--the period when the bulk of the research, analysis, and synthesis will be completed--but that much of this has already been spent by PNL and little evaluation has been accomplished. It seems that a considerable amount of time--and money--will still be required to review the hundreds, if not thousands, of pertinent or potentially pertinent documents *in advance of* analysis and report preparation.

Hundreds of thousands of dollars already have been squandered with very little to show for it --a recurring theme at Hanford. A realistic budget must be developed as an integral part of the proposed change package, and then adequately funded so that the Assessment will be fully completed within the designated time frame. The available dollars must be efficiently spent, and project managers must take full responsibility and provide accountability for their decisions and actions.

CTUIR staff are concerned that a cursory overview of only a few or even a few hundred documents may now be all that is planned by DOE and PNL to comprise the basis of the Assessment. We wish to state at the outset that this is simply not acceptable, as it is just not possible to know if documents contain valuable or pertinent information from screening titles alone or without a careful review of the contents of reports. Moreover, the Assessment must be sufficiently comprehensive and technically defensible to stand up to wide ranging concerns

from a broad spectrum of diverse interests. A careful review and forthright addressing of all comments received in response to last year's CRIEP would comprise a good starting point for issues that must be addressed in the CRCIA. CTUIR staff share the widely expressed reservations about the independence, objectivity, and credibility of PNL to accomplish the identified tasks, especially given their entrenched 30-year history at Hanford, consistent underestimation of the hazards and risks Hanford activities and environmental conditions pose, and vested interests in the process and the outcome.

CTUIR staff support the creation of an independent peer review panel to critically review the resulting Assessment and identify all the inherent assumptions, uncertainties, deficiencies, and limitations. Although supporting completion of such an independent outside review, the CTUIR will not, however, automatically support or rubber stamp the conclusions of any panel's review process. The CTUIR will continue to reserve the right, and in fact expect, to conduct an independent review of the resulting Assessment, including the process that leads to its completion. The CTUIR is uniquely fortunate to now possess staff with both multi-disciplinary analytical capabilities and a fundamental understanding of tribal treaty-reserved rights and the federal government's trust responsibility. This understanding is both largely missing and generally unappreciated outside of tribal organizations. This combination of abilities will be essential to fully protect CTUIR interests, rights, and responsibilities.

## CONCLUSION

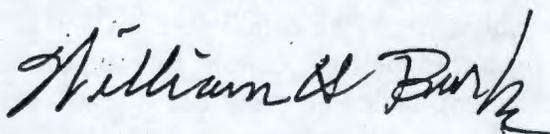
CTUIR staff strongly support completion of an objective and *truly comprehensive* Columbia River Assessment that: 1) is based on an open, interactive process involving tribes at all stages of the process, 2) directly incorporates tribal issues, and 3) meaningfully addresses and resolves tribal concerns prior to making decisions.

- First, such an accomplishment will require frequent consultation with tribal representatives and, at all stages along the way: 1) a free exchange of information, 2) cooperative development of analytical approaches and screening criteria, 3) cooperative development of risk scenarios that fully represent unique tribal lifestyles, exposure pathways, and tribally important food or cultural resources, and 4) upfront recognition and delineation of the inherent limitations, assumptions, and uncertainties that characterize any "risk assessment."
- Second, the Assessment must be truly comprehensive in scope and purpose, as outlined in the M-15 TPA milestone change package proposed by regulators, and must be fully embraced and proactively supported by DOE representatives, as well as tribes, regulators, and stakeholders, in order to succeed.

Confederated Tribes of the Umatilla Indian Reservation  
Letter to John Wagoner/DOE-RL  
6 January 1995  
Page 6

• Finally, the mishandling of funding appropriated for completion of the Assessment, either by DOE managers desperate to balance budgets or by unfocused PNL researchers, must not be permitted to thwart milestones agreed to by the Tri-Parties and supported by the Tribes. Whether advertently or inadvertently, middle-level DOE managers are scuttling what the CTUIR believe were clearly defined direction and firm commitments by DOE-HQ and DOE-RL policy makers. Because this Assessment will play a critical role in both characterizing river conditions and developing Columbia River corridor remediation goals, adequate funding must be preserved for, or if necessary, restored to this project in order to ensure that the full range of agreed upon goals and objectives will be met.

Sincerely,



William H. Burke

Treasurer  
CTUIR Board of Trustees

cc: Donald Sampson, Chairman, CTUIR Board of Trustees  
Michael Farrow, Director, CTUIR Department of Natural Resources  
J.R. Wilkinson, CTUIR Hanford Projects/Program Manager  
Rick George, CTUIR Environmental Planning/Rights Protection Program Manager  
Jeff Van Pelt, CTUIR Cultural Resources Program Manager  
CTUIR Hanford Projects Staff  
Russell Jim, Yakama Nation  
Donna Powaukee, Nez Perce Tribe  
Richard Buck, Wanapum People  
Hazel O'Leary, DOE-HQ, Secretary of Energy  
Steve Wisness, DOE-RL, Hanford Project Manager  
Linda McLair, DOE-RL, ER Program Manager  
Kevin Clarke, DOE-RL, Indian Programs Manager  
Mike Thompson, DOE-RL  
Randy Brich, DOE-RL  
Paul Eslinger, PNL  
Ralph Patt, Oregon Department of Water Resources  
Doug Sherwood, EPA, Hanford Project Manager  
Larry Gadbois, EPA  
Roger Stanley, Ecology  
Dave Holland, Ecology  
Jerry Yokel, Ecology



CONFEDERATED TRIBES  
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January 9, 1994

The Honorable Hazel O'Leary  
Secretary  
U.S. Department of Energy  
1000 Independence Avenue SW  
Washington, D.C. 20585

Subject: DOE-RICHLAND'S MISHANDLING OF COLUMBIA RIVER STUDIES  
AND CONSULTATION REGARDING THESE WITH THE CTUIR

Dear Secretary O'Leary:

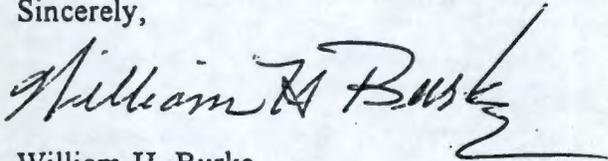
In September of 1993, members of the Board of Trustees of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) met with you at a meeting in Richland, Washington. The purpose of this meeting was to discuss consultation between the CTUIR and the U.S. Department of Energy (DOE). At this meeting, you asked the CTUIR to identify a single issue that could be used as a "yardstick" to measure DOE's progress toward improved consultation with the CTUIR.

The CTUIR's Board of Trustees met in October of 1993 and selected DOE-Richland's continuing studies of the Columbia River as the yardstick for measuring DOE's consultation with the CTUIR. CTUIR representatives traveled to Washington, D.C. that same month to discuss this selection with your representatives, Dan Reicher and Vicky Thornton.

At the Hanford Summit II, in July 1994, we gave our first report on the progress of consultation regarding the Columbia River studies. In the first half of 1994 we had seen a great deal of progress. As a result, Donald Sampson, Chairman of the CTUIR Board of Trustees, publicly stated that DOE was performing well on its consultation with the CTUIR regarding these studies. The Chairman reported that DOE had earned a "B+."

Unfortunately, ever since then DOE has virtually abandoned consultation with the CTUIR concerning the Columbia River. DOE-Richland's record over the second half of 1994 is shameful, and would have to result in a grade of "F." The following letter describes DOE-Richland's mishandling of this critical project, and makes specific recommendations for reform. We hope that this vital issue will receive your attention, as it goes to the core of the relationship between our governments.

Sincerely,



William H. Burke,  
Treasurer  
CTUIR Board of Trustees

Enclosure

cc (with enclosure):

Dan Reicher, DOE-HQ  
Vicky Thornton, DOE-HQ

cc (cover letter only, enclosure sent separately 1/6/94):

Donald Sampson, Chairman, CTUIR Board of Trustees  
Michael Farrow, Director, CTUIR Department of Natural Resources  
J. R. Wilkinson, CTUIR Hanford Projects/Program Manager  
Rick George, CTUIR Environmental Planning/Rights Protection Program Manager  
Jeff Van Pelt, CTUIR Cultural Resources Program Manager  
CTUIR Hanford Program Staff  
Russell Jim, Yakama Nation  
Donna Powaukee, Nez Perce Tribe  
Richard Buck, Wanapum People  
John Wagoner, DOE-RL, Manager  
Steve Wisness, DOE-RL, Hanford Project Manager  
Linda McLair, DOE-RL, ER Program Manager  
Kevin Clarke, DOE-RL Indian Programs Manager  
Mike Thompson, DOE-RL  
Randy Brich, DOE-RL  
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Jerry Yokel, Ecology



CONFEDERATED TRIBES  
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March 30, 1995

Mr. Mark Gilbertson, Program Director  
Dr. Carol Henry, Director of Science and Policy  
Department of Energy  
Office of Integrated Risk Management, EM-6  
Room 5A-031  
1000 Independence Avenue, S.W.  
Washington, DC 20585-0002

Subject: TRANSMITTAL OF CTUIR PAPER ON RISK ASSESSMENT

Dear Mr. Gilbertson and Dr. Henry:

Technical staff of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) understand that your office of the U.S. Department of Energy (DOE) has been compiling papers for a report to Congress, tentatively titled *Risks and the Risk Debate: Searching for Common Ground*. Enclosed is a paper, written by CTUIR technical staff, entitled: *Scoping Report: Nuclear Risks in Tribal Communities*. We formally request that you review this paper and submit it to Congress with your report.

To quote from the introduction to the CTUIR's paper:

The purpose of this report is to advocate reform of current risk assessment practice in order to make risk assessment a more effective tool for public policy and environmental management decision making. In order to illustrate the need for reforms, this report focuses on direct, indirect, and cumulative impacts to CTUIR tribal communities from environmental management decision making at Hanford.

This report provides a more focused perspective on how to establish both technically and politically defensible environmental management policy in an era of fiscal constraints. It also provides suggestions for developing sound values-based risk policy and technical guidance. These reforms will ultimately result in more clearly defined mission plans, more focused strategic planning

goals, and more timely, health-effective, and cost-effective remedial actions. Such a broader perspective will be much more capable of providing the sufficiently broad, representative, and credible information base necessary to facilitate and support the difficult decisions that must be made in order to establish priorities and cost-effectively "clean-up" DOE sites across the nation.

To provide context for our discussion, we have deliberately focused on the ways current risk assessment practice fails to protect communities such as the CTUIR. The paper, however, is much more than an indictment of current risk assessment methodology. The heart of our paper (Section IV, which is also the longest section) details recommendations for how to improve risk assessment practice in order to remedy these glaring technical and public policy shortfalls.

The text is followed by an encyclopedic collection of appendices, which address in greater detail a variety of issues raised in our report. Concerns such as the fundamental differences between tribal culture and mainstream culture, the role of the CTUIR at Hanford, risks posed by Hanford, and examples of reformed risk assessment methodologies are each, in turn, discussed in depth.

Throughout the report we have focused on the core moral, technical and public policy issues that frame the risk assessment debate. We anticipate that the CTUIR report will be of particular value to people participating in that debate, especially since many of these essential, moral concerns have, to date, been largely ignored in this debate.

Please review this paper and pass it on to others examining these fundamental human issues. Please, also, include the CTUIR paper in your report to Congress.

Our paper is intended to open up discussion of issues that have too-long been ignored or misunderstood. We anticipate it is only the beginning of a dialog between CTUIR staff and others involved in this debate. Consequently, we look forward to further discussions with you about these matters.

CTUIR staff are available to address your questions and concerns. Please address your inquiries to J. R. Wilkinson or Tom Gilmore, CTUIR Hanford Program. They can be reached by phone at (503) 276 - 0105 (voice) or (503) 276 - 0540 (fax).

Sincerely,

*J.H. Richards*  
ACTING DIRECTOR

*for* Michael J. Farrow  
Director  
Department of Natural Resources

cc: Board of Trustees, Confederated Tribes of the Umatilla Indian Reservation  
Donna Powaukee, Manager, ERWM Program, Nez Perce Tribe

Russell Jim, Manager, ERWM Program, Yakama Indian Nation

Hazel O'Leary, Secretary, U.S. Department of Energy

Thomas Grumbly, Assistant Secretary for Environmental Management, U.S.  
Department of Energy

Cindy Kelly, Director, Office of Public Accountability, U.S. Department of Energy

John Wagoner, Manager, Hanford Site, U.S. Department of Energy

Kevin Clarke, Indian Programs Manager, Hanford Site, U.S. Department of Energy

Carol Browner, Administrator, U.S. Environmental Protection Agency

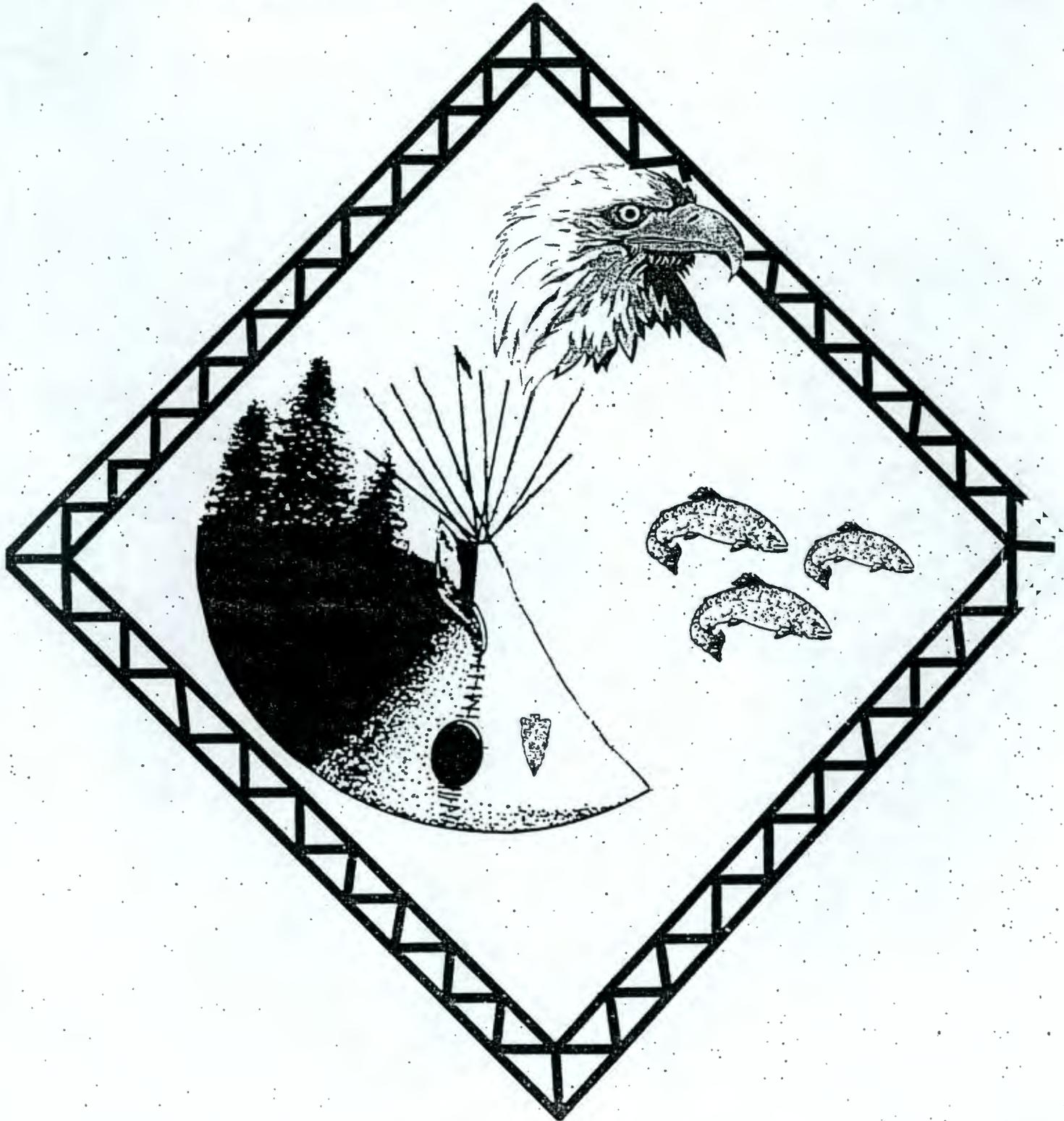
Chuck Clarke, Administrator, Region 10, U.S. Environmental Protection Agency

Mary Riveland, Director, State of Washington Department of Ecology

Mary Lou Blazek, Director, Oregon Department of Energy

Confederated Tribes  
of the  
Umatilla Indian Reservation

018479



Scoping Report:  
Nuclear Risks in Tribal Communities

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# **SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES**

A Report by the Confederated Tribes of the Umatilla Indian Reservation  
Outlining Concerns About Risk-Based Approaches to  
Environmental Management Decision-Making

---

Prepared By:

Confederated Tribes of the Umatilla Indian Reservation  
Department of Natural Resources  
Hanford Program

Prepared For:

U.S. Department of Energy  
Office of Environmental Management  
Office of Integrated Risk Management  
Office of Strategic Planning and Analysis  
Office of Public Accountability

United States Congress  
Committees on Appropriations  
Senate Committee on Energy and Natural Resources

March 1995

# SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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# SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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# SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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Confederated Tribes of the Umatilla Indian Reservation  
Department of Natural Resources  
Hanford Program

## I. INTRODUCTION

Both the United States Congress and the U.S. Department of Energy (DOE) are actively considering the standardized use of risk-based remedial decision-making to address "clean-up"<sup>1</sup> of DOE nuclear production sites across the country. Congress has directed DOE to provide a full risk picture at DOE sites across the nation in order to facilitate cost-risk comparisons and prioritization of remedial actions (Appendix A).

Thus far, no comprehensive or sitewide evaluation of risks and costs has been performed at Hanford or any other DOE site. Risks<sup>2</sup> at DOE sites are associated with environmental, health, safety, and cultural threats resulting from historical operations and unsound disposal practices at DOE sites during the past half century. Those few risk analyses<sup>3</sup> that do exist are narrowly framed, based on very little substantive data, depend on numerous assumptions, result in high degrees of uncertainty, and tend to skew decisions toward actions that may not be thoroughly thought out or truly protective. Fulfilling this Congressional mandate will necessarily require focused information collection so that site risks, costs, benefits, and compliance agreement requirements can be evaluated in a comprehensive and not piecemeal fashion. A full risk picture must include addressing the impacts of time, of doing nothing now--or ever--and of "risking" the future health consequences, accumulating impacts, and the ever increasing public health care costs that will necessarily result if the real risks present are not proactively reduced.

Technical staff of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) are highly concerned that any approach based largely on conventional risk assessment and cost-risk methods may not adequately address those important cultural and social values and other considerations that are an integral part of any comprehensive risk management program. The risks posed by massive historical releases of hazardous chemicals and radioactive materials to the air, water, and soil column will directly impact not only human health and the environment--a particular concern in subsistence-dependent tribal families--but also tribal cultural values, traditional tribal lifestyles, and tribal cultures themselves for many generations to come--risks that often are not accounted for in existing methodologies.

The purpose of this report is to advocate reform of current risk assessment practice in order to make risk assessment a more effective tool for public policy and environmental management decision making. In order to illustrate the need for reforms, this report focuses on direct,

indirect, and cumulative impacts to CTUIR tribal communities from environmental management decision making at Hanford.

This report provides a more focused perspective on how to establish both technically and politically defensible environmental management policy in an era of fiscal constraints. It also provides suggestions for developing sound values-based risk policy and technical guidance. These reforms will ultimately result in more clearly defined mission plans, more focused strategic planning goals, and more timely, health-effective, and cost-effective remedial actions. Such a broader perspective will be much more capable of providing the sufficiently broad, representative, and credible information base necessary to facilitate and support the difficult decisions that must be made in order to establish priorities and cost-effectively "clean-up" DOE sites across the nation.

## II. TRIBAL CONCERNS WITH CONVENTIONAL RISK ASSESSMENT PRACTICE

Risk assessment is often praised for its ability to quantitatively characterize, and thus support ranking or prioritization of actions necessary to eliminate, control, or 'manage' risk.<sup>4</sup> But it is plagued nonetheless by a number of inherent limitations in its ability to reflect cultural or other social values, such as those of American Indian tribes, that are not easily quantified, numerically simulated, or modeled. Conventional risk assessment methods, having been adapted from other techniques for other purposes, inherently possess major shortcomings that now preclude their widespread application as effective or defensible public policy/environmental management tools. Reforms must be instituted so that assessment techniques address the full scope of risk, which necessarily includes qualitative attributes, cultural factors, personal biases, and subjective judgements. No true or comprehensive characterization of risk can ignore such considerations.

The concerns of American Indian communities and individual tribal members, including members of the CTUIR, who practice traditional lifestyles, readily highlight a number of the well recognized and underappreciated deficiencies and limitations of conventional risk assessment methodology. The inclusion of cultural values in a comprehensive evaluation process will have important implications for the use of such a tool in risk management and remedial action decision-making. Only through a values-based analysis within an American Indian-based holistic environmental management framework can the unique nature of tribal culture, needs, rights, and interests be adequately or appropriately represented.

Issues of vital concern to tribes that are not addressed by current risk assessment practice include: 1) unique and multiple use of treaty-reserved rights and resources for subsistence, ceremonial, cultural, or religious practices, 2) multiple exposure pathways that result from cultural resource use that are neither considered nor commonly included in typical "suburban" exposure scenarios, 3) that tribal communities often constitute critical segments of populations whose lifestyles result in disproportionately greater than average exposure potential, either sociologically or geographically, 4) the failure to address the role of time and to adequately

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assess risks to future generations, 5) issues of environmental justice and the right to a safe and healthful environment (the need for formally incorporating affected community input), and 6) more intangible considerations such as aesthetic, physical, economic, community, and future well-being, equity, peace of mind, and sustainability.

### A. Unique Resource Use and Exposure Pathways: An Interdependent Food Web

Tribal culture and individual tribal people consider themselves as integral components of an interconnected and interdependent environment. This perspective stands in stark contrast to the predominant view in non-Indian society where humans are commonly viewed as separate from and superior to the environment in which they live. Tribal members depend upon numerous sources of food and other resources that are not commonly used by the dominant society, and that are thus ignored in traditional risk assessments (Appendix B). For example, tribal people are traditionally subsistence fishers, hunters, gatherers, and traders, and inherently value and utilize all parts of resources, many of which the dominant society simply discards. Consequently, through practicing traditional activities, tribal members may be readily exposed to multiple sources of contaminants along multiple exposure pathways not shared by the typical suburban residents that form the basis of conventional risk analyses and exposure scenarios. Cultural practices themselves also may result in increased exposure potential because the practices employed in food gathering and other cultural practices are themselves integral components of the process, and cannot be separated from it. Certain cultural, ceremonial, and spiritual practices, such as sweat lodges, are unique to tribal people, but present multiple exposure pathways not addressed by conventional risk analyses. Multiple resource use and multiple exposure pathways further compound the bioaccumulation potential of concentrating contaminants among food web trophic levels. For example, typical measures of contaminant concentrations in water do not adequately represent or protect human consumption or use of resources as riparian zone plants growing where contaminated shoreline seeps and springs discharge, salmon redds that overlie riverbottom contaminant discharge zones, or the organisms that in turn feed upon these food sources.

### B. Critical Segments of Populations

Multiple resource use, multiple exposure pathways, and unique traditional lifestyles and cultural practices common in tribal communities mean such communities constitute critical segments of populations--indicator populations, if you will--that may be subject to much higher risk than most elements of non-Indian society. If the exposure and risk potential of a population as a whole can be simplistically modeled as a typical bell-shaped curve, then tribal communities would consistently fall at the high end of the spectrum--one that is underrepresented (or worse) in conventional risk analyses. This effect is still further compounded because the generally small size and limited geographic extent of most tribal populations fail to provide a "statistically significant" sample. Hence, conventional risk analyses ignore such conditions because they

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cannot be confidently or defensibly modeled, even though impacts may be well demonstrated. Furthermore, the limited areal extent of many waste sites, including significant, but localized discharges or exposure potential at Hanford, make it difficult to employ conventional epidemiologic methodology, which typically requires large populations and areas of coverage.

### C. Multi-Generational Impacts and the Impacts of Time

One of the most serious deficiencies of conventional risk methods is that they fully ignore the impacts of time and of accumulating impacts to future generations. Hence, true risks as measured through time are vastly underestimated. Conventional methods address only current conditions. Even where attempts to account for future impacts are made, they must assume that the risk slate is wiped clean with each new generation. In point of fact, impacts accumulate through time, seemingly distinct actions or effects are environmentally interconnected, and the indirect impacts associated, for example, with non-cancerous effects are ignored. Equally severe or life-threatening impacts such as birth defects, reduced birth rates, reduced immunologic or metabolic function, and increased adverse health conditions whose origin may be difficult, if not impossible, to prove are just a few of the indirect impacts to current or future generations that simply cannot be addressed by current methodologies. Such impacts may be particularly important because of the very long-lived, mobile, and environmentally persistent nature of many Hanford contaminants, especially radionuclides, heavy metals, and organic compounds.

Conventional risk methods that ignore the element of time reflect the short-sighted values of the dominant non-Indian society and its obsessive focus on only the here and now. Such a view is largely unknown in tribal culture, where present generations feel a profound commitment to provide for elders and future generations--all of whom may be subject to greater adverse impacts. This is clearly reflected in the protective and sustainable environmental management philosophy that many tribes have long employed by asking the question, "What will be the impacts of our actions today seven generations hence?" For example, non-Indian society has developed techniques to establish remedial standards and standards of residual risk that measurably discount the value of future generations at increasing rates through time. Aside from the questionable moral and ethical considerations involved, this selfish, short-sighted approach is the ultimate slap in the face, as it provides no accountability or commitment to steward current lands and resources for the future. All such efforts only facilitate and encourage maximum environmental destruction now to maximize immediate returns, while at the same time severely prejudicing future options by passing on a worsening legacy of environmental pollution to our children and grandchildren.

### D. Environmental Injustice

There are few better illustrations of environmental *injustice* than those provided by the nuclear industry from its very birth. From the dropping of the first atomic bomb on war-weary East

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Asians, to the concentration of uranium mining activities in tribal lands in the American Southwest, to the preferential location of defense and commercial nuclear reactors and proposed waste storage "solutions" on tribal lands, the focus is consistently on remote areas and communities with little political power or influence--especially those of American Indian tribes. For example, three major defense production, storage, and training facilities are located within the ceded lands of the CTUIR. These include not only DOE's Hanford site, but also the Umatilla Army Depot, where 12% of the nation's arsenal of chemical weapons and agents are stored, and the Boardman Bombing Range, a training range for military pilots from Puget Sound bases. Hence, both tribal members and the Umatilla Reservation itself have long been burdened with a disproportionate share of risk and potential exposure to some of the most dangerous agents or conditions known to humans. These include Hanford's radioactive materials and the radiation they emit, a suite of heavy metals and other toxic or hazardous chemicals, the Umatilla Army Depot's nerve and mustard agents, rockets, and explosives (some of which are intermixed and reactive), and unknown quantities of unexploded ordnance at the Boardman Bombing Range.

Such sites constitute "hot spots," be they geographic (near-source) or sociologic (owing to subsistence dependence on contaminated resources). Issues of environmental justice have received increasing attention in the Executive Branch, as President Clinton has issued an Executive Order<sup>5</sup> directing each cabinet-level department--including DOE--to develop an implementation strategy for addressing such issues. This plan must define how departments will facilitate direct involvement of affected local communities in both recognizing and resolving the disproportionate impacts of federal government actions on critical segments of populations such as American Indian tribes. The development and application of improved risk assessment methodologies in environmental management decision making must be an essential feature of these reforms, and should be specifically addressed.

### III. RISK ASSESSMENT CHALLENGES PRESENTED BY HANFORD

#### A. Overview of DOE Complex and Mission

The mission of the U.S. Department of Energy has shifted greatly in recent years. DOE facilities across the nation supported the massive arms build-up that proceeded steadily from the end of World War II through the 1980s. Growing public concerns over widespread safety questions, environmental problems, and regulatory compliance, however, forced shutdown of major portions of the complex across the nation during the 1980s, a process accelerated by the almost overnight end to the Cold War. But the legacy of the Cold War remains.

By the early 1990s, DOE's mission had shifted equally abruptly. DOE is now attempting to "clean-up" its legacy of widespread waste management problems and uncontrolled environmental pollution, that is, to restore the environment. The Department of Energy clearly recognizes the significant technical, institutional, and political challenges that it faces in cleaning up its legacy--and hints at a solution.

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"Solving the waste-management and contamination problems of this legacy will take decades and enormous resources. . . And even then the task will not be fully completed for those sites and facilities [such as Hanford] that will need continued guarding and monitoring.

"The task of Environmental Management is to begin to close the circle on the splitting of the atom for weapons production through sustained efforts to understand the whole problem as well as its parts.

"The nation faces daunting institutional and technical challenges in dealing with the environmental legacy of the Cold War. We have large amounts of radioactive materials that will be hazardous for thousands of years; we lack effective technologies and solutions for resolving many of these environmental and safety problems; we do not fully understand the potential health effects of prolonged exposure to materials that are both radioactive and chemically toxic; and we must clear major institutional hurdles in the transition from nuclear weapons production to environmental cleanup.

"These challenges cannot be solved by science alone. In the midst of the complexities and uncertainties, one thing is clear: the challenges before us will require a similar--if not greater--level of commitment, intelligence, and ingenuity than was required by the Manhattan Project."<sup>6</sup>

As if such a mission alone were not challenging enough, DOE also is one of the larger federal agency managers of publicly owned lands and natural resources. DOE currently manages at least 137 defense and non-defense sites in 33 states and one U.S. territory that together cover some 3300 square miles and pose some 10,000 individual remedial challenges.<sup>7</sup>

This report focuses on issues at DOE's Hanford site in Washington State. Hanford lies within a portion of the CTUIR's ceded lands, within which the CTUIR maintain treaty-reserved rights and interests (Appendices B and C). Hanford poses some of the most difficult, complex, and pervasive "clean-up" problems of any DOE site in the nation (Appendix D).

### B. The Risks at Hanford Are Real

DOE, as well as many other independent reviewers, clearly recognize that the DOE nuclear weapons complex poses a wide variety of risks and "clean-up" challenges.<sup>8</sup> These risks are characterized in terms of the source and severity of the risk, exposure pathways, and potential receptors. Among sites in the DOE complex, Hanford's problems are profound, complex, and often interrelated, and represent real risks to the surrounding communities, region, and nation that are unparalleled anywhere else within the DOE complex. Although the risks appear to be local, the potential impact from a catastrophic incident may have profound impacts to the

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region's international economy and agricultural base. Events such as the Chernobyl meltdown or the Tomsok tank explosion demonstrate that while distance dilutes awareness, knowledge, and concern about risks outside a commonly perceived area of influence, catastrophic events at one locale can have much more widespread, even global implications.

Historical releases from Hanford are traceable downstream along the Columbia River, spreading over hundreds of square miles of the Pacific Ocean, as far north as Canada and as far south as northern California, and downwind into eastern Washington, Oregon, and Idaho.<sup>9</sup> Such demonstrated historical impacts only hint at the full spatial and temporal scope of future risk. Outlining "real risks" to tribes, the public, site workers, and the environment necessarily combines toxicologic effects, risk perception, risk evaluation, qualitative values, and community or cultural impacts.

At Hanford, risks are present from a variety of conditions and operating practices--past, present, and future--and to a variety of receptors, including individuals dependent upon contaminated natural resources for subsistence or other cultural purposes, the human and ecological communities in which they live, and to future generations of humans and other organisms. The risks posed by these conditions and impacts are outlined in more detail in Appendix G under the following topics.

- Risks from Hanford Nuclear Production Facilities
- Risks from Hanford Tanks
- Risks from Hanford Spent Fuel
- Risks from Past Hanford Disposal Practices
- Risks to Communities and Cultures
- Risks through Time

Risks associated with the first four categories above have been widely recognized and discussed (even if little has actually been done about them), but the last two categories have been widely ignored and their true impacts greatly underappreciated.

### C. Hanford Federal Facilities Compliance Agreement (Tri-Party Agreement)

In 1989, DOE, along with its regulators, the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology, signed a federal facility compliance agreement known as the Tri-Party Agreement (TPA). DOE had been operating its nuclear production facilities across the country, including Hanford, in defiance of federal and state environmental laws for years. The purpose of the TPA was to outline and schedule those tasks that would either permit or constitute "clean-up" of the Hanford site, and to bring operations into compliance with existing federal and state laws.

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The TPA represents a unique product of both regulatory requirements and accomodation of public interests in the Pacific Northwest. By its very nature, the TPA incorporates qualitative values and may be considered as a regionally unique, democratic alternative to conventional risk assessment for establishing remedial priorities. Because it is also the product of a political process, as well as being based on technical demands and institutional requirements, it has received extensive public review and input and thus embodies at least some important social and cultural principles (e.g., protect the Columbia River).

In addition to its benefits, the TPA has its limitations. First and foremost, the TPA defines long-term commitments to Hanford clean-up that transcend typical short-term political vision, attention spans, and election cycles. This also means that a long-term political and financial commitment is required to accomplish the goals of the TPA and to comply with federal and state environmental laws. While they are not blameless, the TPA and regulators too often are singled out for stalling "clean-up," but tribal experience indicates that it is primarily DOE who most consistently fails to serve its "constituents." This failure is most clearly shown by not providing strict management control and responsibility, contractor accountability, an overall purpose and direction that DOE managers also believe in, and *any* good faith, proactive, on-the-ground commitment to "clean-up." It is a widely held belief, strongly supported by extensive historical government records, that Hanford truly is the most polluted place in the country. Hence, a prime purpose of the TPA is to maintain focus on the ultimate goal of environmentally sound waste management, remediation, and restoration of the Hanford site.

Federal (and state) environmental laws--whose principles are embodied directly in compliance agreements such as the TPA--often offer the only protection available against flagrant onslaughts of environmental contamination and the risks they pose to individuals, children, families, communities, lands and resources, and the freedom and right of choice that all such communities collectively depend upon. The bulk of these laws<sup>10</sup> were first passed because of unconscionable abuses such as Love Canal, and are a direct result of the dismal failure of trusting polluters interested only in short-term profits (benefits) to "self-regulate" or protect public resources.

Moreover, while private industry was the target of much of the original legislation, the shutdown of the nuclear weapons complex and other defense facilities made it especially clear that the federal government was in fact one of the most flagrant offenders. Because public agencies such as DOE continued to flaunt regulatory compliance, particularly under RCRA, and maintain its "right" to "self-regulate," the Federal Facilities Compliance Act was passed in 1992 in order to reinforce that federal government facilities were subject to the same laws as everyone else.

But the TPA does not address a number of critically important issues to communities. For example, these include off-site transportation of radioactive or hazardous chemicals, numerous facilities not directly under DOE control, and especially, the true costs of environmental contamination as manifested by adverse human and environmental health impacts and associated public costs, either near-term or long-term. Such impacts are currently and at best, poorly

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understood; more comprehensive and focused efforts must be directed at understanding the interrelation of such chemically-induced causes and health-related effects.<sup>11</sup>

Increased reliance on tools such as risk assessment or risk evaluation only diverts attention from the measurable health-related impacts to uniquely affected communities such as American Indian tribes, whose culture, traditions, and lifestyles put them at much greater risk than the population as a whole (Appendix B): These short-sighted approaches fail to account for the true long-term health impacts and the increased health care costs that directly result, because they fundamentally ignore short-term, long-term, acute, and chronic effects, the long latency period of many carcinogens or other health-impacting agents, the environmental persistence and bioaccumulation of long-lived contaminants and their breakdown products, or the long-term cumulative effects on future generations.

The TPA was not framed with the intent of characterizing, assessing, or prioritizing how much risk would actually be reduced, because little relevant risk information was available at the time the TPA was negotiated. Nevertheless, and although imperfect, the TPA currently constitutes the only generally agreed upon, negotiated combination of priorities and schedules of DOE, regulators, tribal governments, and Pacific Northwest residents, and it is continually evolving to meet new realities.

Fifty years of secrecy and a "self-regulated" license to pollute cannot easily be undone by only six years on the frontier with some semblance of democratic oversight and open tribal/public involvement. The commitment to close the circle must not succumb to short-sighted budgetary considerations, or to a failure of the federal government to take full responsibility for its historical actions by simply legislating "clean-up." Widespread contamination is present and will remain unless *action* is taken. Creating national sacrifice zones, by throwing up a fence and then just walking away from those communities who are directly affected by such unchecked impacts and actions, but have no say in those decisions, is totally unacceptable. Local affected communities who were given no choice in siting or managing such operations historically must not now be forced to disproportionately shoulder the current and future "clean-up" burdens--or their resulting health impacts--alone.

### D. The Struggle of Political, Technical, Cultural, and Institutional Perspectives

For fifty years, DOE had only to meet its own institutional requirements. Because its operations were long hidden behind the secretive cloak of national security, policy and management issues were never open to public scrutiny. Consequently, such issues were debated only internally, and (paradoxically) enjoyed widespread and unquestioning political support in Congress and within the government structure as a whole. Moreover, seemingly insurmountable technical limitations were routinely overcome by a level of drive, ingenuity, and scientific creativity virtually unparalleled in U.S. (if not world) history. This ingenuity, however, was focused solely on the

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goal of producing weapons of war--not on cleaning up the equally fatal waste products of that production on American populations such weapons were ostensibly intended to protect.

With the shutdown of the weapons production complex and a new mission, DOE has struggled profoundly (and with only limited success) to change its own deeply entrenched Cold War "culture." DOE has made some piecemeal attempts to respond to the concerns of other cultures and communities that were long affected by its weapons production activities, but that previously had no say in their operation or resolution. New political realities rightly demand open democratic participation in, and accountability for, costly issues of national concern that have long been ignored by both technical managers and politicians. In addition, a new set of technical exigencies and current limitations now will require an equally diligent drive and dedication to overcome. DOE's continued dependence on a narrow, outmoded management philosophy and closed decision making processes, however, have made it difficult at best for DOE to openly embrace its new mission and achieve substantive progress beyond simply maintaining the status quo.

The unique legacy threatening Hanford (and other DOE sites) took fifty years to accumulate. It will not be resolved overnight, despite political and public impatience. Sustained action will be required to meet goals agreed to in good faith in compliance agreements, and this in turn will require a long-term commitment of both dollars and political will. Some problems will be more readily and quickly resolved than others. Some will require long-term actions and technologies that do not now exist--directly challenging traditional political, institutional, and technological limitations. The federal government has committed in both words and actions that these challenges will be met.

The risks that current and future conditions at DOE sites across the nation now pose are very real. As such, these risks cannot be eliminated or ignored simply because they are difficult, costly, or cannot be solved today or even tomorrow. *Widespread contamination cannot be willed away. Neither can "clean-up" be declared legislatively "complete" simply by altering regulations or so-called "clean-up" standards in order to satisfy political impatience or the short attention spans of the public or Congress. Similarly, "clean-up" cannot necessarily be considered complete simply because of pressure from current conflicting budgetary considerations or past budgetary mismanagement.* Without an adequate risk baseline, it will remain impossible to determine what, if any, actual "clean-up" progress is being made.

Existing wastes and contamination and the daily impacts they now have in human and ecological communities cannot be altered by legislative action, only by remedial actions. Turning Hanford or any other DOE site into a "national sacrifice zone" is not an acceptable legacy to leave to future generations. The paradox is that while such a short-sighted approach may be justified as "cost-effective" now, it fundamentally ignores the long-term consequences, risks, and true life-cycle costs to both affected communities and the U.S. government. *Congress and the public all benefited from the national security provided by the nuclear arsenal that created this legacy of polluted land and resources. Federal government commitments to "clean-up" must be kept and*

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*proactively fulfilled. Affected communities already have had to bear a disproportionate share of the impacts of "self-regulated" federal actions for 50 years; they should not also now be expected to bear a disproportionate amount of the "clean-up" burden as well.*

The Tri-Party Agreement at Hanford and other federal facility compliance agreements constitute the ultimate foundation of prioritization for risk management, risk-reduction strategies, and remedial actions. The TPA is a unique contract blending regulatory requirements, priorities, and the desires of residents of the Pacific Northwest. This agreement has benefited significantly from extensive public review and input and by its very nature prioritizes risk control and embodies public perspectives and regulatory compliance. *Thus the TPA comprises a much more democratic alternative than any strictly risk-based identification of remedial priorities, which both DOE and regulators directly entered into in good faith. Popular acceptance in the Pacific Northwest has resulted only with the firm understanding that the TPA constitutes a legally enforceable federal government commitment and schedule that would direct timely, substantive, and protective Hanford site "clean-up."*

Within a compliance agreement framework, risk evaluations can be an effective remedial decision-making tool, *but only if* a sufficiently comprehensive spectrum of information related to affected communities is considered directly by the process itself. The narrowness of traditional risk assessment alone cannot satisfy these requirements, and often serves simply as a seemingly objective, but in fact highly malleable technique to decide only how *little* is to be done. Unfortunately, this is especially true when--as in the case of DOE--the polluter also is responsible for directing "clean-up." The focus tends to be on defining how *much* pollution or how *little* "clean-up" is acceptable, rather than on a more holistic approach of more broadly defining what is truly desirable and achievable. Conventional risk assessment defines and characterizes risks only very narrowly, for example, based on only single chemicals, exposure pathways, or a single risk factor such as cancer. Moreover, increasing criticism focused on characterizing remedial actions as overly protective (how can this even be possible??) is misdirected. *These narrow concerns ignore the critical importance of the unspoken values, biases, and judgement process embedded within a non-Indian myth that fundamentally violates and dismisses 13,000 years of protective and sustainable environmental management by American Indian tribes.*

Risks to cultures and to cultural values are just as real as risks to human health and the environment. This is especially true for American Indian communities, whose very culture, lifestyles, and tribal identity depend on a clean, healthy environment whose integrity has not been violated (Appendix B). In the Hanford region, sovereign tribes ceded title to vast tracts of their traditional homelands, but specifically retained rights in their treaties to lands, resources, and traditional activities. Hence, all decisions affecting Hanford site "clean-up" must respect tribal sovereignty and treaty-reserved rights, must enhance government-to-government communications, and must facilitate direct and early tribal involvement in decisions that may impact tribes, as mandated under the DOE Indian Policy.<sup>12</sup> Moreover, as one of the nation's larger land and natural resource managers, DOE has trustee responsibilities to protect and

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preserve its lands, natural, and cultural resources not only under the treaties, but also under numerous federal and state laws. Although some progress is beginning to be made in characterizing what might be termed the "ecocultural landscape,"<sup>13</sup> DOE has yet to effectively integrate American Indian cultures, cultural values, and its cultural resource protection and management responsibilities into its site "clean-up" decision-making processes.<sup>14</sup>

Widely recognized deficiencies of conventional risk assessment for comprehensive environmental decision-making have led to numerous independent attempts to create more comprehensive and holistic approaches to risk-based decision-making. The most successful and enduring of these approaches depend on a more integrated environmental management framework that intimately includes values and other qualitative considerations. Numerous, but by no means exhaustive, examples are highlighted within this report.<sup>15</sup> The approaches identified below are readily applicable--and in some cases, have been applied--to DOE sites across the nation, including Hanford.

*There is no need to "reinvent the wheel." These examples all show that more comprehensive risk evaluation frameworks already have been developed, effectively utilized in wide ranging applications across the nation, and can be further adapted to site-specific DOE needs. There is, however, a critical need to have the conviction, courage, and forethought to move forward with incorporating a more holistic management philosophy within all levels of DOE, and to move beyond the historical piecemeal approach to risks, compliance, health, and environmental management in general.*

### IV. TOWARD A MORE JUST AND COMPREHENSIVE RISK EVALUATION PARADIGM

#### A. Risk Perception is the Cornerstone of Risk Assessment, Risk Evaluation, and Risk Management

##### 1) There's More to Risk Than Just Numbers

Despite what we are frequently told, *science is never truly objective*. Science is in fact a highly value-laden product of the culture and society within which it occurs and which it serves. Because we all are members of this society and encounter science daily, we are often unaware or take for granted the imprint of our inherent cultural and personal biases. Furthermore, the nature of the judgement process we apply to filter through all the available information is highly complex and individual, and requires that we select and highlight some information and then ignore or discard the rest. The same is true for all societies or cultures: it is a universal human way to cope with information overload. For example, cultural values and biases dictate the kinds of questions asked in scientific inquiries--and more importantly, the questions not asked.

The term "risk" itself is a value word, like "safe" and "clean." It just *sounds* more numerical, technical, and therefore objective. Risk typically is defined in terms of methods, not goals,

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which only adds further confusion and contributes to its frequent misuse or misapplication. Further, many assumptions, uncertainties, and limitations are inherent in the risk assessment process, largely reflecting a lack of data or knowledge about risk, and have been well delineated (Appendix H). The chief failure of conventional risk assessment--and especially its application--is that it addresses only a part of the much bigger risk picture.

*Many of the identified deficiencies with conventional quantitative risk assessment reflect the fact that risk is not only a function of readily quantifiable (if highly limited) measures of toxicity, dose, exposure duration and pathways, and induced health effects. Risk also inseparably depends upon more elusive, and difficult to measure qualitative factors, such as social and cultural values, along with personal and cultural biases and the relatively subjective or intuitive judgement process used by humans to select and weigh the spectrum of available information and attitudes. Ironically, in many important respects, more is known and quantifiable about "perceived" risk than about toxicological hazards, environmental pathways, and health impacts.<sup>16</sup>*

Although often difficult to specify, such considerations are no less important than conventional measures to affected communities, to technically defensible risk management strategies, and to politically supportable decisions for remedial action. To the confoundment of many so-called experts, who are more comfortable with cold, hard statistics about mortality or accident rates, these often highly subjective considerations--often belittled as the "outrage" component--exert a disproportionate influence on decisions. Because such elusive factors are difficult to measure or model, they have been traditionally excluded from conventional risk assessment methodology, dismissed as only opinions or preferences, or if they are included, it's only as "guiding values" during a later risk management phase. *Yet the political reality is that environmental managers must comprehensively address the full scope of risk in order for decisions to have any true viability, lasting power, or popular support.*

The full scope of risk also is profoundly influenced by personal experiences (which may be misleading), how information is presented (mortality versus survival rates), degree of familiarity, biased media coverage, strength of convictions (that remain steadfast regardless of evidence to the contrary), and a host of other highly variable individual factors. Moreover, when nuclear issues in particular are considered, factors such as uncontrollability, dread, catastrophic potential (on a global scale), fatal consequences, immediacy, high risk to future generations, and involuntariness take on a heightened influence.<sup>17</sup> For example, people are generally willing to accept risks from voluntary activities (such as skiing) that are roughly 1000 times greater than from involuntary hazards (such as food preservatives).<sup>18</sup>

Clearly, risk means different things to different people.<sup>19</sup> For example, a high degree of "perceived" risk typically is required to cause a change in behavior, such as avoidance, stricter discharge limits, or in the case of remedial decisions, "clean-up." It is time to move beyond the arbitrary and fallacious technical distinctions between "hazard" and "outrage," which are too commonly misinterpreted separately as "real" and "perceived" risks (i.e., not "real" to experts, those who matter, even if "real" to affected communities, who don't matter). In point of fact,

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factors commonly associated with "outrage" are more often than not found to be related to quality of life and cultural values that truly are at real risk.

