

**OREGON
ENVIRONMENTAL QUALITY
COMMISSION MEETING
MATERIALS 07/17/2003**



**State of Oregon
Department of
Environmental
Quality**

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State of Oregon
Department of Environmental Quality

Memorandum

To: Environmental Quality Commission
From: Mikell O'Mealy
Subject: July 17-18, 2003 EQC meeting materials

Date: June 23, 2003

Enclosed please find materials for the July 17-18 EQC meeting, which includes a half-day Willamette River boat tour and monitoring demonstration on Thursday, followed by a regular Commission meeting on Friday at DEQ headquarters. Information on both the tour and the regular meeting is provided in this packet.

Please plan to meet in the ground-floor lobby of DEQ headquarters at noon on Thursday to join a van that will take us to our lunch and tour site. Please also be sure to wear comfortable clothes and walking shoes on this day, as we plan to step off the boat for a short walk around Ross Island during part of the tour. Come prepared for rain, but hope for sun! On Friday, we will meet in Room 3B at DEQ headquarters at 8:00 a.m. for an executive session, followed by a regular meeting that I anticipate will conclude early Friday afternoon.

In addition to these materials, you will receive a briefing book on June 30 (or shortly thereafter) from Dennis Murphey and Sue Oliver in DEQ's Hermiston office. This book will contain background information on three items set for Friday's meeting:

- the draft Health and Ecological Assessment Protocol for the Umatilla Depot (Item F),
- a briefing on the process for approving start-up of chemical agent operations at the Depot (Item G), and
- background information on the monitoring technology used to detect chemical agents in and around the Depot (Item H)

If you have any questions about these materials, please don't hesitate to contact Dennis or Sue at 541-567-8297, extensions 22 and 26, respectively.

I will be out of the office from June 24 until July 14, so if you have any questions about the meeting or these materials, please contact Andrea Crozier (503-229-5990, or toll-free at 1-800-452-4011 ext. 5990 in the state of Oregon).

I look forward to seeing you soon.



Oregon Environmental Quality Commission Meeting
July 17-18, 2003
AMENDED AGENDA (Item H canceled)

Oregon Department of Environmental Quality (DEQ), Room 3A
811 SW Sixth Avenue, Portland, Oregon

Thursday, July 17

On Thursday, the Commission will see a water quality monitoring demonstration of work being done to develop pollution limits for the Willamette River. The Commission will then go on a guided boat tour of Ross Island in the Lower Willamette River to hear an update on the progress of reclamation work at the site.

Friday, July 18 Regular meeting begins at 9:00 a.m.

Prior to the regular meeting, the Commission will hold an executive session at approximately 8:00 a.m. to consult with counsel concerning legal rights and duties regarding current and potential litigation against the Department. Executive session is held pursuant to ORS 192.660(1)(h). Only representatives of the media may attend, and media representatives may not report on any deliberations during the session.

A. Approval of Minutes

The Commission will review, amend if necessary, and approve draft minutes of the May 8-9, 2003, Environmental Quality Commission meeting.

B. *Rule Adoption: Consumer Price Index Fee Increase for Oregon's Clean Air Act Title V Permit Program

Oregon's Clean Air Act Title V permit program applies to the largest industrial sources of air pollution and is entirely funded by fees from permittees. DEQ statutes direct the agency to raise fees as needed to cover program costs, and each year DEQ evaluates whether a fee increase is needed to maintain sufficient program staff. The increase relates to changes in "cost of living," referenced in agency statutes as a Consumer Price Index (CPI) adjustment. Last year, DEQ determined that a CPI adjustment was not needed. This year, however, recent changes in PERS and the cost of employee health care have resulted in the need for a fee adjustment to cover projected 2004 program costs. At this meeting, Andy Ginsburg, DEQ Air Quality Division Administrator, will ask the Commission to approve a CPI adjustment that would raise Title V fees by 4.59 percent.

C. Director's Dialogue

Stephanie Hallock, DEQ Director, will discuss current events and issues involving the Department and the state with Commissioners.

D. Informational Item: Status Update on the Umatilla Chemical Agent Disposal Facility

Dennis Murphey, DEQ Chemical Demilitarization Program Administrator, will update the Commission on the status of status of trial burns, public outreach efforts, legal

proceedings, and other issues related to the Umatilla Chemical Agent Disposal Facility (UMCDF).

E. Action Item: Umatilla Chemical Agent Disposal Facility Brine Reduction Area Permit Modification

Dennis Murphey, DEQ Chemical Demilitarization Program Administrator, and Tom Beam, DEQ Senior Environmental Engineer, will propose a permit modification to require operation of the Brine Reduction Area to process all liquid wastes from UMCDF pollution control systems. Off-site shipment of liquid wastes would be allowed only when specific criteria are met. DEQ took public comments on the permit modification in November and December 2002. The Commission does not intend to take public comment on the proposal at this meeting.

F. Informational Item: Briefing on Draft Health and Ecological Risk Assessment Protocol for the Umatilla Chemical Agent Disposal Facility

Sue Oliver, DEQ Senior Hazardous Waste Specialist, will give a briefing on the draft Health and Ecological Risk Assessment Protocol that the Department will use to evaluate potential health and environmental risks from operation of the UMCDF. In 1996, DEQ developed an initial risk assessment using emissions data from other demilitarization facilities. A second risk assessment will now be conducted using new EPA risk assessment guidance and data from UMCDF trial burns and other chemical agent disposal facilities nationwide. DEQ is taking public comment on the risk assessment, and plans to finalize the protocol prior to the start of chemical agent operations at UMCDF.

G. Informational Item: Briefing on the Approval Process for the Start of Chemical Agent Operations at the Umatilla Chemical Agent Disposal Facility

The Commission will hear a briefing on the process the Department will use to assess the readiness of the UMCDF to begin chemical agent operations. The DEQ hazardous waste permit for the facility requires Commission approval for the start of agent operations. Later this year, the Commission plans to hold two meetings in Hermiston; one to take public comment on the readiness of the facility to start agent operations, and a second to take action on approving the start of chemical agent incineration at UMCDF. The Commission will discuss plans for the Hermiston hearings at this meeting.

~~H. Informational Item: Briefing on Chemical Agent Monitoring Technology Used at the Umatilla Chemical Agent Disposal Facility~~

~~The Commission will hear a briefing on the various chemical agent monitors used to detect chemical agents in and around the UMCDF. The Commission expressed interest in hearing more about chemical agent detectors at the May 9, 2003, EQC meeting.~~

Moved to the August 14-15, 2003 EQC meeting

I. Commissioners' Reports

Adjourn

Upcoming 2003 Commission meetings: August 14-15, October 9-10, December 4-5

Agenda Notes

*Hearings have been held on Rule Adoption items and public comment periods have closed. In accordance with ORS 183.335(13), no comments may be presented by any party to either the Commission or Department on these items at any time during this meeting.

Copies of staff reports for individual agenda items are available by contacting Andrea Crozier in the Director's Office of the Department of Environmental Quality, 811 SW Sixth Avenue, Portland, Oregon 97204; telephone 503-229-5990, toll-free 1-800-452-4011 extension 5990, or 503-229-6993 (TTY). Please specify the agenda item letter when requesting reports. If special physical, language or other accommodations are needed for this meeting, please advise Andrea Crozier as soon as possible, but at least 48 hours in advance of the meeting.

Public Forum: The Commission will break the meeting at approximately 11:30 a.m. on Friday, July 18, to provide members of the public an opportunity to speak to the Commission on environmental issues not part of the agenda for this meeting. Individuals wishing to speak to the Commission must sign a request form at the meeting and limit presentations to five minutes. The Commission may discontinue public forum after a reasonable time if a large number of speakers wish to appear. In accordance with ORS 183.335(13), no comments may be presented on Rule Adoption items for which public comment periods have closed.

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Mark Reeve, Chair

Mark Reeve is an attorney with Reeve Kearns in Portland. He received his A.B. at Harvard University and his J.D. at the University of Washington. Commissioner Reeve was appointed to the EQC in 1997 and reappointed for a second term in 2001. He became Chair of the EQC in 2003. Commissioner Reeve also serves as Co-Chair of the Oregon Watershed Enhancement Board.

Tony Van Vliet, Vice Chair

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Lynn Hampton was appointed to the Commission in May 2003 by Governor Kulongoski and is awaiting Senate confirmation to make her appointment official. Lynn is a long-time resident of Pendleton who serves as Tribal Prosecutor for the Confederated Tribes of the Umatilla Indian Reservation. Lynn received her B.A. at University of Oregon and her J.D. at University of Oregon School of Law. She previously served as a Deputy District Attorney for Umatilla County.

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Mikell O'Mealy, Assistant to the Commission

Telephone: (503) 229-5301

Oregon Environmental Quality Commission Meeting July 17-18, 2003

Oregon Department of Environmental Quality (DEQ), Room 3A
811 SW Sixth Avenue, Portland, Oregon

Thursday, July 17

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Willamette River Boat Tour and Monitoring Demonstration Agenda for July 17, 2003

On July 17, the Commission will see a water quality monitoring demonstration of DEQ's work to develop pollution limits (i.e., Total Maximum Daily Loads, or TMDLs) for the Willamette River. We will then go on a guided boat tour of Ross Island in the Lower Willamette River to hear an update on the progress of reclamation work at the site, as well as the status of clean-up work in Portland Harbor. *Please wear comfortable clothes and walking shoes*; we will step off the boat for a brief walk around parts of the Island during the tour. Prepare for rain and hope for sun. Below is the agenda for our day and attached are background materials for advance reading.