### 2) It Always Returns to Values

Hence, conventional quantitative risk assessments alone tell only a limited part of the story. Numbers can provide a representative version of the truth--if the right data are collected--but a comprehensive characterization of risk and its role in risk management and remedial decision-making always returns to values and quality of life issues. The real question is whose values will govern the process. Will it be those of remote, uninvolved "experts," a distant, self-obsessed, and sometimes uninformed federal government, or those of the communities that are affected by such actions every day?

There is much more at risk than human health and the environment, although these are clear measures of health and risk. Important qualitative and cultural values--and cultures themselves--are at risk from DOE facilities and past, current, and future activities across the nation. This equally important cultural risk can only be determined by including both values and the affected communities directly in a rigorous and systematic evaluation process. Such concerns are at the very heart of the environmental justice reforms that all federal cabinet-level departments are implementing. These values cannot simply be applied as *post hoc* "scaling factors" to the "real" (read: legitimate) hazard data during a subsequent risk management phase, nor should they be used solely to modify the tail end of a decision process after the "experts" have already framed the discussion and established "their" boundaries as to the scope of the study or range of options.

Without a more rigorous, credible, and comprehensive process, decisions based on risk alone may result at best in unprotective or short-sighted remedial actions. At worst, they result in political decisions that are based solely on budgetary constraints and rely on a biased, fragmentary information base. To facilitate the widespread acceptance necessary for success and to comprise a credible approach to risk management and remedial action decision making, traditional risk evaluation must become a more responsive, open, and humane process.

## B. Moving Beyond Conventional Risk Assessment

### 1) Overview

The widespread deficiencies and limitations of conventional risk assessment, both as a technical evaluation methodology and as a policy or political decision-making tool, are well recognized by many diverse interests (see Appendix H). Risk assessment is often praised for its ability to quantitatively characterize, and thus support ranking or prioritization of actions necessary to eliminate, control, or 'manage' risk.<sup>20</sup> But conventional risk methods are plagued nonetheless by a number of inherent limitations in their ability to reflect cultural or other social values--such as

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those of American Indian tribes--that are not easily quantified, numerically simulated, or modeled. Regardless, a full evaluation of risk remains a highly subjective matter, which necessarily includes qualitative attributes, cultural factors, and subjective judgements. No true or comprehensive characterization of risk can ignore such fundamental and integral considerations, which can only be identified and incorporated through comprehensive involvement of affected communities and their values throughout the process.

Because so many different sets of values (whose to choose?) are commonly involved, some of which may conflict, many processes and decisions simply leave it to the "experts" or settle for a solution that appears least objectionable to the most people at the surface, even if it is short-sighted or unprotective. Too often, "consensus" simply means compromising any real substance out of a process or decision.

"When common ground is limited, we reach for acceptability, not desirability. In environmental management, when stakeholders have different value systems (cultures) we tend toward analytic thinking. Therefore, trying to get holistic thinking from people with different value systems is difficult. Analytic thinking supports science, individualism, and discovery. Holistic thinking supports management, consensus, and optimization. For [successful] environmental management, clearly we want to blend both holistic and analytic thinking in a situation where our differences force us toward analytic thinking.

"We don't have to define desirability precisely. A rough estimate will do. . . . [A] rough estimate of desirability is not only easier, it's better. . . . [W]hen we define exact boundaries, people will tend to focus on the boundary and meet lower requirements.

"The answer is to optimally blend holistic and analytic thinking and to trade off individualism and technology against unified values and management. Holistic thinking is in itself oriented toward this blend. The environment deserves a profound understanding of the harmonious blend of science and management."<sup>21</sup>

Risk evaluations, as integral components of a political process, should not be allowed to singularly substitute for the need to weigh a broad spectrum of relevant information and make tough decisions or political choices. Nor should tough choices simply default to the so-called "panel of experts" approach that only facilitates further disconnect from affected communities, justifies a "solicit input" and "respond to comments" approach, and isolates democratic decision-making from those activities that affect people's lives and their communities every day.

### 2) Building Consensus

These widely recognized limitations have led to numerous attempts to improve the quality, comprehensiveness, and responsiveness of risk evaluation efforts. One of these efforts was

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conducted in direct response to Assistant Secretary Grumbly's request before the National Research Council in November 1993, which resulted in a report called *Building Consensus Through Risk Assessment and Management of the DOE's Environmental Remediation Program* (1994). The *Building Consensus* report in particular attempts to outline a new risk evaluation framework. It begins by highlighting two elements essential to building a credible risk evaluation process: "it is vital to the quality of the [risk evaluation] process that independent external review and public [and tribal] participation occur throughout"<sup>22</sup> and the "importance of including considerations other than quantitative ones in risk assessment and risk management."<sup>23</sup>

The inclusion of meaningful and effective public/tribal participation in *all* phases of a credible risk evaluation program is the clearest way to build credibility, which *Building Consensus* spells out in some detail.

"Stakeholder<sup>24</sup> participation should begin with scoping and continue throughout the assessment process. It should be included in key decisions and integrated into the work plan. . . . It should begin early in the conceptual phases of a program and continue through[out] each phase. It should be interactive and iterative, and stakeholders should perform consultative roles in which they help define basic concepts and approaches, rather than exclusively the more traditional 'review and comment' role. Broad stakeholder participation can improve the quality of assessments by increasing the comprehensiveness of data; ensuring that all site-relevant pathways, end points, and land uses are taken into account and are based on an accurate understanding of habits, values, and preferences of affected people; and contributing to the discussion of appropriate and acceptable uses for risk assessment in the process of risk management. *Stakeholder participation in assessing risks at DOE facilities must be an integral component of any process that is expected to result in credible, broadly accepted assessments.*"<sup>25</sup> [emphasis added]

Moreover, Assistant Secretary Grumbly is particularly sensitive to the essential need for *credibility* in order to gain public, tribal, and regulator acceptance. Such credibility results directly from a responsive, responsible, and competent organization fully satisfying a comprehensive set of objectives. *Building Consensus* outlines six essential attributes that any risk evaluation "institution" must possess:

- "It needs to be perceived as being neutral and credible.
- "It needs the ability to conduct scientifically valid and responsible risk assessments.
- "Its assessments must be subjected to independent external review by technical experts [not just agents selected by the organization responsible, paradoxically, for both pollution and clean-up].
- "It needs the ability to plan, organize, manage, and facilitate public [and tribal] participation in [affected] communities.
- "It needs to have [financial and scientific] management capability.

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- "It needs the ability to communicate complicated scientific information on potential risks and uncertainties effectively."<sup>26</sup>

"*Building Consensus*" then identifies four principal objectives for risk assessments:

- Providing "credibility,"
- The need to "operate expeditiously,"
- The need to "consider the *full range of risks of concern* to stakeholders in the light of social, religious, historical, political, land-use, and cultural values and needs," and
- Being "efficient and cost effective and produc[ing] results that contribute to identification of remedies and priorities."<sup>27</sup>

### C. Toward Holistic/Integrated Environmental Management

A number of recently completed efforts directly confront recognized problems and limitations with conventional risk assessment methodology. Each attempts to establish criteria and process(es) that provide a sufficiently comprehensive information base to support credible, technically defensible, and politically acceptable risk management and remedial decisions.

A recurrent theme among all of these efforts has been the need to directly address those important qualitative issues, social/cultural values, and elements of time traditionally ignored in conventional risk assessment and piecemeal (crisis) environmental management. The focus of these efforts has been to develop a more comprehensive and rigorous framework that specifically includes qualitative considerations and social/cultural values as an integral component of the risk evaluation and decision making process. This focus is based on universal recognition that many factors in addition to quantitative data are relevant to priority setting and risk management, and that these must be included in the evaluation process in order to provide both credibility and comprehensiveness to the nature, magnitude, and urgency of risks identified. Moreover, there is consistent and universal recognition among these efforts of the critical need for integrated tribal/public participation throughout the decision making process for it to gain the credibility and popular support necessary for success.

These innovative risk evaluation efforts all have directly and successfully challenged the well recognized limitations of conventional risk assessment methodology. They have attempted to construct comprehensive and workable solutions that will improve both the usefulness and defensibility of risk evaluation as an analytical support technique and as a decision-making tool. These state-of-the-art studies consciously recognize and fully incorporate the full scope of risk into their process, and show how it can be done efficiently, cost-effectively, and credibly.

In many respects, these approaches can meet Assistant Secretary Grumbly's mandate by building in credibility and effective tribal/public participation throughout the process. The selected examples highlight numerous, workable, and cost effective alternatives. The critical obstacle yet

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to be overcome is the still deeply entrenched institutional resistance within DOE and its contractors that has effectively prevented even the consideration of new or more comprehensive approaches, let alone their implementation. The principal challenge now is to adapt and adopt these techniques into DOE's decision-making framework, both at the site-specific and complex-wide levels, and to foster DOE's recognition that such efforts will pay off both politically and financially with more widespread popular support and more timely, cost-effective results.

Nine different forums that explore comprehensive risk evaluation and holistic environmental management are highlighted in Appendix I; they are by no means exhaustive. These include the Blacksburg Forum, the Vermont Comparative Risk Project, the Wisconsin Tribes Comparative Risk Project, and the California Comparative Risk Project, and five Hanford-specific forums, Values-Based Risk Evaluation, the Hanford Future Site Uses Working Group, the Hanford Tank Waste Task Force, the Hanford Environmental Dose Reconstruction Project, and the Native American Working Group.

Each of these efforts has developed an innovative approach to characterizing risk and/or developing environmental priorities that are built upon meaningful and comprehensive tribal/public participation throughout the process and firm incorporation of social, cultural, and aesthetic values directly within their evaluation methodology. Each, however, has depended upon a combination of science, an upfront awareness of the critical role of perspective and uncertainty, and the combined judgement (recognizing its subjectivity) of scientists, citizens, and affected community members. The consistent and systematic application of evaluation criteria to both quantitative and qualitative considerations also permit ranking, where desired. Moreover, all forums independently agree that true risk cannot be accurately and comprehensively characterized--and hence broadly accepted risk evaluations result--without an overarching holistic perspective and breadth of data that fundamentally recognizes and incorporates values and qualitative measures of risk into integrated environmental management strategies.

### D. Risks, Costs, and Benefits are Interrelated

Reducing risks requires action on (or in) the ground. The magnitude, breadth, severity, and urgency of the multiple threats that Hanford poses will necessarily result in involuntary human suffering, accumulating environmental damage, and growing associated public health costs, either immediately or over the long-term. Avoiding the adverse impacts, whether direct or indirect, that result directly from such threats can only occur by effectively removing or reducing the risks.

Real risk reduction cannot be accomplished legislatively by gutting current environmental laws, by removing the rights of citizens and communities to enforce such laws on their own if government will not, or by establishing remedial standards or residual risk levels that are not truly protective, but merely the result of intense political pressure and "compromise." True risk reduction must be focused where the greatest risks are really located, which is *not* in the halls of

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Congress or DOE (even though some might disagree). Not only affected communities, but society as a whole will truly benefit, over both the short- and long-term, from substantive actions that demonstrably protect human health, the environment, and cultural values. Many people simply don't trust government and government officials these days--and rightfully so--because of government's persistent failures to live up to commitments. Congress and especially DOE also would benefit enormously and immeasurably from society's restored faith and trust in a government that does not often seem to protect the interests of society as a whole.

The current annual Hanford EM budget (FY 95) is on the order of \$1.4 billion. Current planning in both DOE and Congress indicates that such order-of-magnitude levels are unlikely to continue, regardless of actual field conditions. Allocation of the current Hanford budget is split between various programs including Waste Management, Nuclear Materials and Facility Stabilization, Environmental Restoration, Landlord, and others (Appendix J). For example, funding for Environmental Restoration nationwide totals about 25% of DOE's EM budget, but at Hanford this program accounts for only 13% of expenditures. Moreover, while it is expected that the overall EM budget will decline in real dollars over the next few years, major new "clean-up" responsibilities, such as the Savannah River Site, SC, and the Mound Plant, OH, will be added, leaving even fewer dollars available for existing commitments.

As most people would perceive it, very little of this budget is directed at actual "clean-up" (i.e., the proactive components of remediation and restoration, decontamination and decommissioning); the bulk of funds are spent on "waste management," or simply maintaining the status quo. For example, at Hanford, fully two-thirds of the dollars now spent go simply to monitor and maintain existing conditions (or confirm that they are growing worse) at tank farms, in contaminated facilities, and to store hazardous wastes, and nothing more. Another 20% goes directly for "overhead;" additional major indirect costs that further inflate this figure are hidden throughout each program's budget. *If progress in achieving "clean-up" is ever to occur, a fundamental change in thinking, goals, and decision-making frameworks is desperately required.*

### 1) The Need for a Proactive On-the-Ground Commitment

"Clean-up" of DOE sites has come under increasing scrutiny by tribes, the public, and Congress because considerable expenditures of public funds over the past five years have resulted in little apparent accomplishment of outlined goals. Outside of DOE, there is widespread support for proactive remedial and restoration *actions*: remove or stabilize existing wastes and contamination, stop discharges into the Columbia River, pump-and-treat contaminated groundwater, stabilize tank wastes and spent fuel, remove or reuse outmoded facilities, etc. To most of Hanford's "stakeholders" and to most individuals of whatever community, these types of *actions* are what most people think of as "clean-up."

*It's not that enough money is not available, it's more a lack of proactive commitment and focus to actually conduct meaningful "clean-up" in the field and not just maintain the status quo.*

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*Prioritization alone is not enough. The basic problem has been a refusal to act.* Endless discussions at DOE center on ancillary issues, having all the answers before beginning, waiting for better/cheaper technology, residual risk and clean-up standards, duplicative monitoring, and a focus on the letter but not spirit of regulatory requirements. *These distractions have in common that they are all forms of delay or doing nothing.* Together they have led to a remarkable lack of action in the field to actually reduce or eliminate those very real risks that are affecting both human and ecological communities every day.

Risk evaluation or prioritization cannot become yet another excuse for rationalizing still further delays or doing nothing, for continuing to stall meaningful actions while contamination spreads, for failing to develop values-based remedial designs, or for refusing to accept responsibility for tough decisions that lead to action. It is especially critical that, in an era of budgetary constraints, limited resources must target meaningful actions and focused data collection that directly reduce current and future risks to humans and other communities, not just continued monitoring. The longer we wait, the more complex, difficult, costly, and widespread problems will become. Fences (or other institutional controls) alone cannot mitigate these threats, either now or in the future.

### 2) Impacts of Proposed Budget Reductions for Cost-Effective Risk Reduction

Proposed EM budget reductions over the next several years have been self-imposed at the DOE-Headquarters level in an attempt to avoid perhaps a less selective Congressional budget axe. Currently proposed major cutbacks for FY 1996 and 1997 mean that available funds will be inadequate to meet scheduled TPA milestones, which constitute legally binding commitments on the federal government. The focus of proposed cuts would appear to bring virtually all meaningful field remediation efforts, such as groundwater pump-and-treat programs, to a grinding halt. To make matters worse in the eyes of tribes, the public, regulators, and stakeholders, the Environmental Restoration Program appears to be the disproportionate focal point of cuts year after year. Moreover, expensive new production activities that are now being proposed cannot take precedence, and must not be permitted at the expense of "cleaning up" the legacy of past weapons production activities. DOE appears to be deliberately setting itself up to fail in the eyes of tribes, the public, and Congress when it proposes the largest cutbacks in just those areas that demonstrate the most visible on-the-ground action and have the greatest popular support to accomplish what most people would consider "clean-up."

DOE appears to be heading down the same road to failure because, in its panic to address both real and feared budget cutbacks, it has retreated into its former (?) secretive habits and failed to seek the support and involvement of its "constituents." By not involving its constituents, their values, and interests in the hard decisions to be made, DOE is bound to repeat its past mistakes and fail once again. For example, groundwater pump-and-treatment programs have received widespread support from a diverse group of interests because they are proven to be highly effective and meaningfully contribute to removing, reducing, or controlling further contaminant

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migration--both at Hanford and elsewhere. Few other "clean-up" programs share such a high degree of popular support and demonstrated field success. Specifically, one groundwater pump-and-treat project addressing carbon tetrachloride contamination in the Hanford 200 Areas has been enormously successful.<sup>28</sup> But DOE and especially its contractors have been disturbingly quiet about this unabashed success story--perhaps because they then might be expected to implement such programs more widely.

Contractors must not be allowed to control and further stall meaningful progress out of simple self-interest and greed. It is not unusual for contractors to stall or oppose implementing an agreed upon approach in order to simply perpetuate and institutionalize the incoming federal dollars. The increasing proliferation of contractors (and contractor employees) at the Hanford site has greatly compounded already exacerbated communications problems and work efficiency. Moreover, having too many contractors also has facilitated an "empire-building" mentality consisting largely of petty turf battles. Many program managers appear to have lost all sight of the overall purpose and direction of "clean-up" in their narrowly focused zeal to control programs, staff, workscope, and ever more dollars. Unfortunately, contractors often contribute more to Hanford's problems than to its desperately needed solutions.

Those who only question what is done without simultaneously asking how it is done miss the point. Over a year ago, the Hanford Federal Facility Compliance Agreement was amended to include a Cost and Management Efficiency Initiative geared to result in a savings of \$1 billion at Hanford alone over the next five years. Yet DOE and its contractors appear to have done little to actually implement this desirable program, to actually eliminate top-heavy management, excessive overhead and indirect costs, bureaucratic inefficiency, excessive and redundant oversight, focus employee activities, and to actually get the dollars focused into on-the-ground actions--such as Hanford groundwater pump-and-treat projects. To our knowledge, few if any measures of success have been developed for this effort, and no attempts to solicit values, involve outside interests, and to develop an overarching philosophy for improvement have yet been made.

Similarly promising efforts such as the Schedule Optimization Study (1992) and the Project Performance Improvement Plan (1994)--studies specifically commissioned by DOE--also have faded into oblivion, once the initial fanfare and excitement has dissipated. These forums directly address true obstacles to "clean-up" progress, but their recommendations are consistently ignored by DOE managers who are much more a part of the problem than the solution. Rather than let themselves be blamed, attention is diverted from the crux of the problem. For example, many now call for scrapping the TPA, because "it" can be blamed as the source of delays and excessive costs. This diversionary tactic is their first choice, *even though DOE has made few good faith efforts up to this point to live up to the agreements it signed*, which were negotiated in good faith. Another DOE strategy has been to reduce, postpone, or eliminate workscope and staff in the field, but not in the managers' offices. What does this portend for DOE's already tarnished credibility and trustworthiness in the eyes of tribes, the public, or Congress?

### 3) Action in the Field, Not the Halls of Congress, Is Required

Enough is known now about the most urgent and severe Hanford risks and conditions to begin meaningful action in the field. More data or information is always desirable and in fact must be collected in order to better understand and comprehensively characterize the full scope of Hanford risks sitewide and support their prioritization for resolution. But there are many things that can be done immediately to move ahead with "clean-up" in the field.<sup>29</sup> Use the lessons learned along the way to adjust and make necessary improvements; valuable data and new insights will result. *The key point now is to start.* Make major management and decision-making framework changes, involve affected communities in all aspects of decisions and programs, refocus programs to accomplish timely, good faith results in the field, etc.

"Changing the rules" by legislating "clean-up" approaches or remedial standards without sustained, effective, and comprehensive "clean-up" of the nation's Cold War legacy in the field will only lead to further, magnified, and more widespread problems in the future. While creating "national sacrifice zones" apparently can be rationalized by some as cost-effective in the short-term, this short-sighted approach will necessarily result in proportionally much greater public health, environmental, and societal costs over the full period of *many thousands of years* that such risks will persist, grow, and spread. This legacy, imposed upon tribal and other communities without their knowledge or consent, appears to be rooted in a profound belief that science can be legislated, that both legal and moral considerations can be dismissed if they're inconvenient, and that federal government commitments can remain unfulfilled.

## V. CONCLUDING OBSERVATIONS

Cost-risk-benefit analyses will increasingly be used to support budget allocation, prioritization, and remedial standards. Because of the unforgiving potential consequences of poor or politically expedient decisions, it is more important than ever to improve and better integrate risk assessment, risk management, and decision analysis tools to fit the data needs, public desires, and federal government responsibilities. Within any particular decision context, it is imperative to maintain a consistency of philosophy and a clear understanding of the information needs (breadth, precision, and uncertainty) at different decision levels. Furthermore, this participatory democratic process should be driven by values-based goals, and supported by the most appropriate and defensible tools chosen specifically to accomplish the identified goals.

- Equal access to a shared decision process is often lacking. Full tribal/public participation should influence all stages of the process, from scoping, to values identification, to information requirements, to the final decision.
- The process must *begin* with statements of values, principles, and decision criteria, rather than simply with narrow technical problem statements. Values are system requirements, not just opinions or preferences that can be "addressed" later.

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### A. The Lessons of Piecemeal Environmental Management

The current lack of an integrated environmental management policy based on comprehensive and clearly stated principles and objectives, either at Hanford specifically or throughout the DOE complex in general, has resulted in a long and frustrating history of poor decisions, lost time, and inestimable sums of wasted public dollars. Constant internal reorganizations and perpetually high staff turnover at DOE effectively prevent learning from either past mistakes or successes. For example, the following recent failures from Hanford illustrate the dire need for an overarching vision and consistency of purpose, a more sound integration of technical, institutional, and cultural perspectives, a more sound and open intergovernmental decision process, and a solid base of information to begin with.

- N-Springs barrier (failed to address cultural sensitivity and overlooked technical feasibility issues in rush to act),
- Waste entombment in grout (did not satisfy health and retrievability requirements and failed to involve and meet public/tribal acceptance),
- EMSL siting and resiting (ignored cultural resource protection concerns voiced by both tribes and DOE's own contractor),
- Proposal to quarry rip-rap or barrier material from sacred sites such as Gable Mountain (failure to consider affected tribal community/spiritual values and long-term, cumulative environmental impacts to on- or offsite quarry sites),
- Aesthetic degradation of Gable Mountain from proposed nearby SMES siting (failure to consider affected tribal community/spiritual values),
- Location of ERDF within prime sage-steppe habitat (decision made without tribal/public/natural resource trustee input, considering long-term environmental impacts, or habitat mitigation requirements),
- Deficiencies of simple surface barriers for long-term environmental and value protection (failure to provide long-term protectiveness, indirect and cumulative impacts of mining vast amounts of hard rock and cover soils from external sites),
- Proposal to renege on 300 Process Trenches ROD (original agreement to remove wastes now deemed "too hazardous" to workers), and
- Claim to have "cleaned up" 45% of the Hanford site (a highly deceptive public relations campaign because only an infinitesimal fraction of 1% of contamination--none radioactive--was involved, and restoration of disturbed areas is highly limited).

### B. The Strength of Integrated/Holistic Environmental Management

On the other hand, defensible and widely acceptable decisions are much harder to enumerate. Where they exist, each has in common components of the broader integrated environmental management philosophy described herein, which depend upon a more effective and substantive tribal/public involvement in values identification and multiple phases of decision making, and a

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more solid, if still incomplete, information base. The examples below owe their success to an overarching vision that reflects widely accepted values and a consistency of purpose--elements that are blatantly missing from any of the above failures.

- Recently completed Environmental Restoration Program Refocusing amendments to Hanford Tri-Party Agreement (which DOE balked at signing for months),
- Some Facility Transition planning, and
- The identified "Path Forward" for spent fuel in the K-basins.

In fact, the development of clearly defined principles, goals, and decision criteria and a single sitewide engineering design basis which directly incorporates values, expectations, interests, and rights will be essential to provide the holistic framework necessary for both technically defensible and politically acceptable decisions. This process must include the fundamental establishment of a comprehensive and effective intergovernmental process built together with tribal sovereigns, and not just in response to them.

### C. Returning to Congress' Mandate

The success of DOE's environmental management program overall and the permanence of decisions that result ultimately will require a much stronger information base than now exists. Effective prioritization of activities can only occur with sufficient information, which will also provide a baseline against which risk reduction progress can be measured in terms of both health-effectiveness and cost-effectiveness, and for which cost-risk-health goals can be developed. Credibility, however, will depend upon developing clear and focused data objectives and will require an open process that facilitates the equal participation of affected communities and a comprehensive inclusion and evaluation of all major issues of concern. Current data quality ranges from zero to subjective to (occasionally) relative and (rarely) qualitative or quantitative. *Because of a long history of successful and sustainable environmental management, tribes would appear to be one of the few sources of sound technical and policy guidance on what information is needed for various decision contexts and how to collect it cost-effectively.*

- What is the relation between compliance agreement requirements and actual environment, health, and safety effectiveness?
- Under what circumstances is a life-cycle/cost-risk approach needed, when will a budget-based approach suffice, and when must cultural values predominate?

In returning to these original questions that Congress sought answers to, it is imperative to note that credible cost-risk-benefit analyses cannot take place until a more comprehensive and defensible risk picture begins to develop. This will require the integration of both a sufficient information base and the values of affected communities. This critical point appears to be recognized by both Departmental and Congressional leaders, *but now must result in actions being implemented to provide the necessary scope of information together with the necessary*

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*process that facilitates involvement of affected communities.* Only then can the questions Congress has asked be adequately, comprehensively, credibly, and defensibly addressed.

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### Notes

1. The term "*clean-up*" constitutes one of the most overused and abused terms associated with DOE's new environmental restoration mission at many of its sites. Although this term is often used as shorthand for a variety of activities, its overuse has led to a loss in any real meaning and in fact its use frequently obscures the true nature of actions taking place. In this report, the term "*clean-up*" is used only in a general sense to convey an overall image. Specific actions are referred to by the appropriate term, such as environmentally sound waste management, environmental remediation, or environmental restoration. Although more cumbersome, these terms more accurately and correctly describe the specific nature of actions being undertaken.
2. For the purposes of this report, '*risk*' may be defined as the likelihood of adverse consequences from an action or condition. Quantitative risk assessments tend to substitute the term 'probability' for 'likelihood,' with the implication of greater mathematical rigor and precision.
3. Risk analyses may encompass a wide variety of techniques and approaches. Approaches may produce either quantitative (numerical, probabilistic) results, or result in qualitative rankings such as high, medium, or low levels of risk. Types of analyses commonly in use include, but are not limited to: quantitative risk assessment, comparative risk assessment, qualitative risk assessment, values-based evaluation, alternatives assessment, worst-case scenarios, fault-tree analyses, and other techniques.
4. At first glance, risk assessment appears to offer a number of distinct advantages. In remedial decision-making, for example, a number of potential benefits have been recognized.
  - Risk assessment helps in ranking the relative importance of individual contributions to overall risk.
  - Risk assessment helps to identify risks that are easily reduced or eliminated.
  - Risk assessment can provide an objective [?] basis for decisions on controlling or managing risks.
  - Risk assessment can provide important quantitative information as input to decisions for allocating resources to remediate sites.
  - Risk assessment makes it possible to rank remedial alternatives in terms of risk to workers, the environment, and the public.
  - Perhaps most important, risk assessment can provide a process for consensus and a forum for the participation of stakeholders in the development of the risk assessment process and the identification of important social, cultural, and tribal values in the selection of factors to be assessed and remediation alternatives to be analyzed. This process will hopefully lead to greater acceptance of the eventual result of that remediation as well as provide insights as to how to reduce public health impact during and after remediation. [emphasis added]

from *Building Consensus*, p. 13-14.

5. President Clinton issued Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," on February 11, 1994. "The purpose of this Order is to underscore certain provisions of existing laws that can help ensure that all communities and persons across the nation live in a safe and healthful environment." The cover letter to the Order further states that "[e]ach Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required

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by the National Environmental Policy Act of 1969 (NEPA). . ." Among the requirements in this Order is the identification of differential patterns of consumption of natural resources, and considerations of environmental and human health risks as well as social and economic impacts.

6. *Closing the Circle on the Splitting of the Atom, The Environmental Legacy of Nuclear Weapons Production in the United States and What the Department of Energy is Doing About It*: U.S. Department of Energy, Office of Environmental Management, January 1995, p. 9.

7. *Closing the Circle, and Environmental Management 1995*: U.S. Department of Energy, Office of Environmental Management, February 1995.

8. *Closing the Circle*.

9. See supplemental documentation in Appendix F.

10. E.g., the Comprehensive Environmental Response, Compensation and Liability Act, "CERCLA or 'Superfund'," 42 U.S.C. § 9601 et seq., the Emergency Planning and Community Right-to-Know Act "EPCRA," 42 U.S.C. § 11001 et seq., and the Resource Conservation and Recovery Act, 42 U.S.C. 6901§ et seq.

11. Forcing ATSDR to more meaningfully fulfill its CERCLA mandate would be a step in the right direction. Few of its current efforts have anything to do with understanding or assessing impacts to communities and their health, either presently or in the future.

12. See Appendix C.

13. The term '*ecocultural landscape*' refers to a combination of "landscape ecology" plus the term "cultural landscape," as used by the U.S. Forest Service. It is intended to convey a more all-inclusive ecosystem concept in which humans and their values are an integral part of the whole system and not separate from it.

14. The crisis created by DOE contractors unearthing American Indian cultural artifacts during site grading operations for the Environmental and Molecular Sciences Laboratory (EMSL) in April 1994 is a case in point. Following release of the initial Environmental Assessment for siting EMSL in 1992, the CTUIR submitted comments emphasizing the high potential for cultural artifacts being present along this river margin bluff site. Similar reservations also were expressed by cultural resources staff of DOE's own contractor, the Pacific Northwest Laboratory (PNL). These concerns were ignored. Instead, the favored river view site was chosen in spite of voiced concerns and the availability of two less risky siting options. After artifacts were discovered on the second day of site activities, the process came to a screeching halt while restoration activities began. After several months delay, the building was resited to one of the original alternative locations. This fiasco unnecessarily cost the U.S. taxpayers between \$3 and 8 million, solely because DOE failed to listen to legitimate and widely expressed concerns.

15. See Section IV, Subsection C, *Toward Integrated/Holistic Environmental Management*, and Appendix I.

16. Slovic, Paul, 1987, Perception of risk: *Science*, v. 236, p. 281-283.

17. See Slovic, Paul, 1987, Perception of Risk: *Science*, v. 236, Figure 1, p. 282.

18. Slovic, Paul, 1987, Perception of risk: *Science*, v. 236, p. 282.

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19. These ideas, which are further expanded upon within this note, are largely adapted from Slovic, Paul, 1987, Perception of risk: *Science*, v. 236, p. 280-285.

This is particularly the case with rapidly evolving chemical and nuclear technology issues and the impacts these technologies increasingly have on modern society and the environment--technologies that are unfamiliar and incomprehensible to most people. Harmful consequences may be rare or delayed, hence difficult to quantify or statistically analyze. Such consequences, however, often may be catastrophic, long-lasting, involuntary, not easily reduced, have fatal consequences, appear uncontrollable, pose a high or increasing risk to future generations, and receive much public attention (see Figure following Appendix G). Events like the 1986 Chernobyl meltdown in the former Soviet Union, the 1985 Bhopal chemical release accident in India, or the 1979 accident at the Three-Mile Island nuclear plant in the northeastern United States fit this category.

Such events have been interpreted as "signals" by some researchers that "effort and expense beyond that indicated by a [conventional] cost-benefit analysis might be warranted to reduce the possibility of 'high-signal accidents.'" *Events involving nuclear weapons (war), nuclear weapons fallout, nuclear reactor accidents, and radioactive waste all are specifically identified as "particularly likely to have the potential to produce large ripples. As a result, risk analyses involving these hazards need to be made sensitive to these possible higher order impacts."*

"In short, 'riskiness' means more to people than 'expected number of fatalities.' Attempts to characterize, compare, and regulate risks must be sensitive to this broader conception of risk. . . . [T]here is wisdom as well as error in public attitudes and perceptions. Lay people sometimes lack certain information about hazards. However, their basic conceptualization of risk is much richer than that of experts and reflects legitimate concerns that are typically omitted from expert risk assessments. As a result, risk communication and risk management efforts are destined to fail unless they are structured as a two-way process. Each side, expert and public, has something valid to contribute. Each side must respect the insights and intelligence of the other." [emphasis added]

20. Refer to Endnote 4, above.

21. *Report of the Blacksburg Forum: The First Step Toward the Holistic Approach to Environmental Management*: Management Systems Laboratory, Virginia Polytechnic Institute and State University, Blacksburg, VA, 1991, p. 19-20.

22. *Building Consensus Through Risk Assessment and Management of the Department of Energy's Environmental Remediation Program*: National Research Council, Committee to Review Risk Management in the DOE's Environmental Remediation Program: National Academy Press, Washington, D.C., 1994, p. 21.

23. *Building Consensus*, p. 23.

24. The term 'stakeholder' is commonly used to encompass all 'interested and affected parties' that may be impacted by a particular action or proposed action. A catch-all term, it often indiscriminantly lumps together state and local governments, public interest groups, business and labor interests, environmental groups, and others, in addition to sovereign tribal nations. But not all 'stakeholders' are created equal. Tribal nations comprise a unique legal entity whose rights, interests, and responsibilities are both distinct from and superior to those of state and local governmental interests and any public interest groups. Tribal sovereignty is formally recognized and protected in treaties signed with the United States government, in which tribes specifically reserved rights to utilize lands and resources and to perform traditional activities as they have for thousands of years. Moreover, the treaties also imposed a trust responsibility upon the U.S. government to protect and preserve those lands and resources upon which tribes depend for subsistence or other cultural activities. Furthermore, Columbia Plateau tribes are unusual

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among many tribal nations in that their treaties specifically provide off-reservation treaty rights and guarantee access to resources throughout the lands ceded to the United States in the treaties and throughout all other usual and accustomed locations. The sovereignty of tribal nations also requires the U.S. government to establish formal government-to-government relations and to proactively consult with tribes concerning any proposed federal action or program that may affect the interests of tribes, as mandated in the DOE Indian Policy. Tribes are also designated as Natural Resource Trustees under CERCLA, and thus must be formally consulted in the planning, management, and execution of any "clean-up" programs developed under CERCLA that may impact their sovereignty, treaty-reserved rights, lands, natural and cultural resources, or other interests. *No other entities commonly considered 'stakeholders' share these unique and distinct rights and privileges.* This point is a consistent source of confusion among many state and federal agencies and elements of the public, especially outside the Pacific Northwest where such conditions are rare. Hence, tribes should always be separately identified and their unique rights and interests formally acknowledged.

25. *Building Consensus*, p. 36-37.

26. *Building Consensus*, p. 37-38.

27. *Building Consensus*, p. 24, 26.

28. It is especially interesting to note that any quantitative risk assessment conducted to define the current risk posed by carbon tetrachloride contamination in the 200 Areas would show that the current risk is far below regulatory thresholds that normally would trigger a response action. Thus, such a result would more typically be used to support non-action at the site because there are not now viable exposure pathways to humans or the accessible environment, in the absence of considering this groundwater as a drinking water source. This narrow view, of course, totally ignores any future threat posed when existing contamination migrates and begins to discharge into the Columbia River at concentrations far above permissible standards, as shown in modeling results. Furthermore, this unique scenario clearly emphasizes how risk assessments may or may not be used for political reasons or in response to public concerns. In this case, social values and qualitative concerns about the potential future impacts of this known carcinogen and its inevitable discharge into the Columbia River vastly outweigh the strictly quantitative assessment which in and of itself would show that only a 'negligible' risk is now present.

29. Refer to Section III, Sub-section B, and Appendix G.

APPENDIX A

DOE's RISK REPORT TO CONGRESS

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## APPENDIX A

### DOE's RISK REPORT TO CONGRESS

Several different Committees of both houses of the United States Congress and various offices within the U.S. Department of Energy are examining standardized use of risk-based remedial decision-making to prioritize, and presumably allocate budgets for, "clean-up" of DOE nuclear production sites across the nation.

#### A. Congressional Mandate

Congress passed Public Law 103-126, the National Defense Authorization Act, on October 28, 1993, in which ". . . the Department [of Energy] is directed to review [federal facility] compliance agreements and to submit by June 30, 1995 a report to the Committees on Appropriations evaluating risks to the public health and safety posed by conditions at weapons complex facilities that are addressed by compliance agreement requirements."<sup>1</sup>

Based on a recommendation of the Conference Committee report on the FY94 Energy and Water Development Appropriation, "the objective for this report was for the Department to provide information and evaluation to support the eventual development of a mechanism for establishing priorities among competing cleanup requirements in light of limited Federal discretionary budgets." The conference report emphasized that "these efforts should be done without performing exhaustive, formal risk assessments of the thousands of cleanup activities addressed in compliance agreements." Rather, the review should constitute a qualitative "estimate of the risk addressed by the requirements based on the *best scientific evidence available*." [emphasis added]

#### B. Department of Energy (DOE) Responses

##### 1) Background

In November 1993,<sup>2</sup> Assistant Secretary Grumbly announced DOE's intent to develop "a credible risk evaluation program which will support the Department's EM mission" within two years. "Good risk management, which cannot happen without good risk assessment, is critical to program success," Grumbly observed.

He identified "credible risk evaluation" as key to DOE success in:

- Protection of public health, safety, and the environment,
- Becoming technological world leaders in environmental restoration, and
- Establishing DOE as outstanding stewards of public resources.

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Mr. Grumbly fully recognized the inherent difficulties and limitations associated with conventional risk assessment when he asked, "*Should 'risk' be defined only by a set of numbers, or are there qualitative values that need to be factored in?*" He stated that the following closely related issues must be addressed:

- 1) "We obviously need some meaningful quantitative data, but we need to remember who our customers are--the public--and not get lost in debates over numbers that keep us from seeing the forest for the trees.
- 2) "We need to balance the concerns of the public health community, which is concerned with the results of and threats from past events and their consequences, and the risk assessment community, which tends to focus more on current and future problems.
- 3) "We need to remember that there are more than just technical problems to consider in risk assessment. *We have to address hard institutional and political problems too.* [emphasis added]
- 4) "Who does risk assessment matters."

Mr. Grumbly concluded, "We must have assessments that are acceptable to the scientific and public health communities and the affected public--that's the only thing we will accept, nothing less."

### 2) Current Tools DOE is Using to Prepare Its Report to Congress

In the past, DOE has employed a number of different tools to prioritize its funding allocations, only some of which have focused directly on risk.<sup>3</sup> Few, if any, of these methods have withstood the test of time, largely because they do not truly and comprehensively address legitimate concerns about funding being directed specifically at problem resolution in the field, the full scope of risks presented by DOE facilities, or tribal/public issues, values, and the direct involvement of affected communities.

Currently, DOE is adopting several different, and in some cases, independent mechanisms to utilize in preparing a report to Congress (tentatively titled "Risks and the Risk Debate: Searching for Common Ground"). This report will outline DOE's approach to identifying, characterizing, and prioritizing risks and developing risk-based decision mechanisms for addressing tribal, public, and environmental health and safety concerns posed by DOE sites across the nation.

At least three independent (?) efforts are now ongoing in support of the preparation of DOE's report to Congress. Two of these are occurring within the Department of Energy: the Consortium for Environmental Risk Evaluation (CERE) report and the Baseline Environmental Management Report (BEMR). DOE also is conducting another internal review known as the EM Qualitative Risk Initiative, or Risk Data Sheet (RDS) activity; the nature, scope, and results

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of this late effort are not known to CTUIR staff. An external report is being coordinated by Steve Blush, former DOE staffer, at the request of the Senate Energy and Natural Resources Committee. The Blush report also is examining risks and costs associated with "clean-up" of DOE sites, with particular focus on Hanford. The degree of coordination between these efforts is unclear.

Unfortunately, none of these reports for were available to CTUIR staff prior completion of our report,<sup>4</sup> with the exception of a draft of the CERE evaluation. An initial evaluation of the proposed methods, however, indicates that none of these efforts is likely to provide the desired information base of sufficient scope, breadth, and comprehensiveness to support an adequate description of the full nature of hazards and risks associated with the nuclear weapons complex. Hence, this report has been prepared to assist DOE is assembling a more comprehensive and truly representative version of the risk puzzle: the more pieces of the puzzle that are available, the better chance we all will have of understanding and seeing the whole picture.

The inferred narrowness of existing approaches and their limited ability to provide a full risk picture are strongly supported by our cursory review of the draft report provided to CTUIR staff by the CERE program. The CERE program purports to assess how well weapons complex risks and "clean-up" costs are understood by conducting a qualitative evaluation of existing quantitative risk assessments at six selected DOE sites now governed by compliance agreements. A distinctly separate part of CERE's program is "cataloging concerns of minority, disadvantaged groups, and disproportionately affected communities" as a means of providing DOE with a "laundry list" of public concerns for consideration in its report to Congress.<sup>5</sup>

Only a draft of the CERE report was publicly available at the time this report is being prepared (March 1995). Unfortunately, the CERE draft made available to CTUIR staff contained no new ideas or evaluation processes, and tended simply to reflect the narrowly focused "panel of experts" approach (yawn) that is, in fact, so much a part of the problem. Furthermore, the CERE approach deliberately fails to consider significant risk elements such as offsite transportation of radioactive, mixed, and hazardous chemical wastes, tribal cultural issues, tribally unique resource use and exposure pathways, a sufficiently broad spectrum of land-use options, multiple and cumulative impacts, and the effects of time, among others. CERE defines an overly broad scope, but then depends on a narrow and selective information base, fails to incorporate values and meaningful tribal/public involvement, and draws broad, sweeping conclusions from highly limited data sets. Thus no credible either sitewide or complex-wide risk evaluations and comprehensive cost-benefit analyses are possible. Additional discussion of CERE program limitations is provided in Appendix D.

DOE also is conducting an internal review of its current Fiscal Year budget commitments in order to assess current resources directed specifically at identifying and characterizing risks, remedial costs, compliance agreement requirements, and benefits. A simple review of current budget commitments, however, will comprise neither a sufficient nor representative measure of true risks through time, acute and chronic health impacts, life-cycle costs, short- and long-term

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benefits, and compliance agreement requirements. Budgets and the priorities they fund are the bedraggled by-product of multiple political compromises. They still require the application of judgement and values. The question is *whose* values will govern the decision making process.

This report intends to broaden the "clean-up" debate to include a *full scope of pertinent risks and costs*, many of which are now effectively ignored by the more narrowly defined approaches DOE is employing, or has employed in the past. *The chief failure of the current DOE decision-making framework is that it is dominated by the institutional values of DOE managers and policy makers alone. It does not reflect the breadth and comprehensive perspective required to build either credible technical evaluations or achievable risk management and remedial decisions that share widespread popular support.* Our report focuses attention on major critical issues now not being considered or that are even being undermined in the dynamic risk debate. By including such issues, DOE can create a more inclusive and responsive framework that will satisfy valid Congressional concerns that budgeted funds must be directed at efficiently and effectively solving real problems and permit DOE to both embrace and proactively accomplish its new mission. Most importantly, only through adopting such a reform will DOE be able to meaningfully protect affected communities from the real risks they face, both now and in the future.

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### Notes

1. The following material is excerpted from "*Fact Sheet: June 1995 Report to Congress*," Draft, July 13, 1994, obtained from CERE, February 14, 1995.
2. "*Working Toward Meaningful Risk Evaluation*," speech by Thomas Grumbly at National Research Council Workshop to Review Risk Management in the Department of Energy's Environmental Management Program, National Academy of Science, Washington, D.C., November 3, 1993.
3. Examples of some of these include the RASS (Resource Allocation Support System), the Project Management System (DOE Order 4700.1), and the current PPG (Project Planning Priority Grid). It is critical to note that each of these systems, along with others, depend solely on the values, biases, and judgement process of DOE managers, and not DOE "constituents." Moreover, some approaches, such as RASS, fail to integrate budget priorities across DOE programs, overcome deeply entrenched institutional barriers, and are based only on narrowly framed or selective evaluation and weighting criteria and a judgement process based solely on institutional requirements. Hence, these highly limited approaches typically focus on analytical/numerical approaches that fail to address concerns and values of affected communities.
4. A copy of the Blush report, *Train Wreck along the River of Money, An Evaluation of the Hanford Cleanup*, by Steven M. Blush and Thomas H. Heitman, was received by CTUIR staff only a couple of days prior to completion of this report. Hence, sufficient time was not available for an adequate review.
5. This CERE program overview based on *Tulane/Xavier CERE Program Qualitative Risk Evaluation Fact Sheet*, December 6, 1994.

APPENDIX B

SAMPLES OF CTUIR CONCERNS ABOUT  
LIMITATIONS OF CONVENTIONAL RISK ASSESSMENT METHODOLOGY

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### APPENDIX B

#### A LIMITED SAMPLE OF CONCERNS OF THE CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION COMMUNITY ON USING AN APPROPRIATELY DEFINED RISK ASSESSMENT MODEL

by Stuart Gerald Harris, Natural Resource Specialist, CTUIR Hanford Program;  
Enrolled Member, CTUIR

### INTRODUCTION

The Umatilla Indian Reservation located near Pendleton, Oregon is occupied by descendants of three Columbia Plateau Tribes, the Cayuse, the Walla Walla, and the Umatilla (Tribes). The Tribal Government is referred to as the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). As a full service government, the CTUIR Board of Trustees (BOT), makes the decisions on providing detailed information regarding culturally sensitive information.

Under these Tribes' Treaty of 1855 [12 Stat. 945], the Tribes ceded lands to the United States. The lands comprising the eastern portion of the U. S. Department of Energy's (DOE) Hanford Site is among the lands ceded by the Tribes. Under the treaty the Tribes retained rights to perform many activities on those lands, including but not limited to fishing, hunting, gathering roots, berries, and pasturing livestock.

Long standing U.S. Supreme Court precedent holds that the federal government (including its executive agencies) has a trust responsibility to Indian Tribes. This means that the U.S. has a fiduciary responsibility to protect the rights of Indian tribes, including tribes' property and treaty rights. Additionally, a succession of U.S. Presidents beginning with President Nixon, have affirmed a federal policy of upholding tribal sovereignty and dealing with tribal governments on a "government to government" basis. Furthermore, there are federal laws to protect tribes' cultural, religious, and archeological sites, access to, and exclusive use, of those sites, and of traditions, activities, and practices associated with those sites as well as Hanford as a whole. Finally, environmental laws also confer rights upon the tribes. For example, the CTUIR is a Trustee for Natural Resources under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

### CTUIR - AN INTERDEPENDENT CULTURE AND ENVIRONMENT

The CTUIR is a sovereign government, that has legal interest in the natural resources upon which the CTUIR's Treaty rights are based, including lands of the Hanford Site. Effective exercise of these treaty rights depends on the health of the natural resources. The CTUIR does not want the people exercising their treaty rights to be placed at risk.

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A risk from nuclear or hazardous waste that potentially affects one person of the CTUIR community may have lasting impacts throughout all of the community. In other words, a wave of risk can ripple outwards affecting all of the individuals in our culture, just like a wave generated and propagated in a tapestry. The unique CTUIR culture can be irrevocably changed or extinguished if enough of the environment and the natural resources on which the CTUIR treaty rights are based are irreparably harmed. Without the natural resources, the cultural values of critical significance to the traditional CTUIR American Indian, and her/his community would be lost. If a culture dies, the only remnant is the material culture. In the event of the unthinkable happening, a continuously sustainable natural resource based material culture, such as the CTUIR would rapidly disperse into the natural environment leaving no trace of the living CTUIR culture.

The people of the CTUIR are a unique culture, that has long been complexly intertwined with the environment through their cultural, familial ties, (e.g., marriage, gender, extended families), and relationships with other tribes. The CTUIR people have enjoyed since time immemorial, many types of native foods and artistically constructed items of material culture (e.g., cookware, clothing, etc.). Individual members are an inextricable part of the environment. These members, their community and the environment are essentially one in the same.

The CTUIR culture, which has co-evolved with nature and through thousands of years of ecological education, has provided its' people with their unique and valid version of holistic environmental management. The traditional CTUIR American Indian is aware from cultural teachings that the appropriate behavior leads to continuous sustainable success in gathering food and material. Traditional education regarding food or raw material gathering practices are passed on from one generation to the next, and is done to ensure food for the next season or generation. The knowledge of the many gathering seasons and areas the traditional CTUIR American Indians get to utilize during the year has been handed down from generation to generation. Some CTUIR families teach cultural knowledge in complete secrecy on the maternal or paternal side of the family/tribal unit in order to protect tribal cultural/spiritual knowledge from exploitation from the non-American Indian societies and governments. Within the traditional lifestyle or culture, it simply is not enough to know that there are supposed to be salmon runs at certain times of the year. To sustain the tribes during the remaining interim periods when salmon are not returning to spawn and other foods are available, there has to be knowledge about other interrelated food chain cycles, gathering techniques, preparation, and cultural/spiritual relationships about what is needed for sustenance. This interdependency of the collective knowledge about the seasonal foods not only affects traditional individuals, but affects the whole tribe as a culture. One person can not be expected to know all things. In practical terms, if a tribe depended on one critical individual, the loss of that one "all knowing" person would effectively end or severely disrupt subsistence existence for the rest of the cultural unit. The same is true of oral tribal history, songs, heritable religious practices and numerous other cultural practices. Continuity may depend on specialized knowledge in each generation.

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The natural world in the Northern temperate zone operates on a seasonal clock. Traditional American Indians of the CTUIR are influenced by this clock, and expectantly look forward to the next cyclic event. These events include not only birth and death but change in general. Throughout the year, when the CTUIR traditional American Indian participates in activities, (e.g. hunting and gathering for foods, medicines, ceremonial, and/or subsistence), the associated activities are as important as the end product. In the Judeo-Christian tradition, an analogy would be "kosher" dietary practices. In the exercise of these activities, the traditional CTUIR American Indian may cover hundreds of square miles, thousands of feet of relative elevation, and cross numerous types of physiographic provinces. All of the country crossed in the search for food has special meaning to the traditional American Indian and each area demands special effort and behavior. This traditional activity is a key to the hunting of, and gathering of, traditional American Indian foods and culturally significant materials.

All the foods and implements gathered and manufactured by the traditional American Indian are interconnected in at least one, but more often in many ways. For example, trade made up for what could not be physically gathered by one person in one time period. Salmon caught on the Columbia River are often traded for roots, other produce, or material culture. This trade creates a web of interaction and interdependence cutting across families, bands, and tribes. These objects of life are as important to the traditional American Indian as the materials that comprise them.

The people of the CTUIR community follow cultural teachings or lessons brought down through history from the elders. The goal of these teachings is to foster community cohesion and interdependence. Emphasis is placed upon cooperation and helping others in the community, cultivating close community interactions. This is an ancient oral tradition of cultural norms. The material or fabric of this tradition is unique, and is woven into a single tapestry that extends from the past into the future.

### RISK ASSESSMENT PATHWAYS

The methodologies used in classical risk assessments are being critically considered by the CTUIR. The classical risk assessment has many deficiencies, including a limited breadth of coverage and lack of integration. Through a pseudo-scientific methodology, the classic risk assessment: 1) ignores time, 2) extrapolates from the lab into the field, 3) contains biotoxicological effects that are not fully understood, 4) ignores multiple pathways and complex contaminants, 5) contains enormous uncertainties, 6) ignores long term impacts, effects to health, environment, workers and society, 7) prejudices future options, 8) loses the big picture by ignoring cumulative effects related to assessing only one chemical/one path/one site assessment at a time, 9) ignores eco-cultural sustainability, and 10) is based on a suburban

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lifestyle. The holistic environmental management strategies outlined in the *Blacksburg forum*<sup>1</sup> or *Toward the 21st Century: Planning for the Protection of California's Environment*<sup>2</sup> highlight these major problems.

In order to encompass the wide range of factors directly tied to the traditional American Indians of the CTUIR, a risk assessment has to be scaled appropriately. In effect, a re-structuring of the risk assessment process must occur in order to address the overwhelming problems including but not limited to, lack of breadth of coverage, lack of integration and deficiencies related to not addressing the CTUIR traditional American Indians' quality of life, the interrelated eco-culture and their unique exposure parameters and pathways. Other deficiencies include the failure to address the role of time to adequately assess risks to future generations of CTUIR members. The process of American Indian Tribes supplying cultural conversion metrics for risk assessments is, at best, subject to the legislative processes of the various sovereign Tribal governments. Unfortunately for the risk assessor there are few traditional American Indians willing and able to supply the appropriate pathway information, and to say they can speak for any one but themselves. A risk assessor in search of identifying American Indian data gaps has to identify the affected tribe(s) and approach the subject of lifestyles tentatively identified with a potential risk through the proper protocol of the individual tribal government. Until that information is obtained, the results of the classic risk assessment in no way suggest the potential pathways or exposure routes that fall within the breadth, depth, and richness of the CTUIR's culture. Unfortunately, the processes, the approach and even the necessity to account for traditional American Indian lifestyles have gone unnoticed in classical risk assessments that typically focus on suburban lifestyles.

The potential exposure pathways specifically oriented towards the traditional American Indian lifestyles need further identification to ensure protection of the CTUIR and the resources on which CTUIR culture is based. This must be done to provide risk assessors with the most accurate information possible. The principal concerns that affect the CTUIR traditional American Indian relate to a lack of identification of the critical pathways. In addition some risk assessments identify these pathways, "consider" them, and then ignore them, or label them as "insignificant." These multiple potential pathways to exposure are not included in typical suburban exposure pathway model, which has a seriously deficient relationship to the lifestyle of the traditional CTUIR American Indian. Each path stems from unique and multiple uses of the resources for food, ceremonial, cultural, or religious practices. Just as important to the people of the CTUIR are the more intangible considerations such as: aesthetics; physical, economic, community, future well-being, and equity; peace of mind; and sustainability.

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<sup>1</sup> *Report of the Blacksburg Forum: The first Step Toward the Holistic Approach to Environmental Management: Management Systems Laboratory, Virginia Polytechnic Institute and State University, Blacksburg, VA, 1991.*

<sup>2</sup> *Toward the 21st Century: Planning for the Protection of California's Environment, California Comparative Risk Project, Final Report, May 1994.*

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A risk assessment covering only mechanistic exposure routes linking a single toxicological component to simple one celled organisms, to mega fauna, then to humans, without accounting for the time involved, does little to express the complexity of the interrelationships between the traditional American Indian, their lifestyles, their relationship with the earth and the natural resources. Anyone attempting to derive and plot on a chart the life cycles of all the native plants, animals, as well as the methods of storage, preparation, and all the unique interrelationships that stem from the area of concern, in order to deduce the complete functional pathways for exposure, will find that the process is probably beyond our capabilities and is expensive. Charting whole ecosystems is certainly not in the realm of this paper, moreover, the thought of placing a value on each and every organism for the purposes of producing a number, does not convey what is a traditional American Indian entity. Even if a number could be produced, this does not take into account the traditional American Indian values, let alone uptake rates, absorption rates, mutation rates, bioaccumulation rates, and other food chain data needed to make a decision on what is important and what may affect the CTUIR traditional American Indian.

There are some common food plants such as the common cattail, the tule, the willow, and the nettle, that serve dual or more purposes. These could be considered by risk assessors, if nothing less than to point out the enormous data gaps involved. The traditional tribal communities often constitute critical segments of populations whose cultural lifestyles result in disproportionately greater than average exposure potential. Gathering, cleaning, eating, and using these plants may potentially expose many traditional American Indians multiple times, and may subject critical CTUIR population groups to unneeded exposure. The life of the cultural items made from potentially contaminated plants may last years; exposure may occur daily or more, over multiple generations.

Traditional American Indians of the CTUIR have to bear a disproportionate amount of risk in relation to the longevity of radionuclide contaminated groundwater. Take, for example, the common cattail: in the spring the shoots are eaten, the roots are consumed, and the fibrous stalks and leaves are split, woven or twisted. Later in the year the pollen is used in breads, and the stalks are used. The woven products may include food storage bags, food storage baskets, cook hole layers, cooking baskets, mats for the floor, mats for the sweat lodge, or mats for the funerary. Each of these activities necessitates a behavior pattern that encompasses: traveling to the plants, selection, gathering, sorting, cleaning, stripping, peeling, splitting, chewing, and forming of the plant materials. This is just for one type of plant among the hundreds of plants and animals that are used by traditional CTUIR American Indians.

### CRITICAL SUB-POPULATIONS OF THE CTUIR

Even during the quest for some food, a typical CTUIR member may potentially be exposed through a variety of pathways. The riverbank walk towards the spring where the plant of interest grows may contain discreet particles of radioactive material, such as  $\text{Co}^{60}$ . This affects

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certain subgroups within the CTUIR population more than expected, such as the women and the children. The classic risk assessment focuses on a healthy suburban male of average mass. In comparison the women and children as a result of their smaller mass and shorter stature will receive a higher dose<sup>3</sup>. The mud surrounding some Hanford springs may potentially contain Cr [+6], Sr<sup>90</sup>, or H<sup>3</sup>.

During the assessment of the quality of the plants (i.e., which ones to select for gathering), a process that demands time standing in spring water, or in spring water saturated mud, could result in absorption of H<sup>3</sup> through the skin<sup>4</sup>. The women and children, due to their physical characteristics and their culture, may receive greater exposure. Children in particular may be at much higher risk of radionuclide contamination of the environment than adults. Children have a much shorter stature and less body mass than adults, meaning that they have less natural shielding and are closer to source materials.

The gathering process involves not only continued immersion in the spring water, but immersing the hands and compacting mud under and around the fingernails as well. Sorting the plants afterwards, either at the site or elsewhere involves more handling and washing. The bulbs or root of the food plant may have special cleaning needs. Roots may not be uniformly smooth as carrots or potatoes but undulated, having places where the earth can not be washed out, and if eaten, creates an ingestion pathway for potential exposure. The skin of the root may need to be peeled. Peeling roots is a difficult and time consuming chore involving not only the hands but in many cases a knife and the teeth. Splitting the leaves involves a lot of handling and the experience comes with cuts and abrasions, and more soil accumulation under the nails. If the food is to be eaten and not stored, another potential pathway for contamination is revealed through traditional cooking methods. Local rocks are gathered and heated with local wood. A hole is dug. The heated rocks are dumped in the hole. The rocks are covered with the cattail leaves. The cleaned, peeled, roots are placed on the leaves, and covered with more leaves. This is covered with soil, and a fire is built over the covered cook pit. The result is tasty, but in certain places this type of unique cultural activity could increase exposure. Thus, traditional CTUIR American Indians can be exposed to radionuclides through digging, breathing smoke, breathing dust, breathing steam, eating dust and soil, storing vegetables underground, and eating steamed vegetables.

This risk scenario is but one of many that can be played out for one food, at one site, during one time of the year. The complexities involved with hunting and gathering foods are extremely time consuming and involve at a very primary level many traditional American Indians and the environment. Other significant factors include higher intake rates per body mass for children than adults, the fact that primary gatherers are likely to be women of childbearing age, variations

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<sup>3</sup>U.S. Environmental Protection Agency. 1993. *External Exposure To Radionuclides In Air, Water, And Soil. Federal Guidance Report No. 12. September 1993. EPA 402-R-93-081*

<sup>4</sup>Ohtake, H., Silver S. 1994. *Bacterial Detoxification of Toxic Chromate. Biological Degradation and Remediation of Toxic Chemicals. Ed. G. R. Chaudhry. Portland, Oregon: Dioscorides Press 403-415*

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in metabolic parameters, and increased risk to CTUIR elders with age-dependent decreased physiological resistance or underlying health problems. Because the CTUIR is unique, risk assessors must realize and accept that the threat to the whole living CTUIR culture begins with two reasons for increased risk: increased exposure and increased sensitivity

"The Columbia River continues to be very important to the traditional American Indians that live around it. The river provides a link to the past and a path [for] the future of their children. Understanding the ecosystem and how the traditional American Indian is associated with it is critical for these people and their survival. The health of the river is dependent on the health of the groundwater; the peoples' health is dependent on the river and all that comes from it." (Harris, 1994)

The need for understanding the pathways that directly involve the traditional American Indian cannot be understated. The ties to the environment are much more fixed than is currently understood. These ties will play a very important role in determining how risk assessment methodology is produced and how effective risk management will be. The issues of environmental racism, environmental justice, and the right to a healthy environment, highlight a need to formally incorporate affected tribal input.

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### References:

- <sup>1</sup> Report of the Blacksburg Forum: The First Step Toward the Holistic Approach to Environmental Management: Management Systems Laboratory, Virginia Polytechnic Institute and State University, Blacksburg, VA, 1991.
  - <sup>2</sup> Toward the 21st Century: Planning for the Protection of California's Environment, California Comparative Risk Project, Final Report, May 1994.
  - <sup>3</sup> U.S. Environmental Protection Agency, 1993, External Exposure To Radionuclides In Air, Water, And Soil. Federal Guidance Report No. 12, September 1993, EPA 402-R-93-081.
  - <sup>4</sup> Ohtake, H., and Silver S., 1994, Bacterial Detoxification of Toxic Chromate, Biological Degradation and Remediation of Toxic Chemicals, G. R. Chaudhry (ed.), Portland, Oregon: Dioscorides Press, p. 403-415.
- Harris, S.G., 1994, The Nez Perce ERWM's Recommendations for Refinement of Risk Assessment Proposed by DOE's Columbia River Impact Evaluation Plan: Waste Management 94, U.S. Department of Energy Conference, Tucson, Arizona, March 1994.

APPENDIX C

CTUIR CRITERIA FOR THE EVALUATION OF PROPOSED CHANGES TO THE  
HANFORD FEDERAL FACILITIES COMPLIANCE AGREEMENT  
(JULY 1993)



CONFEDERATED TRIBES  
of the  
*Umatilla Indian Reservation*

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July 21, 1993

Ms. Mary Riveland, Director  
State of Washington  
Department of Ecology  
P.O. Box 47600  
Olympia, Washington 98504-7600

Ms. Dana Rasmussen  
Regional Administrator  
U.S. Environmental Protection Agency  
Region 10  
1200 Sixth Avenue  
Seattle, Washington 98101

Mr. John D. Wagoner  
Manager  
U.S. Department of Energy  
Richland Field Office  
P.O. Box 550  
Richland, Washington 99352

RE: Criteria for Evaluation of Proposed Changes to the Hanford Federal Facility  
Agreement and Consent Order.

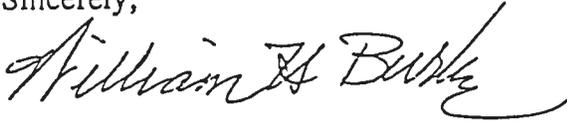
Dear Ms. Riveland, Ms. Rasmussen and Mr. Wagoner:

On April 23, 1993, representatives of the Washington Department of Ecology (Ecology) met with the Board of Trustees of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) to discuss proposed changes to the Hanford Federal Facility Agreement and Consent Order (the Tri-Party Agreement, or TPA). At this meeting, Ecology requested that the CTUIR prepare "criteria" which would represent the CTUIR's standards for reviewing proposed changes to the TPA. Ecology has solicited similar criteria from other interested governments, including the States of Washington and Oregon.

Enclosed is a document entitled Criteria for Evaluation of Proposed Changes to the Hanford Federal Facility Agreement and Consent Order (Criteria). The Criteria outlines the CTUIR's general concerns about Hanford issues; the basis of the CTUIR's interests in Hanford; specific CTUIR concerns about the TPA revision process; and specific criteria by which the CTUIR will measure proposed changes to the TPA. This document represents a good faith effort to respond to Ecology's request.

Please note that, as the TPA revision process is a fluid process, so are a government's needs to respond to new issues as they develop. Please be advised that the CTUIR may develop additional or revised criteria in the future as new issues present themselves.

Sincerely,



for Elwood H. Patawa  
Chairman  
Board of Trustees

Enclosure: Criteria for Evaluation of Proposed Changes to the Hanford Federal Facility Agreement and Consent Order

cc: Dan Silver, Ecology  
Paul Day, EPA

*Criteria for Evaluation of Proposed Changes*

*to the*

*Hanford Federal Facility Agreement  
and Consent Order*

July 21, 1993

Confederated Tribes of the Umatilla Indian Reservation  
Department of Natural Resources  
Environmental Planning and Rights Protection Program  
Hanford Environmental Restoration Project

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

### INTRODUCTION

In 1989, the State of Washington, the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Energy (DOE) entered into an agreement known as the "Hanford Federal Facility Agreement and Consent Order." This agreement is commonly referred to as the "Tri-Party Agreement," or TPA.

The TPA was created because the DOE was operating the Hanford Nuclear Reservation in violation of numerous federal and state environmental laws. The TPA set requirements and deadlines for DOE to bring Hanford into compliance with those laws. The current TPA's deadlines for the Hanford cleanup are arrayed along a 30 year timeline.

Now, the DOE has requested a revision of the agreement, including an extension of the timeline. The State of Washington and its cognizant agency, the Department of Ecology (Ecology), will be evaluating DOE's proposed changes by applying criteria the State has developed. Ecology has requested that other interested governments submit criteria of their own to aid Ecology in its analysis of DOE's proposed changes. One of the governments is the Confederated Tribes of the Umatilla Indian Reservation (CTUIR).

### THE CTUIR'S CONCERNS RELATING TO HANFORD

The CTUIR's concerns relating to Hanford fall into four general categories:

- I. Protection of Tribal sovereignty, including protection of tribal rights in CTUIR ceded territory and areas over which the CTUIR exercises off-reservation treaty rights.
- II. Protection and restoration of the environment, both on the Hanford site and in areas affected by Hanford over which the CTUIR exercises off-reservation treaty rights. Protecting the environment guards the resources upon which treaty rights are based, including Columbia River fisheries and related resources.
- III. Protection of cultural, religious and archeological resources and Tribal rights relating to them.
- IV. Protection of the Umatilla Indian Reservation and its members and residents from hazards caused by Hanford activities and from hazards caused by transportation of radioactive and hazardous materials to and from Hanford.

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

### FOUNDATION OF THE CTUIR'S GOVERNMENTAL INTEREST IN HANFORD

Under the Tribes' Treaty of 1855, the Tribes ceded certain lands to the United States. The lands comprising the eastern portion of what is now the Hanford Nuclear Reservation are among the lands ceded by the Tribes. Under the treaty, the Tribes retained rights to perform certain activities on those lands. According to the Treaty:

[T]he exclusive right of taking fish in the streams running through and bordering said [Umatilla Indian] reservation is hereby secured to said Indians, and at all other usual and accustomed stations in common with citizens of the United States, and of erecting suitable buildings for curing the same; the privilege of hunting, gathering roots and berries and pasturing their stock on unclaimed lands in common with citizens, is also secured to them.<sup>1</sup>

The CTUIR has usual and accustomed fishing stations on the Columbia in and around Hanford. Moreover, prior to Hanford's becoming a secured area, the CTUIR members hunted and performed other treaty activities at the site. The CTUIR's jurisdiction at Hanford is based upon these treaty rights.

In addition, long-standing U.S. Supreme Court precedent holds that the federal government (including its executive agencies) has a trust responsibility to Indian tribes. This means that the U.S. has a fiduciary responsibility to protect the rights of Indian tribes, including tribes' property and treaty rights. Under this duty, agencies such as DOE and EPA have a legal duty to guarantee that their decisions do not harm tribal interests. According to the DOE Indian Policy, "The Department recognizes that some Tribes have treaty-protected interests in resources outside reservation boundaries."<sup>2</sup>

Third, a succession of U.S. Presidents, beginning with President Nixon, have affirmed a federal policy of upholding tribal sovereignty and dealing with tribal governments on a "government-to-government" basis. Both DOE and EPA have adopted Indian

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<sup>1</sup>Treaty with the Walla Walla, Cayuse and Umatilla 1855, June 9, 1855, art. I, 12 Stat. 945.

<sup>2</sup>DOE Indian Policy, Item one.

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

Policies which purport to apply this federal policy.<sup>3</sup> These agencies must comply with the terms of their own policies.

Fourth, federal laws protect tribes' cultural, religious and archeological sites. Hanford is rich in sites of great cultural, religious and archeological importance to the CTUIR. DOE and its regulators have a duty to comply with these laws in conducting their activities at Hanford, including "cleanup" activities.

Finally, environmental laws affecting Hanford decision-making confer rights upon Indian tribal governments. For instance, the CTUIR is a Trustee for Natural Resources under the Comprehensive Environmental Response, Compensation and Liability Act. Likewise, community safety statutes applicable to Hanford recognize the roles of tribal governments such as the CTUIR. As an example, the CTUIR's Tribal Hazardous Materials Safety Committee has been designated as an official "emergency response commission" as defined under the Emergency Planning and Community Right-to-Know Act.

### GOALS OF THE BOARD OF TRUSTEES

The Tribes ratified a Constitution and Bylaws on December 7, 1949, which created a governing body known as the Board of Trustees. The Board has adopted a Mission Statement and Goals. This statement and goals are the CTUIR's guiding principles for its interaction with all other governments.

#### Board of Trustees Tribal Mission Statement

In the best interest of the Confederated Tribes of the Umatilla Indian Reservation, the Board of Trustees shall exert the Tribe's sovereign authority to protect the rights reserved by the Treaty of 1855 and to promote the interests of the members and residents of the Umatilla Indian Reservation. The Board of Trustees shall exercise the authority of the Confederated Tribes so as to promote, enhance and achieve the maximum

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<sup>3</sup>Item one of the DOE Indian Policy states, in part: "1. THE DEPARTMENT RECOGNIZES AND COMMITS TO A GOVERNMENT-TO-GOVERNMENT RELATIONSHIP WITH AMERICAN INDIAN TRIBAL GOVERNMENTS." Item one of the EPA Indian Policy states, in part: "EPA will work directly with Tribal Governments as the independent authority for reservation affairs, and not as political subdivisions of States or other governmental units."

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

degree of self-government, self-sufficiency and self-determination in all Tribal affairs. Doing so objectively and ably is the abiding mission of the Board of Trustees of the Confederated Tribes of the Umatilla Indian Reservation.

### Goals

1. To protect and exercise the sovereign, tribal and individual rights and to maintain the cultural integrity of the CTUIR.
2. To optimize the development of all tribal resources and opportunities within the Umatilla Indian Reservation and the ceded area of the Confederated Tribes as recognized and documented in the Treaty of 1855.
3. To provide, protect and maintain all service and entitlements to the CTUIR.
4. To responsibly assert and develop relationships and cooperate with those governments or governmental agencies - federal, state or tribal - that are willing and able to recognize and respect the sovereignty of the Confederated Tribes and which can assist the Tribe in protecting its rights and interests.

### THE CTUIR'S CONCERNS RELATING TO THE TPA PROCESS

As a sovereign government, the CTUIR is an entity with rights apart from the public. Activities such as public meetings and public education do not, alone, fulfill the responsibility to consult with the CTUIR on a government-to-government basis.

In order to facilitate such a relationship, the CTUIR believes that, at a minimum, TPA signatories should:

1. Formally commit to a government-to-government relationship with the CTUIR.
2. Hold regularly scheduled meetings with the CTUIR to exchange views on policy;
3. Exchange staff reviews of technical information and testimony;

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

4. Coordinate activities of their technical staff with technical staff of the CTUIR to maximize the efficient gathering and dissemination of information;
5. Actively seek CTUIR comments on proposed TPA revisions, on implementation of the revised TPA and on regulatory schemes associated with the TPA.
6. Consistently give timely notice of all TPA-related activities so that the CTUIR can meaningfully participate in the process.

It is vital to successful government-to-government relations that local representatives of federal agencies -- representatives who are familiar with CTUIR concerns from working with the tribes -- take concrete steps to educate their superiors in Washington, D.C. about CTUIR rights and concerns. It is equally vital that those Washington, D.C. managers respect arrangements made between knowledgeable local agency personnel and the CTUIR.

The CTUIR reserves the right to perform its own review of TPA revisions to ensure compliance with the Treaty of 1855 and other legal rights of the CTUIR.

The CTUIR reserves the right to coordinate its activities with other tribes, governmental units, concerned citizens, chartered organizations and other parties in a manner which fosters mutual benefits.

### THE CTUIR'S CRITERIA FOR ANALYZING PROPOSED CHANGES TO THE TPA

The CTUIR has begun a process of establishing criteria for reviewing proposed changes to the TPA from the perspective of the CTUIR's interests. The following is a list of criteria and supporting laws and regulations which address the concerns listed on page 1. This is not an all-inclusive list. Additional criteria may be developed in the future.

#### I. TRIBAL SOVEREIGNTY

##### Criteria

Much of the foregoing discussion has already dwelt at length with the issue of tribal sovereignty. Protection of tribal rights is the primary, all-inclusive goal of the CTUIR. All other issues are viewed with this principle foremost in mind. No resolution of other issues can take place where CTUIR rights are ignored.

# CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

## II. ENVIRONMENTAL PROTECTION AND RESTORATION

### Criteria:

Environmental protection and restoration is a primary purpose of the TPA. The meaningful exercise of tribal treaty rights to Hanford-affected resources is entirely dependent upon the health of the ecosystems upon which those resources depend. A treaty right to fish, wildlife or plants is hardly useful if the fish, wildlife or plants have vanished, or themselves threaten human health. A revised TPA must guarantee that treaty resources are protected or restored to a level which allows the CTUIR to fully exercise its rights to the resources without fear of injury to either the resource or to CTUIR members.

Treaty resources are significant to the CTUIR for a variety of reasons. Tribal members are subsistence hunters and gatherers. Wild game and fish form a major part of the diet of many tribal members. Likewise, plants collected from healthy wild ecosystems form an important feature of many tribal members' diets. Besides consumption as food, these treaty resources are collected for religious ceremonies, cultural uses such as decoration and traditional crafts, and recreational purposes. All indigenous plants and animals have religious significance to CTUIR members who practice traditional Indian religion. In addition, these treaty resources, such as Tribal salmon resources, can be of great economic importance to the CTUIR.

### Laws and Regulations Supporting Environmental Criteria:

Resource Conservation and Recovery Act - RCRA provides a "cradle-to-grave" framework for managing hazardous wastes. The Act, which was amended in 1992 by the Federal Facilities Compliance Act to make RCRA's provisions apply to Federal facilities, provides a regulatory decision-making process for cleaning up hazardous waste sites. This process includes soliciting public comments and incorporating them into the process. The CTUIR, although not regulators of the Hanford site, have treaty rights within the area which mandate the CTUIR's participation on a government-to-government basis in the restoration of Hanford.

Comprehensive Environmental Response, Compensation, and Liability Act - CERCLA creates regulatory decision-making processes for responding to hazardous substance releases. The Act also assigns liability and determines compensation for certain parties injured by hazardous substances releases. These processes also include measures for public and tribal participation in the decision-making process. Furthermore, the CERCLA Natural Resource Damage

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

Assessment (NRDA) process provides for payment of damages for unremediated injuries to natural resources. These payments are made to Trustees for Natural Resources (governments with interests in the injured natural resources). The CTUIR has been recognized as a Trustee for Natural Resources in the NRDA process established under CERCLA § 107(f) and § 301(c). Decisions made in the TPA revision process will largely determine the degree of unremediated injury to CTUIR natural resources.

National Environmental Policy Act - NEPA was passed by Congress to evaluate the effects that actions of the Federal government may have on the environment. NEPA requires that before the government takes any action, the environmental impacts of that action need to be studied and alternatives proposed. The law also contains explicit public involvement procedures. NEPA provides the framework within which proposed actions by DOE for Hanford restoration are integrated. The Act provides guidance on the level of analysis and requires an assessment of the cumulative effects of federal actions.

State Environmental Policy Act (Washington) - SEPA provides the State of Washington an integrative approach to environmental planning and managing natural resources. Similar to NEPA, the Act provides the framework within which the State involves citizens in the decision-making process and provides guidance on the level of analysis.

Wild and Scenic Rivers Act - The W&SRA was enacted to protect and preserve selected rivers which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, or cultural values. These rivers are to be preserved in their free-flowing condition for the benefit of present and future generations. The Hanford Reach of the Columbia River is the last free-flowing stretch of the mainstem Columbia and is being studied for protection under the Wild and Scenic Rivers Act. Protection of river-related values such as water quality, historic and cultural values, fisheries and wildlife resources is considered by the CTUIR to be of utmost importance, due to the loss of key habitat in the Columbia Basin from dam construction. Restoration actions at Hanford must protect and/or enhance Columbia River resources.

Clean Water Act - The goals and policy of the CWA are to restore and maintain the chemical, physical and biological integrity of the Nation's waters. The CWA establishes effluent limitations for pollutant discharges from point sources into navigable waters. Section 311 of the Act prohibits discharge of hazardous substances to the Nation's waters and creates a regulatory

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

framework for responding to such releases. Section 316 provides for limitation of thermal discharges. Nonpoint sources of water and groundwater pollution are also regulated by the Act. The CWA requires permits for discharge of pollutants into navigable waters and for dredging and filling activities. CWA permitting requirements and other standards apply to federal facilities. Moreover, CWA standards are important to the CERCLA process because they are Applicable or Relevant and Appropriate Requirements (ARARs).

Safe Drinking Water Act - This Act, enacted in 1974, is designed to protect drinking water supplies from contamination. This includes ground water used for public drinking water. The law requires EPA to establish chemical-specific Maximum Contaminant Levels (MCLs) for public drinking supplies. Federal facilities, such as DOE's Hanford site, are subject to the law where wellhead areas or single source aquifers are threatened with contamination such as those effluent to the Columbia River. The SDWA also restricts underground injection wells that may pose a threat to drinking water sources. There are numerous wells above MCL located along the Columbia River.

Clean Air Act - This Act was designed to protect and enhance the quality of the Nation's air resources. The law established the National Emission Standards for Hazardous Air Pollutants (NESHAPs) which have also been developed for radionuclide particulate emissions from DOE facilities. These standards are directly enforceable against DOE facilities such as Hanford and are considered under CERCLA to be Applicable or Relevant and Appropriate Requirements (ARARs).

Endangered Species Act - The purpose of the ESA is to insure that all Federal departments and agencies seek to conserve threatened and endangered plant, animal and fish species and utilize their authorities in furtherance of conservation of such threatened and endangered species, and to take such steps as may be appropriate to achieve the purposes of the international treaties and conventions set forth in the Act. The ESA imposes a duty on federal agencies to consult with wildlife agencies to insure that any action authorized by the agency is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of a species' critical habitat.<sup>4</sup>

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<sup>4</sup>Over 47 fish, wildlife and plant species considered rare (either sensitive, threatened or endangered) occur on or have habitat on the Hanford Reservation, including the Hanford Reach of the Columbia River. Currently,

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

### III. CULTURAL RESOURCES

#### Criteria

The CTUIR affirms its authority and commitment to preserve, protect and promote Tribal culture and heritage. Such authority is an inherent feature of Tribal sovereignty. This authority and commitment is embodied in various federal and state laws as well as the CTUIR's Comprehensive Plan, Board of Trustees Resolutions and the proposed CTUIR Cultural Resources Protection and Management Code (Cultural Resources Code). Changes to the TPA must recognize the CTUIR interest in protecting and preserving cultural resources.

Cultural sites and resources include those associated with traditional foods and other natural resources, sites of great religious importance such as Gable Mountain, habitations, and historical events and personalities. It is the intent of the Tribes to protect, preserve and manage cultural resources on the reservation and ceded lands by the use of policy, statutory prohibitions and regulations. At Hanford, cultural resources sites have not been effectively protected from pothunters. It is DOE's responsibility to ensure that these sites are effectively protected and that violators are fully punished. In addition, many cleanup activities (such as drilling new wells or constructing new facilities) can violate cultural resources sites. TPA signatories must integrate protection of cultural resources into their cleanup planning. The proposed Cultural Resources Code provides policy guidance and procedures for DOE's Hanford restoration and management which is complemented by the Federal Native American Graves and Repatriation Act.

#### Laws and Regulations Supporting Cultural Criteria:

Native American Graves Protection and Repatriation Act - The NAGPRA provides for the protection of Native American graves and for the return to Indian tribes of human remains, burial artifacts, sacred objects and objects of cultural patrimony, for

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DOE does not have a policy directed towards management of State Sensitive and Candidate Species such as the Ferruginous hawk, burrowing owl, common loon, great blue heron, shortface lanx, Columbia pebblesnail, Perisistentsepal yellowcress, southern mudwort, shining flatsedge, or dense sedge. It is imperative that a policy designed to enhance habitat and restore viable populations of fish, wildlife, and plant species be developed in consultation with CTUIR to insure that: (1) additional species do not become threatened or endangered, (2) Tribal Treaty resources are maintained, and (3) DOE fulfills its trust responsibility in managing natural resources.

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

the ultimate purpose of repatriation of such remains and objects. NAGPRA's provisions recognize the authority of traditional Indian religious leaders and provide a role for these leaders in carrying out the Act's functions. Inventories for the above artifacts must be conducted in consultation with Indian tribes. This Act protects cultural resources at the DOE Hanford facility.

American Indian Religious Freedom Act - This Act defines the policy of the United States to protect and preserve for American Indians their inherent right of freedom to believe, express and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to sites, use and possession of sacred objects and the freedom to worship through ceremonial and traditional rights. The Hanford site was used significantly by the Wallulapum band (now part of the CTUIR), as well as others.

National Historic Preservation Act - This Act requires federal agencies to assess the impacts of their activities on properties included in or eligible for the National Register of Historic Places. The Act requires such planning on actions as may be necessary to minimize harm to any National Historic Landmark that may be directly and adversely affected by an undertaking. Section 106 of the Act requires federal agencies to take into account the effect of their undertaking on important historic properties for all actions involving federal funds, approval or assistance that could affect archeological resources. The Hanford Reach could potentially be eligible for designation as a historic district on the National Register of Historic Places, and also as a traditional cultural property.<sup>5</sup>

Archaeological Resources Protection Act of 1979 - The Act imposes criminal and civil penalties upon persons without permits who excavate or remove archeological resources from public or Indian lands. ARPA provides for stronger protection for archeological sites through law enforcement monitoring. Over 400 archeological sites are documented by the CTUIR within the Hanford Reservation. Additional cultural resource surveys need to be completed to thoroughly document and re-record these resources. Protection of these resources is a significant concern of the CTUIR and may require additional security.

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<sup>5</sup>Under the Hanford Future Site Uses Working Group Final Report, Cleanup Scenario A for the Reactors Along the River includes removing all reactors and all other structures, contaminated and uncontaminated in the 100 area. To insure that Native American uses can continue, the CTUIR prefer this option over maintaining structures on site.

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

### IV. TRIBAL COMMUNITY HEALTH AND SAFETY

#### Criteria

As a Hanford downwind community, the CTUIR could be severely injured by a catastrophic event at Hanford. Moreover, radioactive and hazardous materials transported to and from Hanford regularly pass through the Umatilla Indian Reservation and along the tributaries of the Umatilla River. A transportation accident on the reservation or the river involving Hanford's radioactive or hazardous materials would pose a great danger to the Tribal community. Protection of the Umatilla Indian Reservation and its members and residents from these hazards must be considered in the TPA revision process.

TPA changes should accomplish several goals, including:

1. reducing the risk of a catastrophic event at Hanford,
2. reducing the volume of hazardous and radioactive materials to be transported off-site for disposal, and
3. reducing the total volume of hazardous materials used in the processing of Hanford waste.

#### Laws and Regulations Supporting Health and Safety Criteria:

Nuclear Waste Policy Act - This Act provides for the development of repositories for the disposal of high-level radioactive waste and spent nuclear fuel. In this process, the CTUIR was recognized as an "affected nation" which must be coordinated with on a government-to-government basis in the development of repositories and disposal of radioactive waste.

Emergency Planning and Community Right-to-Know Act - EPCRA establishes a duty for facilities containing extremely hazardous substances to participate with local communities in planning for emergency response in the event of releases of those substances. Hanford is a facility subject to EPCRA requirements. As a neighboring community, the CTUIR has a right to participate in Hanford-related emergency planning activities.

Hazardous Materials Transportation Uniform Safety Act - This Act regulates the labelling and transportation of hazardous materials. The Act provides for the training of Tribal public sector employees to respond to accidents involving hazardous materials. Transportation of hazardous and radioactive materials is a subject of particular importance to the CTUIR, as the main highway and rail routes for Hanford materials pass through the reservation.

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

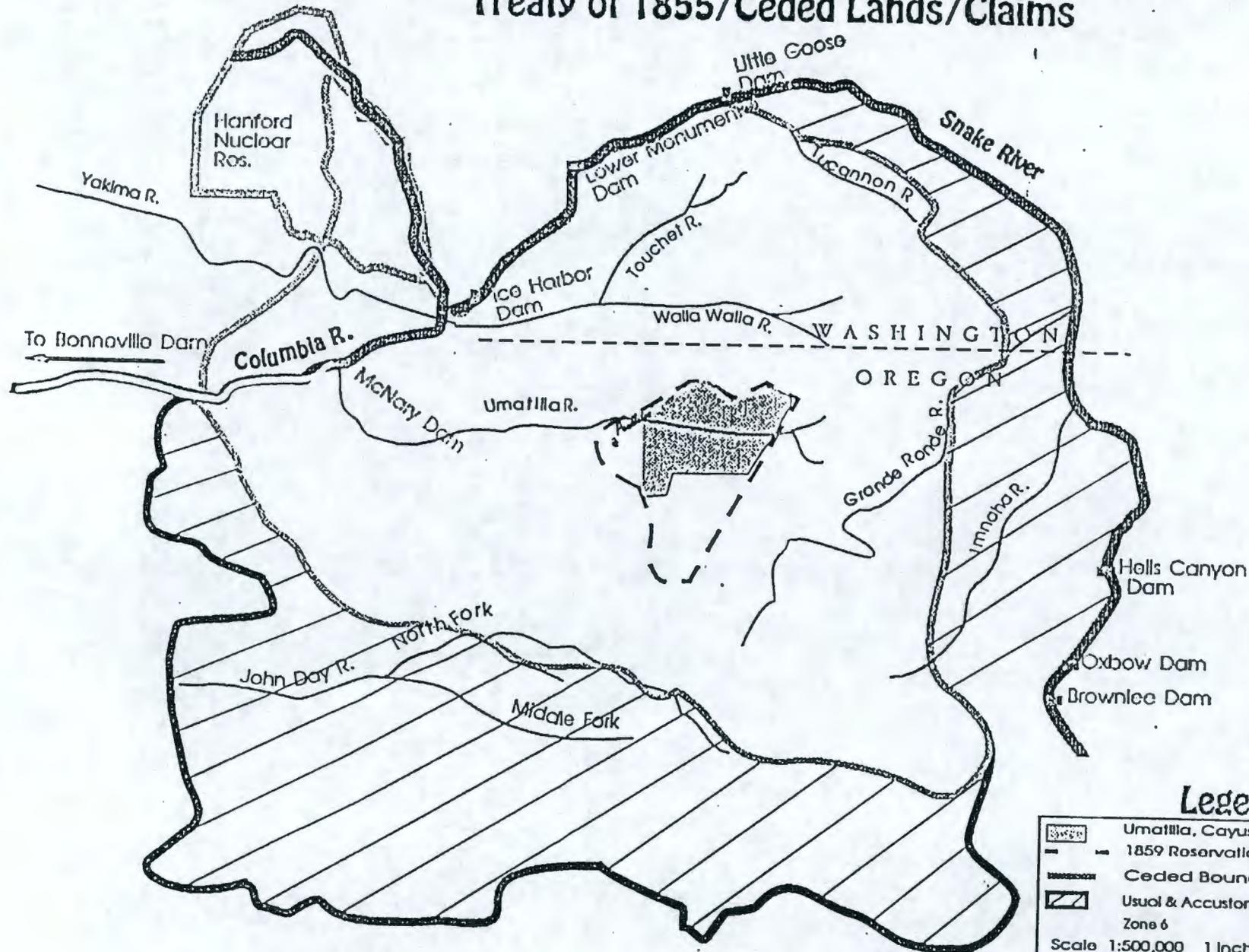
CTUIR Hazardous Materials Emergency Response Plan - Amended in November of 1991, this plan outlines the roles and responsibilities of various agencies involved in hazardous materials emergency response. The Plan contains a section dealing specifically with Hanford.

CONCLUSION

The criteria and supporting laws and regulations listed above are tools the CTUIR will use to analyze revisions and implementation of the TPA. The CTUIR has numerous rights and interests in the Hanford Nuclear Reservation. These rights derive from the Treaty of 1855, the federal trust responsibility, federal statutes and federal policy. Moreover, the CTUIR has committed itself to preservation of its Tribal sovereignty and exercise of its authority over Tribal resources. The CTUIR desires to work on a formalized government-to-government basis with the TPA signatories on environmental restoration, waste management, and environmental enhancement of the Hanford Nuclear Reservation, including revision and implementation of the TPA.

# Confederated Tribes of the Umatilla Indian Reservation

## Treaty of 1855/Ceded Lands/Claims



### Legend

-  Umatilla, Cayuse & Walla Walla Res.
  -  1859 Reservation Boundary Survey
  -  Ceded Boundary
  -  Usual & Accustomed Joint Use Area Zone 6
- Scale 1:500,000 1 Inch = Approx. 8 miles
- Boundaries taken from Indian Claims Commission Docket # 264 Cayuse, Umatilla & Walla Walla Tribes EPRPCED.92/1w

APPENDIX D

INTRODUCTION TO HANFORD

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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### APPENDIX D

#### INTRODUCTION TO HANFORD

Within the framework of the DOE nuclear materials production and weapons complex, Hanford played a unique role in that, more than any other single DOE site, its scope of operations included multiple phases of this cycle. This breadth of historical operations has led in turn to the proportional magnitude and scope of environmental, health, and safety problems that exist today at Hanford, many of which date from the very birth of the atomic age. No other single DOE site shares either the magnitude, scope, or complexity of problems to be addressed nor the equally unique factor that "clean-up" at Hanford directly affects the rights and interests of nearby sovereign American Indian tribes with off-reservation treaty rights (Appendix C).

#### A. Historical Perspective

Just over 50 years ago, the U.S. Government searched across the nation for sites to host then-secret facilities for the Manhattan Project, designed to develop, manufacture, and deploy nuclear weapons. Among the three facilities sited was the Hanford Nuclear Reservation, which covers more than 560 square miles astride the Columbia River near Richland, Washington; its secrecy required displacing all earlier residents and uses, including tribes. During the previous century, American immigrants settled in the area and began to farm the arid soils with water from this major regional water course. In fact, these lands, waters, and the abundance and diversity of the Columbia River ecosystem--especially the salmon--supported some of the largest indigenous American Indian populations in the Pacific Northwest. Prior to the arrival and widespread immigration of non-Indians only a century and a half ago, tribes hunted, gathered, and fished from the lands and waters throughout this region in sustainable harmony with their environment for at least 13,000 years.

#### B. Hanford Overview and Legacy

During the past 50 years, Hanford evolved into a facility that performed many steps in the nuclear cycle. For example, raw uranium ore was manufactured into fuel elements (300 Area), fuel elements were irradiated in nuclear production reactors to produce weapons-grade plutonium and enriched uranium (100 Areas), and weapons-grade material was chemically separated from other "contaminant" constituents by a succession of processes and facilities (200 Areas).

Each step of this process consumed tremendous amounts of resources, and also generated tremendous volumes of hazardous chemical and radioactive wastes that were routinely released to the air, water, and soil column. The long history and the sheer magnitude of the discharges have resulted in the risks now faced by all communities, especially by American Indian tribes, near (and not so near) these facilities or dependent upon surrounding lands and natural resources.

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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Without closing the circle, today's legacy of polluted land and resources will adversely affect human and ecological communities long into the future.

More than 1300 individual waste sites have been identified across the Hanford site, and have been grouped into 78 operable units in order to facilitate planning and management of "clean-up" under various state and federal laws. The magnitude of the problem at this single site alone is almost incomprehensible. In total, more than 444 billion gallons of contaminated liquid wastes containing approximately 678,000 Curies of radioactivity were discharged directly to the ground between 1944 and 1989. These discharges contaminated more than 200 square miles of groundwater, along with vast quantities of soils above the groundwater table, with dozens of potentially harmful radioactive and hazardous chemicals. Many contaminant plumes discharge directly into the Columbia River at numerous locations.

Solid and some liquid wastes were buried, often unsegregated, in hundreds of unlined burial trenches; total volumes are estimated at some 22 million cubic feet and contain more than 4.88 million Curies of radioactivity. The most dangerous high-level radioactive and mixed chemical wastes--61 million gallons worth--are still stored in 177 huge underground storage tanks, and alone constitute more than half of the total radioactivity now present near the surface at Hanford. Many of these tanks have exceeded their design life and now leak their contents into the environment or pose other serious, more immediate safety hazards; the nature and extent of these hazards is not well known. And the dozens of facilities that created these wastes are now shut down, but still highly contaminated; their decontamination and decommissioning now face an uncertain future.

On the other hand, Hanford's very isolation under a cloak of secrecy for so many years has in fact preserved unique and rapidly disappearing elements of the historical Pacific Northwest that have succumbed to the advances of modern civilization elsewhere. For example, Hanford contains the largest remaining expanses of near-natural shrub-steppe habitat in Washington, supports a large number of bald eagle nesting sites and other endangered species, and preserves the last free-flowing stretch of the Columbia River in the United States, a 51-mile segment of which is currently recommended to be designated as a Wild and Scenic River. In addition, Hanford's restricted access has preserved hundreds of American Indian cultural sites and resources from the extensive looting they have suffered elsewhere on easily accessed public and private lands.