- 12:00** Meet in the ground-floor lobby of DEQ headquarters in downtown Portland. From there, we will take a van to the nearby Willamette Park boat dock.
- 12:15 – 12:30** We will eat **lunch at the Willamette Park gazebo** while Mike Rosen, DEQ Northwest Region Voluntary Cleanup Manager, gives an overview of what we will see and do for the day.
- 12:30 – 1:30** Continuing the lunch presentation, Jared Rubin and Greg Aldrich will give an update on DEQ's **development of Willamette River TMDLs**. Jared is DEQ's lead staff working on the TMDLs and Greg is our TMDL program manager.
- 1:30 – 2:30** Greg Pettit, Watershed Assessment Manager in DEQ's Lab, and Steve Mrazik and Dennis Ades, working on water quality monitoring, will give a detailed demonstration of **DEQ's sampling methods for chemical pollutants** in the Willamette. Discussion time is planned so come ready with questions.
- 2:30 – 3:30** Jennifer Sutter, DEQ's lead staff for work at Ross Island, and Mike Rosen will give a presentation on the **progress of reclamation work at the Island** to prepare for the boat tour. Lauri Warner from the Division of State Lands, and representatives of Ross Island Sand & Gravel will join us for the presentation. Discussion time is planned.
- 3:30 – 4:30** The Ross Island Sand & Gravel boat will pick up our group at 3:30 for a **one-hour tour of Ross Island**, during which we will get off the boat for a short walk on the Island and discuss future management plans for the site. Mike Rosen will update the Commission on the status of clean-up work in Portland Harbor, and Keith Johnson, DEQ's Cross Program Coordinator, will discuss progress on reducing toxics in the environment.
- 4:30 – 4:45** At 4:30, the van will pick us up from the Ross Island Sand & Gravel boat dock and bring Commissioners **back to DEQ headquarters**. We'll end the day here, and meet at on Friday at 8:00 a.m. at DEQ headquarters in Room 3B for an executive session before starting the regular meeting.

**Speaker Biographies for the
July 17, 2003 EQC Tour**

Jim Rue

Environmental Manager for Ross Island Sand & Gravel

Four and one half years as general manager environmental affairs of Ross Island Sand & Gravel (RISG). Prior to that, Deputy Secretary of PA Department of Environmental Protection (DEP), responsible for air, waste and radiation protection programs for the Commonwealth of PA. Prior to that, Regional Director of the Philadelphia region of PA DEP. Co-founder of a Biotech Company in Philadelphia and director of operations for three years. Three years as assistant director of the Audubon Society of Rhode Island. Masters of Forest Science and Masters of Business Administration from Yale. Bachelors of Science in Gen Bio from Pacific Lutheran University in Tacoma. Member of the Board of Agriculture for 4 years.

Julie Wilson

PhD, Associate, EnviroIssues, Project Manager for Ross Island Sand & Gravel

Do you wonder exactly how mercury contamination can affect a nearby day care? Julie is a national toxicology expert with the know-how to understand and explain technical information to any audience imaginable. She takes complex information and translates it for decision-making by property owners, elected officials, legal teams, and department leaders. Julie has worked in both the private and public sector for the past 20 years, excelling at regulatory interpretation, risk assessment, site cleanup, and radiation safety. No issue is too complex for Julie - from a remedial investigation and reclamation plan for a gravel mining and processing facility in Portland, evaluating and developing a strategy for area-wide arsenic and lead soil contamination across Washington State, to developing a voluntary cleanup program for the state of Wyoming. If these challenges weren't enough for her, Julie has opened EnviroIssues' Portland Office and is getting to know the I-5 corridor between Seattle and Portland better than the litter cleanup crews!

Commissioner Erik Sten

A native of Portland, Commissioner Erik Sten has been elected to the City Council three times. His current term will expire in December, 2006.

Erik attended Irvington Elementary School, Fernwood Middle School, and Grant High School. He entered Stanford University as a National Merit Scholar and graduated with a Bachelor of Arts degree. He presently lives in Northeast Portland with his wife, Marnie.

As a Portland City Commissioner, Erik is directly responsible for the day-to-day management of Portland's Bureau of Fire, Rescue and Emergency Services and the Bureau of Housing and Community Development. He also has special assignments to direct Portland's programs on energy policy, global warming, the Regional Arts & Culture Council, and the Endangered Species Act. Erik previously directed the Bureau of Environmental Services, Water Bureau, Portland Energy Office (presently the Office of Sustainable Development), Bureau of Emergency Communications, and the Office of Cable Communications and Franchise Management.

Erik began his career in public service as Chief of Staff for now retired Portland City Commissioner Gretchen Miller Kafoury. While in this role, he served as her liaison to the Bureau of Housing and Community Service where, because of his passion for affordable housing issues and the plight of poor people, he quickly became a community leader.

Erik is a leader focused on shaping Portland as *the* preeminent 21st century city. He believes Portland can demonstrate how a city can work in a new era. Portland can be the place in the world that demonstrates that by protecting the environment, the economy will strengthen. He insists that Portland forge the way in designing infrastructure that doesn't hurt the environment. He is resolute that Portland works for people at all income levels. He is intent to see all of Portland's neighborhoods wired for up-to-date computer access. Erik works diligently to ensure that every person in the city has a voice in community issues. He pushes Portland's City government to be responsive and efficient so that it can provide the highest quality services available.

An Innovative and Experienced Community Leader:
~Accomplishments~

Thanks to the help of many great city leaders and some excellent City employees, Erik has been able to accomplish a great deal on a number of fronts:

☐ *The Environment*

Pushing for the Utmost Protection of Portland's Drinking Water. For 5 years, Erik worked with Oregon's congressional delegation to pass the Little Sandy Watershed Protection Act. President Bush finally signed the legislation in August, 2001. The Act applies strict protections on all parts of the Bull Run Watershed and includes the Little Sandy Watershed, which buffers the Bull Run. The legislation gives Portland citizens confidence that their drinking water comes from one of the most protected watersheds in the nation.

Protecting Johnson Creek Homes from Flooding. For a number of reasons, Johnson Creek has flooded SE Portland properties for generations. The flooding was caused by a number of issues. The primary cause being the fact that the creek's channels have been changed and developed over the years, hurting salmon habitat and increasing flooding to homes and property. In addition, the urbanization of the hillsides upstream increased the flow of water during heavy rainstorms. Finally, houses and businesses were built in the floodplain, exposing them to risk due to the natural systems of the creek. Several efforts were made over the years to solve this flooding problem--each one foundered because of intense neighborhood opposition to government intervention and regulation.

Erik worked closely with the community to craft a solution. He tailored the response to fit local perspectives and enlisted the help of the federal government. As a result, the City of Portland has purchased and restored dozens of acres of habitat along the creek, and built projects that allow the creek to flood in a natural way without harming people or property. The federal government, prodded by local residents and impressed by City efforts, eventually lowered flood insurance rates--saving residents hundreds of dollars apiece.

Making Room for Endangered Salmon and Trout. In May, 1999, Erik, Oregon Governor John Kitzhaber and Portland General Electric (PGE) President Peggy Fowler announced an agreement to remove two dams in the Sandy River watershed. This plan to remove the Marmot and Little Sandy dams marks the first time a privately-owned utility has joined with state and city governments to voluntarily remove dams on fish-bearing waterways. Once the dams are removed, endangered salmon and trout will have access to an additional 22 miles of spawning habitat.

Getting People Involved to Protect the Environment. Erik joined with Portland General Electric, the Confederated Tribes of the Grand Ronde and the Spirit Mountain Community Fund on a habitat improvement strategy for the region. The partnership led to the creation of the Team Up! Program, which is coordinated by SOLV. The program links volunteers and resources from area companies with habitat restoration projects throughout the metro area.

☐ *Community Vitality*

Providing Affordable Housing for the Future. Working with the Enterprise Foundation, Erik helped establish the nation's first Smart Growth Fund. This \$20 million dollar loan fund is available to jurisdictions throughout the metropolitan area. The fund will be used to acquire property for future development of affordable housing or mixed-use projects in transit corridors. While the fund is available to all jurisdictions in the region, the City of Portland was the first city to take advantage of the fund. The Smart Growth Fund is a model program that can help communities throughout the nation land bank property at low cost for future community development purposes.

Championing Portland as the Center of the Green Economy. The Portland community prides itself on protecting the environment and promoting livability. The economic vitality of Portland demonstrates that it is not necessary to have to choose between the economy and the environment. In fact, they are critically linked. Companies have demonstrated that those who are willing to preserve natural resources, such as energy and water, save money. Erik is a strong proponent of capitalizing on Portland's environmental values and image and putting them to work in our economy. He is working closely with Mayor Katz and Commissioner Saltzman and many members of the community to brand Portland as the center of the green economy.

Working to Ensure Affordable Housing for All. In 2000, Erik joined the Mayors of Beaverton and Gresham to form *Oregon HOME*. *Oregon HOME* is a regional organization devoted to galvanizing and uniting local elected officials around the issue of affordable housing. The group agreed to pursue strategies to create a Regional Affordable Housing Fund. *Oregon HOME* will serve as a national model for effective regional collaboration devoted to develop and preserve affordable housing for low-income citizens.

Working to Bridge the Digital Divide . Erik is working in important ways to bridge Portland's digital divide. He is working very closely with the national non-profit, One Economy, to provide residents of low-income housing with computers and internet access. One Economy, in partnership with local community development corporations, is making computers available to low-income people throughout Portland. In addition, Portland's Bureau of Housing and Community Development is developing a web-database of affordable housing opportunities. The goal is to make it easier for individuals and agencies to locate affordable rentals.

Erik led Portland's stand on open access that changed the terms of the national debate about Internet Service Providers access to cable companies' high speed internet platform. As a result, consumers who use cable modems will eventually have the same choice of internet service providers as dial-up customers do. Competition among providers is key to maintaining affordable prices for access to the internet.

Gathering the Community to Take-on Neighborhood Gentrification. In 1999, Erik joined community advocates to address the issue of gentrification in Northeast Portland. Following a series of community forums on the topic, Erik won City Council support for a \$1.5 million anti-displacement strategy for the Interstate Corridor Urban Renewal Area. The money will be used to prevent involuntary displacements due to redevelopment activities in Portland's newest urban renewal zone. In its first phase, approximately 1,000 at-risk households will be identified and specific housing assistance will be provided to at least 350 of those families. If this pilot project is successful, additional resources will be made available to help low-income families take advantage of new development in their community without being forced to move because of rising rents and property values.