### C. The Cost of Doing Business at Hanford

The modern Hanford environment includes a broad spectrum of interests and players, including political, technical, institutional, and cultural components. Each of these elements plays an important role in the overall Hanford "clean-up" program, but the interests and role of some are more narrowly or broadly defined than others. Moreover, many of these groups tend to try to persuade DOE to budget more and more "clean-up" funds to their preferred projects, some of

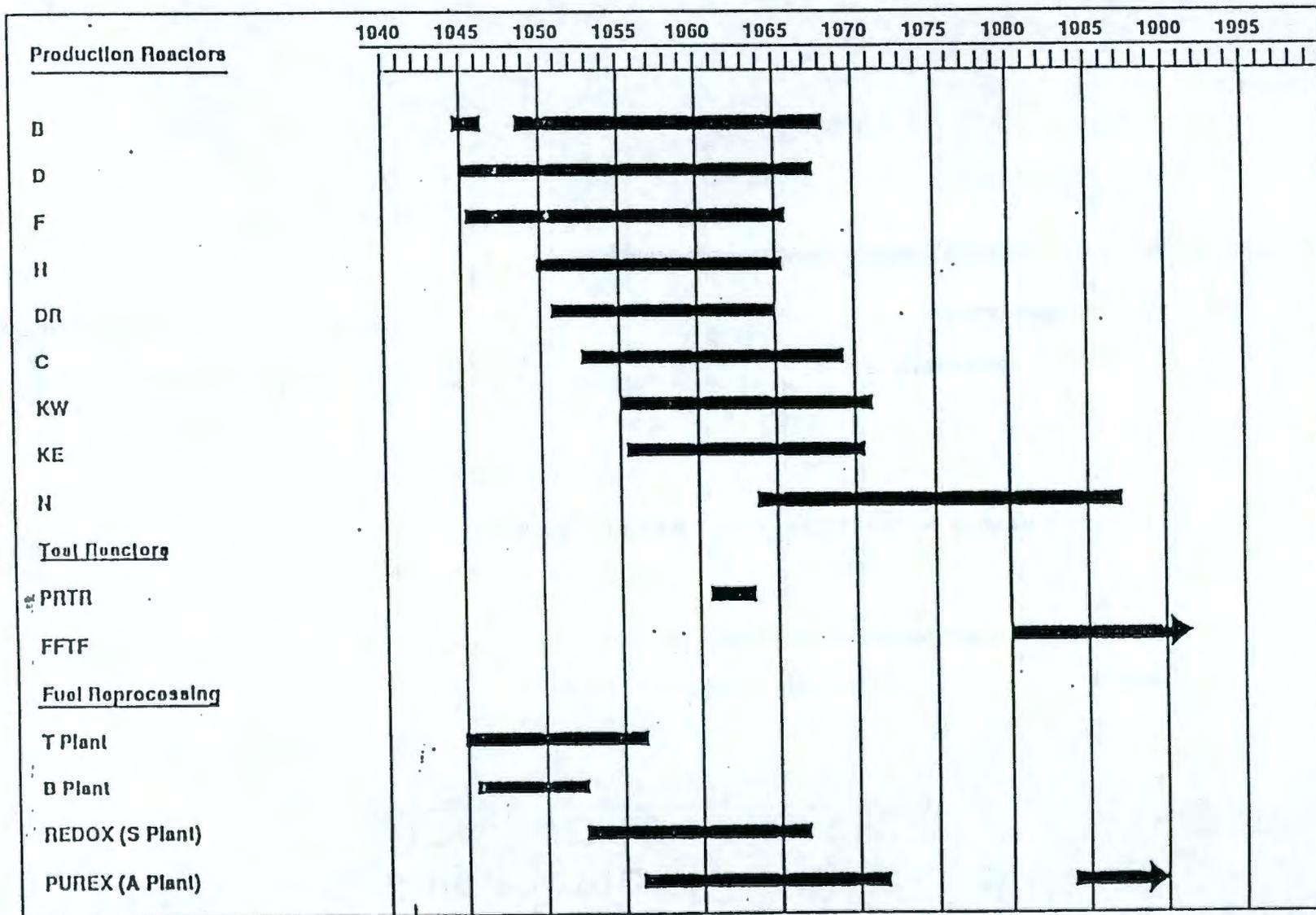
## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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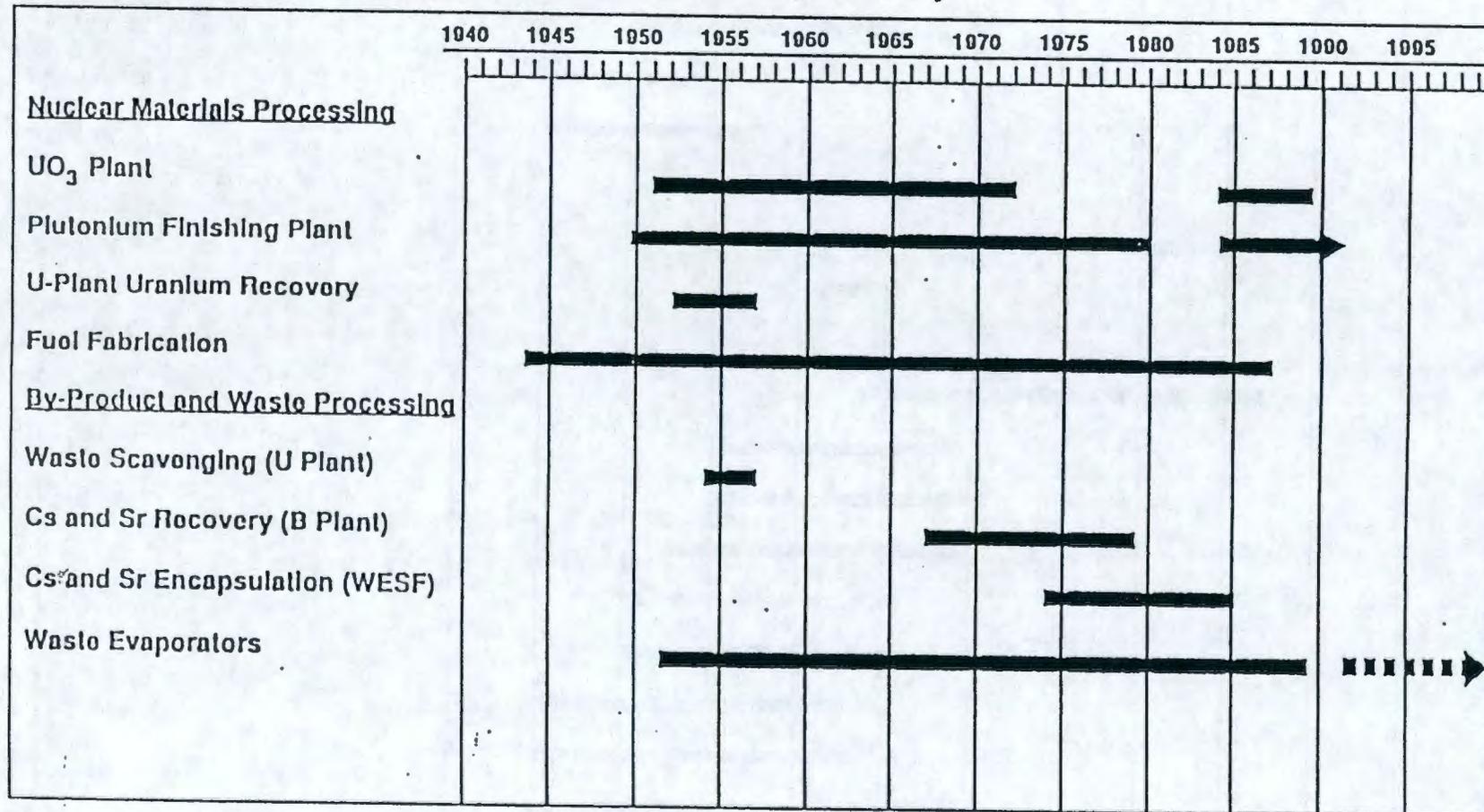
which are only peripherally related to actual "clean-up." The list below is intended merely to illustrate the breadth of interest groups and some of their principal goals, and is not intended to be comprehensive, representative, or exhaustive.

- Department of Energy (continue status quo, perpetuate bureaucracy)
- DOE Contractors (institutionalize federal dollars, prolong clean-up)
- Federal and State Regulators (EPA/Ecology; legal and regulatory compliance)
- American Indian Tribes (sovereign governments with treaty-reserved rights)
- States of Washington and Oregon (protection of public health, environment)
- Other Federal and State Agencies (trustee responsibilities for land or resources)
- Local Governments (control land-use planning and expand tax bases)
- Local Labor Interests (perpetuate high employment, salaries, government contracts)
- Local Business Interests (subsidized economic development, growth, and profit)
- Agricultural Interests (expanded land base for cropping, habitat alteration)
- Environmental Groups (environmental clean-up and compliance)
- Public Health Community (understanding contaminant cause and health effects)

# Major Plant Operating Periods



# Major Plant Operating Periods (Cont.)



# Hanford Waste Management Units

(Sites that received radioactive and/or hazardous chemical waste)

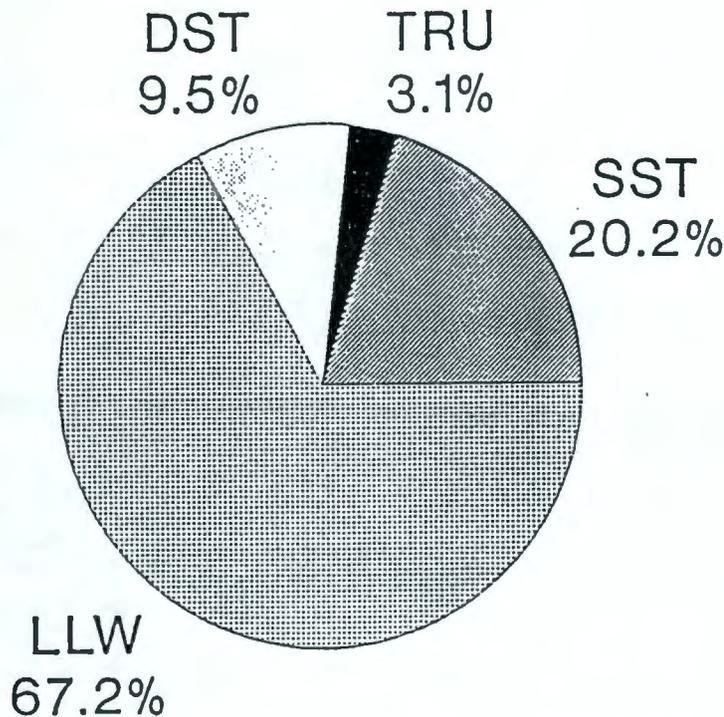
Surplus Facilities (building)	77
Septic Tanks	96
Single- and Double-Shell Tanks and Ancillaries (catch tanks, diversion boxes, tank leaks*, etc. )	311
Other Treatment and Storage Units (existing & future)	130
Miscellaneous Underground Storage Tanks (such as gasoline tanks)	26
Unplanned Release or Spills Sites*	224
Waste Disposal Sites*	<u>508</u>
	1,372

\*The radioactive liquid and solid waste sites described in this report are in these categories

# Reactor Releases to the Columbia River

<u>Radionuclide</u>	<u>Half-Life</u>	<u>Ci</u>
Sodium-24	15 hr.	13,000,000
Phosphorus-32	14.3 day	230,000
Zinc-65	244 day	490,000
Arsenic-76	26.4 hr.	2,500,000
Neptunium-239	2.4 day	6,300,000
Scandium-46	83.8 day	120,000
Chromium-51	27.8 day	7,200,000
Manganese-56	2.5 hr.	80,000,000
Gallium-72	14 hr.	3,700,000
Yttrium-90	64 hr.	440,000
Iodine-131	8 day	48,000
Gross Beta - 4 hr. decay		66,300,000

# QUANTITIES OF HANFORD WASTE

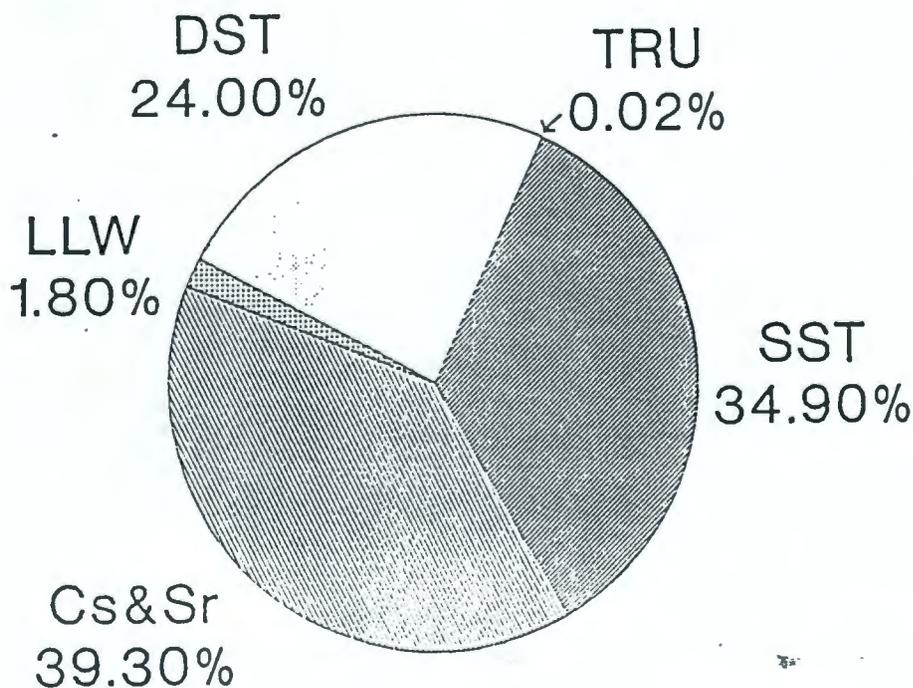


TOTAL VOLUME:

821,000 cubic meters

[Enough to cover 6 football fields each to a depth of 100 ft.]

VOLUME



TOTAL RADIOACTIVITY:

458 million curies

RADIOACTIVITY

Table 2: Where is the dangerous material at Hanford?

	Soil/ Groundwater	Tanks	Special Nuclear Material (inc. SNF/Pu)	Solid Waste
Volume	99%	< 1%	< 1%	< 1%
Radio-nuclide Mass		55%	45%	
Hazardous Waste Mass (Metals/ Organics)	25%	60%		15%

Source: Jim Honeyman, Al Pajunin, Roy Gephart

APPENDIX E

CERE's ROLE IN DOE's RISK EVALUATION PROGRAM

# SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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## APPENDIX E

### CERE's ROLE IN DOE's RISK EVALUATION PROGRAM

In response to both internal DOE and Congressional mandates, a number of separate examinations of risk-based approaches to remedial decision-making are occurring.<sup>1</sup> To complete its report to Congress, DOE is employing several different approaches in order to examine compliance agreement requirements, current site risks across the complex, and tribal/public concerns about these risks.

As one element of this process, DOE contracted with the Consortium for Environmental Risk Evaluation (CERE), a partnership of universities and corporations, in order to evaluate risks associated with "clean-up" of six selected DOE nuclear weapons production facilities now governed by compliance agreements. A distinctly separate part of CERE's program is "cataloging concerns of minority, disadvantaged groups, and disproportionately affected communities"<sup>2</sup> as a means of providing DOE with a "laundry list" of public concerns for consideration in its report to Congress.

Risk "evaluations" can take a number of forms including: quantitative risk assessment, comparative risk assessment, qualitative risk assessment, values-based assessment, alternatives assessment, worst-case scenarios, and other techniques. The CERE team is conducting a qualitative evaluation of selected existing quantitative risk assessments at six of the seventeen DOE facilities whose current mission now includes environmental restoration.

#### A. Purpose and Scope of CERE Risk Evaluation

The CERE program<sup>3</sup> purports to assess how well the weapons complex risks and costs are understood. The purpose of the CERE program is to:

- 1) Provide DOE with a credible evaluation of immediate threats and long-term risks under existing conditions to public and tribal health, to worker health and safety, and to the environment caused by EM activities associated with compliance agreements,
- 2) Assist DOE in documenting, developing, and evaluating cost estimates for EM-managed activities, and
- 3) Provide DOE with a review of the public concerns related to risks associated with EM-managed activities.

The following DOE sites are included in the CERE evaluation: Oak Ridge National Laboratory, TN; Fernald Feed Materials Facility, OH; Rocky Flats, CO; Idaho National Engineering Laboratory, ID; Savannah River, SC; and Hanford, WA. These facilities were chosen because

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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"clean-up" at each site is governed by a federal facility compliance agreement between DOE, EPA, and state regulators, and because these sites are the largest in the DOE complex, in terms of physical size, magnitude of environmental problems, and "clean-up" budgets.

Qualitative risk evaluation, as applied by CERE, is *"a process for interpreting available information concerning various risks to public health, workers, or the environment and drawing qualitative conclusions regarding the nature, severity, extent, and urgency of these risks."*<sup>4</sup> The project is based on site- and selected operable-unit<sup>5</sup>-specific evaluations of available studies by external experts and the CERE team. Specifically at Hanford, CERE's sitewide evaluations and conclusions are based on examining only six quantitative risk assessments.

Within this framework, CERE correctly recognizes that all risk assessments involve judgement, and that the size and complexity of the DOE complex makes the nature of such judgements central to the study. In addition, CERE further recognizes that the quality, availability, and consistency of relevant information varies widely among DOE installations and is thus difficult to combine into a complex-wide quantitative risk assessment.

### B. Xavier University's Inventory of Public Concerns

In a related but separate initiative to the CERE project, Xavier University, is "cataloging concerns of minority, disadvantaged groups, and disproportionately affected communities."<sup>6</sup> This task should be a critical and integral component of any overall program of evaluating risks. Unfortunately, a simple and separate "cataloging" of issues does nothing to expand, correct, or repair the well recognized inability of conventional risk assessment to incorporate these typically qualitative and otherwise difficult to quantify values of unique cultures and communities such as those of American Indian tribes.

This separate "cataloging" process does indicate that Xavier University investigators apparently do not understand the distinct and unique rights, roles, and responsibilities of sovereign tribal governments. For example during the first CERE workshop in Phoenix in October 1994, a tribal representative found it necessary to provide appropriate clarification and direction to Co-Principal Investigator Sarah O'Conner of Xavier University:

"While it is important that the Indian perspective be cataloged, it is also critical that readers differentiate those opinions held by Indian people from those documented as policy statements of sovereign tribal governments. The opinions of Indian people and tribal governments are often similar; however, tribal policy statements carry the additional weight of legal authority, as defined by federal or state recognition, and are backed by Supreme Court rulings on tribal government sovereignty."<sup>7</sup>

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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Because this "catalog" was not received by CTUIR staff prior to completion of our report, no further analysis of the defined approach, activities, or conclusions of Xavier can be provided. From the beginning of any such program, however, it is imperative that such "panels of experts" first fully understand and then be able to distinguish tribal government perspectives, and the unique legal rights, role, and status of tribes from others.<sup>8</sup> Such rights extend far beyond simply having them "cataloged" with and otherwise indiscriminantly lumped together with the public's perspective. Furthermore, CERE/Xavier's defined approach of a distinct and separate process to catalog tribal/public issues alone would not appear to even recognize, let alone directly address and resolve, the tendency--and chief deficiency--of conventional risk assessment methodology to ignore generally qualitative, but inseparable aspects of the full scope of risk.

### C. Topical Problems with CERE Process and CERE/Hanford Evaluation

The CERE risk evaluation project is characterized by problems both recognized and unrecognized by CERE with the chosen process, methodology, and conclusions. The CERE report itself identifies many of CERE's limitations. Major problems with the CERE effort itself are summarized below.

- An overly broad and unfocused mission/scope with far too short a timeline for completion,
- Failure to incorporate meaningful tribal/public involvement in project planning, scoping, and concluding phases, independent technical review, or a tribal/public comment period sufficient to meaningfully review and address identified deficiencies,
- Drawing broad, sweeping conclusions from limited or incomplete sets of data, or from site profiles that will not be completed until *after* conclusions are drafted,
- Exclusion of potentially significant risks associated with off-site transportation of hazardous and radioactive materials, particularly with regard to mixed waste compliance,
- Failure to address cultural resources protection, operating facilities, waste management, or pending site mission redefinition. Such critical omissions along with CERE's admitted inability to fully recognize and address tribal issues directly point to CERE's very limited ability to provide a credible and comprehensive perspective on either major overall complex-wide or site-specific risks,
- Failure to address the risks of doing nothing now and the increased risks and costs simply postponed into the future, from spreading contaminant plumes, for example,
- Highly selective "representation" of the magnitude and scope of risk and other problems facing Hanford site remediation in site profiles,
- Failure to consider an appropriate spectrum of future land-use decisions in risk evaluation,
- Blanket acceptance of data, methodology, results, and conclusions of site-specific quantitative risk assessments that form the basis of CERE's qualitative evaluation; no attempt has been made to assess any underlying assumptions, uncertainties, biases, basis, and limitations of original data and conclusions, which are simply carried through,
- Lack of comprehensive impacts review from unique resource use and pathway exposure to specific members of communities such as tribes;

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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- Failure to include the element of time in any risk evaluations, and how levels of contaminant discharge, exposure, and associated risks change as a function of time,
- CERE site profiles at Hanford based only on selected DOE and contractor documents,
- Failure to recognize and incorporate values from successful DOE-sponsored forums such as Hanford Future Site Uses Working Group and Hanford Tank Waste Task Force, and tribes, regulators, natural resource trustees, or stakeholders, and
- CERE satisfies too few of the basic objectives and institutional criteria laid out in *Building Consensus* report (see main text, Section IV, Sub-Section B (2)).

CERE *could* have chosen to conduct a considerably more comprehensive qualitative risk evaluation. They *could* have chosen both to recognize the fundamental importance of tribal/public involvement *throughout* the process. They *could* have chosen to examine the wealth of additional and related data available, some of which may not be directly included in a formal quantitative risk assessment because dose, exposure, or other factors were uncontrolled. Nevertheless, such information--which constitutes a much larger fraction of the available data--is still highly valuable and directly indicative of risk in a qualitative evaluation. To many, the particular value of a qualitative approach is to be able to include and consider the wealth of data sources that cannot automatically plug into a quantitative risk assessment. For example, the following relevant data sources or other information were not considered, but easily could have been included in a more comprehensive qualitative risk evaluation program based on CERE's direction to evaluate the: "*best scientific evidence available.*"

- The wealth and breadth of available site monitoring data for a variety of environmental media and biota,
- A comprehensive literature search,
- A review of extensive tribal and public comments submitted in response to DOE documents, work plans, records of decision, etc.,
- Medical reports and public health surveys,
- Worker complaints and observations,
- Chemical and toxicity profiles, discussing the quality, significance, and applicability of laboratory data and research, such as those mandated by CERCLA § 104 to be developed by the Agency for Toxic Substances and Disease Registry (ATSDR),
- Environmental toxicological studies of relevant ecological conditions and species, both terrestrial and aquatic, in published scientific journals
- Worst-case analyses, or
- Environmental impact and alternatives analyses.

In short, the CERE evaluation has mechanically repeated or compounded many of the traditional limitations of conventional risk assessment approaches. As a direct result, CERE has failed to provide a either a comprehensive or credible evaluation of risks at *any* DOE complex sites. This failure stems largely from the failure to include meaningful tribal/public involvement throughout the process, failure to recognize and integrate values into the evaluation process, and from a

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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narrow examination of sometimes extremely limited data sources, and an overdependence on risk "experts," their values, and judgement process rather than those of directly affected communities.

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### Notes

1. At least three independent (?) efforts are now ongoing, two of which are occurring within the Department of Energy: the Consortium for Environmental Risk Evaluation (CERE) report and the Baseline Environmental Management Report (BEMR). A third report is being coordinated by Steve Blush, former DOE staffer, at the request of the Senate Energy and Natural Resources Committee. The Blush report also is examining risks and costs associated with "clean-up" of DOE sites, but was received only a few days before this report was completed. Hence, insufficient time was available for its adequate review. Our report primarily addresses the CERE report and process, with which we are most familiar. Nevertheless, because of the intense current scrutiny on risk-based decision-making in general, our report also may be applicable to these other efforts.
2. *Tulane/Xavier CERE Program Qualitative Risk Evaluation Fact Sheet*, dated 12-6-94.
3. This section describing the CERE program is excerpted, verbatim in places, from the *Tulane/Xavier CERE Program Qualitative Risk Evaluation Fact Sheet*, dated 12-6-94.
4. CERE Fact Sheet.
5. The term '*operable unit*' is employed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) to group together contaminated sites based on similarities such as contaminants, media (air, soil, surface water, or groundwater), source terms, geologic/hydrologic or environmental conditions, or remedial needs. At Hanford, where more than 1300 individual waste sites have been identified thus far, 78 operable units have been designated, including 5 groundwater operable units, to facilitate planning and management of remedial activities.
6. CERE Fact Sheet.
7. From meeting of Co-Principal Investigator Sarah O'Conner, Xavier University, and tribal representatives at second CERE workshop held in Salt Lake City, Utah, on January 31 and February 1, 1995.
8. The term '*stakeholder*' is commonly used to encompass all '*interested and affected parties*' that may be impacted by a particular action or proposed action. A catch-all term, it often indiscriminantly lumps together state and local governments, public interest groups, business and labor interests, environmental groups, and others, in addition to sovereign tribal nations. But not all '*stakeholders*' are created equal. Tribal nations comprise a unique legal entity whose rights, interests, and responsibilities are both distinct from and superior to those of state and local governmental interests and any public interest groups. Tribal sovereignty is formally recognized and protected in treaties signed with the United States government, in which tribes specifically reserved rights to utilize lands and resources and to perform traditional activities as they have for thousands of years. Moreover, the treaties also imposed a trust responsibility upon the U.S. government to protect and preserve those lands and resources upon which tribes depend for subsistence or other cultural activities. Furthermore, Columbia Plateau tribes are unusual among many tribal nations in that their treaties specifically provide off-reservation treaty rights and guarantee access to resources throughout the lands ceded to the United States in the treaties and throughout all other usual and accustomed locations. The sovereignty of tribal nations also requires the U.S. government to establish formal government-to-government relations and to proactively consult with tribes concerning any proposed federal action or program that may affect the interests of tribes, as

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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mandated in the DOE Indian Policy. Tribes are also designated as Natural Resource Trustees under CERCLA, and thus must be formally consulted in the planning, management, and execution of any "clean-up" programs developed under CERCLA that may impact their sovereignty, treaty-reserved rights, lands, natural and cultural resources, or other interests. *No other entities commonly considered 'stakeholders' share these unique and distinct rights and privileges.* This point is a consistent source of confusion among many state and federal agencies and elements of the public, especially outside the Pacific Northwest where such conditions are rare. Hence, tribes should always be separately identified and their unique rights and interests formally acknowledged.

APPENDIX F

PROFILES OF HISTORICAL HANFORD CONTAMINANT RELEASES  
(from Hanford Environmental Dose Reconstruction Project)

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# Summary:

Radiation Dose  
Estimates from  
Hanford Radioactive  
Material Releases  
to the Air and the  
Columbia River



April 21, 1994

The Technical Steering Panel of the Hanford  
Environmental Dose Reconstruction Project

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# Air Exposure Pathway

Irradiating uranium fuel rods in a nuclear reactor produces plutonium and a large number of other radioactive materials. Once produced in Hanford's reactors, the plutonium was separated from other radioactive materials in chemical separations plants. Four chemical separations plants—called T, B, REDOX, and PUREX—operated at various times on the Hanford Site from 1944 through 1990. The rods containing the fuel were dissolved in acid and the plutonium was extracted. During the first few years of operations, large amounts of radioactive materials—primarily iodine-131—were released to the air during this process. Once in the atmosphere, the radioactive materials were dispersed throughout eastern Washington and into neighboring states. The dominant direction of transport is to the northeast.

People who lived in the Columbia Basin and other areas of eastern Washington, northeastern Oregon, and western Idaho may have been exposed to the radioactive materials released from Hanford. The radiation dose to people could have occurred from a variety of pathways. Exposures to radioactive materials released to the air may have come from eating food containing radioactive materials, inhaling contaminated air or by direct exposure to radioactivity in soil or air.

The process for estimating doses from the atmospheric pathway began with estimating the amount of material produced in the reactors and transferred to the separations plants. This allowed for an estimate of the amount of radioactive materials discharged to the air from Hanford's separation plants. The concentrations in the air and deposited on the soil were then calculated. Once this was known, scientists determined the effects of environmental accumulation. Dose estimates were then made

using lifestyle information for average or typical groups of people. Much of this work was done using computer models. The computer models were thoroughly tested to confirm they were reliable and valid. These tests are described elsewhere in this summary.

Scientists calculated doses to persons from radioactive releases to the atmosphere from a number of exposure pathways during the years 1944 to 1992. The dose calculations are for representative (or typical) persons in a 75,000 square mile area surrounding Hanford. This area extends from central Oregon to northern Washington, and from the crest of the Cascade Mountains to the eastern edge of northern Idaho. It is about 306 miles from north to south and 246 miles from east to west. The Project study area is shown in Figure 2 (page 10).

The principal radioactive material of interest released to the air is iodine-131. Figure 3 (page 11) shows the iodine-131 release estimates from the reprocessing plants from 1944 through 1951. Iodine-131 releases total nearly 730,000 curies during these years. As filtering systems were added, and then improved, the releases were dramatically reduced. Production processes were also changed to reduce the releases. Rough estimates made early in the Project showed iodine-131 would account for most of the radiation dose people could have received from Hanford.

Doses from iodine-131 releases for the maximum release years (1944-1951) are calculated for 12 age, sex, and lifestyle categories at 1,102 different locations. In addition, dose calculations were made for six radionuclides—strontium-90, ruthenium-103, ruthenium-106, iodine-131, cerium-144, and plutonium-239—for eight locations for the years 1944 through 1972. These six radionuclides make up 99

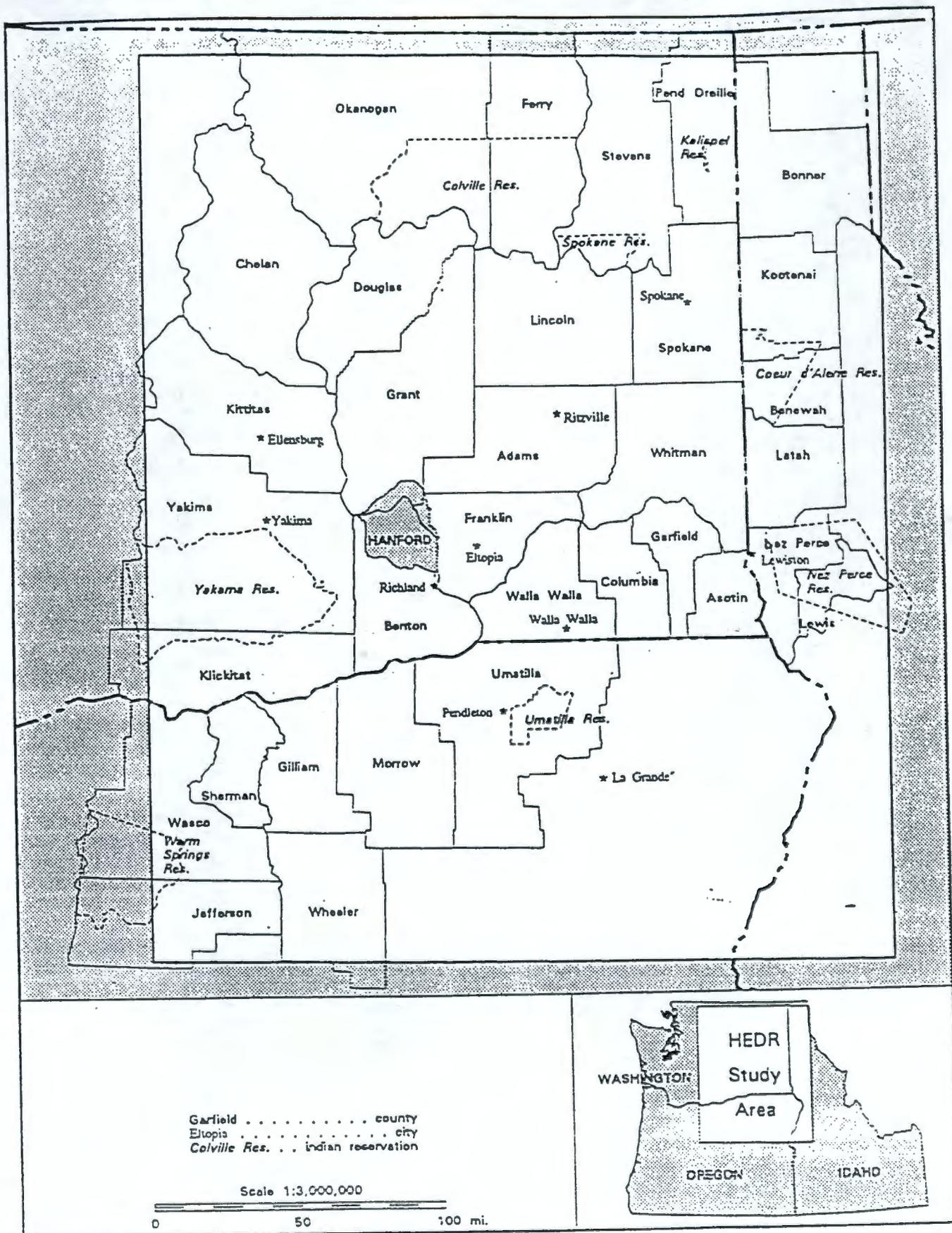
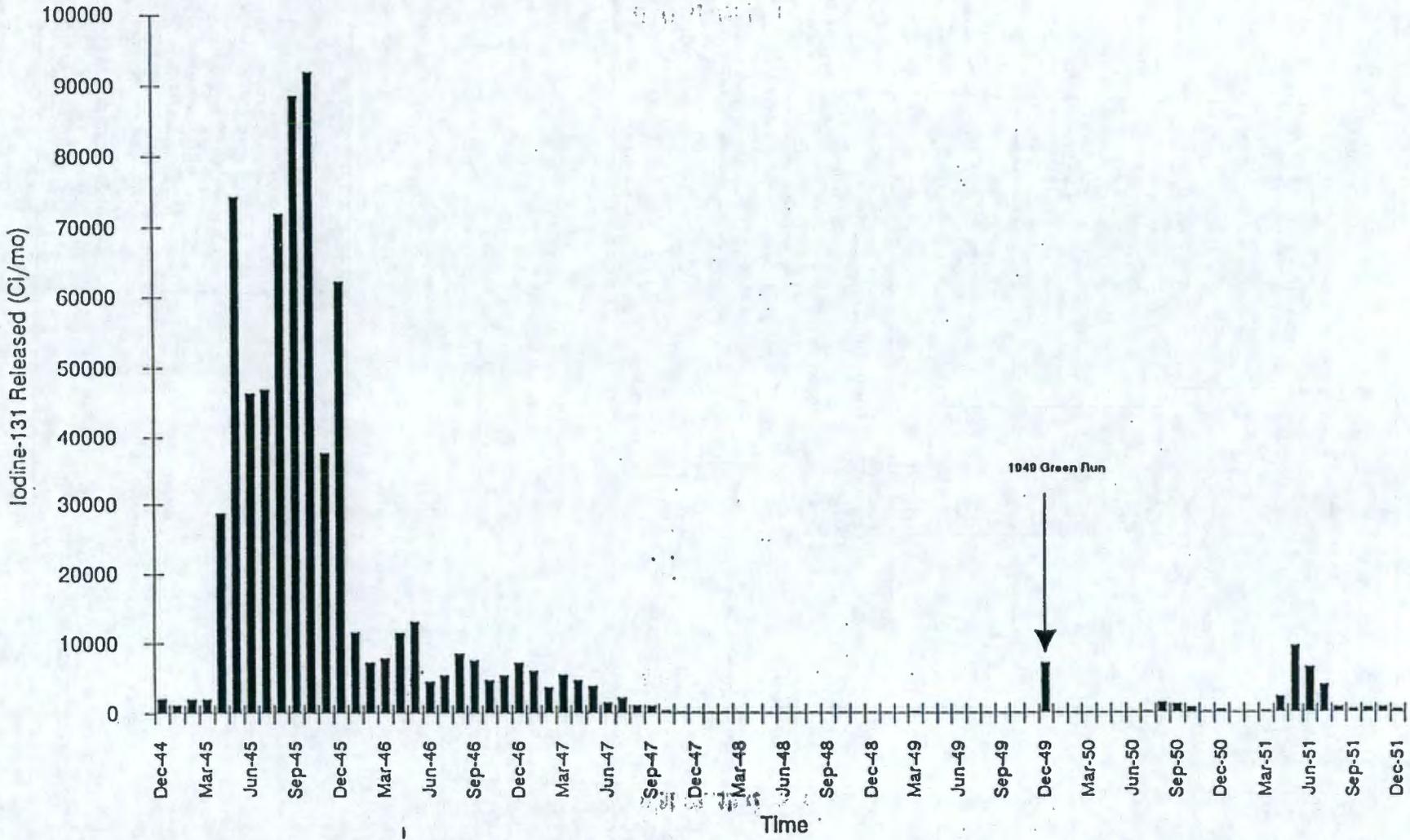


Figure 2. Project Study Area (Air Exposure Pathway)

Figure 3. Monthly Iodine-131 Releases, 1944-1951



percent of the potential radiation dose from the atmospheric pathways. Previously published Hanford Annual Report doses were summarized to complete the dose history for the years 1973 through 1992.

Iodine-131 disappears within a few months of its release. That's because it decays rapidly—half decays every eight days, half of what remains in another eight days, and so on. Because iodine-131 transforms into an element that is not radioactive, within 80 days (10 half-lives) the radioactivity is basically gone.

Once the iodine-131 was released to the air, it traveled in the wind. As the iodine-131 traveled over land, some fell onto vegetation and the ground. During the growing season, iodine that deposited on pasture used by dairy cows and goats would have been eaten by the cows and goats. The iodine-131 went to their milk. The radiation dose to a person is, therefore, largely dependent upon the source of milk and the amount of milk consumed by the person.

Much of the radioactive iodine-131 consumed by people would go to the thyroid gland, an organ that needs iodine to function. After six days, about half of the iodine-131 absorbed by the thyroid gland still remains.

Part of the loss results from radioactive decay, and part is from biological excretion processes.

The largest radioactive material releases to the air consisted of iodine-131 coming from the separations plants during the first three years of Hanford operations. Ruthenium releases were the next highest, followed by cerium-144, strontium-90 and finally plutonium-239 releases. Releases of tritium, carbon-14, and argon-41 from reactor stack gas systems and from reactor effluent cooling water were found to be very small.

**Monitoring of Radioactive Materials from Hanford** Scientists studied environmental and emissions monitoring records to find out how much radioactive materials were released, and how and where they were deposited. Emissions monitoring began with the start-up of Hanford facilities in 1944. It consisted of measuring the amounts of radioactive materials vented to the atmosphere and released to soils and to the Columbia River. The technology to accurately measure atmospheric releases evolved for several years before measurements became reliable. Until then, releases to the air were estimated on the basis of production data and estimated filter efficiencies after filters were installed in 1948.

#### RECONSTRUCTING THE MILK SYSTEM

Pinpointing people's source of milk is an important part of estimating doses from Hanford radioactive material releases. Milk from a cow or goat that ate pasture grass in the downwind area would contain higher levels of iodine-131 than milk from cows pastured in less contaminated areas. Milk from cows that ate stored feed would also contain lower levels of contamination. Family cow and goat milk may yield the highest doses because it was consumed immediately by the owners or their neighbors. In contrast, milk produced commercially might be mixed at the creamery with milk from other, less contaminated areas. It also may not be consumed for several days after milking. This could result in a lower dose to the person who drinks the milk.

To answer some of these questions, it was necessary to reconstruct the milk production and distribution system near the Hanford Site in the late 1940s. Very few records remain from the dairy industry during this time. Scientists consulted dairy farmers, agricultural extension agents, dairy industry specialists from universities and employees of dairies operating during this time. They sought information on where dairies got their milk, where they sold it, and how much dairy farmers relied on pasture to feed their herds. The dairy system from the 1940s was reconstructed by putting together information from all these sources.

Environmental studies started before the Hanford facilities began operating. These consisted of meteorological measurements and observations of atmospheric plume behavior to predict the path of radioactive materials released to the air.

Environmental studies were expanded to include measurements of radioactive materials in the air, ground, vegetation, food, wildlife, Columbia River water, drinking water, sediment, fish, and other aquatic life. It was not until the mid-1950s, however, that the possibility of milk as a pathway for radioactive iodine was recognized. As a result, milk containing iodine-131, which resulted in radiation exposures of as much as 10 to more than 100 times more exposure than from breathing iodine-131, was not monitored during the period of highest releases of iodine-131 (1944 through 1947).

#### Air Pathway Computer Models

Each step in the dose estimation process involves the use of conceptual and mathematical computer models. These models are needed because there is not enough data about radioactive material concentrations in air, soil, vegetation, and foodstuffs for necessary locations and time periods.

Project scientists developed several computer programs referred to collectively as HEDRIC (Hanford Environmental Dose Reconstruction Integrated Codes) to estimate ra-

diation doses and their uncertainties. HEDRIC consists of four collections of programs with well-defined interfaces. The programs, which must be executed in sequence, implement:

- a source-term model
- an atmospheric transport model
- an environmental pathways model
- a dose model.

The first part of HEDRIC consists of three programs that calculate the source term. These are the Reactor Model (RM), Do Iodine (DOI), and the Source Term Release Model (STRM). Collectively, these programs use information about the operation of Hanford's reactors and processing plants to estimate hourly releases of radioactive materials from the processing plant stacks to the air. Appendix 2 shows the annual summary of the six radioactive materials released to the air between 1944 and 1972 that are used in the dose calculations.

Unusual release events such as the December 1949 Green Run were included in STRM. This experimental release from the T Plant occurred when a dissolver was loaded with fuel that had been discharged from the reactor after an unusually short cooling time. The Green Run was conducted to measure how airborne radioactive materials spread. Filtering systems were bypassed to be sure that the release carried enough radioactive material to be measured. The Green Run accounts for about 7,000 curies of I-131 released to the air.

#### DEFINITIONS

**Code**—Instructions that tell a computer to do something. A computer program consists of code. When a reference is made to the project software consisting of 60,000 lines of code, it refers to the code contained in all of the programs in the Hanford Environmental Dose Reconstruction Integrated Codes (HEDRIC).

**Program**—A complete set of code. When you tell a computer to run a program it does something. HEDRIC consists of ten programs plus several data files.

**Model**—A mathematical formula, algorithm, or combination of them that can be used to predict the behavior of something in the real world. Reactor Model (RM) is a program (consisting of a few lines of code) that contains a model of how a reactor works. Battelle used RM to calculate the amount of iodine produced by the Hanford reactors.

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The second part of HEDRIC is the atmospheric transport model. The model in RATCHET (Regional Atmospheric Transport Code for Hanford Emission Tracking) combines the radioactive material release information with observed meteorological data. It then calculates daily air concentrations and surface contamination throughout the Project study region. These estimates are made for over 2,000 locations within the Project study area on a daily basis.

The third part of HEDRIC is the environmental accumulation program, called Dynamic Estimates of Concentrations And Radionuclides in Terrestrial Environments (DESCARTES). DESCARTES is comprised of several environmental models, which together calculate concentrations of radioactive material in the environment and the food chain. Radioactive material transported through the atmosphere deposited on soil and plants, providing the possibility for human exposure and dose. DESCARTES uses the daily inputs from RATCHET to calculate estimates of the concentrations of radioactive materials in several types of vegetation, crops, and animal products. This calculation requires the input of extensive data about the agricultural production and distribution systems during 1944-1951.

Results provide the concentration in vegetables, grains, and fruits eaten by people and in plants (grass, alfalfa, silage, grain) used for animal feed. Animal feed concentrations are then used to determine concentrations in animal products (beef, venison, poultry, eggs, milk). Finally, the radioactive material concentrations in commercially distributed milk are calculated.

The fourth and last part of HEDRIC is a program called CIDER (Calculations of Individual Doses from Environmental Radionuclides) which calculates individual doses. It uses data from the preceding programs to estimate exposure and dose for people living within the Project study area.

The environmental accumulation models establish the concentrations of radioactive materials in environmental media and food products for all locations and times of interest. In

the individual dose model, people are introduced into the calculation. The dose model calculates dose by four exposure pathways:

- submersion in contaminated air;
- inhalation of contaminated air;
- irradiation from contaminated surfaces and soils; and
- ingestion of contaminated farm products and vegetation.

The individual dose model is designed to calculate doses to reference individuals and real people. Annual and cumulative doses are reported. These are calculated as a sum of daily exposures from all sources. The person's movements about the study area may be accounted for, as well as his or her probable sources and quantities of food.

#### **Distributions**

For this Project, scientists felt it was important to consider differences in radiation doses that would result from differences in age, sex, lifestyle, food habits, geographical location, agricultural production, month, season, year, and other factors. To accomplish this objective, input data to the Project model consists of distributions instead of single-number estimates.

For example, instead of using one number to represent the amount of milk all people in the study area drank per day, the Project uses a distribution of amounts of milk that people—by age and sex—could have drunk. This approach accounts for variability and recognizes that actual milk consumption can range from none to more than a quart a day, and that a person often can't remember exactly how much milk he or she drank 45 years ago. The use of distributions enables the dose estimates to reflect differences in milk consumption.

#### **Deposition Patterns**

The total 1945 deposition of iodine-131 across the study area is shown in Figure 4 (page 15). This figure provides an example of the iodine-131 "footprint" or location of deposition. The figure is not intended to give an accurate representation of the iodine-131 concentration in the soil at any given time. It cannot be used to estimate doses. The figure shows the cumu-

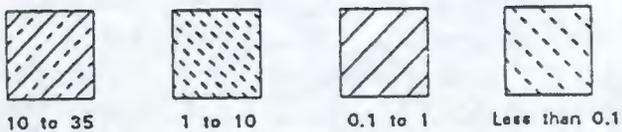
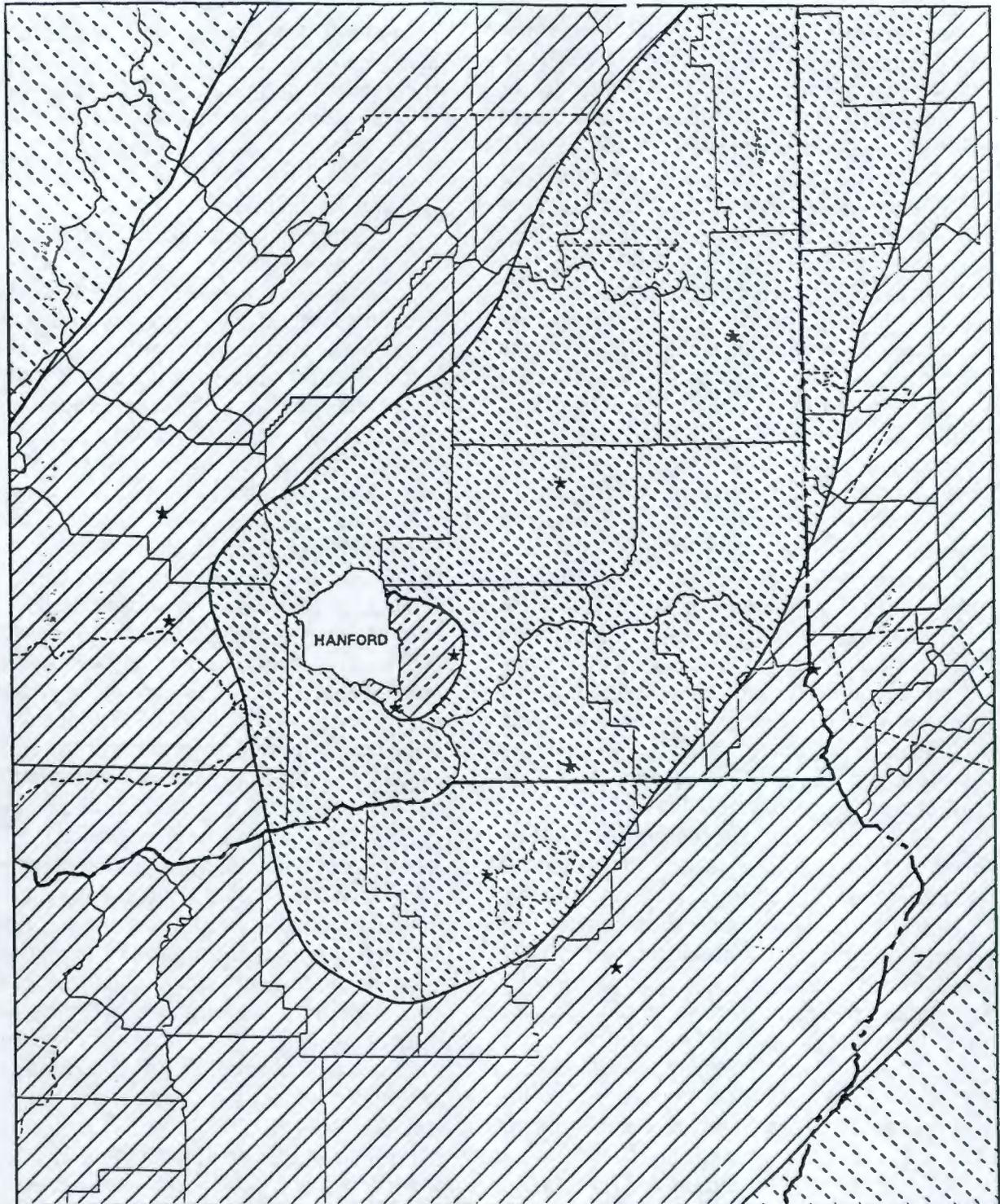


Figure 4. Cumulative Iodine-131 Deposition for 1945 (microcuries per square meter undecayed)

lative undecayed deposition at each location. Because iodine-131 is constantly decaying with an eight day half-life, the actual concentrations in surface soils would be less.

The figure shows that in general the iodine-131 is deposited to the northeast of Hanford. There is a slight southeastern component to the pattern as well. These findings are consistent with the prevailing winds in the region. Material released to the atmosphere at Hanford is generally transported from the site in a southeastern direction toward the Tri-Cities. It is then moved to the northeast with the continental winds.

The total amount of iodine-131 deposited in the project study area during 1945 as shown in Figure 4 is about 260,000 curies. This accounts for roughly half of the 555,000 curies estimated to have been released during that year. On average, 55 percent of the iodine-131 released from Hanford is estimated to have been deposited within the Project study area. Some 10 percent decayed during atmospheric transport within the study area. The remaining 35 percent was either deposited outside of the study area or decayed during atmospheric transport beyond the study area.

#### Dose Calculations

For a given person, the dose program calculates the radiation dose from a single radioactive material, iodine-131, at a single location. To calculate the dose at more than one location, the calculation is repeated for each location of interest.

Doses are calculated for people of various ages because an individual's dose response to a given intake amount changes with age. Dose factors are provided for several age/sex groups. Dosimetry for male and female children through about age 15 is essentially the same and is modeled as being identical; the only potential variable is the difference in food consumption by the sexes.

Doses from external exposure and inhalation are functions only of location and age. The model in the CIDER program uses equations that are commonly used in environmental dosimetry calculations. Project scientists determined that air submersion is a minor pathway.

For the purpose of estimating the dose to persons who were exposed to the atmospheric pathway, a set of representative persons was selected. The characteristics of these persons are intended to approximate those of selected segments of the general population.

There are a number of different factors that describe the characteristics of these representative individuals. The most important is diet. The dietary information used was derived from United States Department of Agriculture dietary data collected in 1977. Based on this diet and the knowledge that people generally consumed more milk, eggs, and vegetables and less beef and poultry in 1945 than in 1977, it was possible to estimate a typical diet in 1945.

The representative dose estimates were calculated using some general assumptions regarding the source of foods eaten and the type of feed provided to milk-producing cows. The dose from iodine-131 is highly dependent upon the amount of milk consumed and the source of that milk. The doses were determined to be the largest for persons consuming large amounts of milk from cows that were grazed on fresh pasture. Doses are much lower for persons who consumed less milk or whose milk was obtained from a cow that was fed stored feed. The milk from a cow that was fed stored feed is lower than that of a cow on fresh pasture because of the radiological decay of iodine-131 during the time the feed was stored.

Representative dose estimates were prepared for three general food source scenarios:

- 1) The person consumes foods grown in a backyard garden or farm. All foods including milk, leafy vegetables, other vegetables, fruit, grain, eggs, poultry and beef come from the same location at which the person lives. The cow that provides all the milk for this person feeds on fresh pasture.
- 2) Identical to the first except that the person obtains milk from a cow fed with stored feed.
- 3) The person consumes milk and leafy vegetables obtained from a local commercial source such as a grocery store or other market.

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# Columbia River Exposure Pathway

The Project estimated doses to persons who may have used the Columbia River as a source of drinking water or who ate fish or waterfowl from the river. Some dose could also have been received by swimming in or boating on the river. Doses may have also been received by persons who ate salmon which had migrated up the river or by eating shellfish from Pacific Ocean estuaries.

To calculate doses, scientists needed to know:

- the type and amount of radioactive materials released to the river from Hanford reactors;
- how radioactive materials were transported in Columbia River water;
- the accumulation of radioactivity in fish and waterfowl; and,
- people's diets and lifestyle.

TSP and Battelle scientists estimated the historic releases of eleven radioactive materials to the Columbia River during the operation of Hanford's eight original reactors. These reactors operated at Hanford from 1944-1971. N Reactor, the ninth and last operating production reactor, recirculated water within its core and did not discharge directly to the river. N Reactor continued operation until 1987.

The use of river water to cool the reactors resulted in the release of radioactive materials to the Columbia River. Releases of radioactive materials to the ground resulted in smaller releases to the river.

Nineteen radioactive materials were initially examined to determine their significance to dose. Of these, five (sodium-24, phosphorus-32, zinc-65, arsenic-76, and neptunium-239) are included in the dose calculations because they contributed about 94 percent of the estimated dose to people (see Appendix 2). Six others (scandium-46, chromium-51, man-

## SOIL AND GROUND WATER

From the time Hanford facilities first began operating, highly radioactive liquids were routed to underground storage tanks, and slightly less radioactive liquids were discharged directly to the ground in ponds, ditches, and engineered structures called cribs. Some of the radioactive liquids moved through the soils into ground water. Some, such as tritium, traveled in the ground water and reached the Columbia River. These radioactive liquids contributed very little to the much larger amounts of radioactive liquids that were routinely discharged into the Columbia River as part of the cooling water from the original reactors.

ganese-56, yttrium-90, iodine-131, and neptunium-239) were included in the source term estimates either because they were needed to validate the river transport model or they were of particular interest to the TSP. The other eight were considered not to have any significant impact on doses.

Columbia River water for use in cooling the reactors was pumped into a treatment plant. Chemicals were added to purify the water and help prevent corrosion of the piping and reactor tubes. The processed river water was then filtered and pumped into large holding tanks. From the tanks it was pumped to the reactor.

Radioactive materials were created when neutrons in the reactor core activated elements present in the cooling water and elements added during water treatment processes. Reactor neutrons also produced radioactive materials by activating elements in the metals used for process tubes and fuel cladding. The resulting radioactive materials

were released in the cooling water discharged to the Columbia River.

During its brief passage through the reactor core (1 to 2 seconds), the water was heated to over 212°F in the highest-powered tubes. The hot effluent water was discharged from the reactor into holding ponds near the Columbia River. After cooling and allowing time for the shortest-lived radioactive materials to decay, the water was discharged to the river.

As the reactors operated, film deposits built up on both the tubing and the fuel elements. Plant operators periodically removed or "purged" the film buildup. Because the film contained radioactive materials, purges resulted in increased radioactive discharges to the river. But these releases were minor compared to routine operational releases and fuel-element failures.

Nearly 2,000 fuel-element failures occurred in the eight original Hanford reactors. A failure is a crack in the aluminum rod that contained the uranium fuel, allowing coolant water direct access to the fuel. Each failure resulted in the release of fission products to the water in the reactor. The reactor was shut down when a rupture occurred. Scientists found many records of ruptures in Hanford reports. The data was included in the source term, but contributed only a small amount to the total released.

#### River Monitoring Information

Extensive monitoring data are available to help scientists in their research. Discharges from each reactor were measured daily in 1964-1966. Weekly measurements were taken of river water at several locations. Drinking water was sampled at Richland, Pasco, and to a lesser extent, Kennewick. Several kinds of fish were sampled — especially whitefish — which could be caught year-round. Whitefish had among the higher concentrations of important radioactive materials, such as phosphorus-32. External radiation along the river bank from sediments containing radioactive materials were also measured.

However, even with these extensive records, it is not possible to make dose calculations for the river pathway based entirely upon historical monitoring data. That's because sampling was not done at every location along the river on a constant basis for radioactive materials of interest. Therefore, computer modeling was needed to fill in these gaps.

#### Columbia River Computer Modeling

The process of estimating doses to persons from the river pathway starts with estimating the amount of radioactive materials discharged to the Columbia River. This is the Source Term. The Source Term data provided monthly average releases from each of the eight reactors from January 1950 through January 1971. This was done by using reactor operating history and measurements of radioactive material concentrations, where the latter were available. The radioactive material releases were corrected for decay from the time of release from the reactors to the time of discharge to the Columbia River.

A distinct seasonal cycle is evident in the data. During late spring and summer the melting snow in the Cascades and Rocky Mountains increased the river flow, causing increased dilution of radioactive materials. Reduced Columbia River flow in the winter resulted in the maximum concentrations occurring at this time of the year.

Figure 21 (page 41) shows the annual releases of the five key radioactive materials used for dose calculations.

Using the source term estimates, scientists calculated the concentrations of key radioactive materials in the Columbia River water at several downstream locations (see Figure 22 page 42). This was done by simulating radioactive material flow and transport in the river.

A computer program called CHARIMA, which contains a river model, was used to simulate transport of specific radionuclides from the Hanford reactors to Portland, Oregon. The length of river considered extended from Priest Rapids Dam near Hanford to river mile 100, just downstream of the Willamette

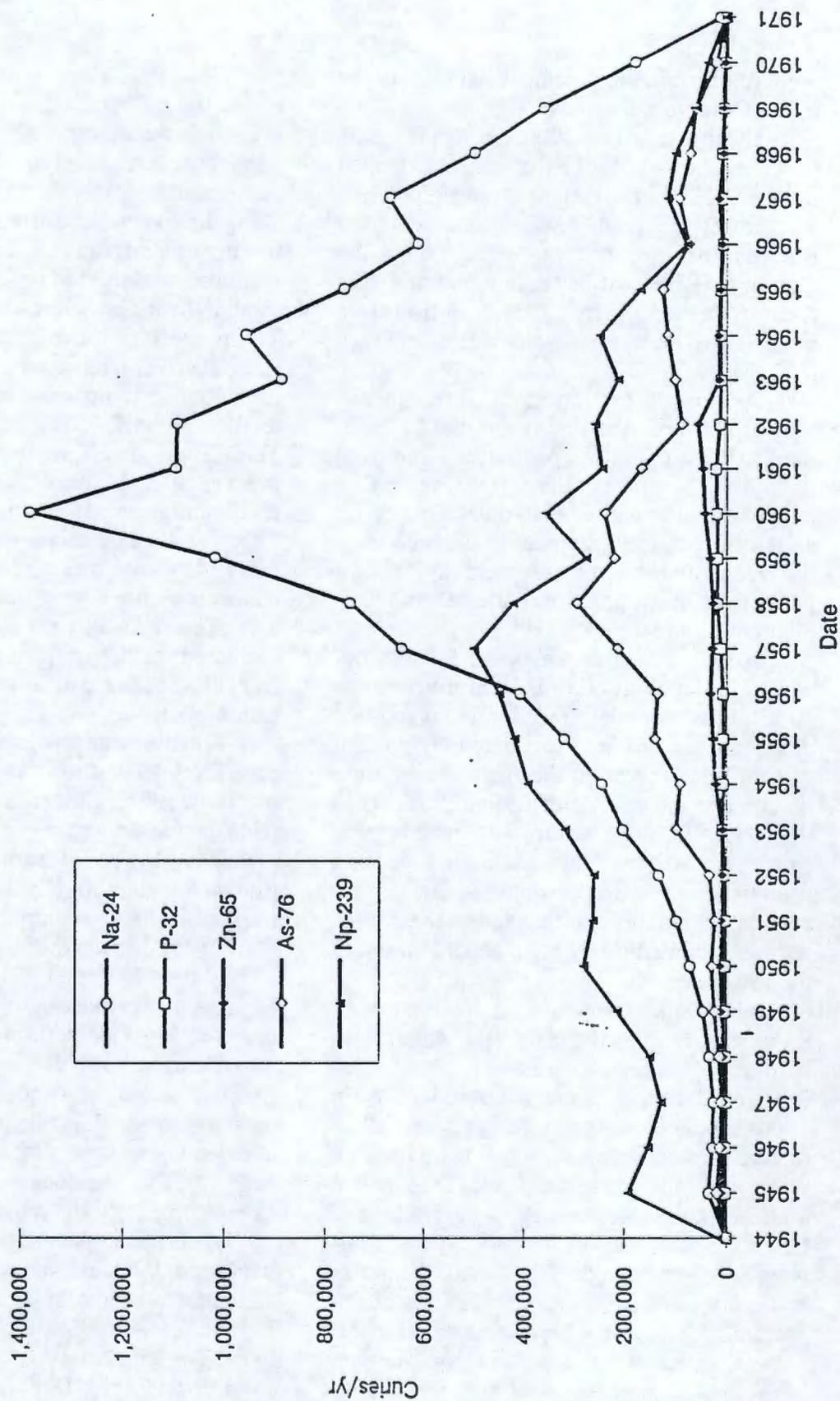
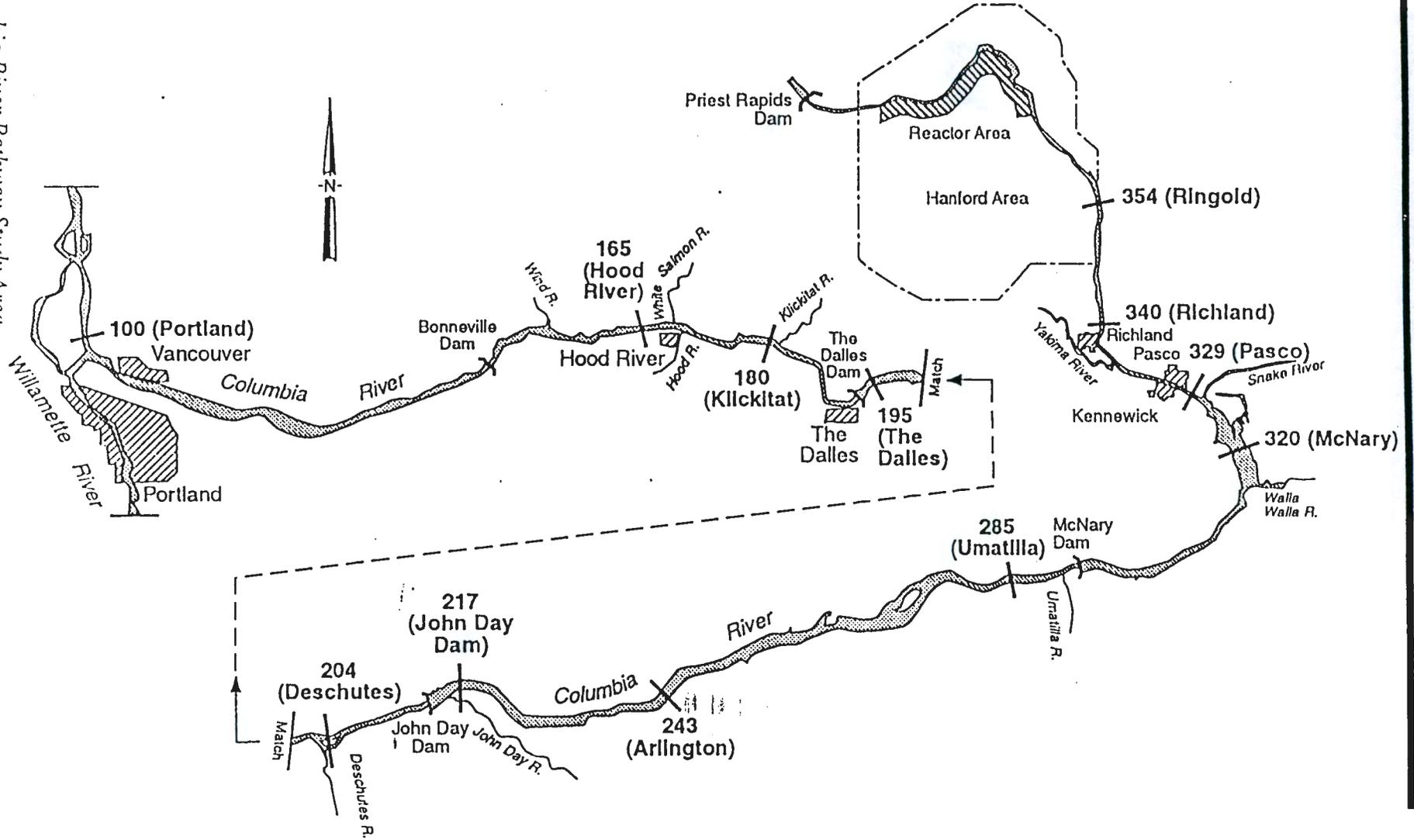


Figure 21. Key Radionuclides Released to the Columbia River by Year, 1944-1971

Figure 22. Columbia River Pathway Study Area



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River confluence at Portland. The time frame spans a 21-year period from January 1950 through January 1971.

Monthly average water concentrations were reconstructed at 12 locations for sodium-24, phosphorus-32, zinc-65, arsenic-76, and neptunium-239. Concentrations for chromium-51 were computed to help validate the transport model, but were not considered significant for use in dose estimates. Where actual monitoring data were limited, concentrations were calculated by using measurements of releases from the reactors along with information about dilution in the river.

These water concentrations were then used to calculate dose estimates. Historical river monitoring data was used to validate computed water concentrations.

The CHARIMA program can account for tributary inflows, multiple channels within a river and the presence of dams and reservoirs. It also has the capability to route contaminants to any specified location.

The results of the modeling indicated that the five key radioactive materials can be separated into two groups, based on their transport characteristics in the Columbia River. The first group, radioactive materials with relatively short half-lives — sodium-24, arsenic-76, and neptunium-239 — was sensitive to downstream travel time. After dams were constructed below the Snake River, transport speeds were significantly reduced. The reduced flow increased the travel time and allowed more radioactive decay to occur. Downstream travel times were significantly increased after 1953 when the operation of McNary Dam began. The raising of the reservoir behind The Dalles Dam in March 1957 did not have as great an effect as McNary Dam, probably because of its proximity to the Bonneville Dam and reservoir. John Day Dam began operating in April 1968, and a reduction in concentrations was evident. Because of the dams, water concentrations for the three radioactive materials at downstream locations were

much lower than they would have been under open channel conditions.

The second group — consisting of phosphorus-32 and zinc-65 — was not as much affected by dam construction because of their longer half-lives. Phosphorus-32 has a half-life of 14.3 days. Zinc-65 has a half-life of 245 days. These are long enough to greatly reduce the effects of travel time.

Major gaps in the information base were due to the lack of specific radioactive material concentration measurements before 1951 and the absence of monitoring data during some months. Missing data were reconstructed using statistical analysis of existing data coupled with modeling techniques.

#### Radioactive Material Concentrations in Aquatic Organisms

In order to estimate doses to individuals who ate fish or waterfowl taken from the Columbia River, scientists needed to estimate the radioactive material concentrations in those organisms. Several different approaches were used. Each approach relied heavily on historical monitoring data collected by Hanford researchers and by other State and Federal government agencies and universities.

The concentration of radioactive material in fish and waterfowl can be related to the radioactive material concentration in the water in which they live and feed. A large historical database of measured radioactive material concentrations in Columbia River fish, waterfowl, and water was assembled. This was used to develop bioconcentration factors specific for the Columbia River. These factors directly relate the radioactive material concentration in the organism to the concentration in the Columbia River water.

#### Waterfowl

Two types of ducks were included in this study — diver ducks that eat small fish and invertebrates, and puddle ducks that eat near-surface water plants and grain crops. Geese, which feed in a similar manner to puddle ducks, were included in this summary because historical

data were available for them. No seasonal dependence was found in the historical sampling data. Therefore, the bioconcentration factors are for all seasons.

#### Shellfish

Zinc-65 and phosphorus-32 concentrations in shellfish near the mouth of the Columbia River were first detected in the 1950s. Information was compiled on phosphorus-32 and zinc-65 in shellfish for locations such as Willapa Bay, Astoria, Cannon Beach, Coos Bay, Seaside Beach, Tillamook Bay, and Agate Beach. Oysters generally contained higher concentrations of zinc-65 than did other marine organisms.

#### Salmon and Steelhead

Anadromous species (fish that live part of their lives in freshwater and part in salt water) such as chinook salmon, sockeye salmon, coho salmon, and steelhead trout travel up the Columbia River to spawn. Sockeye and other Pacific salmon species do not feed once they enter fresh water and head upstream to their spawning area. The fish rely on reserves of fat and protein stored up during their ocean residence to reach their spawning area.

Juvenile salmon and steelhead feed during their three to 24 month river migration downstream to the ocean. However, it is thought that anadromous species such as salmon and steelhead in the Columbia River took in radioactive materials primarily while feeding in the ocean. Fish in the ocean may have accumulated radioactive materials from both Hanford discharge and fallout from atmospheric testing of nuclear weapons. Information on 47 historical samples of salmon caught in the Columbia River show that 37 samples were below the minimum detection limit (0.1 picocuries per gram — pCi/g) for zinc-65. The rest of the samples varied from just above the detection limit to a maximum of 13 pCi/g. The median value for zinc-65 was 0.6 pCi/g.

The TSP determined that doses from salmon and steelhead should be calculated using two approaches. The first approach would be to use available monitoring data. The second approach assumed that the salmon spend

their entire lives in the Columbia River and accumulate radioactive materials as do resident species. The second approach provided an upper limit for doses from ingestion of salmon and steelhead. It was used to estimate the uncertainty in salmon and steelhead doses. It yielded zinc-65 concentrations in salmon ranging from about 1 pCi/g to 100 pCi/g.

Standard dose assessment methods were used to translate the radioactive material concentrations in environmental media into the radiation dose that could have been received by a person. The environmental media of concern for the Columbia River pathway include treated and untreated drinking water, resident fish, waterfowl, salmon, and shellfish. The Columbia River Dosimetry Code (CRD) calculates doses for twelve specific river segments. The segment names and approximate locations are as follows:

1. Ringold (from below reactor areas to north of Richland)
2. Richland (from north of Richland to above the Yakima River)
3. Kennewick/Pasco (from below the Yakima River to above the Snake River)
4. Snake/Walla Walla River (from below the Snake River to McNary Dam)
5. Umatilla/Boardman (from below McNary Dam to near Arlington, Oregon)
6. Arlington (Arlington, Oregon area)
7. John Day Dam/Biggs (from John Day River to Deschutes River)
8. Deschutes River (Deschutes River mouth area)
9. The Dalles/Celilo (The Dalles/Celilo area)
10. Klickitat River (Klickitat River mouth area)
11. White Salmon/Cascade Locks (from White Salmon River to Bonneville Dam)
12. Lower River (from Bonneville Dam to Columbia River mouth)

Doses resulting from eating shellfish from Willapa Bay and from salmon and steelhead caught at any location in the Columbia River were also calculated.

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Specific information relating to exposure must be supplied by each person for whom a radiation dose is to be calculated. The information to be supplied for use in the CRD program includes:

- a. river use: swimming (hours/month)
- b. river use: boating (hours/month)
- c. untreated drinking water ingestion (Liters/month)
- d. treated drinking water ingestion (Liters/month)
- e. resident fish (omnivore) ingestion (kilogram/month — a kilogram is about 2.2 pounds)
- f. resident fish (first-order predator) ingestion (kg/month)
- g. resident fish (second-order predator) ingestion (kg/month)
- h. waterfowl ingestion (kg/month)
- i. Willapa Bay shellfish ingestion (kg/month)
- j. Columbia River anadromous fish (salmon/steelhead) ingestion (kg/month)

APPENDIX G

THE RISKS AT HANFORD ARE REAL

### APPENDIX G

#### THE RISKS AT HANFORD ARE REAL

DOE, as well as many other independent reviewers, clearly recognize that the DOE nuclear weapons complex poses a wide variety of risks and "clean-up" challenges.<sup>1</sup> These risks are characterized in terms of the source and severity of the risk, exposure pathways, and potential receptors. Among sites in the DOE complex, Hanford's problems are many and serious, and represent real risks to the surrounding communities, region, and nation that are unparalleled anywhere else within the DOE complex. Although the risks appear to be local, the potential impact from a catastrophic incident may have profound impacts to the region's international economy and agricultural base. Events such as the Chernobyl meltdown or the Tomsk tank explosion demonstrate that while distance dilutes awareness, knowledge, and concern about risks outside a commonly perceived area of influence, catastrophic events at one locale can have much more widespread, even global implications.

Historical releases from Hanford are traceable downstream along the Columbia River, spreading over hundreds of square miles of the Pacific Ocean, as far north as Canada and as far south as northern California, and downwind into eastern Washington, Oregon, and Idaho. Such demonstrated historical impacts only hint at the full spatial and temporal scope of future risk, if current myopic planning either dismisses or falls short of comprehensively identifying and addressing the full scope of potential risks. Outlining "real risks" to tribes, the public, site workers, and the environment necessarily combines toxicologic effects, risk perception, risk evaluation, qualitative values, and community or cultural impacts.

#### A. Risks from Hanford Nuclear Material Production Facilities

Significant risks to site workers and to the environment exist from aging nuclear materials production facilities at Hanford. Among these, for example, is the Plutonium Finishing Plant, which now stores approximately 11 metric tons of special nuclear materials<sup>2</sup> in a variety of chemical forms. Many of these materials are not in a physically or chemically stable form that would permit safe long-term storage, and currently represent a particular risk to workers at the plant. Significant quantities of plutonium also exist in the ventilation ducts of the plant and represent a significant source of concern for release to the environment, particularly because this antiquated, above-ground repository does not meet even minimal seismic safety standards. Potential for release of radioactive contaminants through ventilation ducts and other vectors also exist for many other processing plants including PUREX, Redox, T-Plant, and B-Plant.

Other hazards also exist owing to the aging state of nuclear production reactors along the river. In recent years, the condition of these facilities has deteriorated to the point where site workers have been injured, one fatally. Ironically, considerable sums must be spent to maintain and even upgrade structures slated for eventual removal.

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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### B. Risk from Hanford Tanks

Hanford tank wastes have long been recognized as one of the most significant problems faced by DOE anywhere in the nation. Current Hanford tank wastes are complexly mixed combinations of reactive or poorly compatible constituents, unlike the more uniform composition of tank wastes at Savannah River, for instance. Their poorly understood, but continuing chemical and physical evolution poses numerous safety problems including episodic flammable gas releases ("burping"), high heat generation, and criticality potential.

Several years ago, safe storage of these high-level radioactive and mixed wastes became such a concern that Congress passed a law designating certain tanks as "watch list" tanks<sup>3</sup> because of the potential for uncontrolled release of radioactive and hazardous substances or other health and safety hazards. Any catastrophic release could be expected to fatally injure many site workers, severely impact offsite populations for a considerable distance, adversely affect the Columbia River ecosystem in a complex, accumulating manner, and render an unknown area uninhabitable and an even larger region unfarmable long into the future. In addition, Hanford's single-shell tanks have greatly exceeded their design life and continue to fail at an average of about one per year, allowing highly radioactive wastes to leak into the soil and further contaminate the vadose zone, groundwater, and the Columbia River.

### C. Risks from Hanford Spent Nuclear Fuel

Nearly 80% of the spent nuclear fuel from throughout the DOE complex is stored at Hanford. Of the over 2100 metric tons of spent nuclear fuel stored at Hanford, most is now located in the K-East and K-West basins in very close proximity to the Columbia River. The K-East basin is an acknowledged leaker releasing very high concentrations of tritium into shallow groundwater that quickly reaches the river; leaks are concentrated at unreinforced joints in the huge concrete basin. An earthquake comparable to recorded historical events might cause catastrophic failure of the basin that would rapidly release large volumes of tritiated water and other contaminants to the soil, groundwater, and the Columbia River. The unencapsulated and poor condition of the bulk of the fuel in the K-East basin in particular and deterioration of the fuels cladding and the fuel itself have raised major concerns about long-term stability and a safe long-term storage configuration owing to the fuel's pyrophoric nature.

### D. Risks from Past Hanford Disposal Practices

Historical disposal practices at Hanford have created widespread areas of extensive contamination in both the soils and groundwater across the Hanford Site. Concentrations of contaminants in the environment greatly exceed established regulatory standards and risk levels. Hazardous chemical substances, including carbon tetrachloride, trichlorethylene, chloroform, and hexavalent chromium, have been identified in Hanford groundwater at concentrations as much as

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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1,000 times applicable health and environmental standards. Radioactive contaminants, including uranium isotopes, strontium-90, tritium, and technetium-99, also exceed risk-based standards (where they exist) in soil and groundwater across the Hanford Site. The extent of contamination continues to expand, and the failure to act creates ever more difficult control, containment, and "clean-up" challenges.

Previous treatment efforts directed at increasing tank storage capacity and separating and removing the principal radioactive and thermal heat generating materials during the 1950s and 1960s resulted in the encapsulation of several thousand cesium- and strontium-compound capsules. Individual capsules measure only about 2.6 by 21-inches and hold about six pounds, but contain about 50,000 Curies of radioactivity each. To put it in perspective, the more than 2200 cesium capsules now stored in Hanford's Waste Encapsulation and Storage Facility now contain more radioactivity than the approximately 45 million gallons of high-level waste contained in all 149 single-shell tanks. These 2200 capsules comprise far less than 1% of the total waste volume now present at Hanford, but alone account for more than 39% of total radioactivity in surface wastes (excluding that in soil and groundwater). These materials must be kept safely shielded and cooled for hundreds of years.

### E. Risks to Communities and Cultures

Risks to communities and cultures are widespread, but much more difficult to quantify. As such, they are often dismissed or belittled by the "experts" as simply uninformed opinion, "outrage," or "perception." But to affected communities and the ecocultural landscape, risks to the health and safety of the Columbia River ecosystem and its resources threaten traditional tribal subsistence lifestyles, spiritual beliefs about the sanctity of nature and the environment, long-term survival, and the very basis and future of tribal culture, spirituality, and tribal identity.

Human health and ecological risks are important measures, but only one aspect, of risks impacting unique and disappearing indigenous cultures of North America. For example, risks associated with transportation of hazardous chemical and radioactive materials across tribal reservations, not only along highways and railroads, but also along culturally significant, treaty-protected corridors such as the Columbia River, are an especially grave concern. In fact, such risks will increase considerably given the Federal Facilities Compliance Act requirements for treatment and disposition of mixed wastes and current DOE planning strategies, regardless of whether one or fifty such facilities are built.<sup>4</sup>

If a permanent geologic repository is ever constructed, massive transportation campaigns of unprecedented volume, frequency, and duration will shuttle high-level wastes disproportionately to, from, and through Indian lands around the country, but especially in western states. Such risks threaten the very land and natural and cultural resource base that is the core of tribal cultures and communities, and threaten cultural extinction if that essential land base and spiritual center of tribal culture and identity is irreparably damaged.

### F. Risks through Time

The risks extending through time and the risk of doing nothing now pose among the greatest and most underappreciated threats to human health, the environment, and cultures and communities from DOE facilities and activities. Too many political leaders and even technical managers are disturbingly willing, even anxious, to bury their heads in the sand and pass on a legacy that will increasingly threaten future generations by arrogantly and unjustifiably discounting their value and prejudicing their options. In government at many levels these days, there is excessive focus on only the immediate crisis at hand (cost), and this narrow focus tends to lead to just as narrowly framed, poorly conceived, and short-sighted actions that will not stand up to the test of time. *The impacts or risks through time and the risk of doing nothing or doing only as little as possible now must comprise central elements of any truly comprehensive and politically supportable risk evaluation strategy. Otherwise, the true long-term risks, costs, and benefits of current risk management and remedial decisions for addressing dangerous, long-lived, mobile, and environmentally persistent contaminants, conditions, and their potential impacts to communities simply cannot be understood in any comprehensive or defensible manner.*

For example, existing contamination in the soil and groundwater at Hanford--some estimates indicate that's where 99% of it is--will spread much more extensively, intermix in unknown ways, and greatly increase from current discharge levels into the Columbia River for thousands of years into the future. Such threats will pose ever greater risks to humans, via concentrated uptake into biological systems and the resources upon which humans depend. Much larger land and resource areas than now necessarily will have to be placed *off limits* to control dose levels and exposure pathways for periods of time that challenge conventional political planning processes. Fences or other institutional controls do nothing to remove or reduce this threat, either now or in the future, and will effectively "institutionalize" the threat. In the end, whether paid for *now*, or *later* with much more expensive dollars and much more extensive and complex remedial efforts required, or *never*, the true costs to both the public and the federal government in terms of remediation and especially adverse health impacts in the future will only grow geometrically with further inaction now.

The responsibility of the current generation of American Indians to future generations is a core cultural value not widely shared by the non-Indian community. This fundamental difference results in an Indian perspective that is fundamentally focused on minimizing long-term, accumulating, multi-generational impacts, whereas perspectives of the dominant society are far more narrowly focused on only the here and now. Hence, within such narrow perspectives, the dominant society can easily discount or dismiss far more profound future impacts. Simply because such impacts now may be poorly characterized, they are, nevertheless, fully recognized, and their more pernicious, long-term effects are too easily dismissed by short-sighted decision makers because they might be "costly" or affect "progress."

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### Notes

1. *Closing the Circle on the Splitting of the Atom, The Environmental Legacy of Nuclear Weapons Production in the United States and What the Department of Energy is Doing About It*: U.S. Department of Energy, Office of Environmental Management, January 1995.
2. Special nuclear materials include enriched uranium, plutonium, and other isotopes that have value in weapons production. While considerable debate still surrounds this issue, these materials are still considered assets--not wastes--by the U.S. government at the present time, severely complicating their ultimate disposition.
3. As of December 1994, 54 of Hanford's 177 tanks are on the "Watch List;" 10 of these are on more than one "Watch List." (Source: Hanlon, B.M., *Waste Tank Summary for Month Ending December 31, 1994*: Westinghouse Hanford Company, WHC-EP-0182-81, February 1995.)
4. See attached figures outlining current mixed waste inventories by state and intended disposition (from training course on Federal Facilities Compliance Act).

**Table 1. Volume of Mixed Low-Level Waste (by State) and Proposed Treatment Locations.**  
Inventory plus 5-year projected generation in cubic meters (m<sup>3</sup>)

STATE	DOE WASTE TREATED IN STATE	STATES RECEIVING WASTE FROM OUT-OF-STATE DOE SITES									TREATMENT LOCATION NOT SPECIFIED		TOTAL
		CO	FL	ID	NM	SC	TN	TX	UT <sup>3</sup>	WA	INVENTORY WASTES	WASTES NOT YET GENERATED	
California <sup>1</sup>	1,067.9	2.4	4.7	44.4	9.9		0.7	3.7	3.5	245.4	36.3	22.5	1,441.4
Colorado	16,251.1	—		931.8	659.8		142.6			203.7	0.0 <sup>2</sup>		18,189.0
Connecticut						7.0				7.3			14.3
wair	0.5									2.2			2.7
Iowa							0.3			0.0 <sup>2</sup>			0.3
Idaho	26,721.2			—			8.9						26,730.1
Illinois	107.8						11.6		26.4	29.5	0.1	1,512.8	1,688.2
Kentucky							588.1			161.8	116.8		866.7
Maine	0.2									0.6			0.8
Missouri	1,774.8	0.5					60.1		0.4	1.7			1,837.5
New Jersey	14.7										24,480.0	5.5	24,500.2
New Mexico	965.4		4.5		—		9.3		8.2		269.9		1,257.3
Nevada	4,160.0		0.2								2.7		4,162.9
New York	9.8					18.7	13.7	4.0	5.7	42.3	76.6	31.1	201.9
Ohio	14,313.3						840.9		471.5	13.5	273.2	25.0	15,937.4
Pennsylvania	0.1			0.2		1.1				14.9			16.3
South Carolina	5,688.8			7.7		—					2,902.8	675.6	9,274.9
Tennessee	25,579.9						—		586.5		9,871.0	0.2	36,037.6
Texas	285.4		0.0 <sup>2</sup>				9.4	—	5.8				300.6
Virginia	1.0			2.5		0.5							4.0
Washington	122,964.6						45.4			—	48.9	105.3	123,164.2
STATE TOTALS	219,906.5	2.9	9.4	986.6	669.7	27.3	1,731.0	7.7	1,108.0	722.9	38,078.3	2,378.0	265,628.3

<sup>1</sup> Volumes for California waste do not reflect the latest DSTP for Lawrence Livermore National Laboratory.

DSTP options summary database as of August 22, 1994

- Less than 0.05 cubic meters of waste.
- 3 Some waste proposed may not require treatment.

from Slovic, P., 1987, Perception of risk: Science, v. 236, p. 280-285.

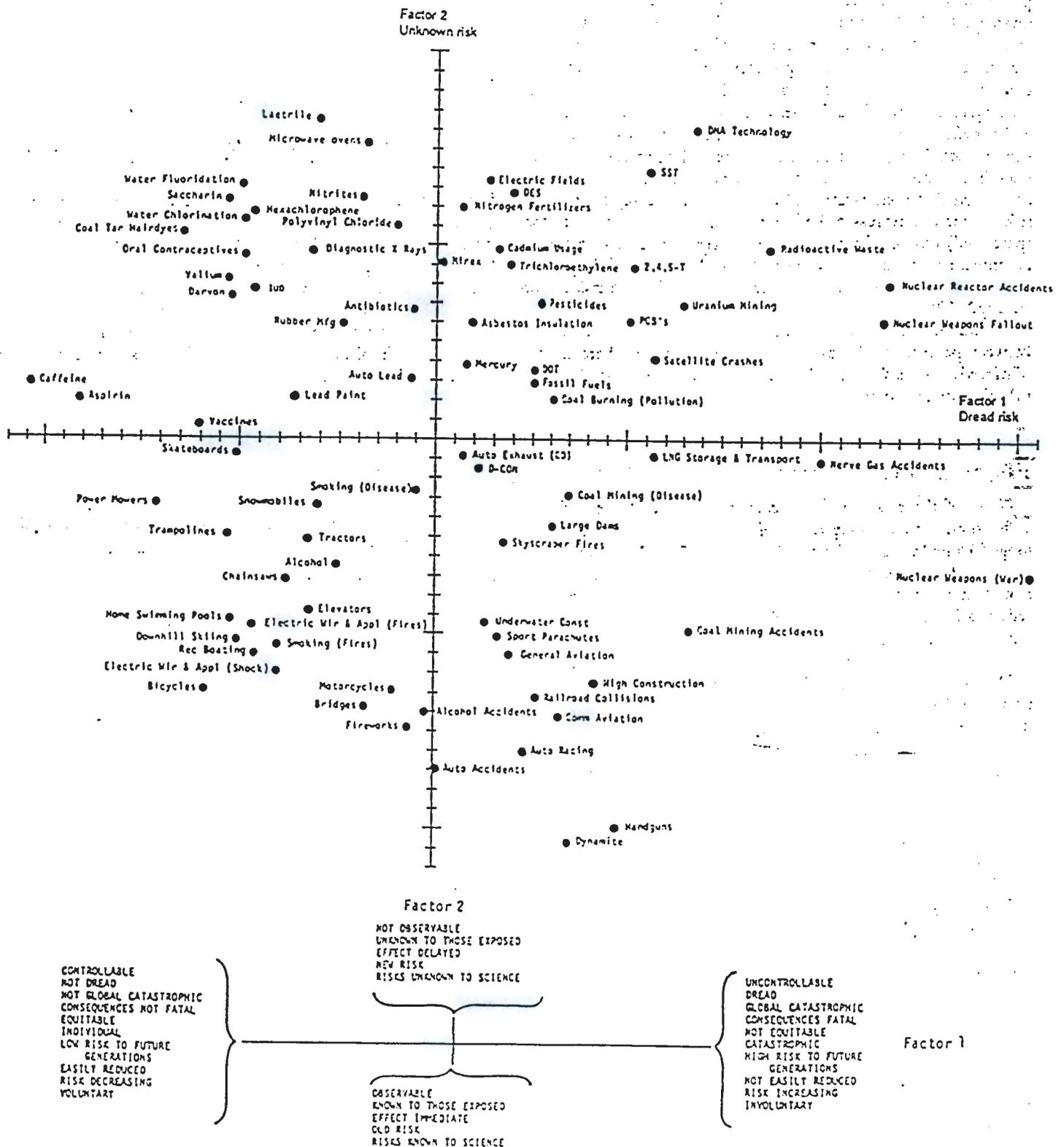


Fig. 1. Location of 81 hazards on factors 1 and 2 derived from the relationships among 18 risk characteristics. Each factor is made up of a combination of characteristics, as indicated by the lower diagram (25).

APPENDIX H

LIMITATIONS OF CONVENTIONAL RISK ASSESSMENT

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## APPENDIX H

### LIMITATIONS OF CONVENTIONAL RISK ASSESSMENT

Risk assessment methods comprise an increasingly common tool used to support remedial action decisions and a wide variety of other environmental planning and management decisions by numerous federal and state agencies. Conventional risk assessment methods, however, deserve close scrutiny both for its technical merits and limitations and for the political implications of its use as a decision-making tool. Risk assessment is often praised for its ability to quantitatively characterize, and thus support ranking or prioritization of actions necessary to eliminate, control, or 'manage' risk. But it is plagued nonetheless by a number of inherent limitations in its ability to reflect cultural or other social values--such as those of American Indian tribes--that are not easily quantified, numerically simulated, or modeled. *Regardless, assessing the full scope of risk remains a highly subjective matter, which necessarily includes qualitative attributes, cultural factors, personal biases, and subjective judgements.* No true or comprehensive characterization of risk can ignore such considerations, if it seeks credibility and tribal/public acceptance.

The following set of bullets summarizes a wide spectrum of concerns expressed by diverse interests over the inherent limitations of conventional quantitative risk assessment. This list should in no way be considered comprehensive or complete. Some concerns are narrow technical issues related to various steps of the risk evaluation process. Others are much broader, overarching concerns about how risk assessment--particularly in light of its inherent limitations--is used in the political decision-making process of a democratic society.

- Risk alone should not predominate the decision-making process.
- Focusing on quantitative aspects of risk *does not provide enough information on the qualitative aspects*, such as anxiety about the future, involuntariness of exposure, and equity concerns.
- Risk assessment and the comparative risk model are *not solely "science-based"* but incorporate *judgements* and *values* and are limited by a *high degree of uncertainty*. These elements should be, but commonly are not, explicitly acknowledged.
- Comparative risk projects *often neglect the public participation and social/cultural values* needed to make good decisions about environmental priorities that will be supported by affected parties.
- Risk assessment does not and indeed *cannot* consider *cumulative and indirect impacts* over either time or space. Risks from multiple or successive hazardous actions or chemicals are additive, and the risk slate is not wiped clean with each new generation: *impacts accumulate*.
- Risk assessment *ignores the interdependence of various elements of ecosystems*.
- Risk assessment examines contaminant impacts to a hypothetical "average" person, which either *ignores or facilitates victimization of disproportionately affected population segments*.
- Risk assessment, under current regulations, *consciously permits and justifies toxic releases* that

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- will result in the random murder of one in every ten thousand to one in every million citizens, without either their knowledge or consent.
- Risk assessment is inherently anti-democratic, because the complexity of the process requires "expert" understanding, judgement, and resources beyond the capabilities of normal citizens.
  - Decisions to permit toxic discharges assume that chemicals are innocent until proven guilty. Significant and demonstrable harm must occur to health or environment *before* any regulation or discharge reduction requirements will be considered--a time- and resource-consuming process--by which time irreparable damage may have occurred.
  - Risk assessment assumes that some "safe" or "insignificant" level of exposure to toxic chemicals exists, which can be singularly and quantitatively determined.
  - Risk assessment examines only one chemical and one exposure pathway at a time. Hence, any additive, synergistic, or cumulative effects of multiple contaminants and/or other conditions, either in humans, other organisms, or the environment, are ignored.
  - Risk assessment is generally conducted only for current conditions; it fundamentally ignores both the past history that has led to current conditions and the changing conditions and associated risks in the future. The element of time is especially critical for long-lived, highly mobile, or environmentally persistent contaminants.
  - Risk assessment assumes that specific toxicity levels can be determined in a laboratory, under controlled conditions, to cause specific health effects and then unquestioningly extrapolates such values to highly variable natural conditions and environments.
  - Risk assessment assumes that scientists fully understand all important factors influencing the environmental fate and transport of toxic chemicals; current or historical dose levels, exposure pathways, and duration, which then can be "accurately" calculated; the full range of human or ecological response to toxics, and diverse impacts to biological systems, bioaccumulation factors between ecological trophic levels, and specific health effects to humans or other organisms. Effects that are not known, suspected, or studied are not included.
  - Hazardous elements or other factors not quantified or not easily included in a standard risk analysis are generally treated as "zero" in the computations, often without justification or acknowledgement.
  - Risk assessment encourages ranking or prioritizing, rather than focusing on solving environmental problems, either explicitly or implicitly indicating that some problems are "more important" than others and/or that some problems can just be ignored.
  - Risk assessment does not identify or assess a full range of reasonable and desirable alternatives to toxic releases or leaving existing contamination in place, but rather, simply defines levels of acceptability while justifying new or existing pollution up to designated levels.