☐ Government Efficiency

Pushing for Efficiency in City Government. Due to frustration and anger about rising property taxes, Oregon voters capped the revenues available to local governments and schools by passing Measures 5 and 47. In addition, other sources of government revenues are flat or in decline, putting essential City services like police, fire and parks under financial pressure. In response, Erik submitted a proposal to City Council that called on the City to get its own house in order before cutting direct services to citizens. He targeted duplication in human resources, financial planning and information technology. He also pushed for cuts to expensive outside consultant contracts. All together, these cuts save \$10 million a year, protecting funding for police, fire and parks and other direct services.

Reducing Water and Sewer Rates for Portland Citizens. In 1998, Erik led a successful fight to reduce Portland's franchise fee on the City's water and sewer services. This saved ratepayers hundreds of thousands of dollars annually. Erik continued to work to change unfair aspects of Portland's water and

sewer rates. He fought to give people credit for keeping rain out of the City's overtaxed sewer system. He also convinced the City Council to reduce the \$32 worth of service charges on water and sewer bills by 70%. This change alone continues to save residents a total of \$8 million a year.

~Honors~

In June, 2002, Erik was awarded a Fannie Mae Foundation Fellowship to attend Harvard University's John F. Kennedy School of Government. The fellowship is targeted at outstanding senior executives in state and local government who work on affordable housing issues. The curriculum focused on intensive leadership training and decision-making skills.

Columbia River Inter-tribal Fish Commission, Award for Local Government Partnership to the Portland Endangered Species Act Program, August, 2001.

Oregon Sierra Club, Elected Official of the Year, 1999.

United Nations Conference of the Parties on Climate Change, Presenter, 1998.

Oregon Business Journal, "Ones to Watch", 1997.

State of Oregon Excellence in Housing Award, 1995.

Ma Curtis Award for Social Activism, 1995.

Mike Houck

Director of the Urban Greenspaces Institute and Urban Naturalist, Audubon Society of Portland

He has a BS in Zoology from Iowa State University (1969) and a Masters of Science in Teaching, with an emphasis in plant ecology and plant physiology, from Portland State University, Portland, Oregon (1972).

Mike founded the Urban Greenspaces Institute in 1999 to provide a venue for working on urban design and park issues as part of his work on growth management issues. Since 1982 Mike has served as the Audubon Society of Portland's Urban Naturalist and as Director of the Society's Metropolitan Wildlife Refuge System project. The Audubon Society of Portland was one of the founding members of the Coalition For A Livable Future (CLF). Mike works with other Coalition members and the Coalition's Natural Resources Working Group to ensure the integration of affordable housing, transit alternatives, urban design, compact urban form, and the urban Greeninfrastructure (urban fish and wildlife habitat, wetlands, urban streams, parks, regional trails) into regional growth management strategies. Mike is co-editor of *Wild in the City, a Guide to Portland's Natural Areas*, a natural history guide to the Portland metropolitan region. In April, 2003 he published *Wild on the Willamette, A Guide to the Lower Willamette River*.

Honors

Oregon Trout "Riverkeeper Award" for conservation of urban streams, 1989.

Chevron Corporation national conservation award for the Metropolitan Wildlife Refuge System project, May 1990.

Oregon Department of Fish and Wildlife Commission award for work on Urban Wildlife Habitat issues, July 1990.

Oregon chapter, American Society of Landscape Architects "Conservation of The Urban Landscape" award, September 1990.

American Planning Association, Oregon Chapter 1991 award for contributions to Oregon's land use planning program in the urban environment.

George Russill Community Service Award, through the Oregon Community Foundation, 1991.

National Wetlands Conservation Award, Environmental Law Institute, Washington, D. C., 1994.

Designated as a "Giraffe" by The Giraffe Project, awarded to "Giraffes" who stick their necks out in community-oriented work, July 18, 1995.

Heidelberg Award for Environmental Excellence, Heidelberg International Club, Heidelberg, Germany, November 30th, 2002. The Heidelberg Award for Environmental Excellence was established in 1995 to encourage environmental action worldwide. It acknowledges tangible results which will be of lasting benefit to the natural environment.

Was accepted as a Loeb Fellow at the Harvard School of Graduate Design for fall, 2003 through spring, 2004.

State of Oregon
Department of Environmental Quality

Memorandum

To: Environmental Quality Commission

Date: June 24, 2003

From: Greg Pettit
Watershed Assessment Section, Laboratory Division

Subject: EQC Willamette River Tour and Water Quality Monitoring Demonstration

I am delighted that we will be able to conduct a monitoring demonstration and discussion during the upcoming July EQC meeting. We will be meeting at Willamette Park near downtown Portland for a demonstration of water and sediment sampling procedures by Laboratory Watershed Assessment Program staff. The purpose of this portion of the field trip is two fold. First, we would like to demonstrate the sampling and field analysis procedures that are used in our Ambient River Monitoring Program throughout the state. This program has been continuously operated since the late 1940s, and is the cornerstone of our water quality monitoring and watershed assessment program. Data from the Ambient River Monitoring Program is used to determine long term water quality trends, to identify stream segments and water quality parameters that are not meeting environmental and public health standards, and to develop pollution loads for those stream segments to control the amount of pollution they receive from various sources. Pollution loads are developed in terms of "Total Maximum Daily Loads," or TMDLs, for stream areas. Information collected through our the Ambient River Monitoring Program also helps us evaluate the effectiveness of TMDL limits over time. We will discuss the state's TMDL program and the Willamette Basin TMDLs over lunch.

The second purpose of the field trip is to demonstrate and discuss the monitoring work DEQ is doing to support the development of the Willamette Basin TMDLs. Included will be a demonstration of sediment sampling procedures. Contaminated sediments are often the primary sources of concern for toxic chemicals that are polluting our rivers and streams. After the demonstration of our monitoring procedures, we will have plenty of time discuss DEQ's monitoring programs and the progress of this effort.

I have included for your review, a report that was presented at the "Willamette State of Knowledge Summit" that was held last year in Corvallis. The report, "Overview of Water Quality in Willamette River Basin Based on the OWQI," is intended to provide a big picture overview of water quality conditions within the Willamette River Basin. The report describes both spatial and temporal trends in water quality based on the Oregon Water Quality Index (OWQI). Included is a map of water monitoring locations in the Basin that have been sampled for both surface and groundwater, and a map showing the relative quality of individual stream segments. Also attached is a general update on the development of Willamette Basin TMDLs, which we will discuss in greater detail during the trip.

Accurate and reliable assessment of watershed conditions is the foundation for appropriately targeted and effective water quality management. I am grateful for your interest in this subject and an opportunity to discuss it with you, and am looking forward to seeing you on July 17th. If you have any questions in advance or would like to discuss DEQ's watershed monitoring programs, please call me at (503) 229-5349.



Overview of Water Quality in Willamette River Basin Based on the Oregon Water Quality Index (OWQI)

*Presented By Greg Pettit
Manager Water Quality Monitoring Oregon DEQ
Willamette State of Knowledge Summit
La Salle Stewart Center, Corvallis Oregon
May 29, 2002*

Background:

The Willamette River Basin is the 13th largest river basin in the conterminous United States in terms of stream flow and produces more runoff per square mile than any of the other larger rivers. Over 2 million people (1990 data) or 70 percent of Oregon's population live in the Willamette Basin. Forested land (70 percent of the basin) dominates the foothills and mountains of the Coast and Cascade Ranges. Agricultural land, mostly cropland, comprises 22 percent of the basin and is located primarily in the Willamette Valley. Urban land (6 percent of the basin) is located primarily along the mainstem Willamette River. Total Maximum Daily Loads (TMDLs) have been approved by EPA for the Willamette River mainstem for dioxin; Tualatin River for temperature, bacteria, DO, solids, ammonia, chlorophyll a, pH, phosphorous; Yamhill River for phosphorous; Pudding River for Ammonia, BOD; Rickreall Creek for BOD; and Coast Fork Willamette for ammonia, phosphorous.

This report only presents a summary of Oregon Water Quality Index (OWQI) findings from the Department's ambient river monitoring sites in the Willamette Basin. In addition to the ambient monitoring network there have been numerous toxics studies, mixing zone studies, TMDL studies, groundwater studies, and biological surveys conducted by the Department and other agencies in the Willamette basin. The findings of those studies are not included in this report.

Ten-year OWQI seasonal averages are computed for summer (June through September) and fall, winter, spring. All OWQI scores reported are the minimum of these seasonal averages.

Ambient Monitoring Network:

The Department maintains a network of 44 ambient water quality monitoring sites in the Willamette Basin. Six Willamette mainstem sites are sampled monthly, 13 sites in the Clackamas, North Santiam, and McKenzie basins are sampled 8 times per year, and the remaining sites are sampled 6 times per year. Samples are analyzed for conventional indicators of water quality such as pH, dissolved oxygen, temperature, nutrients, and bacteria. Currently samples are analyzed for 21 water quality variables. These samples are not analyzed for toxic substances such as mercury or pesticides. The purpose of the network is to assess water quality status, compliance with standards, and spatial and temporal trends. Some of the sites in the network have been routinely sampled since 1949. The consistency of the sampling provides an excellent basis for long-term trend analysis.

Spatial Trends:

Spatial trends in water quality are displayed on the attached map of OWQI Status and Trends. Water Quality within the basin ranges from excellent to very poor (Table 1). As a general rule, water quality in streams decreases from headwaters to mouth. As the water travels along its course added pollutants are cumulative, slope decreases, and land uses become more agricultural and urban. This pattern holds true in the Willamette mainstem and most of its tributaries.

The streams that drain the west slope of the Cascade Mountain range all have good to excellent water quality. Those streams are the Sandy, Clackamas, Mollala, North Santiam, So. Santiam, McKenzie, and Mid Fork of the Willamette. The 6 sites with the highest OWQI scores in the state are all located in the McKenzie, Clackamas and North Santiam River basins. OWQI scores in these streams ranged from 88 at the Mollala to 96 at the South Fork of the McKenzie. Generally, there is a slight decrease in OWQI scores from headwaters to mouth, but these streams remain good to excellent throughout their length.