As outlined above, conventional risk assessment commonly asks narrowly defined questions such as, "How much of each particular toxin can the environment or organisms, including humans, be exposed to or assimilate without causing damage?" rather than broader questions such as "What options do we have to best repair and/or minimize the amount of damage that human activities

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do to the environment and other organisms?" The nature of questions asked dictates the narrowness or breadth of the scientific investigations conducted to answer these questions. The results may have enormous political and societal impacts, especially because some groups inevitably will be more affected than others. Such inquiries are in fact intimately intertwined with the political process. They should not, however, be allowed to substitute for the need to weigh and make tough political choices or default to the so-called "panel of experts" approach that only facilitates insulation from political decision making and from those activities that affect people's lives and their communities.

Even though quantitative risk assessments typically back their analyses with seemingly objective, authoritative, and rigorous numerical analyses, these 'analyses' often mask huge areas of ignorance. Often, the lack of pertinent data or knowledge requires adopting many wide ranging assumptions at any step in the process to fill in the holes or data gaps. This in turn induces a high degree of uncertainty in the analyses and results, which makes definitive conclusions difficult to defend. A detailed and critical examination of the sources or basis of such numerical values and analyses is always required so that the validity, accuracy and representativeness of such values is scientifically defensible. Blind reliance on seemingly objective and authoritative numbers whose origin is uncertain or even questionable may give an unjustified and unwarranted appearance of fact, precision, and certainty that is in fact baseless.

Interpretation of these numerical results then requires subjective judgement and is profoundly influenced by personal or cultural biases, whether recognized or not. Typically, such judgement has been left to the so-called "technical experts," but increasingly, informed citizens and other community members have rightfully demanded to be included in risk-based decision making. Risk-based decision-making can only be politically effective if it is based directly on community values, needs, and impacts, and if it is directed toward actually addressing and resolving community-identified risks. After all, it is these groups that are most affected by risk-based decisions to allow toxic discharges into the environment at certain levels or to "clean-up" risky sites contaminated by environmentally unsound disposal practices only to certain levels. How clean is clean (enough)? Well, it surely depends on whether or not you're affected by it, and whether you believe, in a democratic society, that people have the right to participate in decisions affecting their lives and the future of their children.

APPENDIX I

MODELS OF INTEGRATED/HOLISTIC ENVIRONMENTAL MANAGEMENT

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## APPENDIX I

### TOWARD HOLISTIC/INTEGRATED ENVIRONMENTAL MANAGEMENT

#### A. Overview

This section highlights a number of recently completed efforts that directly confront recognized problems and limitations with conventional risk assessment methodology. Each attempts to establish criteria and process(es) that provide a sufficiently comprehensive information base to support credible, technically defensible, and politically acceptable risk management and remedial decisions.

Several states and a tribal organization recently have been funded by EPA, DOE, and other funding mechanisms to experiment with developing new risk evaluation paradigms to help alleviate the common deficiencies of conventional risk assessment. These efforts attempt to more comprehensively understand and compare the true costs, benefits, and risks of environmental compliance and management in times of tightening budgets; some also attempt to prioritize. Other independent efforts also are highlighted, including several specific to Hanford site needs and interests.

#### B. Models of Comprehensive Risk Evaluation and Holistic Environmental Management

Nine different forums that explore comprehensive risk evaluation and holistic environmental management are highlighted below; they are by no means exhaustive. These include the Blacksburg Forum, the Vermont Comparative Risk Project, the Wisconsin Tribes Comparative Risk Project, and the California Comparative Risk Project, and five Hanford-specific forums, Values-Based Risk Evaluation, the Hanford Future Site Uses Working Group, the Hanford Tank Waste Task Force, the Hanford Environmental Dose Reconstruction Project, and the Native American Working Group.

Each of these efforts has developed an innovative approach to characterizing risk and/or developing environmental priorities that are built upon meaningful and comprehensive tribal/public participation throughout the process and firm incorporation of social, cultural, and aesthetic values directly within their evaluation methodology. Each, however, has depended upon a combination of science, an upfront awareness of the critical role of perspective and uncertainty, and the combined judgement (recognizing its subjectivity) of scientists, citizens, and other community members. Some have concentrated on risks alone, whereas others have started with priorities and recommendations or a mixture of risks and priorities, but many common themes emerge.

New conceptual frameworks, methods, criteria, and measures either have been identified, experimented with, or further refined in each of the various approaches. Each effort culminates

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in a largely qualitative evaluation, but individual analyses are based on rigorous and systematic quantitative data to the maximum extent that data availability permits. Moreover, all forums independently agree that true risk cannot be accurately and comprehensively characterized--and hence broadly accepted risk evaluations result--without an overarching holistic perspective and breadth of data that fundamentally recognizes and incorporates values and qualitative measures of risk into integrated environmental management strategies.

### 1) Blacksburg Forum

The Blacksburg Forum (1991) was convened as an outgrowth of ongoing communications problems between DOE, American Indian tribes in the Hanford region, and state representatives in the State and Tribal Government Working Group (STGWG). This forum sought to integrate differing perspectives, problems, and solutions to effective environmental management. Success required emphasizing the fundamental importance of values, the essential need for an overarching philosophy or vision and consistency of purpose, an intimately interrelated judgement process that blends holistic and analytic thinking, and the need to seek desirability rather than simply acceptability. The resulting report outlines "three perspectives [that are] important to building an integrated comprehensive approach to managing the environment--technical, institutional, and cultural."<sup>1</sup>

"The technical perspective relies on scientific principles, laws of nature, and methods for implementing knowledge of those principles and laws into programs of both preventive and remedial nature. The institutional perspective anchors on regulations, laws of society, and policies. We usually approach and explain culture in human terms: values, norms, traditions, beliefs and attitudes. By broadening our perspective, we can study environmental culture where humans are just one component. Thus the cultural perspective recognizes the values, traditions, and norms of the environment as opposed to the values, norms, and traditions of the societies interacting with the environment."<sup>2</sup>

As a result of its deliberations, the Blacksburg Forum identified six broadly defined rules for successfully implementing holistic environmental management.

- Consider relationships and interactions over components,
- Get stakeholders' predecisional involvement and maintain focus on overcoming short-term impatience (and distractions) for long-term results,
- Get a systems integrator in addition to a strategic manager,
- Listen to what the environment tells us,
- Break narrow discipline barriers to eliminate parochial advocacy to a technology or any single perspective, and
- Consider permanency of the environment and those who evolve with it over transient needs and peoples.

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The Blacksburg Forum concludes with some overarching interpretations of the issues and perspectives that define a focused integration of holistic and analytical thinking.

"Successful environmental management requires holistic thinking. For success, environmental managers need an overarching philosophy and a constancy and consistency of purpose. Philosophy and purpose come from participatively-generated and universally-supported mission, vision, and principles statements.

"We must accept the idea of perception as being as important as reality. Informed or uninformed, what people perceive to be the case is reality--the reality environmental managers must manage. Perceptions often outweigh reality such that the distinction between the two is usually irrelevant for an environmental manager. These managers must make decisions that satisfy both reality and perception. . . . Knowing how people perceive and use information is central to understanding how they solve problems.

"Stakeholders and the experts they choose must help set and evaluate standards and measurements for production, technological, and institutional constraints resulting from the criteria and boundary conditions of the environmental values, beliefs, and goals and objectives."<sup>3</sup>

### 2) Vermont/Northeast Center for Comparative Risk Project

The Vermont Comparative Risk Project (1991) constitutes one of the first substantive efforts to meaningfully address risks to quality of life as well as traditional analyses of risk to human and ecosystem health. The Vermont approach first identified environmental problems facing the state and its residents, *focusing on residual risks remaining after existing controls (or regulations) had their effect.*<sup>4</sup> The resulting list depended upon technical and scientific analyses of issues by experts, identification of important social/public values through public forums and formal opinion surveys, and personal judgement from Committee members to integrate the technical and social issues and qualitatively rank the risks. Significantly, the Committee discovered during the evaluation process that "the technical information often conflicted with the public's perception of risk."<sup>5</sup>

Ultimate ranking always required judgement to bridge technical data gaps and/or insufficient public input. The Vermont group was unusual in explicitly acknowledging and emphasizing the role of uncertainty in their decisions.

"Officials and scientists sometimes try to downplay or deny uncertainties, probably out of a mistaken belief that doing so improves their public credibility. Such false confidence usually leads to public disillusionment with government."<sup>6</sup>

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The Vermont process also adopted a largely holistic overview of environmental problems by recognizing that many different problems commonly have interrelated causes and effects, that existing laws and regulations tend to focus only on discrete aspects of problems, and deliberately blurring the artificial distinctions often made between human health, ecosystem health, and quality of life (values). *The definition and application of values actually facilitated the Committee reaching consensus or agreement on rank order or environmental priorities more readily than in the absence of such information.*

Based upon public forums, opinion polls, and surveys, the Advisory Committee identified seven criteria for evaluating impacts to Vermont's quality of life including aesthetics, economic well-being, fairness, future generations, peace of mind, recreation, and sense of community.

"Although these qualitative descriptions of risk often lack precision and scientific objectivity, they focus attention on specific critical issues and thus are useful tools for comparing the problems systematically and consistently.

*"The problems that the Advisory Committee ranked the highest tend to be those with the most serious ecological impacts. These problems affect several criteria, including aesthetics, recreation, economic well-being, and, most importantly, future generations. As it did in its ranking of risks to ecosystems, the Committee concluded that the most serious risks to Vermonters' quality of life are those with very long-term effects." The Vermont project identifies alteration/destruction of natural habitats as posing the greatest risk to both ecosystem health and quality of life values.*<sup>7</sup> [emphasis added]

The Vermont project concludes with several important recommendations. First, "reducing risks to human health, ecosystems, and quality of life should be the primary goal of environmental policy." Second, "government should share more information about risk with the public, and, more importantly, share more decision-making power with the public. More [affected individuals and communities] need to be directly involved in assessing risks and deciding how to manage them." Furthermore, "environmental problems have been exacerbated by fragmented, uncoordinated policies."<sup>8</sup>

Major environmental problems such as those identified in this report, which many recognize to be complex, interrelated, and to have potentially significant long-term social and economic impacts, too often are shunted aside in the interests of political expediency, quick solutions, and the tendency to focus only on the immediate crisis at hand. Developing and implementing technically sound and politically supportable environmental management decisions will necessarily require more, not less, tribal and public involvement throughout risk assessment, risk management, and decision making. This will require a more all-inclusive, comprehensive, flexible, responsive, and long-term decision-making framework than is now commonly employed at both the technical and policy levels.

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### 3) Wisconsin Tribes Comparative Risk Project

The Wisconsin Tribes Comparative Risk Project (1992) was the first comparative risk evaluation project to specifically focus on environmental risks faced by tribes; in this case, 11 tribes located in Wisconsin. The project depended upon conventional risk assessment methodology, modified so as to accommodate unique tribal lifestyles, culture, and values, and it ranked problems separately "in terms of [human] health risks, ecological risks, and social and economic damages they pose to tribes."

"The Indian Tribes of Wisconsin have a lifestyle, culture, values, and environment different than most Americans. Their reservations are relatively isolated and undeveloped and are much more nearly in their natural condition than the land surrounding them. The Tribes rely extensively on harvesting of local fish, game, and plants for subsistence. They also place high cultural value on preserving the quality of their environment, and seek to manage their activities so as to maintain their lands in undiminished condition for future generations."<sup>9</sup>

As a result, standard risk evaluation methodology was modified to better accommodate unique tribal resource use, exposure pathways, values, and priorities.

"In estimating health risks, particular attention was given to the influence of tribal lifestyles on exposure pathways. Heavy subsistence consumption of local fish and game was very important. In evaluating social and economic damages, two non-traditional categories of damages were given great weight: damages to Indian cultural and religious values, and damages to subsistence activities. One traditional damage category was also emphasized--damages to natural resources of commercial value to the tribes. For ecological risks, traditional assessment methods were not changed. We [EPA] maintained that the methods and conclusions about ecological risks in a particular area should be the same whether the study is performed from the perspective of Native Americans, the mainstream culture, or any other group."<sup>10</sup>

Interestingly, both the human health and social and economic damages evaluations indicated that *food contamination* constituted the highest risk to Wisconsin tribes.

The Wisconsin project also highlighted numerous limitations with the conventional risk evaluation approach for including important tribal values. For example,

"other factors which EPA must consider include tribes' reliance on natural resources for subsistence and the cultural importance of the environment to American Indians." Moreover, "EPA's comparative risk framework tends to emphasize current, demonstrated environmental risks without focusing on how environmental problems may increase in the future. In addition to analyzing the

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risks from current environmental problems, it is also necessary to consider: a) the need to protect the land and Indian culture from risks for the very long term future, and b) the expected vulnerability of the small amount of reservation land to growing risks from outside the reservations in the future. . .

"In addition, the tribes place high value on their traditional harmonious relationship with their natural surroundings. They are limited in pursuing their traditional activities to the small vestigial reservation areas. *These areas must remain undamaged for centuries into the future if the tribes are to maintain their ancestral values [and identity].*"<sup>11</sup> [emphasis added]

### 4) California Comparative Risk Project

The California Comparative Risk Project (CCRP; 1994) constitutes one of the most thorough approaches yet developed to address comprehensive comparative risk evaluation. Innovative approaches were defined in broad ranging analyses of human health, ecological health, social welfare, environmental justice, education, and economics perspectives. The crowning accomplishment of the CCRP, however, is its emphasis on the importance of social/cultural issues in risk evaluation, which led to the development of one of the most innovative, comprehensive, and rigorous approaches yet devised to characterizing and including qualitative considerations in a comprehensive risk evaluation program.

The CCRP approach includes establishment of a series of both social welfare criteria and measures, followed by an assessment of these considerations using a matrix format. The assessment is based not only on technical evaluations, but also on examining both individual and community case histories and public testimony. This new methodology and framework were developed by first identifying seven principal evaluation criteria: environmental and aesthetic well-being, economic well-being, physical well-being, peace of mind, future well-being, equity, and community well-being. Eight measures then were developed "to evaluate the extent of impacts associated with each criterion: number of people exposed, number of people impacted, severity, irreversibility, involuntariness, uneven distribution, potential for catastrophic impact, and lack of detectability."<sup>12</sup>

The criteria and measures then were laid out in a matrix format, where a qualitative (but clearly defined) "ranking" of high, medium, or low levels of concern was assigned to each combination by reviewers along with a single, subjectively-weighted summary of overall social welfare rank. Final evaluations were a result of detailed discussions among committee members of available data, differences of opinion, and values "because social welfare impact assessment necessarily requires value judgements, not simply scientific measurements of impacts, and *it matters whose values are used in making those judgements.*"<sup>13</sup> [emphasis added]

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*"Environmental decision-making is a multi-dimensional process. [Quantitative] risk-based rankings of environmental topic areas are valuable and should be used for priority-setting in conjunction with other factors, including economics, public input, the potential for pollution prevention, the need to address the existence of disparate impacts on different populations, and the emergence of future risks. Sustainability (improving the quality of life while preserving environmental potential for the future -- or "living within the Earth's means") was a sixth factor identified as important in environmental decision-making."*<sup>14</sup>

The CCRP concludes with strong recommendations that "social welfare must be considered in any similar policy exercise or assessment of risk," and that "social welfare analysis should be integrated into regulatory decision-making." Furthermore, the evaluation process "must include community and public participation and input at every stage of the process, and in particular, impacted communities must be involved." Finally, the environmental management decision-making process "should give due consideration to the sometimes amorphous beliefs, fears, hopes, and perceptions of the public. Values are an important component of prioritizing risk or risk-reduction strategies, and should be made explicit where possible."<sup>15</sup>

### 5) Hanford-Specific Forums

Although the previous forums address issues of environmental management around the nation, the following Hanford-specific forums represent successful application of similar approaches that implement many of the themes identified in previous forums. Historically, Hanford depended upon its secrecy and "self-regulation" to manage its resources and programs. Today, regulatory oversight, citizen advisory boards, and tribes participate in various forums designed to provide an exchange of information, to address legitimate issues of concern, and to communicate values. Examples of Hanford-specific forums below show how many of the key elements from national comparative risk exercises described above can be directly applied, in one form or another, to DOE planning and management decisions.

One of the first and often most difficult steps to resolving the complex environmental, regulatory, health, and legal issues present at DOE sites involves getting polarized parties to sit down at the same table. Making technically sound and politically acceptable decisions involves ensuring community leaders, tribal representatives, and other interested parties that the risks being addressed and (hopefully) reduced by expenditure of public funds at Hanford provide specific, immediate, and long-term benefits to residents and the environment of the Pacific Northwest. Although Hanford appears to be a regional issue, the nation as a whole has benefitted from 50 years of a Hanford-based nuclear deterrent and, as a nation, must now complete paying the mortgage.

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### a) Values-Based Risk Evaluation

Values-based risk evaluation, an ongoing effort being developed by the Pacific Northwest Laboratory at the Hanford site, is a promising technique to measure and integrate qualitative and cultural values into an improved, broad-based risk assessment methodology in a rigorous, scientifically defensible, and cost-effective manner.

The overall focus is on both "process" (the establishment of a forum in which leadership is shared among impacted parties and risk assessors, and education flows equally in both directions), and on "substance" (any modifications or additions to conventional assessment methods required to accommodate different cultural perspectives and information needs). The ultimate goal of this type of evaluation is to produce an information base broad enough to support stable decisions, and thorough enough to serve as initial technical guidance for developing values-based decision criteria, information-based engineering design criteria, proactive remediation specifications, and protective remedial standards.

The first element of a values-based risk evaluation (namely an open forum with co-leadership) recognizes that the overall decision is driven primarily by values, and is supported by risk data that informs the debate but does not drive the decision. It also recognizes that the impacted parties are the "experts" about the values and principles at risk, while the assessors are the "experts" in data collection and processing. Experience indicates that just as much effort must be expended to educate the assessors about values as to educate the communities about technical methods (refer to each comparative risk project highlighted above).

The second element is a description of the "ecocultural landscape," which includes both culture and environment. The particular characteristics of the landscape at risk will guide the selection of specific metrics for human health, ecological/environmental integrity, and quality of life, using the comparative risk approach described above. Because the Hanford landscape is historically a function of tribal cultural perspectives, a shift from conventional engineering and risk assessment perspectives is a prerequisite both to the development of an acceptable Hanford mission plan that enjoys widespread popular acceptance, and to successful implementation of the plan.

Once the shift in perspective is made, parameters can be (and are being) developed to reflect and integrate both values and the information needs. Conventional risk methods must be expanded to include parameters related to culture-specific consumption patterns and exposure pathways, as well as threats to natural and cultural resources, traditional activities, cultural values, and community well-being. Most of the requisite parameters are under development at Hanford, and the actual data collection could proceed relatively smoothly. The most time-consuming and difficult portion of this process appears to be related to the reluctance of risk assessors to fundamentally change narrow, outmoded approaches or expand entrenched scientific data collection habits. Where this change occurs, however, decisions are widely acknowledged to be more technically defensible, more politically acceptable, and more cost-effective, especially over the long-term. Risk assessment principles recently published by DOE<sup>16</sup> reflect a refreshing

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understanding of this process and both the monetary and political benefits to be gained from its application.

### b) Hanford Future Site Uses Working Group

The Hanford Future Site Uses Working Group (1992) was convened by DOE in order to develop an array of options for ways that different parts of the site could be used in the future. The final report<sup>17</sup> identifies various clean-up scenarios necessary to enable these future uses, along with major recommendations regarding priorities for clean-up and ways to focus clean-up more efficiently. The CTUIR participated in the organizing committee for the Working Group and participated as a tribal government once convened. Working Group membership was diverse, and included federal, state, tribal, and local governments, agriculture, local business and economic development, labor, academic, and environmental interest groups.

The signatories to the TPA committed to using the Working Group's products to inform and guide them in all relevant aspects of their clean-up decisions. The Working Group's principal tasks included:

- "To examine Hanford and identify a range of potential future uses for the site,
- "To select appropriate clean-up scenarios necessary to make these future uses possible in light of potential exposure to contamination, if any, after clean-up; and
- "To probe for convergences among the Group's clean-up scenarios for any priorities or criteria which could prove useful in focusing or conducting the clean-up of Hanford."

A Charter and a set of groundrules established the framework for achieving these goals. The process began with developing a common base of information relevant to the Group's charge. In addition, four critical caveats were identified.

- Future use options were included in the report if they were advocated by one or more members of the Working Group and should not be considered to be recommendations of the Working Group for future uses.
- The Working Group did not assign priorities to future use options or clean-up scenarios; the order of their presentation in the final report has no significance.
- Future use options identify the general kinds of uses that were considered and clean-up scenarios identify levels of access, based on existing contamination levels and extent, needed to make those uses possible.
- Specific future use options proposed for each geographic area may not preclude or exclude other uses from occurring simultaneously in the same geographic area. In some cases, a mix of future use options was identified for an area.

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In order to facilitate discussions about particular areas of Hanford's large and diverse landbase, the site was divided into six geographical areas: Arid Lands Ecology Reserve; North of the River; Columbia River; Reactors on the River (100 Areas); Central Plateau (200 Areas); and All Other Areas. Future use options were deliberately generalized and included: Agriculture; Industrial and Commercial Development; Wildlife and Habitat Preserves; Environmental Restoration and Waste Management Activities; Public Access and Recreation; and Native American Uses such as hunting, gathering, and religious practices.

One caveat in the report states that, "*The [report] is not a land use report per se. The Working Group did not intend to specify and delineate the exact future uses which would occur throughout the site. To have done so would have meant addressing the issue of future site management and/or ownership which was beyond the scope of the Working Group's Charter.*"<sup>18</sup> By defining future use options, the Working Group could then define four levels of access necessary to permit those uses to occur: unrestricted, restricted, exclusive, and buffer.

The Working Group concludes by identifying seven findings that reflect its overarching vision and expectations at Hanford, while simultaneously retaining sufficient flexibility about specific uses and their implementation that does not prejudice future options.

- *Hanford is Important.* Its history, economic benefits, importance to American Indian tribes, and pristine ecosystems all contribute to the Pacific Northwest. Risks posed by existing contamination are now driving clean-up and regulatory actions.
- *Clean-Up is Now DOE's Primary Mission at Hanford.* This statement guides Hanford's current mission.
- *The Hanford Site Will Change as Clean-Up Proceeds.* The Working Group fully recognizes this changing reality, and thus makes no predictions regarding to whom, by what time, or to what extent land might be transferred, sold, or disposed. Its recommendations are framed to expect changes and maximize flexibility.
- *Both Clean-Up and Future Land Uses Face Significant Constraints.* The Working Group recognizes that the volume and variety of contaminants and the potential risks associated with some of them create difficulties in planning future options, as does the current lack of treatment technologies to address some types of contamination.
- *Native American Treaty Rights Exist.* The entire Hanford site is within the boundaries of lands ceded by the Yakama Indian Nation and the Walla Walla Band of the CTUIR in their 1855 treaties. The Group specifically acknowledges those treaty rights, believes that these rights are embedded within all of the Working Group's findings, and recognizes that they will have significant bearing on the actual future use after clean-up and/or surplusing of excess land by DOE.
- *Uncertainty and Risk Surround the Clean-Up.* The Working Group was confronted by the fact that current information about the nature and extent of contamination at the site is incomplete, and that this lack of knowledge exacerbates the sense of

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risk associated with clean-up. Unplanned and unanticipated threats may exist throughout the full range of Hanford waste management and environmental restoration activities. Significant uncertainty and debate exists about the health and environmental effects, especially cumulatively, from exposure to various contaminants or combinations.

- *Time is a Critical Element in Focusing the Clean-Up.* Given the long time horizon of the clean-up and the long life span of the contaminants, a critical question for future land use is when various clean-up objectives will eventually be achieved. Ultimately, the Working Group desires to see that all of Hanford would be clean enough for future uses other than waste management.

Nine recommendations that constitute overarching or guiding values applicable to Hanford clean-up as a whole emerged from the Working Group, representing a remarkable degree of agreement among a highly diverse group of Pacific Northwest interests on both purpose and direction.

- *Protect the River.* The Columbia River is a vital resource in the Pacific Northwest. Several contaminated groundwater plumes from throughout the site connect with the River as it traverses the site and cause various degrees of concern for human and ecological safety, both now and in the future.
- *Deal Realistically and Forcefully with Groundwater Contamination.* A large volume and areal extent of groundwater beneath Hanford is contaminated with a wide variety of hazardous chemical and radioactive contaminants. In addition to representing both current and future threats to human health and the River, the presence of contaminated groundwater poses significant constraints and issues for possible future land use.
- *Use the Central Plateau Wisely for Waste Management.* To facilitate clean-up of the rest of the site, wastes from throughout the Hanford site should be concentrated on the Central Plateau. Wastes generated in or coming into the Central Plateau from other areas would not necessarily be permanently disposed of in the Central Plateau. This area would have an exclusive level of access with a surrounding buffer zone in order to reduce exposure to long-term risks.
- *Do No Harm During Clean-Up or with New Development.* The Working Group believes that both clean-up and future development decisions should be guided by the principle to "do no harm." Wise application of this principle is likely to maximize effective clean-up over time as well as support sound, long-term development of the site.
- *Clean-Up of Areas of High Future Use Value is Important.* Future use value as a clean-up priority need not conflict with, and may complement, risk-based criteria. Two areas were identified specifically as priorities for Hanford clean-up: the Columbia River corridor and the southeast corner of the site (near the city of Richland).
- *Clean Up to the Level Necessary to Enable the Future Use Option to Occur.* In developing clean-up scenarios for the various future use options, the Group

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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specified the relevant level of access -- restricted, unrestricted, or exclusive. Where residual contamination could still enable a particular future use, restricted use was applied. It is important to note that unrestricted status would, by and large, enable all future use options to occur.

- *Transport Waste Safely and Be Prepared.* The Working Group recognized that decisions related to the Hanford clean-up will have a direct impact on the transportation of radioactive and hazardous materials within, to, and from the Hanford site, including frequency of shipments.
- *Capture Economic Development Opportunities Locally.* The Working Group urges DOE and its contractors to help the tribes, state, and local communities create the potential for meaningful economic development as clean-up progresses.
- *Involve the Public in Future Decisions about Hanford.* The Working Group process is an excellent example of the type of tribal/public involvement in forum planning, values identification, and decision-making that should serve as a model for other DOE planning and decision-making efforts.

### c) Hanford Tank Waste Task Force

While the Future Site Group identified a range of land use options and designated general levels of clean-up necessary to support such uses, the Hanford Tank Waste Task Force (1993) was chartered to develop and help integrate a broad cross-section of 'stakeholder' values on tank waste remediation issues into planned revisions to the Tri-Party Agreement. Many of the representatives to the Future Site Uses Working Group also participated on the Task Force and the accumulated experience, information base, and familiarity with common issues from the Working Group effort provided a valuable and broad based foundation for activities of the Task Force.

"The report of the Task Force is worthy of significant consideration for three major reasons:"<sup>19</sup>

- It highlights important stakeholder views on clean-up without selecting specific remedial alternatives or technical solutions, and it provides guidance on important objectives and areas needing attention in order for clean-up to succeed.
- It conveys a strong Pacific Northwest perspective on the proper direction of the clean-up, and it can be displayed to Congress with the conviction that Hanford clean-up can succeed and is worthy of essential national support.
- It illustrates the critical imperative of building tribal, local government, and public input into all phases of key Hanford decisions and activities.

The primary intention of the Task Force was to aid negotiations over tank farm remediation, but discussions about the role and impacts of the TPA itself naturally emerged. The Final Report<sup>20</sup> is divided into four sections based on key Task Force values surrounding the TPA, and these values are highlighted below within the following overarching themes.

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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- The Tri-Party Agreement as a Whole,
- The Agreement as a Management Vision and Tool,
- The Agreement and its Effect on the Environment, and
- The Timing of Actions in the Agreement.

### The Tri-Party Agreement as a Whole

The TPA needs strengthening and improvement and should be enforceable, binding, and contain milestones or other measures of progress and accountability. In addition, DOE should comply with all existing environmental laws and should acknowledge and preserve existing treaty rights. The three signatories should increase public involvement that leads to a partnership in the "goals, scope, pace, and oversight of the clean-up." The Task Force expects that the renegotiated TPA will be implemented, that TPA "milestones should be considered an obligation of the federal government," and that DOE "is bound to seek funding from Congress to meet the milestones. Milestones should provide methods of assessing performance that are meaningful, measurable, and understandable."

### The Agreement as a Management Vision and Tool

The TPA should accelerate the process of continuous improvement in the management and operation of the Hanford site. It is imperative that specific means and measures be developed that advance the changes needed to achieve effective clean-up of Hanford and that the TPA *"should encourage imagination to solve problems that arise because of regulatory complexity, jurisdictional problems, or technical difficulties and other barriers to progress."* This includes a demonstrated accountability for the expenditures of funds for specific projects or activities, a portfolio of technological options and strategic investment, and a recognition of not promoting "further research on unlikely options." Once clean-up actions and associated milestones are established, the TPA should direct the parties to implement programs in ways that contribute to the community's economic transition initiatives and mitigate adverse socioeconomic impacts.

### The Agreement and its Effect on the Environment

This section of the final report identifies ten principles regarding the impact of clean-up on the environment, including:

- Minimize land use for waste management,
- Avoid contamination of uncontaminated land,
- Avoid further harm to cultural resources, natural resources, and the environment, especially critical habitat and groundwater,
- Protect the Columbia River,

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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- Do not depend on dilution of effluent wastes to effect safe conditions,
- Accomplish conservation and reuse of resources,
- Recognize the importance of preserving the biodiversity of the Hanford site and the Columbia River,
- Integrate CERCLA-Natural Resource Damage Assessment processes into appropriate TPA milestones to minimize overall restoration costs,
- Preserve natural resource rights embodied in treaties, and enforce laws protecting natural and cultural resources, and
- Include CERCLA-like risk assessments for natural and cultural resources in environmental restoration/waste management actions and all other site activities.

### The Timing of Actions in the Agreement

The TPA should measurably chronicle that the three agencies are getting on with clean-up and are not relying on procedural milestones to delay or avoid difficult tasks or choices. The end of clean-up is predictable, even if a specific date is not.

The final report of the Task Force includes a chapter on "Values" and outlines five broad, overarching issues and seven specific implementation-related values. The five issues include:

- Protect the environment,
- Protect tribal/public/worker health and safety,
- Get on with clean-up, to achieve substantive progress in a timely manner,
- Apply a systems design approach that keeps endpoints in mind as intermediate decisions are made, and
- Establish management practices that ensure accountability, efficiency, and allocation of funds to high priority items.

Seven specific issues are then outlined as critical to effectively implementing and applying the identified values.

- *Timing* details what "getting on with cleanup" means,
- *Management* outlines systems design and management practices,
- *Tank Leaks* identifies values related to "clean-up" of the actual tank farms,
- *Technology* refines and focuses application of research and development and emphasizes the need for a folio of available options,
- *Waste Form and Storage* establishes values with the output of tank farm remediation, treatment, and disposition options,
- *Transportation* recognizes both on- and offsite values and impacts associated with achieving cleanup, and
- *Training* "for everyone who will be on the site is critically important."

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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The Task Force was not intended to focus on specific technical aspects of any option or alternative, nor to provide specific recommendations on the technical merits, or lack thereof, of any specific option or alternative.

### d) Hanford Environmental Dose Reconstruction Project and Technical Steering Panel

The release of historical DOE documents during the mid-1980's, and their subsequent scientific, public, and tribal review, demonstrated that potentially significant impacts to offsite populations resulted from the magnitude and extent of Hanford releases, particularly early airborne releases (1940s) and river releases during the peak reactor operating periods (1960s). These results--and legitimate concerns raised by residents throughout the Pacific Northwest--prompted the development of a computer model to estimate a site- and individual-specific radiation dose received by typical Pacific Northwest residents from historical Hanford operations--the Hanford Environmental Dose Reconstruction Project (HEDRP).

This highly complex and never-before-attempted integrated approach required a comprehensive identification of source term, environmental dispersal and transport mechanisms, bioaccumulation factors, and receptor pathways. Devising a computer model with this capability, however, necessarily required consideration of political and social dynamics, and unique exposure potential of particularly vulnerable population segments such as American Indian tribes. To address this problem, a panel of nationally recognized scientists, known as the Technical Steering Panel (TSP), was convened to guide the development of a computer model whose codes could systematically estimate an individual's dose based on known temporal and geographic exposure factors and that person's life history and food consumption patterns.

The TSP/HEDRP assembled, analyzed, and assessed a tremendous volume of historical information. Any model of such inherent variability and complexity will necessarily oversimplify or smooth over some interdependent environmental conditions or the relationships between variables; hence, there is always some sticking point that individuals or groups can use to discount the findings of the TSP. Nevertheless, this integration of at least four different computer models to develop a single individual dose estimate represents a state-of-the-art model for integrating widely variable scientific data, techniques, and cultural values. Moreover, this model offers an independent check on at least some Hanford risk assessment/evaluation methodologies and conclusions, even though its primary purpose is not to predict potential health outcomes.

A subsequent effort, the Hanford Thyroid Disease Study (HTDS), which is now completing its pilot phase, will take HEDRP-generated dose estimates and predict the incidence of thyroid disease among Pacific Northwest residents and critical segments of populations. This study is an outgrowth of rigorous scientific debates, which have identified a clear cause-and-effect relationship between exposure to radioactive iodine-131 and incidence of thyroid cancer. The study will focus on the 1944-1957 time period when airborne iodine releases from Hanford's

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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chemical separation plants were very high. Lessons learned from both the HEDRP and HTDS efforts may provide unique opportunities for comparison with independently generated risk evaluation results.

### e) The TSP and the Native American Working Group

The TSP *"believes that direct Tribal involvement appropriately recognizes the sovereignty of Tribal government[s]."*<sup>21</sup> Based on the HEDRP results, many Indian, as well as non-Indian, communities recognize that Columbia Basin tribes may have received radiation doses consistently higher than the general public. Such doses are associated with traditional tribal practices involving subsistence fishing, hunting, gathering, and other social behaviors throughout the region that result in increased dose potential, multiple exposure pathways, and more frequent exposures. These patterns are distinctly different from the non-Indian population.

In recognition of the unique demographics, lifestyles, and dietary cultural patterns practiced by Columbia Basin American Indian tribes, the TSP established the Native American Working Group (NAWG) in order to advise and guide incorporation of tribal research into HEDRP. Nine tribes,<sup>22</sup> including the CTUIR, are now participating in the forum; each tribe has received an individual contract to participate through Centers for Disease Control.

The NAWG provides a valuable forum for tribal staff to develop and coordinate tribe-specific technical activities in support of scientifically defensible data collection, methodology, and information/conclusions for HEDRP research within the TSP framework. For example, during 1991 and 1992, CTUIR staff gathered preliminary information about specific and unique demographic, lifestyle, and dietary cultural patterns. Factors affecting these patterns are typically tribe-specific, based largely on spatial distribution around Hanford and duration of exposure, but individual variability between tribes, individuals, and dose estimates can be attributed to dietary differences, population distribution, social patterns, military service, school attendance locations, food and farm product source areas, and a host of other individual factors. Hence, reconstructing accurate and representative tribal dietary, population, and lifestyle information for a period nearly fifty years ago is both a technically complex and culturally sensitive task. The more rigorous primary phase is currently underway at several reservations.

With the HEDRP nearing completion, the NAWG has nearly completed its original charge. Tribal representatives, however, recognize that much further research is needed both as HTDS progresses and in support of activities underway by the Agency for Toxic Substances and Disease Registry (ATSDR). Moreover, the NAWG comprises a valuable forum for expressing and coordinating tribal health issues and provides a solid foundation for building broad-based information collection and analysis capabilities focused on tribal issues. With a new operation plan and bylaws to guide its work, the NAWG recently has evolved into the Inter-tribal Council on Hanford Health Projects (ICHHP), a forum designed to offer coordinated input and to support scientific defensibility, tribal sovereignty, and effective management of resources for ongoing

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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studies of health impacts related to Hanford. This forum may facilitate the now-missing links and cultural ties between environmental releases and health outcomes in the future as more specific and focused data are collected and methodologies are developed.

### 6) Summary

A recurrent theme among all of these efforts has been the need to directly address those important qualitative issues and social/cultural values traditionally ignored in conventional risk assessment and piecemeal (crisis) environmental management. The focus of these efforts has been to develop a more comprehensive and rigorous framework that specifically includes qualitative considerations and social/cultural values as an integral component of the risk evaluation and decision making process. This focus is based on universal recognition that many factors other than quantitative data are relevant to priority setting and risk management, and that these must be included in the evaluation process in order to provide both credibility and comprehensiveness to the nature, magnitude, and urgency of risks identified. Moreover, there is consistent and universal recognition among these efforts of the critical need for integrated public/tribal participation throughout the decision making process for it to gain the credibility and popular support necessary for success.

These innovative risk evaluation efforts all have directly and successfully challenged the well recognized limitations of conventional risk assessment methodology. They have attempted to construct comprehensive and workable solutions that will improve both the usefulness and defensibility of risk evaluation as an analytical support technique and as a decision-making tool. These state-of-the-art studies consciously recognize and fully incorporate the full scope of risk into their process, and show how it can be done efficiently, cost-effectively, and credibly.

In many respects, these approaches can meet Assistant Secretary Grumbly's mandate by building in credibility and effective tribal/public participation throughout the process. The above examples highlight numerous, workable, and cost effective alternatives. The critical obstacle to be overcome is the still deeply entrenched institutional resistance within DOE and its contractors that has effectively prevented even the consideration of new or more comprehensive approaches, let alone their implementation. The principal challenge now is to adapt and adopt these techniques into DOE's decision-making framework, both at the site-specific and complex-wide levels, and to foster DOE's recognition that such efforts will pay off both politically and financially with more widespread popular support and more timely, cost-effective results.

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### Notes

1. *Report of the Blacksburg Forum: The First Step Toward the Holistic Approach to Environmental Management*: Management Systems Laboratory, Virginia Polytechnic Institute and State University, Blacksburg, VA, 1991.

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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2. *Blacksburg Forum*.
3. *Blacksburg Forum*, p. 6-7.
4. It should be noted that this approach would be much more difficult to apply to DOE facilities, where residual risks associated with long-lived radioactive contaminants often are measured in thousands to hundreds of thousands of years.
5. *Environment 1991: Risks to Vermont and Vermonters, A report by the Public Advisory Committee, The Strategy for Vermont's Third Century*: Vermont Agency of Natural Resources, p. 5.
6. *Environment 1991: Risks to Vermont and Vermonters*, p. 6.
7. *Environment 1991: Risks to Vermont and Vermonters*, p. 14.
8. *Environment 1991: Risks to Vermont and Vermonters*, p. 40-41.
9. *Tribes at Risk: The Wisconsin Tribes Comparative Risk Project*: U.S. Environmental Protection Agency, Region 5, p. vii.
10. *Tribes at Risk: The Wisconsin Tribes Comparative Risk Project*, p. viii.
11. *Tribes at Risk: The Wisconsin Tribes Comparative Risk Project*, p. x-xi.
12. *California Comparative Risk Project*, Report of the Social Welfare Committee, p. 207-208.
13. *California Comparative Risk Project*, Report of the Social Welfare Committee, p. 208.
14. Report of the Statewide Community Advisory Committee for the California Comparative Risk Project, *California Comparative Risk Project, Summary Report*, p. 16, 52.
15. *California Comparative Risk Project*, Report of the Social Welfare Committee, p. 218.
16. "DOE Issues Principles Defining Major Roles for Risk in its Cleanups," *DOE Risk Policy Report*, February 21, 1995.
17. Copies of the *Final Report: Future Site Uses Working Group*, is available from Environmental Data Management Center, Westinghouse Hanford Company, P.O. Box 1970, Mail Stop H6-08, Richland, WA, 99352.
18. "The Future For Hanford: Uses and Cleanup," Summary of the Final Report of the Hanford Future Site Uses Working Group, December 1992, p. 4. Much of the main text following this footnote is quoted directly or paraphrased from this report.
19. Cover letter accompanying Final Report of the Hanford Tank Waste Task Force.
20. *Final Report of the Hanford Tank Waste Task Force*, September 1993.
21. *Columbia Basin's American Indians Involved in Hanford Dose Reconstruction*, Technical Steering Panel, Fact Sheet 13, June 1992.

## SCOPING REPORT: NUCLEAR RISKS IN TRIBAL COMMUNITIES

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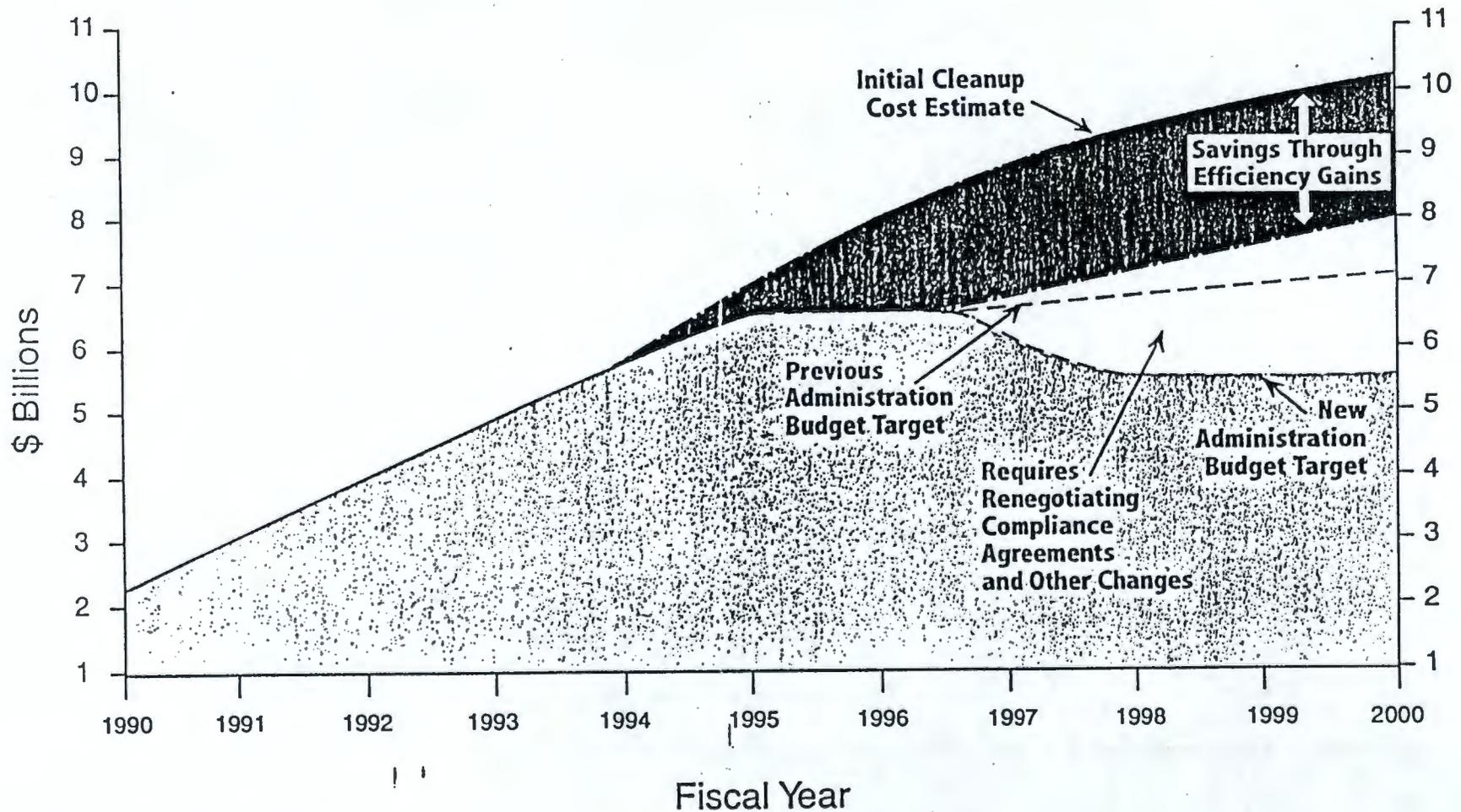
22. The represented tribes include: Couer d'Alene, Colville, Kalispel, Nez Perce, Spokane, Umatilla, Warm Springs, Yakama, and more recently, North Idaho Kootenai, which were recently designated as a federally recognized tribe.

APPENDIX J

DOE BUDGET FIGURES

# DOE CLEANUP WILL BE "REINVENTED"

Efficiency Improvements Have Already Achieved Large Savings



## Major Environmental Management Sites FY 1996 Budget Request

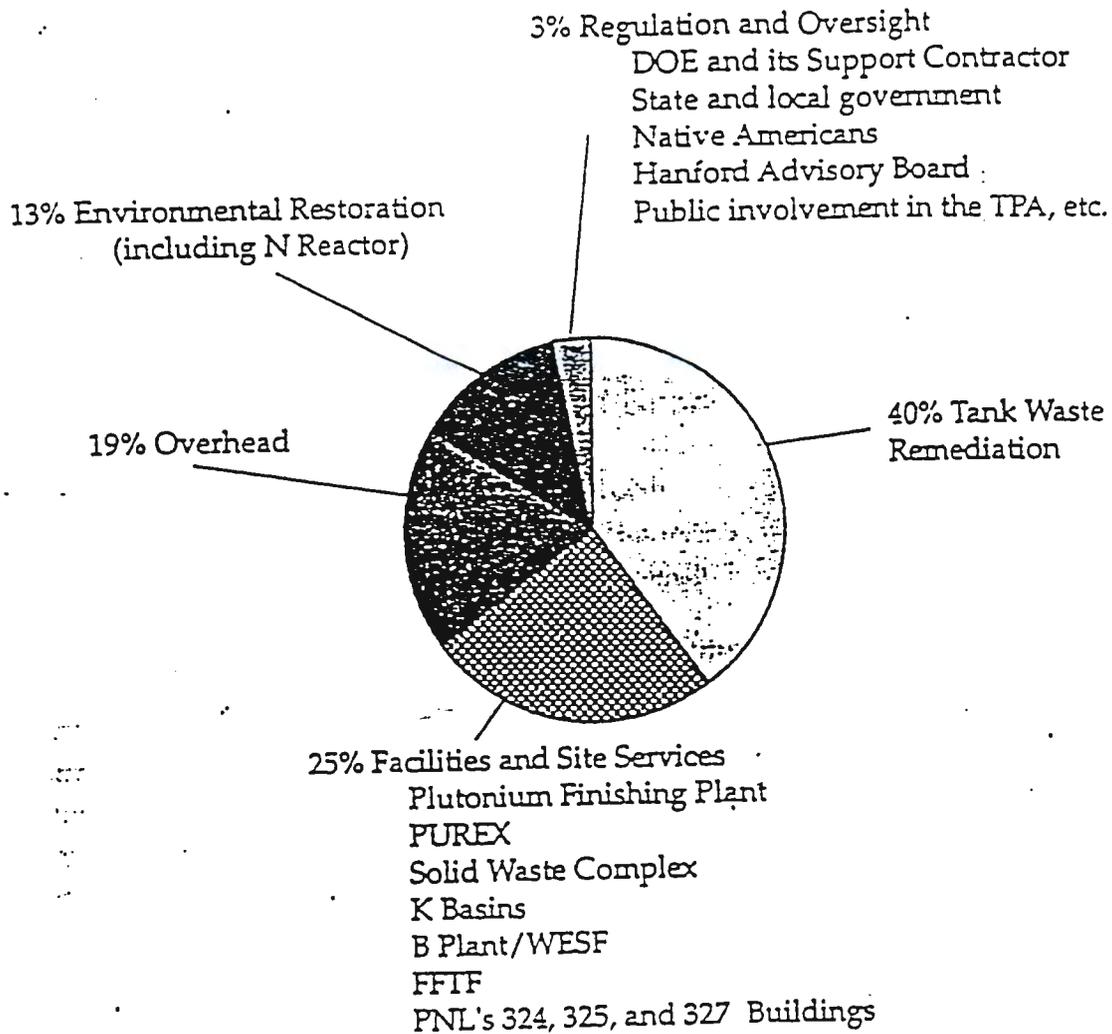
(Dollars in Thousands)

	Waste Management	Environmental Restoration	Nuclear Materials & Facilities Stabilization	Totals*	% Δ From FY 1995 Totals**
Hanford, WA	946,388	173,454	286,107	1,434,688	-16.3%
Savannah River Site, SC	553,757	104,163	686,146	1,344,352	89%
Rocky Flats, CO	97,978	147,753	393,804	639,918	3.4%
Idaho***	225,462	87,914	162,147	481,145	10%
Fernald, OH	0	256,330	0	256,330	-2%
Waste Isolation Pilot Plant, NM	172,700	0	0	172,700	-0.9%
Oak Ridge K-25 Plant, TN	60,472	16,725	630	160,461	-29.4%
Oak Ridge National Laboratory, TN	68,698	61,822	14,130	147,470	19.6%
Los Alamos National Laboratory, NM	64,309	64,804	6,824	135,995	-16.2%
West Valley Demonstration Project, NY	122,100	0	0	122,100	-2.4%
Mound Plant, OH	10,386	46,091	53,821	110,298	156.1%

\* Totals may also include funding for Transportation Management, Uranium Enrichment D&D Fund, and Program Direction. Technology Development site allocations are not reflected in the site totals. Technology Development funds will be distributed for FY 1996 after appropriation.