Streams whose watersheds contain a higher percentage by area of valley agricultural lands have fair to poor OWQI scores. Those streams are the Long Tom, Calapooia, Mary's River, Yamhill, and Pudding. Mary's River, which has the highest percentage of forestlands in this group is the best of these with a fair OWQI score (81). The Pudding River at Woodburn, which has the highest percentage of agricultural land is the worst of this group with a very poor score (51).

Streams with watersheds with large areas of urban lands have poor to very poor water quality. These streams are all in the Portland Metropolitan area and are the Tualatin (and tributaries), Johnson Creek, and Columbia Slough. The best of this group is the Tualatin River at Rood Bridge (most upstream site) with a poor score (73) and the worst is Johnson Creek at SE 17th, with a very poor score (26). The lower most site on the Tualatin at Boones Ferry Rd. has a very poor score of 55. The Columbia Slough at Landfill Rd is similar to Johnson creek and scores 29. Although water quality in these Portland area streams is poor to very poor, it is not the worst in the state.

Water Quality in the mainstem of the Willamette starts off as excellent and slowly declines towards the mouth of the river. The Willamette River at Springfield has excellent water quality (92), by the time the river has reached the SP&S Railroad Bridge near St. Johns the OWQI has declined to a poor 75.

Temporal Trends:

OWQI data from each ambient river network site is analyzed for the presence of significantly increasing or decreasing trends. The nonparametric Seasonal-Kendall test is used for trend analysis to ensure that the significant trends that exist are not due to normal seasonal variation. Significant trends are reported at the 80% confidence interval. If available a 10-year period is trended but a minimum of 30 sampling events is required for this type of trending.

Of the 44 sites in the basin, 1 had insufficient data for trending, 8 sites showed no significant trend, 1 site (So. Fork McKenzie) had a slight decreasing trend, and 35 sites had improving trends.

Streams with poor and very poor water quality have the largest room for improvement. This is certainly the case in the Willamette Basin. The west slope Cascade streams that have the highest water quality generally showed no trends, or slight improving trends, and the one site in the state, that has the highest score, was the only site in the state with a declining trend (no place to go but down). The most improved sites, are those that had poor and very poor water quality in the Tualatin and Yamhill River Basins where TMDLs have been developed and Water Quality Management Plans are being implemented. Water quality improvements in these basins can be directly traced to those activities.

All of the sites in the Tualatin basin show strong improving trends in water quality. The magnitude of the 10-year trend slope ranges from 9.8 at Fanno Creek to 24.4 at the Tualatin at Boones Ferry Rd. The largest improvements are in the main stem Tualatin and can be attributed to reduced pollutant loading from sewage treatment plants. Fanno and Beaverton Creeks also have strong improving trends as well. This provides strong evidence for the success of other activities occurring in the basin such as nutrient controls, and storm water management. These overall improvements in water quality in the Tualatin basin or even more remarkable considering the phenomenal population growth the basin has been experiencing over this same time period.

The Yamhill River basin sites also have strong improving water quality trends, ranging from 4.1 at the South Yamhill at Hwy 99W to 9.9 at the Yamhill at Dayton. Evidence is again strong that some of this improvement can be attributed to activities being implemented through the TMDL Water Quality Management Plan.

Other Willamette River tributary ambient network sites in the basin have moderately improving to no trends.

All sites on the mainstem of the Willamette have improving water quality trends. The least improvement is at the Willamette at Springfield, the only site that was already in excellent condition. Sites in the middle section of the river, all range in improvements from 4.0 to 8.9. The greatest improvements are at the sites with the lowest scores, and are in the lower river at Portland, ranging in improvement from 9.9 to 10.1. The greatest improvement is at the lowest site on the river, the Willamette at SP&S Railroad Bridge.

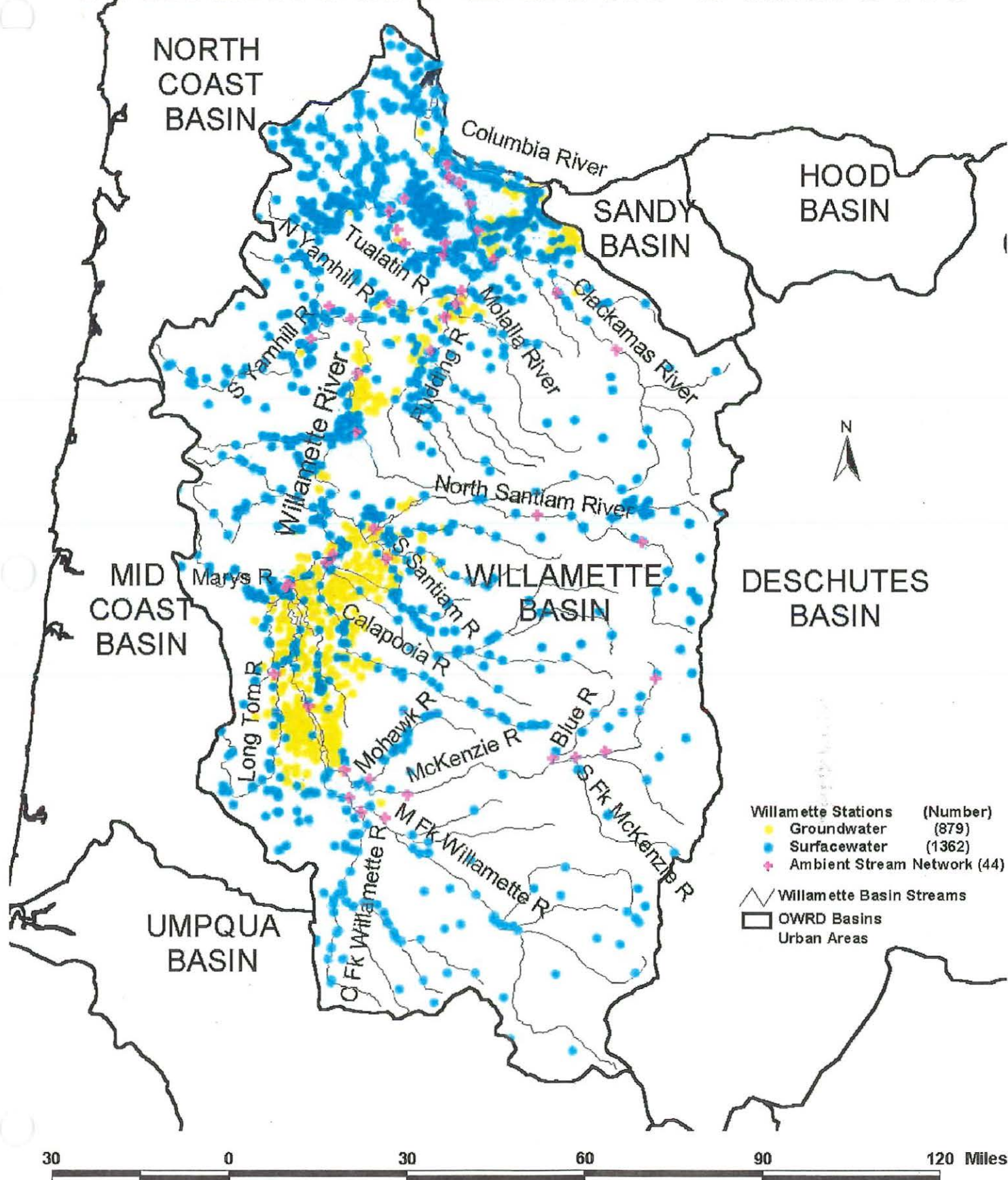
Table 1 OWQI Status and Trends Summary Willamette Basin 1991-2000

Basin	Site	RM	Score	Category	Trend	Magnitude
Willamette - Lower	Beaverton Ck. at 216th St. (Orencia)	0.3	54	vp	Inc.	+10.2
Willamette - Lower	Clackamas R. at High Rocks	1.2	89	g	Inc.	+6.7
Willamette - Lower	Clackamas R. at McIver Pk. (Upper Boat Ramp)	22.6	94	e	ID	
Willamette - Lower	Clackamas R. at Memaaloose Rd.	35.7	90	e	NT	
Willamette - Lower	Columbia Slough at Landfill Rd.	2.6	29	vp	Inc.	+8.3
Willamette - Lower	Fanno Ck. at Bonita Rd. (Tigard)	2.3	62	p	Inc.	+9.8
Willamette - Lower	Johnson Ck. at SE 17th Ave. (Portland)	0.2	26	vp	NT	
Willamette - Lower	Tualatin R. at Boones Ferry Rd.	8.6	55	vp	Inc.	+24.4
Willamette - Lower	Tualatin R. at Elsner Rd.	16.2	65	p	Inc.	+18.5
Willamette - Lower	Tualatin R. at HWY 210 (Scholls)	26.9	63	p	Inc.	+12.5
Willamette - Lower	Tualatin R. at Rood Br.	39.0	73	p	Inc.	+12.5
Willamette - Lower	Willamette R. at Hawthorne Br. (Portland)	13.2	79	p	Inc.	+9.9
Willamette - Lower	Willamette R. at SP&S RR Br. (Portland)	7.0	75	p	Inc.	+10.1
Willamette - Lower	Willamette R. at Swan Island Channel midpoint	0.5	73	p		+9.1
Willamette - Middle	Mollala R. at Canby	3	88	g	Inc.	+3.3
Willamette - Middle	North Santiam R. at Cooper Ridge Rd.	63.8	95	e	NT	
Willamette - Middle	North Santiam R. at Gates School Rd.	39.0	93	e	Inc.	+2.5
Willamette - Middle	North Santiam R. at Green's Br.	2.9	92	e	Inc.	+3.3
Willamette - Middle	North Yamhill R. at Poverty Bend Rd.	4.5	73	p	Inc.	+7.5
Willamette - Middle	Pudding R. at HWY 211 (Woodburn)	22.4	51	vp	Inc.	+14.6
Willamette - Middle	Pudding R. at HWY 99E (Aurora)	8.1	57	vp	Inc.	+10.6
Willamette - Middle	South Santiam R. at HWY 226 (Crabtree)	7.6	91	e	Inc.	+5.0
Willamette - Middle	South Yamhill R. at HWY 99W	16.5	77	p	Inc.	+4.1
Willamette - Middle	Willamette R. at Canby Ferry	34.4	83	f	Inc.	+7.9
Willamette - Middle	Willamette R. at Newburg Br.	48.6	82	f	Inc.	+8.3
Willamette - Middle	Willamette R. at Salem	84	84	f	Inc.	+6.3
Willamette - Middle	Willamette R. at Wheatland Ferry	71.9	85	g	Inc.	+8.9
Willamette - Middle	Yamhill R. at Dayton	5.0	68	p	Inc.	+9.9
Willamette - Upper	Blue R. at Blue River Dr.	0.3	95	e	NT	
Willamette - Upper	Calapooia R. at Queens Rd. (Albany)	3.0	70	p	Inc.	+9.0
Willamette - Upper	Coast Fk. Willamette R. at Mt. Pisgah Pk.	3.0	86	g	NT	
Willamette - Upper	Long Tom R. at Stow Pit Rd. (Monroe)	4.7	76	p	Inc.	+5.7
Willamette - Upper	Mary's R. at HWY 99W (Corvallis)	0.2	81	f	Inc.	+3.3
Willamette - Upper	McKenzie R. at Coburg Rd.	7.1	92	e	Inc.	+3.9
Willamette - Upper	McKenzie R. at Hendricks Br.	24.0	94	e	NT	
Willamette - Upper	McKenzie R. at HWY 126 (d/s Clear Lake)	89.0	94	e	NT	
Willamette - Upper	McKenzie R. at McKenzie Bridge	68.1	95	e	NT	
Willamette - Upper	Middle Fk. Willamette R. at Jasper Br.	8.0	93	e	Inc.	+2.4
Willamette - Upper	Mohawk R. at Hill Rd.	1.6	86	g	Inc.	+5.0
Willamette - Upper	South Fork McKenzie R. at Forest Rd. 19	3.9	96	e	Dec.	-1.7
Willamette - Upper	Willamette R. at HWY 126 (Springfield)	185.3	92	e	Inc.	+1.3
Willamette - Upper	Willamette R. at HWY 20 (Albany)	119.3	85	g	Inc.	+5.0
Willamette - Upper	Willamette R. at HWY 34 (Corvallis)	131.4	86	g	Inc.	+5.0
Willamette - Upper	Willamette R. at HWY 99E (Harrisburg)	161.2	89	g	Inc.	+4.0