\*\* Savannah River and Mound include large Defense Programs transfer amounts in FY 1996.

\*\*\* Excludes Argonne National Laboratory-West and Naval Reactors Facility.



Hanford Site Budget - FY 95

# ENVIRONMENTAL MANAGEMENT

## PY 1996 Congressional Request

RICHLAND	FY 1995	FY 1996	Add'l Reductions					Revised	Program	FY 1996	Uncoated	NIT	FY 1997
	Adjusted /DP Trans	IIQ Prelim Passback	Productivity Efficiency	IIQ Reductns	Pro Rata Reductns	Contractor Reductions	TOTAL REDUCTS	PY 1996 Request	Adjustmnts	CONG REQUEST	Balance	PY 1996 REQUEST	
<b>Defense</b>													
Waste Mgmt/Correc Act	987,861	950,696	---	---	(12,181)	(16,253)	(28,434)	922,262	11,762	934,024	(45,906)	888,118	779,561
Environ Rest	203,540	215,562	(24,000)	---	(2,439)	(3,255)	(29,694)	185,868	(12,414)	173,454	(10,313)	163,141	143,165
- DLD Fund	0	0	---	---	---	---	0	0	0	0	0	0	0
Trans Mgmt	1,258	6,217	---	---	(81)	(108)	(189)	6,028	(2,217)	3,811	(292)	3,519	3,115
Facil Transition	237,655	239,687	---	---	(3,097)	(4,133)	(7,230)	232,457	(5,850)	226,607	(9,544)	217,063	190,607
Analysis Plans & Risk	0	0	---	---	0	0	0	0	0	0	0	0	0
Compl & Prog Coord	8,892	9,990	---	---	(91)	(120)	(210)	9,780	16,091	25,871	(3,330)	22,541	19,768
Subtotal, Def	1,439,206	1,422,152	(24,000)	0	(17,885)	(23,869)	(65,757)	1,356,395	7,372	1,363,767	(69,385)	1,294,382	1,136,216
<b>Non-Defense</b>													
Waste Mgmt/Correc Act	11,897	9,411	---	---	(122)	(163)	(285)	9,126	3,238	12,364	0	12,364	10,902
Environ Rest	0	0	---	---	0	0	0	0	0	0	0	0	0
Facil Transition	62,724	55,343	---	---	(725)	(968)	(1,693)	53,650	5,850	59,500	(1,503)	57,997	50,916
Subtotal, Non-D	74,621	64,754	0	0	(847)	(1,131)	(1,978)	62,776	9,088	71,864	(1,503)	70,361	61,818
<b>DLD Fund</b>													
Environ Rest	0	0	---	---	---	---	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>1,513,827</b>	<b>1,486,906</b>	<b>(24,000)</b>	<b>0</b>	<b>(18,735)</b>	<b>(25,000)</b>	<b>(67,735)</b>	<b>1,419,171</b>	<b>16,460</b>	<b>1,435,631</b>	<b>(70,888)</b>	<b>1,364,743</b>	<b>1,198,034</b>

**SPECIAL DIRECTION/NOTES:**

- Assumes additional reduction in work force of 2,700 contractor employees
  - Assumes implementation of prioritization options
  - Transfer \$15M from EM-40 to EM-30 to accelerate K-Hash efforts
  - Prioritize least effective projects within EM-40 to get \$15M
  - Increase efficiency at Tank Farms and meet urgent risks
  - Assumes some renegotiation with the State, but limit renegotiation on the EM-40 side
  - Transferred \$2,586K for EM-40 program direction from Headquarters to cover base program PTE expenses
- NOTE: An additional shift within the program dollars allocated is required to cover the PTEs allotted through the EM Pilot Program.

0041039

DEPARTMENT of  
NATURAL RESOURCES

Administration

018479



CONFEDERATED TRIBES  
of the  
*Umatilla Indian Reservation*

P.O. Box 638  
PENDLETON, OREGON 97801  
Area code 503 Phone 276-~~8447~~<sub>0105</sub> FAX 276-~~8447~~<sub>0540</sub>

10 April 1995

Paul R. Beaver, Unit Manager  
U.S. Environmental Protection Agency  
Hanford Project Office  
712 Swift Boulevard, Suite 5  
Richland, Washington 99352

Subject: CTUIR COMMENTS ON PROPOSED "REMEDIAL" PLAN FOR 200-BP-1  
OPERABLE UNIT

Dear Paul:

Technical staff of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) submit the following comments on the proposed "remedial" work plan for the 200-BP-1 operable unit, in response to your formal written request for CTUIR technical review of the document, dated 4 January 1995. Implications of the ambiguous outcome of the so-called "Evaluation of Indian Values" workshop sponsored by EPA and held in Richland in December 1994 also are discussed.

INTRODUCTION

CTUIR staff review of the 200-BP-1 Proposed Plan has identified a number of significant flaws in the proposed "remedial" plan.

- Both general and specific tribal concerns associated with the overall approach defined in the Plan,
- Faulty assumptions,
- Complete failure to reasonably address long-term needs required to mitigate adverse impacts of long-lived contaminants,
- Complete failure to recognize and include true long-term costs,
- Too narrowly focused and prejudicial remedial objectives,
- Minimization of current risks and complete failure to characterize future, much greater risks,

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

- A proposed "remedial" methodology that contains little meaningful action to "address" widespread contamination present beneath this series of cribs,
- A proposed "remedial" methodology that consumes vast quantities of resources without a concomitant guarantee of effectiveness, and
- A proposed "remedial" strategy that appears totally uncoordinated with, and which may adversely impact, directly related remedial actions at the adjoining 241-BY tank farm and in the underlying 200-BP-5 groundwater operable unit, of which 200-BP-1 is the principal source.

### SUMMARY OF OVERARCHING CONCERNS

Issues of tribal concern can be summarized into the following overarching issues, which are then discussed in more detail below.

- *What's the rush* to remediate this relatively low-priority 200 Areas site, when the principal driver, namely large-scale liquid waste discharges already has been stopped?
- Tribes, stakeholders, regulators, and even the Department of Energy *all* have agreed that Columbia River corridor sites are the highest and first priority for remediation. With all the across-the-board cutbacks coming, the available dollars and manpower for remediation must be most effectively and efficiently concentrated along the immediate river corridor *first*.
- Barrier construction has yet to be demonstrated, from either a technical or engineering standpoint, to fulfill its stated primary function of limiting or diverting infiltrating water and *preventing remobilization of vadose zone contamination* for short periods of time (years to decades), let alone for the *thousands of years* required to adequately mitigate the impacts of long-lived uranium contamination distributed throughout more than half a million cubic yards of vadose zone soils.
- Despite the availability of data to the contrary, *the Proposed Plan ignores the impact of time* on future migration of and changing exposure potential to widespread contamination that, as proposed, is not and will not *ever* be isolated from the environment--or the Columbia River. *Time simply cannot be ignored when "addressing" contaminants with half-lives measured in hundreds of millions of years--or in safeguarding Tribal rights and interests.*
- The risk assessment that justified selection of this remedial alternative is based on only a single potential exposure pathway, a single contaminant of concern, and current conditions. Future risks associated with much higher predicted uranium discharges to the Columbia River over thousands of years or from potential exposure of other highly radioactive contaminants at the surface have been ignored, greatly minimizing apparent

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

- risk through time, and permitting selection of an ineffective long-term remedial option.
- *Barrier effectiveness is misrepresented* by overly simplistic or unrealistic assumptions of homogeneous subsurface conditions or that all infiltration is a vertical straight shot to groundwater. Discontinuous caliche layers or local sedimentary-facies aquitards in Hanford's subsurface introduce considerable lateral spreading, temporal variability, and other localized complexities into the generally downward path. *Lateral spreading of infiltrating water is a necessary result of Hanford's highly variable subsurface conditions.* Under such conditions, *no* barrier of reasonable areal extent could prevent infiltration within a sufficiently large area that could not eventually migrate into and leach existing contamination.
  - *Barrier construction consumes valuable land and resources.* Little appreciation is evident of the cumulative and indirect impacts, true costs, or large-scale environmental degradation associated with mining the vast quantities of basalt and top soil required to facilitate the more widespread application of barriers at Hanford. These unrecognized but directly connected actions will result in accumulating, areally extensive, adverse environmental impacts simply being displaced and actively encouraged elsewhere in the name of "remediation" at Hanford.
  - The Proposed Plan selects and attempts to justify a "remedial alternative" that is really a last-ditch measure to be employed only after other proactive remedial alternatives have been tried and failed.
  - There is *naive and excessive reliance on institutional controls*, of which barriers comprise but one example, to control either contaminated site access or exposure potential over *extremely long periods of time.* CTUIR staff believe it is unrealistic to rely so heavily on such controls, which in this case must last *thousands of years* longer than any other human endeavor in history or prehistory. The increasingly rapid pace of cultural change in modern society necessitates that the most effective means of true control (such as environmental isolation, containment, or contaminant removal) must be tried first. Institutional controls give the all-important appearance of doing something, but offer no substance or long-term protection.
  - Barriers are not a panacea, a cure-all to just cover up all the difficult problems that exist at Hanford. The true purpose of selecting this remedial alternative appears to be "so that these barriers can be used more extensively on the Hanford site as well as other semi-arid environments" (Proposed Plan), but such increased use will be at the expense of real remedial actions and the health of affected communities. Barriers have their place at Hanford, but a blind and widespread reliance on what is really a last-resort strategy with limited effectiveness and application *decidedly does not.*
  - CTUIR staff do not support the hurried completion of final remedial actions such as recent construction of a barrier over the B-57 crib without proper DOE and regulator consultation with affected tribes. Moreover, it is further unacceptable to refer to this

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

*final remedial action* as an "experiment" or a "constructability test," when it is clear that neither DOE nor regulators will ever revisit actual *remediation* of the crib.

- Tribal treaty rights and the Federal government's trust responsibility to tribes exist *in perpetuity*. CTUIR staff do not believe that such rights and responsibilities are best fulfilled by this proposed short-sighted and short-term solution to a very long-term problem.

### BASIS OF TRIBAL CONCERNS

Two sentences in the proposed plan highlight a biased analysis of remedial alternatives that appears to be driven chiefly by cost and expedience, and resulted directly in development of a deficient, short-sighted, and environmentally unsound "remedial" plan:

"This proposed plan addresses soils contaminated at the 200-BP-1 Operable Unit." [emphasis added], and

"Since the contaminated soils must remain on the Hanford Site for the foreseeable future regardless of the alternative chosen, and the most significant contamination is located from 15 to 50 feet below the ground surface, it makes sense to leave the waste in place at this operable unit." [emphasis added]

Simply covering up a problem and saying that the associated future risks are "acceptable" does not "make sense" to the Tribes, nor does it *in any way* "address" contaminated soils. The proposed plan cynically offers to do as little as possible now and offers no substantive protection for the future. Wouldn't it both make much more "sense" and actually "address" the problem directly by reasonably *isolating from the environment, containing, or removing the most highly contaminated soils, which will remain hazardous and pose severe health and environmental threats for thousands of years?* The defined approach does not reflect DOE's and regulators' stated policy to practice environmentally sound waste management for the long-term at Hanford, and to develop remedial programs that would proactively fulfill DOE's trust responsibilities to effectively manage and restore land and natural resources.

### FIRST PRIORITIES FIRST

What's the rush to complete this proposed "remedial" plan for a central plateau, 200 Areas operable unit, especially because the principal driving force--namely large-scale liquid waste discharges--already has been eliminated? CTUIR staff understand from the recently

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

completed TPA negotiations that *sites along the Columbia River corridor were to be the first priority for funding and completion of remedial actions*. Especially given the recent crisis over vastly reduced budgets at Hanford overall, but especially for Environmental Restoration activities, *all available dollars and manpower efforts should first be concentrated along the immediate Columbia River corridor*.

It is a difficult choice to agree to postpone equally important and even more challenging plateau remedial projects, as impacts from 200-BP-1 and other 200 Areas operable units will ultimately reach the river. *But we agree that near-river sites deserve first priority*. So far as CTUIR staff are aware, this is one of the few issues that tribes, regulators, stakeholders, and even the Department of Energy agree upon. *Put 200-BP-1 on the back burner until there is some meaningful progress in remediating more immediate threats along the river corridor*.

### BARRIERS AS A "REMEDIAL" STRATEGY

Barriers simply cover over contaminated sites. No real remediation, i.e., remedy, is involved. No contamination is removed. No toxicity or potential mobility is reduced. No threat to human health or the environment is truly "addressed" or reduced. No exposure pathways are controlled or eliminated, over the full period that contamination remains a hazard. No long-term effectiveness, protection, or permanence is provided.

*Waste remains uncontained forever--this is not compliant with ARARs--to behave as it will over a physically, chemically, and temporally complex and ever-changing environment. This is a particular concern with highly radioactive, very long-lived, and environmentally mobile contaminants such as uranium*. Only an *appearance* of controlling future migration potential is implied through the construction of a barrier, as a surface barrier is readily bypassed even in the shallow subsurface.

Nevertheless, barriers are a necessary strategy for controlling some waste sites at Hanford and elsewhere. Barriers are appropriately applied, for example, to old municipal landfill sites, where exhumation of complexly mixed and hazardous wastes of diverse media is impractical. Similar conditions at Hanford may require a similar approach. Conditions, however, must be objectively evaluated on a case-by-case basis, with barrier use reserved only for those truly intractable conditions or circumstances.

*The proper role for barriers is as a remedial approach of last resort, only to be considered after other reasonable attempts at real remediation have failed*. Barriers are *not* properly used *first* when other, more effective remedial approaches are available and practical. In the case

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

of 200-BP-1, however, *no practical attempts at real remediation are even proposed to be tried*, and barriers are the first and preferred choice. *All alternatives that include real soil remediation in 200-BP-1 have been rejected from the beginning*, presumably because of overemphasized short-term, but unrecognized true long-term costs or impacts.

### PERMANENCE OF INSTITUTIONAL CONTROLS

There is excessive and unsupported optimism about both the effectiveness and permanence of barriers or other institutional controls. To be fair, 200-BP-1 is far from the only project relying excessively on such blind-faith-in-the-future measures. The Proposed Plan notes that: "All of the [proposed remedial] alternatives would require some form of institutional control to provide *long-term effectiveness*" [emphasis added]. Naive and unfounded faith is repeatedly placed in the use of "institutional controls" for the protection of human health and, supposedly, the environment from *the real and very long-term risks* posed by simply leaving vast amounts of highly dangerous and long-lived contamination in place.

Modeling results provided by EPA staff during the Evaluation of Indian Values workshop in December 1994, *clearly indicate that the threats posed by the existing contamination at 200-BP-1 will persist--and in fact greatly increase--for thousands of years*. The proposed construction of barriers to simply cover it all up does NOTHING to remove or reduce this threat. *Failure to meaningfully control contamination now present in the vadose zone will preclude any possibility of success in remediating the contaminated groundwater originating from this source*. The current thinking (i.e., "discounting") appears to be that future human and Columbia River ecosystem generations--especially those far into the future--are not important, or not as important. In fact, our children and grandchildren must be far less valuable since it seems to be OK to leave them this permanently dangerous, uncontained, and possibly uncontrollable legacy.

Is it realistic to presume that institutional controls will remain in place *for the full period of many thousands of years during which a threat exists*? How will institutional controls protect the Columbia River long into the future as groundwater-transported contamination reaching the river gradually increases? Even the barrier itself is only being (optimistically) designed to last 1000 years--an engineering milestone in and of itself. But how long will a fence last--and how effective will it be in 1000 or 5000 years? How long will DOE's commitment to environmentally sound waste management, remediation, and restoration at Hanford last, given the rapidity and fickleness with which political winds and funding priorities change? How long do tribal treaty rights and the federal government's trust responsibility last?

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

Blind faith in institutional controls presumes a depth of commitment, an ability, and a permanence that infinitely surpasses that of any human institution known to have existed. Moreover, given the increasingly rapid pace of cultural change in modern society, it is simply unwise (or worse) to depend on the presumed persistence of any such frail and fleeting human institutions. *Any assumptions of institutional controls should never be permitted to extend more than 100 years into the future--and even this may prove to be overly optimistic if we realistically assess the nature and magnitude of change occurring in our society during the past 100 years. Excessive reliance on institutional controls provides a false sense of security and a false impression of "doing something," with little actual substance to back it up.*

### PREJUDICING FUTURE OPTIONS

Barriers prejudice future options. Emplacement of expensive and complex engineered barriers greatly reduces or outright eliminates the likelihood that any more meaningful future remediation will ever occur. Why is there such a rush to move forward so quickly with the construction of barriers in this operable unit when the principal contaminant driving force has already been removed, when river-margin sites are the top priority, when many issues such as impacts to groundwater or tank farm remediation have not been thoroughly worked out, and when remediation in this operable unit probably could be best coordinated with tank farm closure? If there is a potential threat of affecting the integrity of the 241-BY tank farm by actively remediating the site now, then doesn't it make more sense to better plan and coordinate these adjoining remedial efforts now? In the interim, a simple plastic cover would save vast sums of money better spent on near-river remediation--*the first priority*, would serve to control some infiltration around 200-BP-1 in the interim, would prevent widespread adverse environmental impacts associated with large-scale basalt and top-soil mining, and would not prejudice future remedial options at either 200-BP-1, 200-BP-5, or the 241-BY tank farm. The construction of a Hanford soil/rock barrier would necessarily represent a *de facto* final remediation. It's just not being called that.

### BARRIER EFFECTIVENESS

The results of modeling contaminant discharge to groundwater through time shown to CTUIR staff in the above referenced package appear to be based on highly unrealistic assumptions as to be schematic at best for the intended purpose of assessing barrier effectiveness. For example, all modeling results assume that infiltration is purely vertical with no lateral movement occurring throughout an unchanging and uniformly homogeneous vadose zone. The common presence of discontinuous caliche layers or local-facies aquitards throughout the

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subsurface at Hanford demonstrates that infiltrating water will take a highly complex, generally unpredictable, and time variable path "downwards," but *this path will necessarily involve substantial lateral spreading*. As the Hanford Sitewide Groundwater Protection Management Plan (DOE/RL-89-12, Rev. 2, p. 5) notes:

". . . downward movement of moisture in the vadose zone is retarded by heterogeneities in soil composition (e.g., silt or cemented layers)," and

"Layers of silt or cemented layers generally slow the downward movement of water, *resulting in lateral spreading of water and localized saturated zones* (i.e., "perched" water zones) above the top of the unconfined aquifer. *This condition may expand a contaminant source area beyond the physical dimensions of a disposal facility.* [emphasis added].

Over time--and with such long-lived contaminants there will be plenty of time--this lateral spreading will inevitably leach existing vadose zone contamination and transport it to groundwater and the Columbia River.

Hence, how can a barrier, even if constructed to substantially overlap the areal extent of a waste site at the surface, offer any truly long-term protection from the vastly greater amounts of water that will infiltrate in the general vicinity surrounding a waste site and then travel through the waste site vertically and laterally at multiple depths throughout the subsurface? Moreover, all runoff from the surface of the barrier itself is simply transferred to and concentrated along the margins of the cover, regardless of its areal extent. *All barrier discussion ignores these inherent drawbacks and critically important facts about the nature of water infiltrating into the highly complex and heterogeneous subsurface conditions that actually exist at Hanford.*

Furthermore, the defined approach ignores potential spatial and temporal variations in the subsurface hydrologic regime that may at least partly defeat any surface barrier's intended purpose. For example, the existing uranium groundwater plume has not only travelled through the entire thickness of the vadose zone but has already spread with the groundwater more than a mile downgradient of its source, all within 40 years. How does emplacement of a barrier control the further spread or support remediation of this actively spreading plume? How does a surface barrier remove or control the future threat to groundwater from continuously remobilized contamination below the barrier?

Moreover, future groundwater levels beneath the site will vary in response to either natural or human-induced changes. If (when) groundwater levels rise, contaminants now present in the

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lower vadose zone will become mobilized, resulting in further volume increases and plume migration through time. Remember, the extremely long-lived nature of 200-BP-1 contaminants, especially uranium isotopes, and the associated environmental and exposure threats they pose will remain for *thousands of years*. Contaminants will be left uncontained, free to move as changing conditions permit, forever. Significant if unpredictable geologic and hydrologic change will occur over the time spans involved. The nature and magnitude of natural changes recorded during Holocene time can be used as a direct measure of the types and magnitude of expectable future problems that are not now even being conceived of, let alone planned for, in these *proposed permanent uncontained subsurface nuclear waste repositories*.

### LONG-TERM IMPACTS ARE NOT BEING CONSIDERED

The failure to adequately and realistically consider long-term impacts of the proposed alternative is clearly driven home in modeling of contaminant "concentrations" (actually, radioactivity levels) in groundwater with time, given different postulated infiltration rates. Accepting for the moment the validity of the inherently faulty assumptions outlined above, then the figures clearly show that with low infiltration rates, comparable to modern conditions, uranium activity levels will *increase indefinitely* for at least 11,000 years. Higher infiltration rates result in much higher uranium levels that peak in 5000 to 8000 years, and then decline over the following several thousand years. Depending on infiltration rates, predicted uranium activity levels may range as high as *several thousands of picocuries per liter*, but at all modeled infiltration rates will *increasingly exceed* the proposed standard of 30 pCi/L for *thousands of years*.

Yet the Proposed Plan states: "[Uranium] concentrations [sic] currently entering groundwater from the soils at 200-BP-1 are *declining* and are generally near or below EPA's drinking water standards." [emphasis added] A subsequent statement then *totally contradicts* the first: "Modeling indicates that . . . natural precipitation (rain and snow) will transport uranium downward towards the groundwater. According to the modeling, uranium concentrations [sic] will exceed the proposed drinking water standard (30 pCi/L) in about 700 years." *How can both these statements possibly be true?*

In light of the modeling results, this mischaracterization is unacceptably simplistic, reflects incorrect interpretation of the available data, and gives a false impression that things are getting better. It is possible that *current* uranium levels in groundwater are actually declining slightly and "near" drinking water standards *in the short term* (over a few years). *But even with its faults, the modeling clearly emphasizes that uranium levels will greatly increase over*

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

*the next several thousands of years--and possibly indefinitely--to levels that may exceed the proposed drinking water standard by up to two orders of magnitude and last for many thousands of years. A risk assessment focused only on current conditions ignores ever increasing future risks of exposure and both the health and environmental impacts of such increasing releases. Implementation of the proposed "remedial" alternative means that the Columbia River will suffer for many thousands of years hence from uranium-contaminated groundwater discharges that dwarf any current discharges and greatly exceed any current threat. The risk of time and to future generations is not accurately characterized.*

An even more unpredictable impact may be the effects of human-induced changes on the natural system, many of which we can hardly guess at now, given the long time spans involved and current pace of technological change. Hanford operations over the past half century alone resulted in major changes to the hydrologic regime--significantly increasing natural hydraulic gradients and even reversing the natural groundwater flow direction in some cases.

Although some past changes have been mitigated by the cessation or reduction of many Hanford discharges, future changes may have much broader, even larger scale, and other yet unknowable impacts on the natural hydrologic regime. For example, significant quantities of treated or partially treated groundwater from Hanford remediation activities are proposed to be discharged into new facilities surrounding the 200 Areas. Such large-scale discharges will impact future subsurface conditions by creating new contaminant plumes, groundwater mounds, flow directions, or gradients in new areas and may potentially, even if unintentionally, remobilize and further spread existing subsurface contamination. In addition, a minimum 4 to 5 foot future increase in groundwater levels sitewide has been estimated, along with corresponding gradient increases, owing to increased irrigation and artificial recharge in the upper Cold Creek Valley and other upgradient areas. Localized or sitewide rise in groundwater levels of this magnitude could play a significant--and currently underappreciated--role in continuously remobilizing lower vadose zone contamination across the site, including beneath 200-BP-1.

### BARRIERS CONSUME RESOURCES

*Barriers require tremendous consumption of valuable land and natural resources and directly result in increased environmental degradation, whether at Hanford or elsewhere. The construction of Hanford, RCRA, or other proposed barriers requires a vast source of basalt (and why is consideration limited only to basalt?). CTUIR staff repeatedly have made it clear that the CTUIR will strongly oppose the mining and further degradation of any culturally*

## CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

significant sites at Hanford such as Gable Butte or Gable Mountain. There would appear to be few other "readily available" basalt sources that would not involve huge transportation costs from offsite and/or result in adverse environmental impacts somewhere else.

But really, all this entire approach does is to transfer problems from one place or time to another. Is it really acceptable to totally devastate another, and likely more pristine or comparatively unaltered, site of substantial extent in the name of "remediation" at Hanford? This philosophy of disconnect, which appreciates neither cumulative impacts nor connected actions in other areas, only represents further piecemealing of remediation *and restoration* efforts at Hanford.

Furthermore, the soil cover for the proposed barrier would similarly involve the large-scale disruption and mining of yet another area for top soil. The currently designated sacrifice zone is the McGee Ranch area west of Hanford, an area known for the high quality and comparative uniqueness of its loamy soils. Should this valuable resource now be plundered and yet another vast tract unalterably destroyed to permit more widespread application of barriers in the name of "remediation" at Hanford?

### EVALUATION OF INDIAN VALUES

In connection with development of the Proposed Plan for 200-BP-1, EPA staff convened a workshop in December 1994, in order to better understand American Indian values associated with remediating this operable unit. Unfortunately, CTUIR and other tribal staff all shared a lingering mutual concern that this workshop was simply an attempt to establish a set of "tribal criteria" which could then somehow be separated, quantified, and applied to the evaluation process. It appears to be simply an attempt to create a tribal "checklist," if you will, to satisfy "consultation" or advertise that "tribal values" have been fully incorporated into this or any other process.

Tribal staff do not employ any sort of "checklist" in our evaluation of DOE and regulator actions; such an approach is in fundamental conflict with tribal values and a holistic world view. Tribal staff evaluate all projects solely on their specific and individual merits and on their potential impacts to tribal rights, interests, and responsibilities. For your reference, CTUIR staff enclose a copy of our Criteria document, developed in July 1993, as an outreach to the Tri-Parties, outlining four basic criteria that tribal staff and policy makers would use in evaluating the impacts of then-proposed changes to the Tri-Party Agreement. But the Criteria are equally applicable to a wide range of other Hanford activities, including remedial planning for the 200-BP-1 operable unit.

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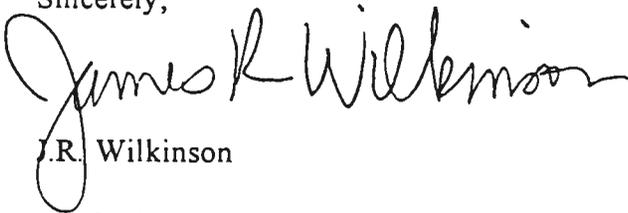
In conjunction with the integrated set of tribal values embedded within this document, review of the Criteria document will provide you with a basic overview of tribally important values that transcend persistent attempts by Hanford decision makers to subdivide and pigeonhole. Attempts to break apart a holistic world view into its individual components first assumes that *all* such components can be identified and quantified, and then that an accurate characterization of a "forest" can be built solely from individual descriptions of only some of its "trees." In fact the whole system is far more complicated, interrelated, and interdependent than simply the sum of a few of its parts.

CONCLUSION

The rush to finalize the proposed plan for 200-BP-1 is highly premature. As proposed, the plan represents but a cynical attempt to give an appearance of "doing something" while in fact conducting as little real remediation of an environmentally mobile and long-lived threat as is conceivably possible. Such an approach does not protect tribal rights and interests, now or in the future, nor does it fulfill DOE's trust responsibility to tribes or DOE's commitment to begin being an effective steward of land and natural resources. *Put the brakes on this deficient plan now and focus immediate efforts directly along the Columbia River corridor.*

Thank you for the opportunity to provide comments on the proposed "remedial" plan for the 200-BP-1 operable unit. CTUIR staff expect to receive detailed responses to the comments provided herein, including a description of how the proposed remedial plan will be modified in response to outlined tribal concerns. CTUIR staff will be available to meet with you for further discussions following your review of this letter owing to the significant nature and number of concerns raised herein. Owing to numerous other obligations that limited CTUIR staff review of this proposed plan, CTUIR staff also reserve the right to submit additional comments in the future. Please coordinate future efforts on this project with either myself or Tom Gilmore, Hanford Environmental Restoration Project Hydrogeologist, at 503-276-0105.

Sincerely,



J.R. Wilkinson

Hanford Projects/Program Manager  
CTUIR Department of Natural Resources

*CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION*

cc: William Burke, Treasurer, CTUIR Board of Trustees  
Michael Farrow, Director, CTUIR Department of Natural Resources  
CTUIR Hanford Program Staff  
Russell Jim, Yakama Nation  
Mike Bauer, Yakama Nation  
Donna Powaukee, Nez Perce Tribe  
Kevin Clarke, DOE-RL, Indian Nations Program Manager  
Bryan Foley, DOE-RL  
Donna Wanek, DOE-RL  
Doug Sherwood, EPA  
Dave Lundstrom, Ecology  
Feng Gang Ma, Ecology

## PROTECTION OF TRIBAL RIGHTS AND INTERESTS REQUIRES PROACTIVE GROUNDWATER REMEDIATION AND PROTECTION AT HANFORD

Thomas D. Gilmore

Confederated Tribes of the Umatilla Indian Reservation

Department of Natural Resources, P.O. Box 638, Pendleton, OR 97801

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As one of the most polluted sites nationwide, Hanford site, southeastern Washington, poses among the greatest technical, institutional, and political remediation challenges facing modern society. Hanford is a microcosm of larger national problems reflecting rampant increases in land and waterway pollution and persistent failures to institute effective preventative controls and waste minimizing production technologies. Such foresight would preclude much more difficult and expensive after-the-fact "clean-up" and associated adverse health impacts to affected human and ecological communities caused directly by policies maximizing "acceptable" pollution.

Tribal on-reservation water resource protection regulations reflect a proactive philosophy of contamination prevention and remediation, strict regulation of well construction, stream zone alteration, and beneficial uses, preventing overappropriation of surface or groundwater, and protecting and preserving long-term quantity and quality of tribally owned reservation waters. Such holistic resource and ecosystem management strategies are far less effectively employed by state and federal agency managers off-reservation within tribal ceded lands--such as Hanford--where tribes maintain treaty-reserved rights and interests.

Tribes, regulators, and diverse public interests have long supported proactive groundwater remediation and protection at Hanford. But a proactive approach is not enthusiastically supported by DOE and its contractors, and (ironically) is actively opposed by some impatient local business and governmental interests. In the non-Hanford world, pump-and-treat programs are field proven for wide ranging chemical and radiologic contaminants and hydrogeologic environments, constituting among the simplest, most effective, widely employed remedial strategies to measurably reduce contaminant volume, extent, toxicity, and mobility and to control contaminant spread, commingling, future discharges, and ecosystem and human health impacts. At Hanford, each of five pilot-scale (20-50 gpm) pump-and-treat projects has resulted in >90% removal of contaminants of concern, leaving treated discharges below MCLs. DOE brags little about these unabashed successes, and has no plans to continue--let alone expand--current treatment projects. *In fact, DOE's current budget projections will totally eliminate all Hanford groundwater pump-and-treat projects by 1997!*

Diverse Hanford interests, the press, and Congress have soundly criticized DOE for spending so much yet accomplishing so little. Only proactive pollution prevention efforts--such as full-scale groundwater pump-and-treat programs--will accomplish what most interests consider "clean-up," protect tribal treaty-reserved resources and rights, and minimize direct, indirect, or cumulative health impacts to subsistence-dependent tribal communities. Current pilot-scale programs already surpass effectiveness expectations. Despite DOE's dire political need to demonstrate "clean-up" progress, little *action*-directed expansion is being seriously considered, let alone aggressively implemented. Further delays will only exponentially increase true costs, remedial complexity, and adverse health impacts, while simultaneously increasing the severity and urgency of risks to affected communities, such as American Indian tribes. In addition, proactive treatment programs can only enhance plummeting DOE credibility in the eyes of tribes, regulators, Congress, and the public through good-faith commitments to fulfill legal and moral federal government obligations.



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17 May 1995

K. Michael Thompson  
U.S. Department of Energy  
P.O. Box 550  
Richland, Washington 99352

Subject: CTUIR NOMINEE FOR COLUMBIA RIVER ASSESSMENT BLUE-RIBBON  
TECHNICAL REVIEW GROUP

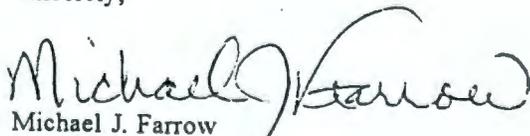
Dear Mr. Thompson:

Technical staff of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) are pleased to nominate Dr. Mary O'Brien, of the Environmental Research Foundation, to serve as staff technical consultant on the proposed Blue-Ribbon Technical Review Group for the Columbia River Comprehensive Impact Assessment.

CTUIR staff have reached a tentative agreement with Dr. O'Brien to participate on this panel. We now need more information from DOE with respect to the compensation package that will be available for Technical Review Group members and an estimated schedule/time commitment for planning purposes. This information will permit Dr. O'Brien to set aside appropriate time for her involvement and permit CTUIR staff to determine if any further resources may be necessary to ensure her full and informed participation.

Please contact either J.R. Wilkinson or Tom Gilmore of my staff, at 503-276-0105 (phone) or 503-276-0540 (fax) with the necessary information so that we may finalize arrangements with Dr. O'Brien at the earliest time possible. Thank you very much for the opportunity to nominate a technical consultant for this panel.

Sincerely,

  
Michael J. Farrow

Director  
CTUIR Department of Natural Resources

cc: William Burke, Treasurer, CTUIR Board of Trustees  
J.R. Wilkinson, CTUIR Special Sciences and Resources Program Manager  
Special Sciences and Resources Program Staff  
Mary O'Brien, Environmental Research Foundation  
Kevin Clarke, DOE-RL, Indian Programs Manager



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26 May 1995

Randy Brich  
River Sites Restoration Division  
U.S. Department of Energy  
P.O. Box 550  
Richland, Washington 99352

David Maughn  
Pacific Northwest Laboratories  
P.O. Box 999  
Richland, Washington 99352

Subject: PRELIMINARY CTUIR SCOPING OF SPECIES OF CONCERN FOR  
COLUMBIA RIVER COMPREHENSIVE IMPACT ASSESSMENT

Dear Columbia River Ecological Risk Assessors:

Technical staff of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) appreciate the opportunity to provide lists of species of concern for inclusion into the evaluations for the Columbia River Comprehensive Impact Assessment. This letter provides the species lists as an attachment, outlines guiding principles and general criteria that CTUIR staff used in developing the lists, and describes an appropriate ecological framework for the risk assessment(s).

#### THE SPECIES LISTS

The attached lists contain selected "indicator species" identified by CTUIR staff to be evaluated in the risk assessments planned for the Columbia River Comprehensive Impact Assessment. It should be noted that all species are considered cultural resources by tribal people, and each is recognized to serve a unique and valuable role in an interdependent ecosystem. Although some species are used more commonly than others as food sources or for other cultural purposes, none are considered inherently more important or valuable than any others. Based on thousands of years of experience, tribal culture respects and proactively protects the land, the waters, and all the life forms that inhabit the physical environment.

These lists are by no means exhaustive or complete listings. They do not necessarily represent the most culturally significant plants and animals to tribal members or communities. They do, however, represent some of the trust resources protected under the Treaty of 1855 between the CTUIR and the U.S. government. Moreover, they also represent some of the natural resources for which the CTUIR--as well as the U.S. Department of Energy--are Natural Resource Trustees, under CERCLA Section 107.

The attached species lists provide a starting point for identifying appropriate receptors, endpoints, or midpoints for the ecological risk assessments. Traditional ecological and human health risk assessments generally evaluate featured species only, such as those listed as Threatened or Endangered, or those species currently in the cultural (whose culture?) limelight. Such a skewed focus raises legitimate questions about "representativeness" and whether a few selected species can adequately characterize the diversity and complexity of interdependent ecosystems. In most cases, CTUIR staff did not identify specific species, but rather identified various taxa representative of the complex food web associated with aquatic and terrestrial systems in the mid-Columbia basin. Individual species will be identified in consultation with CTUIR staff.

#### ECOLOGICAL GUIDANCE PRINCIPLES

Species were selected to represent several different trophic levels in the mid-Columbia River ecosystem. *As core or critical elements of this ecosystem, the identified species should comprise central evaluation elements of a comprehensive assessment process geared to examine the past, current, and future impacts and direct, indirect, cumulative, and synergistic/antagonistic effects of contaminants on land, air, water, and biota within the Hanford Reach, its environs, and downgradient areas.* In the context of comprehensively evaluating contaminated environments, trust resources such as land, air, water, and biota must not, and indeed cannot, be evaluated in a credible and technically defensible manner independent of the web of life and the interdependent function and structure of the ecosystem of which they are integral parts.

In addition, traditional risk assessment methods tend to focus exclusively and narrowly on single species/single contaminant/single pathway, suburban-based, ecotoxicity evaluations. Critical but inherently difficult-to-quantify issues such as overall habitat quality for all resident and migratory species cannot be ignored in any truly comprehensive assessment process. A process based largely or entirely on a strictly reductionist approach is likely to ignore the fundamental law of the natural sciences, namely that "everything is related to everything else," and too easily lose sight of the forest for all the trees.

Moreover, a truly comprehensive Columbia River Assessment must necessarily include the element of time. The context of current conditions can only be assessed through understanding the past conditions and history that have resulted directly, indirectly, or cumulatively in currently observed and measured conditions. History is the sum of a uniquely ordered succession of events which cannot be comprehensively understood by designating some arbitrarily chosen, very

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recent date from which to begin that significantly postdates the beginnings of Hanford activities and impacts. Furthermore, a one-time snapshot of current conditions is only a start. Current conditions--and the past conditions and history that have led to them--are a stepping stone to begin to understand what measures are needed to *effectively mitigate* future impacts. This must be recognized to comprise the true goal of a credible, comprehensive Columbia River Assessment--and of DOE's mission at Hanford.

But assessing current conditions alone cannot tell us the true benefits of remediating existing contamination compared to the impacts of doing nothing--it is this essential debate that the Columbia River Assessment must enlighten. Ultimately, it comes down to defining appropriate perspectives. For example, carbon tetrachloride contamination currently comprises a spreading, 7-square mile plume centered on the 200 West area, slowly moving toward the Columbia, about 10 subsurface miles away. Because current exposure pathways are highly limited, the attendant risk is therefore very low. But modeling results show that within 100 years, if no remedial measures are taken, this known carcinogen will be discharging directly into the Columbia River at levels hundreds of times the drinking water standard.

Hence a risk assessment based only on current conditions fails to capture or even recognize the inevitable deterioration of river and ecosystem conditions over time caused by failure to control the now areally restricted carbon tetrachloride plume and permitting its inevitable, uncontrolled spread and migration through the subsurface and into the Columbia River over time. This future risk is very high. The consequences of continued inaction will fundamentally impact both the nature and magnitude of future human health and ecological risks posed over long time periods and the demonstrable adverse impacts to ecosystem integrity and human health that will necessarily occur if no control measures are taken now. The nature and extent of contamination, the conditions that result from contamination, and the risks and impacts such contamination poses to humans and ecosystems are not static through either time or space. In a credible Columbia River Comprehensive Impact Assessment, they cannot be treated or modeled as such.

Taking a more intuitive and scientifically credible approach to assessing the influence of stressors on an ecosystem or the organisms within it requires a thorough evaluation of each element and function of the system. Such an approach will better permit a comprehensive understanding of stressor effects and changes at each level of the system and on the system as a whole. Multiple endpoints may be necessary in some or many cases in order to credibly model a complex, multi-layered ecosystem with multiple, overlapping pathways.

In defining the scope of species and habitats that should be included in the analysis and that is reflected in the attached lists, CTUIR staff have focused largely on successive trophic levels of aquatic, riparian, and upland habitats most closely associated with the Columbia River itself. Although distal terrestrial environments are no less a part of the Columbia River ecosystem as a whole, our species lists deliberately focus on those organisms most dependent on the river and river margin habitats. CTUIR staff recognize this selectivity, which has provided some basis to limit and focus the lists of species. Those terrestrial species included depend significantly on the

riparian ecotone, a diffuse zone of influence of varying width from the river margin, but extending well into the terrestrial upland/shrub-steppe. Contaminants affect both aquatic and terrestrial habitats, but many contaminant discharge areas and exposure pathways are concentrated disproportionately in riparian corridors and near-shore river environments--and these same areas also are disproportionately populated or utilized by many organisms including humans.

## SUMMARY

Traditional American Indians and traditional tribal ways of knowing do not artificially separate humans from the environment, as is so common throughout the dominant society. This arbitrary separation is epitomized in the equally arbitrary distinction between human health and ecological risk assessments or by the application of different human and ecological protection standards. To traditional American Indians, humans are an integral and interdependent part of a larger ecocultural system that includes the earth, all the natural resources in, upon, or above it, and all living things, including humans and the culture they have evolved to respectfully, harmoniously, protectively, and sustainably live within this system.

This way of thinking is different than that of the dominant society, and thus has been difficult to incorporate into much more narrowly framed and scoped conventional risk assessment methods. Moreover, risk assessment is a linear process, whereas both tribal concepts of humans and their environment and the concept of food webs themselves are circular. Conventional risk assessment methods must recognize and overcome this inherent dichotomy by incorporating the values and perspectives of those being risk assessed. Risk assessment should not be a "black box" where the internal parts and workings are invisible; the process must be made as open and transparent as possible. In a credible risk assessment, critical assumptions, data limitations, and sources of uncertainty are thoroughly and explicitly identified and discussed. Only in this way will credible, technically defensible, and politically acceptable decisions result.

The species identified in the attached lists constitute a starting point for the Columbia River ecological risk assessments. By informal mutual agreement, these lists have been developed independent of simultaneous activities being conducted by PNL staff. CTUIR staff developed these lists based largely upon the general ecological considerations outlined in this letter. CTUIR staff understand that PNL has developed an informal set of criteria that it is using to screen species; we have neither received nor reviewed PNL's screening criteria during the development of our own independent lists. The next step will be to compare the CTUIR and PNL lists, in addition to the screening criteria, in order to see how well they mesh, how well they can be combined, and how to resolve differences. A meeting of CTUIR and PNL staff should be scheduled to discuss similarities, differences, and where to go from here once exchanged lists are reviewed.

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Thank you very much for the opportunity to provide CTUIR input on the species of concern to be included in the Columbia River Comprehensive Impact Assessment. CTUIR staff believe that the guiding principles and ecological framework outlined in this letter begin to define an appropriate purpose and scope for a credible and truly comprehensive Columbia River Assessment. We look forward to continued dialogue with DOE, its contractors, and regulators concerning the completion of this assessment. Please contact either me, or Tom Gilmore of my staff, at 503-276-0105 (phone) or 503-276-0540 (fax) to schedule further discussions.

Sincerely,



James R. Wilkinson

Special Sciences and Resources Program Manager  
CTUIR Department of Natural Resources

cc: William Burke, Treasurer, CTUIR Board of Trustees  
Michael Farrow, Director, CTUIR Department of Natural Resources  
CTUIR Special Sciences and Resources Program Staff  
Allen Childs, CTUIR Wildlife Program  
Larry Gadbois, EPA  
Dave Holland, Ecology  
Paul Esslinger, PNL

Fish

fall chinook salmon  
sockeye salmon  
steelhead  
rainbow trout  
white sturgeon  
mountain whitefish  
Pacific lamprey  
carp  
catfish  
bighead minnow  
bass

Shellfish

freshwater mussels  
crustaceans  
crawfish

Amphibians

Great Basin spadefoot

Reptiles

Western painted turtle  
rattlesnake  
whip snake  
bull snake  
lizards

Macroinvertebrates

stonefly  
caddisfly  
mayfly  
dragonfly  
lepidopterans  
polychaete worms

Mammals

coyote  
black-tailed jackrabbit  
cottontail rabbit  
mouse (pocket, deer, harvest)  
mule deer  
raccoon  
weasel  
badger  
bats  
humans

Waterfowl/Shorebirds

Canada goose  
mallard  
common merganser  
great blue heron  
cormorant  
avocet  
grebe  
kingfisher  
coot  
pelican

Raptors

bald eagle  
burrowing owl  
hawk spp.  
osprey

Ecotone/Upland Birds

crow/raven  
vulture  
magpie  
ring-neck pheasant  
quail  
cliff swallow

Riparian/Wetland Plants

dogbane  
black cottonwood  
black locust  
coyote willow  
weeping willow  
crack willow  
cattail  
tule  
bulrush  
sedges  
rushes  
reed canary grass  
common witchgrass  
large barnyard grass

Ecotone/Upland Plants

cheatgrass  
Russian thistle  
tumble mustard  
rabbit brush  
big sage  
wild onions (Allium)  
yellow bells

Aquatic Vascular Plants

waterweed  
duckweed  
pondweed  
Columbia yellow cress  
watercress

Decomposers

fungi  
beetles  
ants  
millipedes  
sowbugs  
earthworms

Other

macrophytes  
photopelagic plankton  
zooplankton  
diatoms  
algae spp.

feces- coyote  
rabbit  
mouse  
eagle  
coot/cormorant  
Canada goose  
owl

eggshells



CONFEDERATED TRIBES  
of the

*Umatilla Indian Reservation*

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0540

5 June 1995

John Wagoner, Manager  
U.S. Department of Energy  
P.O. Box 550  
Richland, Washington 99352

Subject: URGENT CALL FOR EXPANDED PUMP-AND-TREAT PROGRAMS TO  
ADDRESS PERSISTENT AND UNCONTROLLED DISCHARGE OF  
CONTAMINATED HANFORD GROUNDWATER INTO  
THE COLUMBIA RIVER

Dear Mr. Wagoner:

The Columbia River is the cultural lifeblood of the Pacific Northwest. For many material and spiritual reasons, this is just as true for modern society today as it has been for traditional American Indian tribal societies for many thousands of years. But today the Columbia River suffers needless and preventable abuse.