RM: River Mile. Score: Minimum Seasonal Average. Category Key: e: Excellent; g: Good; f: Fair; p: Poor; vp: Very Poor.

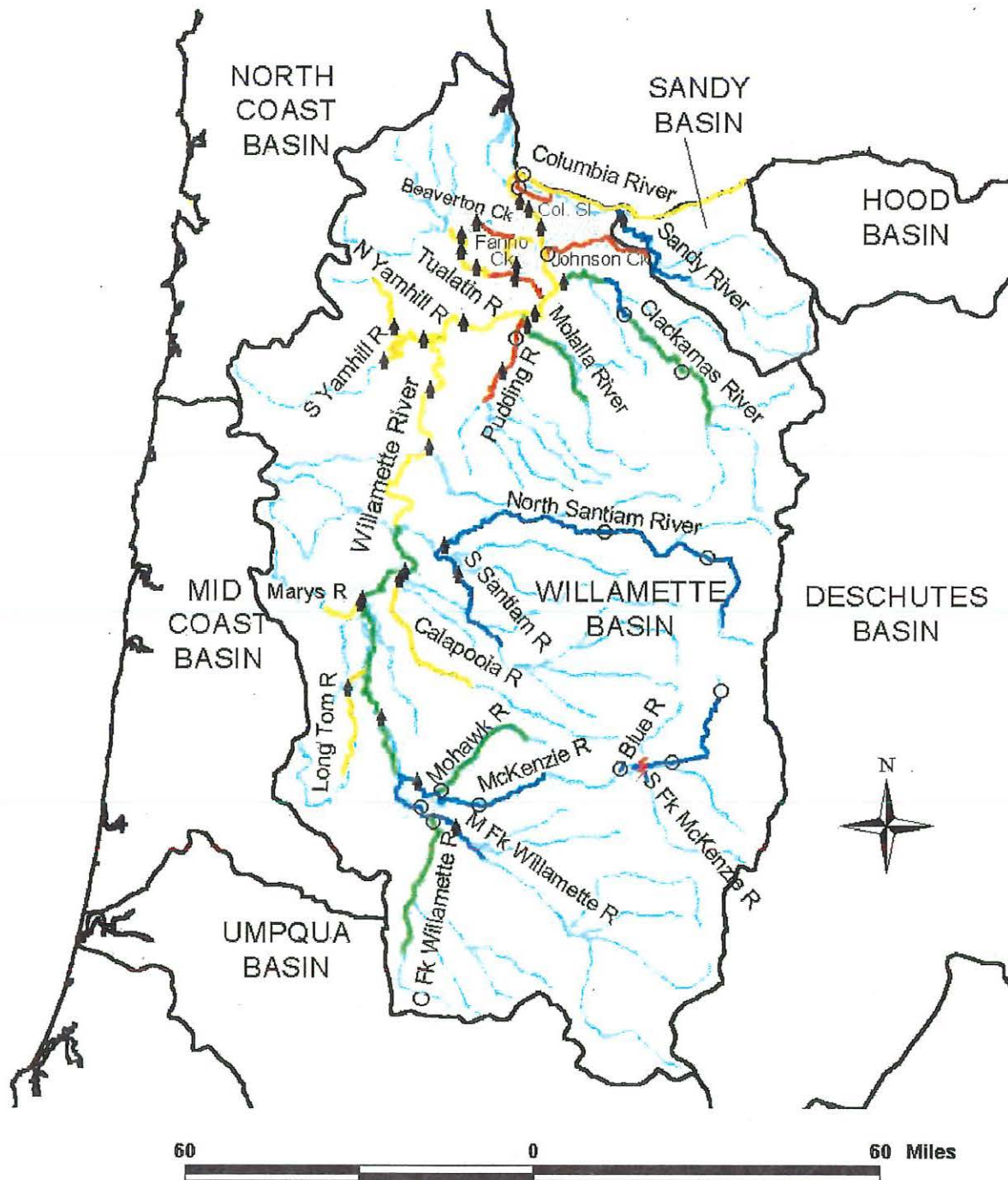
Trend Key: Dec.: Significant Decrease; Inc.: Significant Increase; NT: No significant Trend; ID: Insufficient data available.

Willamette Basin Stations



Willamette and Sandy Basins

OWQI Status and Trends - Water Years 1990 - 1999



OWQI Status

- Excellent (90 - 100)
- Good (85 - 89)
- Fair (80 - 84)
- Poor (60 - 79)
- Very Poor (0 - 59)

Water quality monitoring at 26 sites in the Willamette and Sandy Basins from Water Years 1990 - 1999 shows generally improving water quality. S Fk McKenzie shows a decline.

Trend Analysis Results

- ▲ Increasing Water Quality
- ⚡ Declining Water Quality
- No Significant Change

Urban Areas

Update on the development of Willamette Basin Total Maximum Daily Loads

The Clean Water Act 1998 "303(d) list" of impaired waterbodies identified more than 1,400 miles of rivers and streams in the Willamette Basin that failed to meet numeric or narrative water quality criteria developed to protect beneficial uses. As is the case statewide, elevated water temperature was identified as the leading cause of waterbody impairment in the basin. Bacteria and toxics, including mercury, were also common causes of impairment along with dissolved oxygen, biocriteria and elevated pH. Several segments of the mainstem Willamette River and its tributaries were listed for more than one of these parameters.

DEQ is working to address water quality problems identified in the 1998 303(d) list through the development of total maximum daily loads and water quality management plans. In collaboration with basin stakeholders, DEQ has collected data to support the development of analytical tools and plans to improve water quality. In 2001, DEQ completed Tualatin River TMDLs to address the 1998 303(d) listings in that subbasin. TMDLs for nine of 12 Willamette subbasins are scheduled for completion by the end of 2003, while TMDLs for the Mollala-Pudding and Yamhill subbasins are scheduled for completion in 2007.

Water temperatures exceed numeric criteria in many areas of the Willamette Basin. Portland State University and the United States Geologic Survey are assisting DEQ with the development of a basin scale model that demonstrates how river flow, riparian shade and point source discharges affect river temperatures. Outcomes from this analysis will identify appropriate temperature targets in the basin and result in thermal load allocations for dams, nonpoint sources and point sources.

Mercury levels in Willamette River fish often exceed state and federal criteria adopted to protect consumers of these fish. DEQ has undertaken a comprehensive effort to characterize the distribution of mercury in the river and to understand how mercury works its way through the environment. Staff have collected and analyzed river sediments, water samples and fish tissue samples to support the development of a food web model specific to the Willamette River. With results from this analysis DEQ staff and stakeholders will identify water column concentrations necessary to support the safe consumption of fish taken from the Willamette River and mercury load reductions necessary to achieve this target.

DEQ is also developing smaller, watershed scale TMDLs when appropriate to address **localized water quality issues**. DEQ worked with watershed councils, municipal staff and other stakeholders to collect data in the rural and urban areas throughout the basin. These groups provided valuable data which DEQ supplemented with targeted sampling events. These collaborative efforts demonstrate contributions watershed councils and other stakeholders offer to the development of TMDLs. These groups may also have an important role monitoring the effectiveness of water quality management plans as they are implemented.

Finally, not all water quality issues identified in the 1998 303(d) listings will be addressed through the TMDL process. For example, **biocriteria listings** stemming from skeletal deformities observed in fish of the Newberg Pool and lower Willamette River cannot be addressed through a TMDL process until causal mechanisms have been identified. Researchers from Oregon State University suggest that these deformities are not directly attributable to contaminants, but may be caused by parasites in the river sediments. Further analysis is necessary to understand this situation and to determine how to address these deformities.

Fact Sheet

Ross Island Investigation

Overview/Background

Work began in fall 1998 to assess contaminated sediment disposal at Ross Island Sand & Gravel lagoon, and to determine if past disposals in either the lagoon or upland areas pose a current or future risk to human health and the environment.

To accomplish this, the Department of Environmental Quality (DEQ) entered into an Intergovernmental Agreement with the Port of Portland, and an Order of Consent with the Ross Island Sand & Gravel Company (RISG). These documents spell out requirements for each party to develop work plans and implement separate, but coordinated, investigations to determine what, if any, environmental or human health risks exist within the Ross Island complex. The Port of Portland completed its investigation and submitted a final report on December 1. Ross Island Sand & Gravel completed the first phase of a broader investigation, and is currently implementing the second phase of this work.

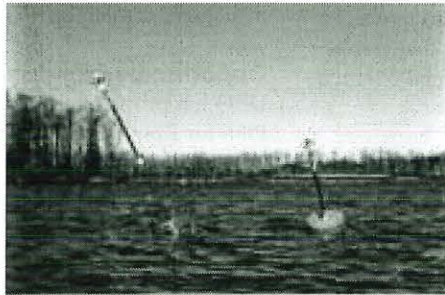


Aerial view of Ross Island

Investigation history

Between November 1999 and April 2000, the Port of Portland conducted investigative fieldwork in and around five confined, in-water disposal sites (cells) within the lagoon. The investigation focused on identifying environmental risks, if any, posed by disposal at these locations of dredged sediments removed from Port drydocks and terminals between 1992 and 1998. The investigation included surface water, groundwater, soils and sediment testing. The investigation was designed to determine whether the underwater disposal cells effectively prevent release of contaminants into the lagoon and groundwater now and over the long term. The final report on the Port's investigation was submitted to DEQ on December 1, 2000.

Concurrent with the Port's investigation, RISG implemented Phase I of a broader investigation aimed at assessing the environmental risk, if any, posed by other fill material from multiple industrial and commercial sources placed at the site, and the RISG facility as a whole. This investigation consisted of collecting soil samples in upland fill areas and analyzing sediment samples collected by the Port. A final report on this work was submitted to DEQ in September 2000.



Two of the Port's piezometers installed to monitor groundwater conditions in and below one of the confined disposal cells

Port investigation findings

In February 2001, DEQ made the determination that no further investigation of the Port's confined disposal cells is warranted. DEQ based this determination on the following findings which are supported by the Port's Site Investigation Report:

- ◆ Groundwater flow in the lagoon is upward; consequently contaminants in the cells are not expected to move into groundwater below the cells.
- ◆ Migration of contaminants from the cells to the surface water is limited. Contaminant concentrations reaching the surface water are expected to be below levels considered directly toxic to human health or fish.
- ◆ Concentrations of bioaccumulating compounds would generally be below detection limits.
- ◆ Erosion of cap material is not anticipated.
- ◆ Stability of the slopes adjacent to disposal cells will be improved as reclamation proceeds.

DEQ indicated that long-term management associated with the cells was most appropriately addressed by RISG at the completion of their broader environmental investigation. This



State of Oregon
Department of
Environmental
Quality

Northwest Region
Site Response
Program
2020 SW 4th Ave
Portland, OR 97201
Phone: (503) 229-5263
Fax: (503) 229-6945
TTY: (503) 229-6993
Contact: Jennifer Sutter
Phone: (503) 229-6148

Last Update
5/23/01
J. Sutter

broader investigation continues with RISG in the lead.

Phase II investigation

RISG submitted a final Phase II work plan to DEQ in February 2001. In response to DEQ comments, an addendum revising the overall sampling strategy and addressing the evaluation of bioaccumulation was submitted in April 2001. The primary issues addressed in the Phase II investigation work plan include:

- Completion of fill characterization to identify any areas of contaminant concentrations of concern.
- Assessment of the potential for contaminants detected in the fill to move into the lagoon at concentrations that would pose a threat to aquatic life now and over the long term.
- Evaluation of the potential for contaminants detected in the sediments to pose a threat to human health or the environment through bioaccumulation.
- Further evaluation of whether the sediments are toxic to fish, considering the results of the Port study.

Implementation of the work plan began in April 2001 and is on-going.

As a result of discussions among members of the TAP and DEQ, a limited fish sampling in the lagoon, with tissue analysis for PCBs, was conducted at the end of April. The results of this testing will be considered along with the results of worm tissue studies to be conducted by RISG in evaluating potential for bioaccumulation in Ross Island lagoon.



Drillers collecting sediment samples as part of the Phase II investigation

Reclamation

RISG's current permit with the Division of State Lands (DSL) provides the opportunity for RISG to coordinate a multi-interest stakeholder committee to consider modifications to its existing reclamation plan for the islands. RISG has identified the members of this panel and will be setting a date for an initial meeting shortly. DEQ will be providing input to the evaluation via the State agency committee member, DSL Director, Ann Hanus. In the interim, reclamation is proceeding according to the 1979 reclamation plan developed by the City of Portland. Reclamation fill currently going to the island must meet strict testing requirements with DEQ oversight. DEQ will continue to evaluate reclamation filling protocols as a long-term management plan for Ross Island is developed.

Opportunities for public participation

DEQ has provided the revised Phase II Work Plan for Ross Island and associated addendums to local neighborhood groups interested in the project and placed it in the Multnomah County Library – Central (801 SW 10th Ave.) and Sellwood (7904 SE Milwaukie Ave.) branches. The project file is also available for review by appointment at DEQ's Northwest Region Office, 2020 SW 4th Ave., Portland. To set up an appointment please contact Crystal Montgomery at (503) 229-6729.

Direct comments, questions, and requests to be added to the mailing list to the DEQ Project Manager, Jennifer Sutter, (503) 229-6148, sutter.jennifer@deq.state.or.us.

For more information

More information about the Ross Island investigation is available at the DEQ website: www.deq.state.or.us/nwr/rossisland.htm



Ross Island Investigation – Update June 2003

This fact sheet updates ongoing environmental work at Ross Island and assumes a certain level of familiarity with the project. For background on the project, please see the May 23, 2001 Fact Sheet.

Fact sheets and additional information about the Ross Island investigation are available at the DEQ web site:

<http://www.deq.state.or.us/nwr/rossisland.htm>

Environmental investigation approved

Ross Island Sand and Gravel Co. (RISG) submitted the final Remedial Investigation/Risk Assessment Report on October 21, 2002 and DEQ approved the report on November 12, 2002. The final version addresses comments provided by DEQ. The response to comments, indicating how the comments were addressed in the final report, is available on the DEQ web site.

Feasibility study in progress

Because contaminated material exceeding risk-based standards is present at Ross Island, an evaluation of appropriate measures to clean up the contamination must be completed. Clean-up actions can range from those that prevent exposure through engineered or administrative controls to actions that remove or treat contamination. The Feasibility Study for the Ross Island site will need to address the following:

- Areas along the southern shore of the lagoon where elevated levels of pH in sediment and groundwater have been detected.
- Long-term monitoring and management for existing confined aquatic disposal cells in the lagoon.
- Long-term monitoring and management of breach material confined in the former eastern section of the upland settling pond.
- A limited area along the southern shore where soil concentrations indicated a potential for adverse impacts due to erosion.
- Two upland areas where zinc and arsenic were found at elevated concentrations in surface soils.

- A limited area in the southern portion of the upland areas where subsurface concentrations of contaminants may pose a threat via groundwater migration.
- Elevated concentrations of contaminants detected in surface sediments in the southeast bench area and in the vicinity of the breach of one of the confined disposal cells.
- Potential migration of contaminants detected at elevated concentrations in two grab groundwater samples collected near the southern shoreline of the lagoon.
- Elevated concentrations of petroleum hydrocarbons detected at several locations in the upland fill area.

Pilot testing may be required to fully evaluate cleanup options for some of the issues identified above. Testing protocols will be described in the Feasibility Study report. The Feasibility Study will also address how cleanup actions will be coordinated with site reclamation activities.

An outline and schedule for the Ross Island Feasibility Study was approved by DEQ in February 2003. The schedule provides for completing the Feasibility Study in sections over an approximately 12-month time frame, with the final report expected at the end of January 2004. The schedule incorporates time to complete pilot testing associated with addressing the elevated pH in nearshore sediments.

The first three sections of the Feasibility Study were submitted to DEQ for review at the end of March 2003. These sections provide general project background, summarize the results of the remedial investigation, and outline the specific areas of the site that require remediation. The draft text and associated DEQ comments (letter dated 5/1/03) are available on DEQ's web site.

Ross Island Sand and Gravel Company submitted a proposal to conduct pilot testing to evaluate the effectiveness of various types of capping material in reducing the elevated pH levels detected in shoreline areas in April 2003 and, in response to DEQ comments, provided



State of Oregon
Department of
Environmental
Quality

Northwest Region
Site Response
Program
2020 SW 4th Ave
Portland, OR 97201
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TTY: (503) 229-6993
Contact: Jennifer Sutter
Phone: (503) 229-6148

Last Update:
6/19/03
J. Sutter

additional details on this testing in June. DEQ expects to approve of the pilot testing which is scheduled to begin the week of June 23.

Next steps

Pilot testing results and Sections 4 and 5 of the Feasibility Study are scheduled to be submitted in August 2003. Sections 4 and 5 will describe and evaluate a range of remedial options for site areas warranting action. The final sections (6 through 9) of the Feasibility Study will provide a detailed analysis of alternatives and recommend particular remedial actions.

When the Feasibility Study is completed and approved, DEQ will issue a proposal (staff report) for remedial action. DEQ will hold a public review and comment period, and consider any public comment received, before this proposal is finalized in a Record of Decision (ROD) for the site. The public review period will likely occur in March/April 2004.

Reclamation

The final meeting of the reclamation committee was held in September 2002. The committee endorsed the proposed modification to the reclamation plan in principal and the proposal was submitted to the Division of State Lands as part of the Ross Island fill permit application. The Reclamation Plan proposal is available on the Division of State Lands web site at: http://www.standlandsonline.com/pdfs/ross_island_app0009819b.pdf. DSL provided a public review period for the proposed plan and held a public meeting to receive comments on it in January 2003. DSL accepted the Reclamation Plan proposal and the permit was amended in June 2003.