For the past half century, nuclear weapons production activities at Hanford have caused widespread environmental pollution of unparalleled nature, extent, and magnitude. Such unconscionable pollution has measurably damaged and degraded wide ranging natural resources of the Columbia River ecosystem and the Columbia River itself. Although the U.S. Department of Energy's (DOE) mission changed from production to environmental remediation and restoration more than six years ago, little substantive and measurable progress toward "cleaning up" this mess has been made, despite the expenditure of billions of public dollars. Meanwhile, unacceptably high levels of Hanford-origin contaminants continue on a daily basis to damage or threaten treaty-protected trust resources and rights of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR).

Many diverse interests have repeatedly and consistently expressed to DOE that their primary and overriding concern is to *PROTECT THE COLUMBIA RIVER*. Such interests include not only all affected American Indian tribes--including the CTUIR, but also regulators, natural resource trustees, states, and diverse environmental and public interest groups. This message has been loud and clear.

---

But DOE instead consciously chooses to allow dangerous chemical and radiologic contaminants to routinely discharge into the Columbia River at many locations every day. This sorry situation is largely preventable or controllable with field-proven technologies that are widely accepted outside of Hanford. DOE, however, is frustratingly paralyzed by an institutional commitment to inaction. The time for endless DOE stalling and excuses has ended.

Thomas Grumbly recently bragged before several U.S. Senate Committees that DOE has pumped and treated 2.4 billion gallons of groundwater and at least 1.6 billion gallons of surface water since 1989.<sup>1</sup> He does not mention that, of this impressive total, less than 10 million gallons--*a small fraction of one percent*--was treated at Hanford, almost entirely in 1994 and 1995 'treatability tests.' Why is it that other DOE sites across the nation--faced with far less severe and widespread problems than Hanford--appear so readily able to take advantage of this well established and demonstrably successful remedial strategy?

In the non-Hanford world, pump-and-treat programs are field proven for wide ranging chemical and radiologic contaminants and hydrogeologic environments at NPL and many other contaminated sites. Thoughtfully designed pump-and-treat systems constitute among the simplest, most effective, and widely employed remedial strategies to measurably reduce contaminant volume, extent, toxicity, and mobility. *In fact, such systems are so widely accepted and effective that standard EPA guidance identifies pump-and-treat as the presumptive (default) remedy for contaminated groundwater.* Moreover, such proactive and protective programs also have been shown to effectively control contaminant spread, commingling, future discharges, and cumulative ecosystem and human health impacts, all of which greatly reduce true remediation costs over the long term. Thus groundwater pump-and-treat programs constitute not only *highly effective remedial techniques* but serve equally well as *effective and proactive pollution prevention strategies*--a novel concept to many at DOE-RL.

*DOE must begin immediately and aggressively protecting the Columbia River, as DOE has long promised and as diverse interests have long demanded.* Enough is known about major contaminant plumes now impacting the Columbia River to fully justify widespread groundwater pump-and-treat programs at Hanford. Moreover, in spite of far less than optimal operating conditions, DOE's own treatability tests, conducted under Hanford-specific conditions, have been remarkably successful, by any measure. Regulators have repeatedly called upon DOE to aggressively implement such programs more widely. There is absolutely no excuse for any further delays and any further inaction.

Currently fragmented and piecemeal remedial approaches at individual Hanford waste sites must be integrated under a holistic and comprehensive sitewide program. This program must clearly

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<sup>1</sup> Thomas Grumbly, DOE Assistant Secretary for Environmental Management, in Statement before U.S. Senate Committee on Armed Services, April 25, 1995, p. 10; and in Statement before U.S. Senate Committee on Environment and Public Works, Subcommittee on Superfund, Waste Control, and Risk Assessment, May 9, 1995, p. 3.

define an overarching vision outlining how the individual pieces fit into the big-picture goal of *remediating and protecting Hanford site groundwater and the Columbia River both now and in the future*. This will require much more than just words. It will require ACTIONS. DOE must:

- 1) Comprehensively and systematically eliminate, minimize, control, or contain *all major river-margin contaminant plumes* that now routinely discharge into the Columbia River along the entire Hanford Reach, or threaten to in the future. This goal must be pursued *aggressively* using realistically-scaled groundwater pump-and-treatment programs.
- 2) Use aggressive groundwater pump-and-treat and hydrologic control programs to control the further spread and commingling of all major *plateau-origin contaminant plumes* that will eventually impact the river.
- 3) Develop and, most importantly, IMPLEMENT a truly holistic and comprehensive sitewide groundwater protection management plan to govern the integration of all sitewide groundwater remediation and protection efforts (see attachment). Although many essential elements of such a plan are already in place, the current "plan" is routinely ignored because it lacks both the teeth necessary for meaningful implementation and enforcement and the visible, aggressive support of DOE Site and Deputy Managers. A sustained level of dedicated high-level oversight will be essential in controlling the excessive discretion now exercised by individual program managers and contractors to selectively implement or ignore critical elements as they so choose.
- 4) Place an immediate moratorium on the funding of never-ending additional "studies" of marginal value. Use these significant funds directly for aggressive, in-the-field remedial programs, such as full-scale groundwater pump-and-treat. Enough is now known to focus immediate remedial efforts on critical river-margin plumes while simultaneously gathering additional--and more relevant--information during full-scale pump-and-treat operations.
- 5) Thoroughly reassess, consolidate, and comprehensively integrate all groundwater monitoring programs sitewide. End duplicative and excessive monitoring by multiple contractors and programs. This could be achieved through creative negotiations with regulators that will comprehensively satisfy the spirit of regulatory compliance requirements without sacrificing legitimate data objectives. Eliminate petty competition and turf wars between contractors for program, staff, and budget control of high-profit monitoring programs. Use the huge amounts of dollars now wasted on excessive monitoring for aggressive, in-the-field remedial programs, such as full-scale groundwater pump-and-treat.
- 6) Reorganize all groundwater treatment and monitoring programs from now diverse DOE offices, programs, and purposes under a single sitewide umbrella group. This single sitewide groundwater protection oversight program would be managed by a single "groundwater czar," such as the Site Deputy Manager. This individual must have the full authority, responsibility, and accountability--not to mention the strong personal commitment and backbone--necessary to exercise meaningful control and to ensure

compliance of each and every Hanford program impacting groundwater conditions across the site, regardless of individual program resistance, power struggles, and foot-dragging.

- 7) Establish a realistic incentive program for both DOE and its contractors that systematically rewards measurable, cost-controlled progress toward clean-up (e.g., payments linked to volume of groundwater treated, volume of contaminants removed, sustained decreases in river margin seep/spring contaminant concentrations, or measurable improvements in Columbia River water/habitat quality). The program also must provide equally strong disincentives and funding cutbacks for continued stalling, further costly studies of marginal value, preventable contaminant increases, and unnecessary water quality/natural resource degradation.

Diverse Hanford interests, the press, and Congress have soundly criticized DOE for spending so much yet accomplishing so little. Aggressive, comprehensive, remediation and pollution prevention efforts--such as full-scale groundwater pump-and-treat programs--are essential, integral elements of a holistic and sitewide groundwater protection strategy for the Hanford site. Only such a comprehensive strategy will accomplish what most interests consider "clean-up," protect tribal treaty-reserved resources and rights, and minimize direct, indirect, or cumulative impacts to Columbia River and subsistence-dependent tribal communities, now and in the future.

Current pilot-scale groundwater pump-and-treat programs at Hanford greatly surpass effectiveness expectations, in spite of less than optimal operating conditions. Despite DOE's dire political need to demonstrate "clean-up" progress, little *action*-directed expansion of these unabashed success stories is being seriously considered, let alone aggressively implemented. Further delays will only exponentially increase true costs, remedial complexity, and adverse health impacts, while simultaneously increasing the severity of damages and urgency of risks to affected communities, such as American Indian tribes.

Ultimately, aggressive field treatment programs can only enhance plummeting DOE credibility in the eyes of tribes, regulators, Congress, and the public. Like few other actions, such good-faith commitments to fulfill legal and moral federal government obligations and to simultaneously restore the health of the Columbia River ecosystem will immeasurably benefit both DOE's credibility and the environment. It is a true win-win situation: for both DOE and for those of us who deeply cherish the Columbia River.

Sincerely,



Michael J. Farrow

Director  
CTUIR Department of Natural Resources

cc: CTUIR Board of Trustees  
CTUIR Special Sciences and Resources Program Staff  
Senator Mark Hatfield, Oregon  
Senator Patty Murray, Washington  
Senator Slade Gorton, Washington  
Hazel O'Leary, Secretary of Energy  
Thomas Grumbly, Assistant Secretary of Energy for Environmental Management  
Jerry Meninick, Yakama Indian Nation  
Charles Hayes, Nez Perce Tribe  
Ron Izatt, DOE-RL, Deputy Manager  
Linda McClain, DOE-RL, Assistant Manager for Environmental Restoration  
Kevin Clarke, DOE-RL, Indian Nations Program Manager  
Dan Silver, Washington Department of Ecology  
Chuck Clarke, EPA, Region X Administrator  
Mary Lou Blazek, Oregon Department of Energy

## ATTACHMENT: ESSENTIAL ELEMENTS OF A COMPREHENSIVE HANFORD SITEWIDE GROUNDWATER PROTECTION STRATEGY

### Purpose

- The purpose of a groundwater protection strategy is to prevent the degradation of natural groundwater and surface water quality and quantity.
- This purpose is best accomplished through proactive pollution prevention. This provides the best protection to both human and ecological health now and for future generations.
  - Waste Minimization (reduced dependence of transported hazardous materials)
  - Recycling (excavated soils, demolition concrete/metal)
  - Alternative Production Technologies (less resource consumptive, less waste producing)
  - Source Control (ongoing discharges, existing waste sites, vadose-zone)
  - Pump-and-Treat Programs (prevent further spread, commingling, discharges of existing contamination)
- Is the goal to protect the resource itself or human use(s) of the resource? This not-insignificant consideration may influence the development of protective strategies and residual contamination levels. Tribal philosophy emphasizes maintaining natural integrity and viability of entire ecosystems and all of their components.
- *A groundwater protection program must constitute an implementable plan that contains proactive preventative, remedial, and protective actions that meaningfully contribute to achieving long-term protection (i.e., non-degradation) of water quality and quantity.*

### Strategies and General Philosophies

- Once contamination has occurred, the best strategy is to prevent further degradation of either water quality or quantity. Such pollution minimization must have the ultimate and desirable goal of restoring injured conditions as best as possible to normal, pre-contamination conditions. This can be accomplished in various ways, depending upon technological, political, economic, institutional, and cultural limitations and desires. For example, any of the following (non-exhaustive) strategies may be employed, and are listed in approximate order of effectiveness for achieving the goal of minimal degradation of natural conditions.
  - Removal (excavation, pump-and-treat)
  - In-Situ Isolation (physical, chemical, hydrologic)
  - Containment/Control (physical, hydrologic, cryogenic)
  - Fix in Place (chemical, physical)
  - Surface Cover/Barriers
  - Natural Attenuation -- The No-Action Alternative (with the emphasis on NO action)

- Activities that permit degradation of now uninjured areas, or that permit further injury of areas already injured, must not be permitted.
  - Prevent further contaminant spread
  - Focus on long-lived, mobile, environmentally persistent contaminants
  - Focus on discharges, either current or at *any* time in the future, of contaminants that will pose a hazard to human or ecological health
  - Focus on the condition, health, and integrity of the resource itself (groundwater is only surface water that has not reached the surface yet--it's only a matter of time)
  - Assess impacts of permitted discharges for both ongoing activities and treated effluents--are they protective??

• Statutory, regulatory, and treaty-based drivers must be outlined and their role in a groundwater protection program must be defined. Interrelationships, interdependence, complicating factors, and conflicts must be explicitly identified and their resolution discussed.

• Time is an essential element that must comprise *the* basis of any truly "protective" long-term groundwater protection plan. For example, direct, indirect, and cumulative impacts must be explicitly addressed for both the short- and long-term. The human, ecological, and cultural health impacts of doing nothing, either now or in the future, must be explicitly discussed in relation to groundwater protection.

• A truly sitewide and comprehensive plan must consider the entire site, and address *all* activities--past, current, and future--that have the potential to impact groundwater quality or quantity, including those offsite (i.e., upgradient) areas that can affect onsite conditions (e.g., expanded irrigation).

• Characterization is a supporting strategy to understand how severe and urgent current and future threats are through measuring current contaminant extent and levels, understanding hydrogeologic conditions, and developing effective remedial *actions* to prevent further and long-term degradation. It is not an end in and of itself.

• Monitoring is a supporting strategy to measure how well the proactive elements of the Plan are succeeding, not an end in and of itself. Programmatically separate and duplicative monitoring efforts must be consolidated and eliminated.

• Interim/permanent waste management on the Central Plateau must be explicitly addressed.

- Develop and IMPLEMENT a proactive plan directed at achieving these goals
  - Preventative, remedial, and protective ACTIONS must be the basis of any meaningful/realistic groundwater protection program
  - Precisely measuring how things are growing worse is simply not enough
  - *Only* through action can both costs be controlled and human and ecological health be protected, now and in the future--Isn't this the basic point and purpose??
  - The oversight group must outline and initiate actions to achieve these goals



CONFEDERATED TRIBES  
of the  
*Umatilla Indian Reservation*

Administration  
Special Sciences  
and Resources  
Program

P.O. Box 638  
PENDLETON, OREGON 97801  
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018479

June 20, 1995

Mr. Steve M. Alexander  
Perimeter Areas Section Manager  
Nuclear Waste Program  
State of Washington  
Department of Ecology  
1315 W. Fourth Avenue  
Kennewick, Washington 99336-6018

Mr. Douglas R. Sherwood  
Hanford Project Manager  
U.S. Environmental Protection Agency  
712 Swift Boulevard, Suite 5  
Richland, Washington 99352-0539

RE: TRIBAL STAFF CONCERNS ABOUT TECHNICAL PEER REVIEWERS FOR THE CRCIA

Dear Messrs. Alexander and Sherwood:

Ms. Julie K. Erickson, Director of Department of Energy/Richland Operation's River Sites Restoration Division, recently wrote you concerning DOE/RL's proposed technical peer reviewers for the Columbia River Comprehensive Impact Assessment (CRCIA). I received a courtesy copy of that letter, dated June 13, 1995. My purpose in writing to you today is to correct some serious errors of fact that Ms. Erickson made in her letter. I also request that you take no action upon Ms. Erickson's letter until DOE/RL corrects these errors and rectifies this situation with appropriate Tribal staff. For your information, I will highlight the particular statements of Ms. Erickson that are inaccurate and explain their relevance.

STATEMENT #1: "The nominees were solicited from all interested parties, agencies, American Indian Tribes, and the public."

Attached you will find a letter dated May 17, 1995, that identifies Ms. Mary O'Brien as the technical peer reviewer nominee put forth by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) staff. I'm not sure which nominee(s) Ms. Erickson is referring to by this statement but NONE of the peer reviewers, other than Mr. Jeffery J. Wong, is familiar to me. Contrary to the implications in Ms. Erickson's letter, Tribal staff timely submitted a nominee who does not appear on her list.

Letter to Mr. Alexander and Mr. Sherwood  
CTUIR Concerns about Technical Peer Reviewers for the CRCLIA  
June 20, 1995  
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Furthermore, I am very concerned that the "Tribal and Cultural Resources" nominee, Mr. William Lang, has no knowledge of the CTUIR's program, interests, direction, or policy needs. How can someone unfamiliar with the Tribe's program represent "Tribal and Cultural Resources"? These issues have not been addressed.

STATEMENT #2: *"The three tribes still have the option of selecting a technical peer reviewer to collectively represent all three Tribes."*

The underlying notion of this statement is that the three tribes could (or should) be represented by one individual. This action alone would rewrite the status of inter-tribal relations and the nature of the government-to-government relationships between each tribe and the federal government. Such a fundamental shift in DOE policy needs to be clearly articulated by responsible DOE personnel.

It is my recollection that this whole concept of one reviewer for the three tribes came from a Hanford Advisory Board - Environmental Restoration subcommittee meeting. The Tri-Party Agreement (TPA) signatories know that the HAB has no right to advise DOE in its relations with American Indian Tribes. The CTUIR is *ex officio* on the HAB precisely because of the need to avoid this type of conflict. The DOE is violating its trust responsibility to the CTUIR by deferring to an advisory board subcommittee's statements about the interests of a sovereign government.

In conclusion, the staff for the CTUIR are committed to completing a Comprehensive Columbia River Impact Assessment (CRCLIA) that is truly comprehensive. While the Technical Peer Reviewers is a TPA milestone, a successful CRCLIA would allow the Tribes the baseline information to gauge "cleanup" along the Columbia River. If you have any questions, please contact me directly at 503/276-0105.

Sincerely,



James R. Wilkinson, Manager  
Special Sciences and Resources Program  
Department of Natural Resources  
Confederated Tribes of the Umatilla Indian Reservation

c.c.

William H. Burke, CTUIR-Board of Trustee Treasurer  
Michael J. Farrow, CTUIR-Department of Natural Resources Director  
Special Sciences and Resources Program staff  
Kevin Clarke, DOE-Indian Nations Program Manager  
J.K. Erickson, DOE-River Sites Restoration Division Director  
Donna Powaukee, Nez Perce ERWM Manager  
Russell Jim, Yakama Indian Nation ERWM Manager

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**Department of Energy**

Richland Operations Office  
P.O. Box 550  
Richland, Washington 99352

FEB - 6 1995

Mr. William H. Burke, Treasurer  
Confederated Tribes  
of the Umatilla Indian Reservation  
P.O. Box 638  
Pendleton, Oregon 97801

Dear Mr. Burke:

**THE CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION'S (CTUIR) CONCERNS ABOUT PROGRESS ON THE COLUMBIA RIVER COMPREHENSIVE IMPACT ASSESSMENT (CRCIA)**

I was disappointed to read in your letter to me of January 6, 1995, that you are not satisfied with the progress being made on the Columbia River Comprehensive Assessment (CRCIA) and that in your opinion, we had failed to consult with the Tribes on any substantive issues associated with the CRCIA.

You outlined three principal concerns associated with the progress of the CRCIA: (1) frequency and effectiveness of past consultation with Tribal representatives; (2) perspectives of the nature, scope, and intended purpose of the CRCIA (including Tribal support for the draft Hanford Federal Facility Agreement and Consent Order change package developed by the U.S. Environmental Protection Agency (EPA); and (3) funding for the CRCIA.

**CONSULTATION**

The CTUIR and the Department of Energy (DOE) both desire an interactive relationship in development of CRCIA project work. I want to make you aware of a number of opportunities the DOE has provided for technical exchange on this issue, which were not reflected in your letter. The CTUIR Hanford Projects staff was not able or did not take full advantage of these opportunities.

Representatives of the CTUIR were invited by the U.S. Department of Energy, Richland Operations Office (RL) in late November 1994 to attend special presentations on the rough draft report titled "Identification of Contaminants of Concern" (COC) for the CRCIA Project. The Confederated Tribes and Bands of the Yakama Indian Nation and the Nez Perce Indian Tribe were also extended this opportunity and they participated in separate meetings. However, the CTUIR declined to have an exchange on the report. The invitation was extended at such a time that their concerns could have been incorporated into the report before it was issued for public review. In addition, a direct offer was made by RL to Mr. J. R. Wilkinson at the December 1994 meeting of the Environmental Restoration Committee of the Hanford Advisory Board to have Pacific Northwest Laboratory (PNL) staff travel to the offices of the CTUIR to discuss progress on the project. The CTUIR have not followed up on this draft COC report is expected to be issued the first week of

HANFORD PROJECT OFFICE  
FEB 8 1995  
ENVIRONMENTAL PROTECTION AGENCY

Mr. William H. Burke

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February 1995, which will provide another opportunity for the CTUIR to have input into the project scope.

Interactions with the CTUIR concerning the sediment sampling in September and October 1994, could have and should have been more extensive. During the last week of July 1994, PNL was directed by RL to apply unallocated FY 1994 funds to a sediment sampling effort. An intense effort then ensued to resolve planning, quality assurance, and contractual issues in about six weeks. A meeting with the CTUIR during that time to discuss the contaminants and sampling locations would have been beneficial. The CTUIR staff was provided with a list of contaminants and sampling locations in such a time frame that their suggestions could have been incorporated into the sampling effort. Changes were made to the sampling plan after the CTUIR were provided the information, based on suggestions received from others. Sampling locations were identified in general terms in the sampling plan to allow the field crew latitude in locating sediment deposits. The field crew then recorded the sampling locations in precise detail.

The CTUIR staff have not been given the laboratory results from the sampling effort; but neither has anyone else outside of PNL, because the results are still coming in from the analytical laboratories. PNL has an open door policy on science for the CRCIA and a representative of the CTUIR is welcome to make an appointment to look through the results that have been received, thus far, from the labs. To make an appointment, contact Mr. Randy Brich, River Sites Restoration Division, on (509) 376-9031. Under current funding expectations, PNL will produce a data report on the sampling results for publication in the summer of 1995, which we will immediately provide to the CTUIR, as well as other interested parties.

#### PURPOSE AND SCOPE

RL negotiated an agreement with EPA and the State of Washington, Department of Ecology (Ecology) to perform a comprehensive impact assessment of the human and ecological impacts attributable to current release of contaminants (e.g., seeps) and the impacts associated with remaining Hanford-derived contaminants (e.g., sediments) to the Columbia River. This data and assessment will be used for the purpose of remedial decisions at the Hanford Site. Near-term cleanup decisions will be based on current conditions; however, RL agrees that data concerning past releases and conditions are valuable for determining the potential for locating areas that may presently be contaminated. This is why the first step in the CRCIA was to produce a data compendium. Additionally, the CRCIA will not duplicate work already completed by state or federal public health agencies. An example of this type of work is the State of Washington, Department of Health's special report titled "Radioactivity in Columbia River Sediments and their Health Effects," March 1994.

009220

Mr. William H. Burke

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## FUNDING

The FY 1995 funding for the CRCIA is \$500,000, not \$300,000 as indicated by the CTUIR. Progress has been hindered by the inability of RL, Ecology, and EPA to agree on the technical peer review.

## CTUIR CONCLUSIONS

I agree with your conclusion that this effort requires frequent consultation at all stages along the way. I respectfully suggest that both Hanford and the CTUIR staffs redouble their efforts at effective consultation to improve not only our governmental relationship but to produce the important quality document we both desire.

We believe the best way to achieve your second conclusion, regarding the scope and purpose of the CRCIA and necessary support, is to establish technical peer reviewers. Until such time that an effective peer review is in place and functioning we believe it would be inappropriate to set the detailed scope and schedule for the CRCIA.

Concerning your third conclusion relative to funding, I agree that the CRCIA will play a critical role in both characterizing river conditions and developing Columbia River corridor remediation goals. We must recognize that this study is one of many important initiatives of Environmental Restoration. The significant reduction of the Department of Energy budget requires difficult decisions regarding multiple objectives and goals. The process of managing the planned and ongoing projects in the arena of diminishing funds is one that concerns all of us but we are committed to doing it in a responsible manner.

I am very aware of the importance to the CTUIR of the completion of the CRCIA in a comprehensive and objective manner and we share the CTUIR's particular interest in the Columbia River. I would like to encourage the CTUIR Hanford Projects staff to continue to work with Mr. Randy Brich in our efforts to achieve meaningful progress in this matter. I also suggest that we try again to organize the float trip on the Hanford Reach that the CTUIR suggested in August 1994.

In an attempt to correct or avoid future misunderstandings, please encourage the Hanford Projects staff to initially contact the Indian Nations Program office (509-376-6332), if they encounter problems with consultation efforts. The Indian Nations Program was established, in part, to address and correct problems in communications with tribal governments. Until your January 6, 1995 letter to me, and January 9, 1995 letter to Secretary O'Leary, we had no indication that there was a problem with effective communication and consultation on the CRCIA.

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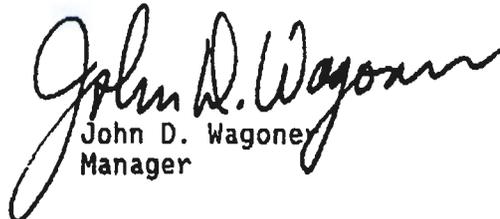
FEB 06 1995

Mr. William H. Burke

-4-

If you desire to discuss this matter further or require additional information, please feel free to contact me, or your staff may contact Mr. Brich.

Sincerely,



John D. Wagoney  
Manager

RSD:RFB

cc: D. Sampson, CTUIR  
R. Jim, YIN  
D. Powaukee, NPT  
R. Buck, Wanapum  
R. Patt, Oregon DOE  
Doug Sherwood, EPA  
Roger Stanley, Ecology



Confederated Tribes and Bands  
of the Yakama Indian Nation

Established by the  
Treaty of June 9, 1855

018479

March 15, 1995

Mr. John Wagoner, Manager  
Richland Field Office  
Department of Energy  
P.O. Box 550 A7-50  
Richland, WA 99352

Dear Mr. Wagoner:

Subject: CHROMIUM CONTAMINATION IN GROUND WATER PLUMES CURRENTLY  
POISONING FISH SPAWNING IN THE COLUMBIA RIVER'S HANFORD REACH;  
REQUEST FOR IMMEDIATE ACTION TO REMEDIATE CONDITION AND ELIMINATE  
SOURCE OF CHROMIUM--

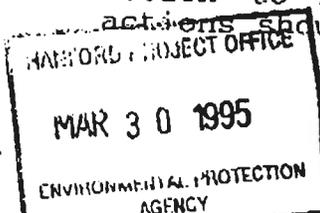
BACKGROUND:

It was recently revealed by river bed sampling sponsored by DOE/RL at the H-Reactor area that elevated levels of a hexavalent chromium chemical species are contaminating fish spawning areas in the rocky river bottom. The levels of hexavalent chromium reported in a conversation between DOE/RL (M. Thompson) and the Yakama Nation (F. Cook) on March 14, 1995 ranged from none observable to 130 ppb in ground water entering the river bottom at locations 100 feet from shore. Toxic levels for small developing salmon is reported to be 11 ppb. However, it is not apparent that the limit of 11 ppb considers mutagenic effects on salmon eggs and developing fish embryos, this effect being an ecological concern of the Yakama Nation.

Chromium contamination is entering the river bed at several locations related to the disposal of sodium dichromate in the past in cribs and ditches at the old reactors. D-Reactor and H-Reactor have significant plumes. However, any location where water with the dichromate species was discharged may be a potential source for river contamination, even if current data reveals no actively moving plume. Chrome remaining in the vadose zone at disposal sites can be mobilized in the future either by river flooding and/ use scenarios that introduce water at the surface, for example irrigations scenarios.

RECOMMENDATION/REQUEST FOR ACTION--

In light of the current contamination entering the river at H-Reactor, the Yakama Nation requests that DOE/RL take immediate action to mitigate this problem. Specifically the following actions should be taken:



Post Office Box 151, Fort Road, Toppenish, WA 98948 (509) 865-5121

ENVIRONMENTAL PROTECTION AGENCY

1. Pump and treat operations which have been demonstrated to adequately remove Chromium from ground water at testing at the D-Reactor should be initiated at the H-Reactor to protect fish spawning this spring. We consider that initial capacity should allow treating 500 gallons a minute. Existing wells should be used first. New wells should be planned considering hydrologic characteristics of the site and the location of plumes as they enter the river to allow more effective remediation of the ground water and to more effectively control the flows. Preparations for each site that is contributing chromium contamination to the river should anticipate the need for 500 gallon per minute capacity to start operations.

2. Use of river level control should be evaluated to control the bank storage of water and the concentration of chromium entering the river. Such river control may be considerably more effective than pump and treat actions.

3. Design work should be immediately started to find, characterize and remediate sources of chromium at the H-Reactor and other reactor sites along the river. This should be accomplished in conjunction with characterization of the vadose zone with respect to other contaminants besides chromium. Our comments with respect to remediation of N-Reactor cribs and ditches contain alternative actions for source remediation that should be considered at the other reactor sites.

4. Evaluation of the hydrology at the sites should include detailed information on the physical dimensions of the unconfined aquifer which is contaminated, small discrete high-conductivity pathways that may exist and be conduits for much of the contaminated groundwater to the river. Knowledge of these conditions should make the remediation by pump and treat more effective through effective pump placement and river water level control.

5. The detailed characterization of the river shore with respect to the extent of contaminant pathways and the actual chemical species carrying the chromium should be accomplished. In addition, action to understand the total chromium in the ground water and its chemistry should be accomplished. For example, does the oxidizing environment found at the surface of the aquifer carrying the chromium effect its speciation or mobility.

6. Differential temperatures between the ground water and the river water may substantially effect the ground water flow during periods of changing river stages. Warm river water bank storage may effect the release of chromium differently than cold river water bank storage. These effects should be modeled so as to determine the effects of changing river stages at different times of the year.

7. Actions should be coordinated with known spawning times of the salmon to avoid unnecessary impacts.

The Yakama Nation considers that actions outlined here are essential to address the unacceptable conditions noted above. It is requested that a course of action to accomplish these actions be incorporated into an integrated plan to mitigate river chromium contamination. Current planning should be revised to reflect the urgency with respect to rapid mitigation of the problem. We request that planning be accomplished with concurrence of the Yakama Nation ER/WM Program. Initiation of robust treatment actions should be initiated promptly, for example, within two months.

Sincerely,



Russell Jim, Manager  
Environmental Restoration/Waste Management Program  
Yakama Indian Nation

cc: K. Clarke, DOE/RL  
L. McClain, DOE/RL  
M. Riveland, WA Ecol.  
C. Clarke, U.S. EPA Reg. 10  
T. Grumbly, DOE/EM  
T. O'Toole, DOE/EH  
Washington Gov. M. Lowry  
U. S. Senator P. Murray  
DNFSB  
D. Sherwood, EPA, Richland



Department of Energy

Richland Operations Office  
P.O. Box 550  
Richland, Washington 99352

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APR 18 1995

Mr. Russell Jim  
Confederated Tribes and Bands  
of the Yakama Indian Nation  
P.O. Box 151  
Toppenish, Washington 98948

018479

100 AREA CHROMIUM CONTAMINATION

This letter is in reply to the Confederated Tribes and Bands of the Yakama Indian Nation (YIN) letter to Mr. John D. Wagoner from Mr. Russell Jim "Chromium Contamination in Ground Water Plumes Currently Poisoning Fish Spawning in the Columbia River's Hanford Reach; Request for Immediate Action to Remediate Condition and Eliminate Source of Chromium--," dated March 15, 1995, which outlines a number of requested actions to be taken within two months to mitigate upwelling of chromium contaminated groundwater into sections of the Columbia River shoreline in the 100-Area. The YIN letter also requests that the actions be integrated into a plan for mitigation of chromium, that planning be revised to reflect the "urgency with respect to rapid mitigation", and that the YIN be involved with (and concur with) the planning efforts.

The letter presumes that the initial results of sampling performed to date provides adequate basis to justify expenditures to install and operate 500 gallons/minute pump and treat systems at H-Area and each site that may be contributing chromium contamination to the river. At this point, the U.S. Department of Energy (DOE) does not agree with this conclusion for the following reasons:

- (1) The initial water quality results are insufficient for final conclusions regarding water quality conditions in salmon redds. In agreement with points raised in the YIN letter, numerous factors may influence the occurrence of chromium-bearing interstitial water in riverbed substrate. These may include preferential pathways for groundwater to flow into the river channel; the dimensions of the interface zone where groundwater and river water meet; and past-practices modifications to the near shore river environment due to reactor construction and operations. The meandering river environment that created the sedimentary framework of the aquifer has resulted in highly variable pathways and rates for groundwater movement. Design of extraction well networks must be balanced with the level of effort to characterize the aquifer being pumped. Plans are included in the work scope for the next year to survey the 100 Areas shoreline to delineate areas of preferential inflow of groundwater to the nearshore environment.
- (2) Based on aerial and underwater observations of substrate types (gravel composition/size) known to be used as spawning habitat by the salmon, the substrate pore water samples from the transect yielding the highest chromium levels occurred in gravels that would not be preferred as spawning habitat. The presence of a more predominant silt/sand matrix

APR 18 1995

within the coarse gravel that contributes to embeddedness (i.e., compaction/concretion) would make the digging of the redds more difficult, would provide less oxygen to the developing salmon, and would be more prone to smothering the developing salmon. Conversely, areas that yielded relatively low levels of chromium have a coarse gravel/cobble complex. Good spawning habitat consists of well aerated, coarse gravel mixed with the cobble.

- (3) Seventeen transects along the riverbank at 100-H have been sampled to date, of which two transects (#1 and #4) have shown hexavalent chromium concentrations that are above the U.S. Environmental Protection Agency Ambient Water Quality Criteria of 11 ug/l (concentration defined as protective of aquatic life). The acute toxicity level for juvenile salmon is considerably higher; 200 ug/l has been observed in laboratory tests as the concentration observed to be lethal to 50 percent of the exposed fish. Additionally, although there is evidence of mutagenic activity from hexavalent chromium in mammals, it does not appear that any mutagenic activity has been observed or reported in salmon from exposure to hexavalent chromium (reference: Eisler, R. 1985, "Chromium Hazards to Fish, Wildlife, and Invertebrates: A Synoptic Review." Fish and Wildlife Service, U.S. Department of the Interior, Biological Report 85, Contaminant Hazard Reviews Report No. 6 Washington, D.C.).
- (4) Treatability tests conducted to date have not shown that chromium removal by pump and treat methods is either effective or efficient in reducing chromium contaminant concentrations in either the unconfined aquifer or in the riverbed gravel environment. Pump and treat testing at 100-D has demonstrated that chromium can be removed from pumped groundwater, but the testing has not demonstrated a measurable improvement to water quality in the unconfined aquifer. This is mostly due to the limited withdrawal capacity of existing wells, and it is considerably less than 500 gpm. Numerous new wells would be required to achieve this capacity.
- (5) Chromium removal from groundwater away from the river will not change the exposure to contaminants within salmon redds for some time to come, due to the relative slow movement of groundwater at 100-D (one-half foot per day estimated), so there is virtually nothing that can be done to change the environment for this year's hatching of young salmon.

It is inappropriate to proceed with additional pump and treat systems based on preliminary inconclusive data concerning impacts caused by upwelling chromium contaminated groundwater. The first year cost to design, construct, and operate a 200 gallon/minute pump and treat system, including wells, is approximately \$5,700,000. Subsequent operational costs are approximately \$800,000/year. The requested capacity of 500 gallons/minute would be somewhat higher. DOE interprets the YIN letter to request installation of such systems, at a higher flow rate, at a minimum of three locations (100-H, 100-D, and 100-K).

Mr. Russell Jim

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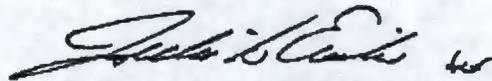
APR 18 1995

River stage control for the purpose of managing the upwelling of groundwater contaminants into the riverbed gravels, as suggested in the letter, may in theory be possible. However, it is probably impractical, considering the competing uses of the river, including managing flows to enhance downstream migration of salmon. In addition, river stage control might help slow the movement of contaminants at the water table, but may not do much to slow movement through the river bed. The hydraulic relationship between the unconfined aquifer and the river is complex and not completely understood; however, current ideas suggest a fairly constant rate of influx of groundwater into the submerged part of the river channel.

Clearly, there is a need to conduct further investigations to understand the exposure of salmon to upwelling of chromium-contaminated groundwater. Sampling will resume in late summer/early fall. DOE will coordinate such studies with the YIN and the studies will be conducted in such a way as to not adversely impact salmon populations. The DOE Richland Operations Office staff attempted on April 7, 1995, to schedule a meeting with the YIN; however, it appears that your travel schedule precludes such a meeting in April 1995. Please contact Mr. K. Michael Thompson at (509) 373-0750 to schedule a meeting at your convenience. Preliminary data, that has been collected to date, will be provided to Mr. F. R. Cook at the Richland, Washington, YIN Office within a week of this letter. RL looks forward to working with the YIN to resolve any issues concerning this subject.

If you want to discuss this matter further or require additional information, please contact Mr. Thompson.

Sincerely,



Linda K. McClain, Assistant Manager  
for Environmental Restoration

RSD:KMT

cc: F. R. Cook, YIN  
D. R. Sherwood, EPA  
R. F. Stanley, Ecology



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10 HANFORD PROJECT OFFICE  
712 SWIFT BOULEVARD, SUITE 5  
RICHLAND, WASHINGTON 99352

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0041053

018479

April 26, 1995

K. Michael Thompson  
100 Area Groundwater Manager  
U.S. Department of Energy  
P.O. Box 550, H4-83  
Richland, WA 99352

Re: Hanford Cleanup Costs In Perspective: Pump-and-Treat for  
Hexavalent Chromium

Dear Mr. Thompson:

This letter provides a perspective to cleanup costs at Hanford, and illustrates the potential for dramatic cost savings. Despite recent efforts to curtail cleanup costs, The U.S. Department of Energy (DOE), U.S. Environmental Protection Agency (EPA), and the Washington State Department of Ecology (Ecology) (collectively the "Tri-Parties") are pressed by fiscal responsibility and budget constraints to achieve further cost efficiencies. This letter provides a tangible example of high Hanford costs and a potential template for efficiency.

The DOE Hanford budget has taken dramatic cuts in recent months. The DOE is commended for taking some of the painful but necessary steps to respond to the budget cuts. In addition to efficiency-oriented efforts, EPA has also been witness to DOE proposals for widespread delays or elimination of necessary cleanup actions.

Critics of the high cleanup costs at Hanford illustrate a DOE bureaucracy and regulatory morass created by State and Federal environmental laws and DOE Orders that stymie cleanup progress. This letter provides an example of cost efficient cleanup at a non-DOE site in accordance with Washington State and Federal environmental laws, in comparison to comparable cleanup at Hanford. The comparison provides insight into the proportion of high DOE costs that are self-imposed. It also raises concerns with recent proposals EPA has seen that would exempt DOE/Hanford from environmental laws or limit environmental liability.

Much of the impetus for the budget cuts is a dissatisfaction with the amount of cleanup that has occurred. The Tri-Parties must respond to the budget crunch by doing even more cleanup at much lower costs. The remainder of this letter illustrates an example that this can be done.

K. Mike Thompson

-2-

April 26, 1995

The Boomsnub site in Vancouver, Washington provides an analog for pump-and-treat operations for chromium in the 100 Area at Hanford. Analogous aspects of Boomsnub include the following:

- \* National Priority Listed (NPL) Superfund site.
- \* Cleanup is administered by a federal agency (EPA).  
(The same federal acquisition regulations apply.)
- \* Similar contaminant, similar media, similar remedial process.
- \* Located in Washington State  
(The same federal and state environmental laws apply.)

The Boomsnub site has an installed operating pump-and-treat system using ion exchange resin. While the above similarities would suggest that cleanup costs should be comparable, there are reasons that the Boomsnub cleanup should be much more expensive than Hanford, namely:

- \* Groundwater chromium concentrations are several hundred times higher at Boomsnub. Thus treatment resins are consumed at a comparable higher rate. This has a direct bearing on resin purchase, disposal and labor expenses (the major component of operations and maintenance costs).
- \* Boomsnub (at 100 gallon/minute) does not have the economy of scale that Hanford would have.

Despite all the reasons that unit cleanup costs for pump-and-treat at Boomsnub should be many times more expensive than at Hanford, its costs are cheaper. Much cheaper. Below are tabulated costs for comparison, all based on pump-and-treat using ion exchange resins:

LOCATION	COST BASIS	O&M* COSTS	RATE	WELLS
Vancouver, WA NPL site (Boomsnub)	actual	0.3 ¢/gal	100 gpm	17
100-HR-3	estimated	1.4 ¢/gal	410 gpm	13
100-HR-3 Test	actual	10.3 ¢/gal	25 gpm	3
100-KR-4	estimated	1.4 ¢/gal	1100 gpm	11

\* Operations and Maintenance

K. Mike Thompson

-3-

April 26, 1995

Three lessons to learn from this:

- (1) Despite efforts thus far, Hanford costs are too high.
- (2) Budget realities must be met by reducing the costs per unit of cleanup, not by reducing the units of cleanup.
- (3) A template is available to dramatically reduce pump-and-treat costs.

Enclosed is much more detail on the design and costs for the Boomsnub system, and an explanation for the cost information in this letter.

I hope that this information helps DOE fulfill its responsibility to ensure that its contractor costs are reasonable. Towards those ends the DOE and its contractors are invited to visit the Boomsnub site and meet with the engineers who designed and implemented the system. The EPA Coordinator is also available for a Boomsnub tour and is amiable to travel to Richland. If you have any questions on this letter, including details in the enclosure, please contact me at (509) 376-9884.

Sincerely,

*Laurence E. Gadbois*

Laurence E. Gadbois  
100-KR-4 Unit Manager

Enc: Hanford Cleanup Costs In Perspective:  
Pump-and-Treat for Hexavalent Chromium

cc: w/Enc:

Dick Biggerstaff, BHI  
Chuck Cline, Ecology  
Greg Eidam, BHI.  
Wayne Soper, Ecology

Administrative Record: 100-BC-5, 100-KR-4, 100-NR-2,  
100-HR-3, 100-FR-3

cc: w/o Enc:

Steve Alexander, Ecology  
Linda McClain, DOE  
Dan Silver, Ecology  
Roger Stanley, Ecology

004P247



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10 HANFORD PROJECT OFFICE  
712 SWIFT BOULEVARD, SUITE 5  
RICHLAND, WASHINGTON 99352

018479

May 18, 1995

Linda K. McClain  
Assistant Manager for Environmental  
Restoration  
P.O. Box 550, A4-83  
Richland, Washington 99352

Re: 100 Area Groundwater Proposed Plans (014477)

Dear Ms. McClain:

The U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology) have received your letter of response (Dale E. Jackson to Douglas R. Sherwood and Steve M. Alexander dated May 12, 1995) to our "Notification of Intent to Invoke Informal Issue Resolution: Pump and Treat for 100-HR-3 and 100-KR-4."

Ecology and EPA continue to be extremely frustrated with delays to issuance of proposed plans and focused feasibility studies for the 100 Areas. Late last year, EPA and Ecology agreed to defer work on the 100-BC-5, 100-HR-3, and 100-KR-4 Proposed Plans and Focused Feasibility Studies, while we worked informally to revise the 100-BC-1, 100-HR-1, and 100-DR-1 Proposed Plans and Focused Feasibility Studies. It is now mid-May and not one of these proposed plans has reached public comment even though we have had repeated informal agreements to do so.

Ecology and EPA can no longer continue this unsuccessful informal working arrangement with the U.S. Department of Energy (DOE). We expect DOE to submit written responses and revised proposed plans for 100-HR-3 and 100-KR-4 on or before the June 9, 1995 date as proposed in the May 12, 1995 letter. It should be noted that in accordance with provision of Section 9.2.1 of the Action Plan in the Hanford Federal Facility Agreement and Consent Order, 100-KR-4 responses were due 30 days after submittal (May 11, 1995) and revised proposed plans are due 45 days after submittal (May 26, 1995). Comment responses and revised documents for 100-HR-3 and 100-KR-4 are due to Ecology and EPA by June 9, 1995.

The primary issue raised in our comments is the selection of the preferred alternative identified by the DOE. Ecology and EPA cannot agree to an institutional control alternative as proposed by DOE. Ecology and EPA maintain that the potential impact of hexavalent chromium on juvenile salmon justifies the need for action. This message is not a new one.

Linda K. McClain

-2-

May 18, 1995

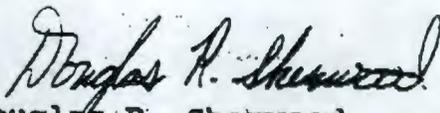
In fact, Ecology and EPA have taken the time and effort to visit another hexavalent chromium remedial action site in Region 10 with DOE's contractors to illustrate the effectiveness of such treatment and provide actual cost data to reduce the projected costs of these actions.

DOE continues to expend funds to reassess existing data and develop new scenarios to justify institutional controls. DOE and its contractors continue to pursue efforts such as development of a "Comprehensive 100 Area Groundwater Strategy Document" to assist in the decision-making process. Ecology and EPA request a full accounting of the expenditures to support the 100-BC-5, 100-KR-4, and 100-HR-3 Operable Unit investigations since the submittal of the proposed plans in September and October of 1994. It is our impression that although Ecology and EPA have agreed to cut back groundwater monitoring requirements and delay action on the proposed plans, that DOE continues to expend resources for little additional environmental value. Please supply the requested cost information by June 9, 1995 along with the revised documents.

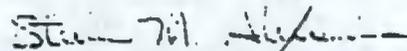
If DOE, Ecology, and EPA are not in agreement as to the preferred alternative for remediation of 100-HR-3 and 100-KR-4 by June 9, 1995, Ecology and EPA will enter into formal dispute resolution under Paragraph 59 of Part III of the Hanford Federal Facility Agreement and Consent Order.

Please contact either of us should you require additional clarification regarding the matters addressed in this letter. We may be reached at (509) 376-9529 or (509) 736-3045 respectively.

Sincerely,



Douglas R. Sherwood  
Hanford Project Manager  
U.S. Environmental  
Protection Agency



Steven M. Alexander  
Perimeter Area Section Manager  
Washington State Department  
of Ecology

cc: Tanya Barnett, AG  
Andy Boyd, EPA  
Julie Erickson, DOE  
Mike Gearheard, EPA  
Mary Harmon, DOE-HQ  
Dale Jackson, DOE  
Steve Liedle, BHI

Jim Rasmussen, DOE  
Randy Smith, EPA  
Phil Staats, Ecology  
Roger Stanley, Ecology  
Mike Thompson, DOE  
Mike Wilson, Ecology  
Administrative Record