As part of the revised permit, DEQ prepared a Fill Evaluation Scope of Work as Attachment A of the permit. The Fill Evaluation Scope of Work describes the process for determining if material proposed to be used for reclaiming the habitat at Ross Island can be safely placed there without long-term management. Material meeting these criteria is considered Class A fill. Ross Island Sand and Gravel Company has indicated that they will only accept Class A fill.

Opportunities for public participation

Draft sections of the Feasibility Study as well as DEQ comments on these sections can be accessed on DEQ's web page. Many project documents are also available at the Multnomah County Library – Central (801 SW 10th Ave.) and Sellwood (7904 SE Milwaukie Ave.) branches. The project file is also available for review by appointment at DEQ's Northwest Region Office, 2020 SW 4th Ave., Portland. To set up an appointment please contact the

Environmental Cleanup File Specialist at (503) 229-6729.

DEQ is available to provide updates at neighborhood or other group meetings if there is interest.

Direct comments, questions, and requests to be added to the mailing list to the DEQ Project Manager, Jennifer Sutter, (503) 229-6148, sutter.jennifer@deq.state.or.us. Please indicate if you do not want your comments placed on the web site for public consideration.

Alternative Formats

Alternative formats of this document can be made available. Contact the DEQ Office of Communication and Outreach for more information: (503) 229-5696.





Portland Harbor

Project Update Newsletter

Spring 2003

Introduction

The Environmental Protection Agency (EPA) added Portland Harbor to the National Priorities List in December 2000. EPA is responsible for cleanup of contaminated sediments in the river and the Oregon Department of Environmental Quality (DEQ) serves as the lead agency for cleaning up sites on the banks of the river.

Most of 2001 was dedicated to setting up a legal and organizational framework for the upcoming study of the site and contamination. The *remedial investigation and feasibility study*, a task required by the Superfund law, is underway. The investigation started in early 2002 and should take three to four years to complete. The investigation will provide project managers with information needed to make good decisions about the cleanup.

What Is Happening in 2003

The revised project work plan is anticipated in the spring of 2003. The work plan provides a road map for studying the harbor and developing alternative cleanup strategies leading to a Proposed Plan and Record of Decision.

Last June, the Lower Willamette Group (LWG) submitted the Draft Round 1 Work Plan to EPA. EPA, DEQ and the Interagency Technical Coordination Team reviewed the initial document, then asked for it to be revised and resubmitted to EPA. Technical Assistance grantee Willamette Riverkeeper also reviewed the work plan and provided written comments to EPA. In addition, the Portland Harbor Citizens Advisory Group reviewed the draft work plan and provided comments to EPA.

During spring 2003, fish tissue, river sediment and beach samples that were collected over the summer and fall of 2002 are scheduled for

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thorough and careful scientific analysis. EPA and DEQ will make sure the data meet acceptable quality assurance standards.

A field sampling plan for a second round of data gathering in 2003, by the Lower Willamette Group, is expected to be submitted to EPA for review and approval. After a preliminary review by EPA, the field-sampling plan will be available for public review.

Fish tissue data reports from the first round of sampling are planned for summer 2003. After EPA, DEQ and their inter-governmental partners receive the reports from the Lower Willamette Group, there will be a variety of public review opportunities that may include fact sheets, press releases, community meetings and open houses.

The second round of data gathering is planned for 2003. It will focus on the nature and extent of the contamination, sediment chemistry, sediment toxicity bioassays and surface water sampling. This work will enable scientists to better answer the questions about the contamination, including what chemicals are in the river, how much there is and where it is located. These studies will also help EPA understand risks to human health, fish, wildlife and the environment.

EPA and DEQ will also be studying ways to control ongoing sources of contamination to the river. Contaminants can be carried to the river by both surface runoff and groundwater.

Review of 2002

Three Sampling Efforts Completed Last Year

During 2002, contractors for the Lower Willamette Group completed the first round of data gathering on fish, sediment and riverbed structure. Samples were collected using rigorous scientific and quality assurance procedures, and the resulting data must be thoroughly analyzed to develop an accurate picture of site conditions. The project team will add information from future years to what they learned in 2002 in order to develop appropriate cleanup remedies.

Gone Fishing for Data

During July and August 2002, fish and other aquatic life were collected from sample sites throughout Portland Harbor. Species collected included juvenile Chinook salmon, brown bullhead, black crappie, carp, large-scale sucker, smallmouth bass, northern pikeminnow, peamouth, sculpin, clams and crayfish. This selection represents a broad cross section of aquatic life living in or traveling through Portland Harbor. There are many additional fish species in the Willamette River, but their feeding and movement habits are similar to individual species included in the sampling.

(continued on page 3)



Fish samples collected from the Willamette River will help assess public health and environmental risks.

(continued from page 2)

Fish were collected by three primary methods: electro-fishing, beach seining and trotlines. In addition, hook and line, standard crayfish traps, and benthic grab samplers were used to target specific species.

Both fish fillets and whole fish samples will be analyzed for pollutants that may have originated in Portland Harbor. The information will be used to determine the risk posed to people who eat fish from the Willamette River, and assess potential harm to the river ecosystem.

The fish tissue sampling results report should be available for public review by summer of 2003.

Getting to the Bottom of Things

A bathymetric survey was conducted for the Willamette River from near Ross Island down to the Columbia River from December 13, 2001 to January 14, 2002. This technology uses sonar to get an accurate picture of the depth and contours of the riverbed. The bathymetry helps scientists understand how sediments move in the river, where they are being deposited and removed by river currents, and how flooding and storm events affect the river bottom.

A contractor for the Lower Willamette Group used a multibeam sonar which records up to 101 soundings in a single sonar ping to get highly detailed data about the contours of the river bottom.

A draft bathymetric survey report was submitted to EPA on April 26, 2002. Additional bathymetric surveys are planned over the next couple of years. Bathymetric work takes place over a couple of years to provide information on how the riverbed changes over time. The bathymetric survey produced both full-sized drawings and digital images. If you would like to see 3-D video of the river channel, contact Judy Smith at EPA and request a CD copy of the 7-minute overview of Portland Harbor developed by the Lower Willamette Group.

Getting a Picture of Sediment Characteristics

Sediment profile imaging was conducted from November 28 to December 11, 2001 and a draft report was submitted to EPA in April 2002. A sediment profile camera was used to take pictures of cross-sections of the sediment. Photographs were taken at over 500 sample locations in the Willamette River between Ross Island and the Columbia River.

Data gathered during this sediment survey include grain size, depth, feeding voids excavated by benthic organisms, insects, presence of methane gas, and other technical information.

(continued on page 4)

What are Benthos and Why are They Important?

Things that live in the sediment at the bottom of a river are known as "benthos" and are sometimes called "benthic invertebrates." Some of the benthos you may have heard of include crayfish, segmented worms and midge larvae.

Because the primary concern at the Portland Harbor Superfund Site is contaminated sediment, it is important to identify what benthos are present and where they are located. These bottom dwelling critters feed in the sediment, so contamination such as metals, pesticides and polychlorinated biphenyls (PCBs) can accumulate in their body tissues. When fish, wildlife or people catch and eat contaminated benthos, they can absorb the toxins. Scientists refer to this process as "bioaccumulation." Some pollutants, like PCBs, become more concentrated as they move up the food chain. This is referred to as "biomagnification." Bioaccumulation and biomagnification may lead to dangerous contaminant exposures for fish consumers, like people and bald eagles.

In order to protect people, fish and wildlife from hazardous substances in the sediment, we must learn about the risk to and from benthos. In some cases, the health department might issue a fish consumption advisory to let the community know about the risk of eating certain benthos or organisms that prey upon them.

(continued from page 3)

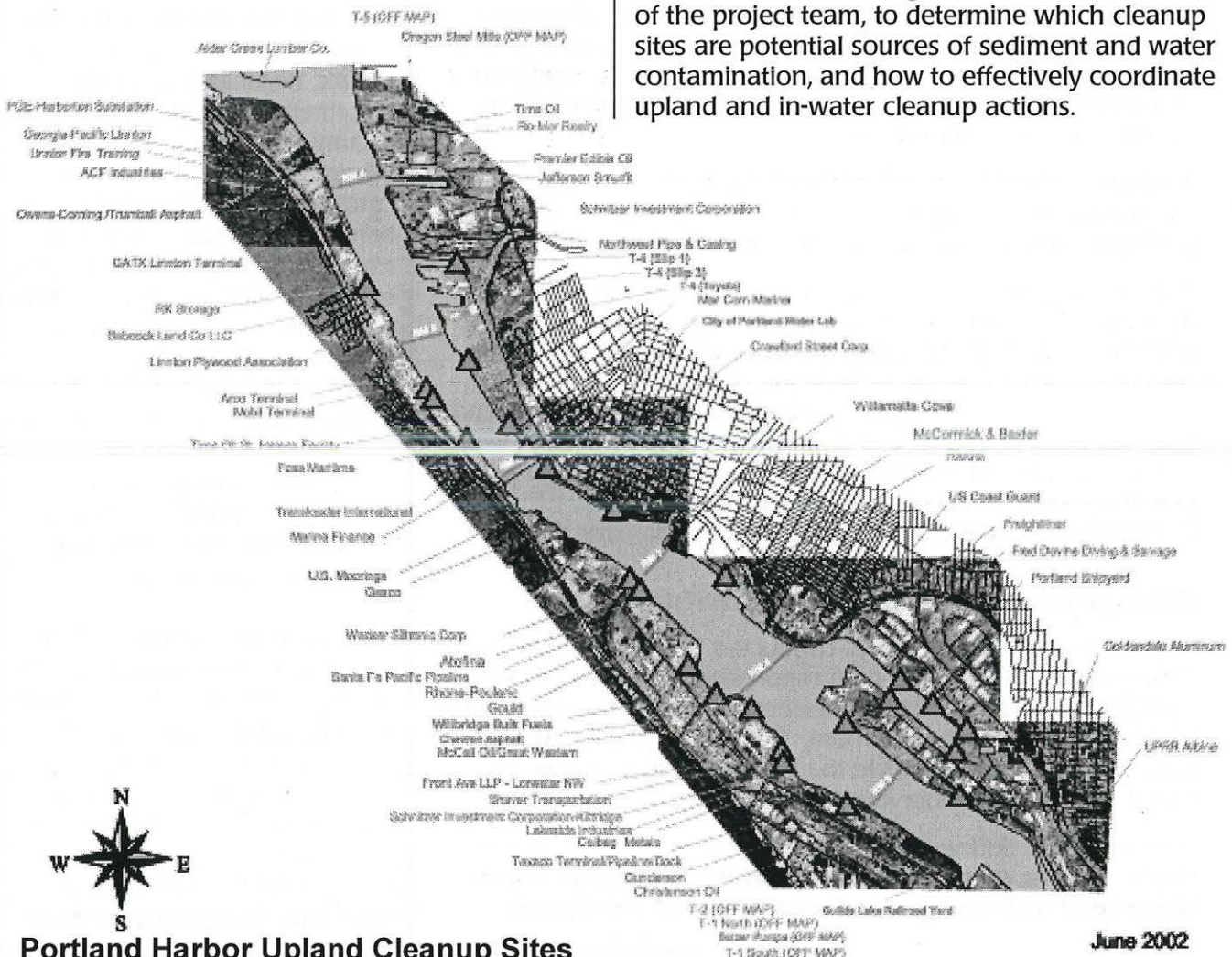
Observers also noted the presence of debris or organisms within the sediment column, sediment textures and features, organic content and how sediment is sorted and layered. In addition, the data provide a look at river dynamics such as whether the sediment is being eroded, being deposited, or is stable.

This sediment profiling information will be used to assess river bottom conditions, and evaluate the general quality of benthic habitat. This information may also be used to look at potential changes over time, by comparing it with earlier studies. Sediment profiling was originally developed for marine areas, and Portland Harbor was the first large-scale use of this technology in a large freshwater river system.

Uplands Update

As a key partner in the Superfund cleanup, DEQ is responsible for managing cleanup activities on the shores and upland areas of Portland Harbor. As of January 2003, DEQ is working with property owners on over 70 sites, including 44 high-priority sites. The work ranges from the very early stages of investigations to active cleanup actions. Check out the Portland Harbor site map, at www.deq.state.or.us/nwr/phmap.pdf, allows you to click directly on the map for site-specific cleanup information.

The goal of DEQ's upland work is to identify and eliminate sources of contamination to Portland Harbor. DEQ is working with EPA, and the rest of the project team, to determine which cleanup sites are potential sources of sediment and water contamination, and how to effectively coordinate upland and in-water cleanup actions.



Construction Begins at McCormick & Baxter

The McCormick & Baxter Creosoting Company site, located just south of Willamette Cove, near the University of Portland, was placed on EPA's National Priorities List (NPL) in 1994. It is located within the area of Portland Harbor Superfund Site, which was listed in 2000. Through an agreement with EPA, DEQ is leading the cleanup at McCormick & Baxter.

Over 33,000 tons of contaminated soil and debris and 1,950 gallons of creosote have been removed from the McCormick & Baxter site, but creosote continues to contaminate the Willamette River. EPA and DEQ will install an underground barrier wall encircling contaminated soils, to reduce the amount of creosote from migrating into the river. The barrier is an 80-foot deep buried metal wall along the riverfront, and an inland trench filled with an impermeable clay mixture.

Construction of the barrier wall begins April 2003 and should be completed by mid-summer. Work will take place weekdays between 7:00 am and 5:30 pm.

During the first two weeks in April, neighbors can expect about 15 trucks per day, traveling to and from the site via North Edgewater St.

The trucks will bring in loads of material and equipment. The trucks will travel to and from Interstate 5, along North Columbia Boulevard and North Portsmouth Avenue.

Contractors will install 1,400 linear feet of interlocking sheetpile along the riverbank of McCormick & Baxter. Similar to installing individual pilings, this involves driving the 80-foot sheetpiles into the ground. To lessen impacts to the nearby residential community, noise generating activities will not begin before 7:30 am. The contractors are using a vibratory method to install the sheetpiles, instead of the traditional hammer method. Noise levels at the riverbank are expected to be 90-95 decibels. Noise levels at the nearest residences, some 1,000 feet away, are expected to be under 60 decibels, the volume of a person talking.

In addition to the barrier wall, DEQ is working on the final design for a permanent sediment cap to protect the river from the underlying contamination. Installation of the sediment cap will begin in the summer of 2004. Design work will begin soon for the protective soil cap that will cover the surface of the site, and make it safe for people and wildlife.

❖ ❖ ❖ ❖ ❖ Hear about McCormick & Baxter on March 20th ❖ ❖ ❖ ❖ ❖

Come to the public information meeting to learn more about the construction and the continuing cleanup of McCormick & Baxter and to find out how you can participate in the design process that lays the groundwork for future public use of McCormick & Baxter. The Portland Harbor Citizen's Advisory Group will be on hand to invite public participation in the Harbor cleanup process.

Thursday, March 20th, 7- 8:30 pm
University of Portland
Buckley Center

For information, contact Kevin Parrett,
Project Manager, 503-229-6748,
parrett.kevin@deq.state.or.us

Visit our website:

<http://www.deq.state.or.us/nwr/mccormick.htm>

City of Portland and DEQ kick off Stormwater Pilot Project

The City of Portland operates 17 stormwater outfalls within Portland Harbor. These outfalls transport stormwater draining from city-owned rights-of-way and from private property, including local industry. City outfalls have been identified as a potential source of sediment and water contamination in the Harbor because stormwater may pick up and transport soil and contaminants such as metals, paint, oil, grease, and chemicals to the river.

DEQ and the City are working together on a pilot project at the M-1 outfall on Swan Island to investigate and control sources of contamination entering the storm drains. The goal of the pilot project is to minimize potential recontamination of sediments after the Superfund cleanup is completed.

The pilot project has three key components. First, DEQ technical assistance staff are visiting sites to help business owners develop proper waste management procedures and use best management practices to reduce or eliminate potential sources of contamination to the river.

Second, the City of Portland Bureau of Environmental Services Industrial Storm Water Program is inspecting industrial facilities whose operations may contaminate storm water runoff.

Third, the City is helping these facilities identify best management practices to minimize pollutants in storm water runoff. In some cases, a facility may be required to obtain a storm water permit. DEQ's Cleanup Program staff continue to assess whether current and historical property uses could contribute contamination to the river and whether further investigation is needed.

Results of the pilot project will be used to help DEQ and the City expand the interagency source control effort for the rest of Portland Harbor.

Cleanup Remedy Proposed for Port of Portland Terminal 4, Slip 3

The Port of Portland Terminal 4 facility is located along the east bank of the Willamette, near River Mile 5. Historically, Slip 3 was used in part as a bulk fuel transfer facility, moving diesel from marine vessels through a 1,500 foot underground pipeline to tanks owned by Union Pacific railroad at the east side of the property.

Fuel transfer operations ceased in 1983, however, pipeline leaks have released petroleum to soil and groundwater at the site.

The Port of Portland entered a Voluntary Cleanup agreement with DEQ in 1998, and completed the remedial investigation in 2000. In April 2002, DEQ reviewed and approved the Port's feasibility study, which identifies different cleanup options.

After evaluating the options presented in the feasibility study, DEQ proposed a final cleanup remedy for the upland area. The recommended cleanup includes pumping and treating groundwater to remove petroleum contamination, and excavating contaminated riverbank soil in Slip 3 and disposing of it at a location off-site. In addition, the presence of residual contamination in the soil will be documented to protect future site workers.

The remedy is designed to protect human health and eliminate harmful migration of petroleum products into the Willamette River. DEQ will consider feedback gathered during the public comment on the proposed remedy and incorporate it into the Record of Decision, expected to be issued by the end of March 2003.

Contaminated sediments in the river are being evaluated separately as part of the EPA Portland Harbor in-water cleanup investigation.

Citizens Advisory Group

Since forming last spring, the Portland Harbor Citizens Advisory Group has played an active role in making sure community concerns are considered during the early stages of the remedial investigation. This dedicated group of volunteers is made up of a diverse group of community members representing neighborhoods, environment, recreation, business, health and the community-at-large. The group reviewed the draft Round 1 Work Plan and provided feedback to DEQ and EPA. During the first week of February, the group held a press conference to introduce themselves, share their issues of concern and encourage citizen participation in the Portland Harbor investigation and cleanup.

Superfund Citizens Advisory Groups are made up of members of the community and are designed to serve as the focal point for the exchange of information among the local community and EPA, the State regulatory agency, and other Federal agencies involved in cleanup of the Superfund site.

The Portland Harbor Citizens Advisory Group meets on the second Wednesday of every month at NE 800 Oregon Street in Portland from 6 to 8 p.m. The next meeting is March 12. For information about the CAG contact Joe Keating at keats@teleport.com, or Willamette Riverkeeper at 503-223-6418.

PHCAG Mission statement: To ensure a Portland Harbor Cleanup that restores, enriches and protects the environment for fish, wildlife, human health and recreation through community participation.

Can Someone From EPA or DEQ come talk to our group about Portland Harbor?

Yes! The exchange of information between project staff and the community is very important to the long-term success of the cleanup. Contact Judy Smith or Fenix Grange using the information listed on page 8 to set up a time for a meeting.

Who Is Working on Portland Harbor:

Interagency Technical Coordination Team: A group of government agencies and tribes who are combining expertise during the investigation and cleanup of Portland Harbor. A Memorandum of Understanding outlining responsibilities and processes was signed in 2001 by the following parties:

Oregon Department of Environmental Quality
U.S. Fish and Wildlife Service
National Oceanic and Atmospheric Administration
Oregon Department of Fish and Wildlife
Confederated Tribes and Bands of the Yakama Nation
Confederated Tribes of the Grand Ronde Community of Oregon
Confederated Tribes of Siletz Indians
Confederated Tribes of the Umatilla Indian Reservation
Confederated Tribes of the Warm Springs Reservation of Oregon
Nez Perce Tribe
Oregon Department of Human Services

Lower Willamette Group: A group of potentially responsible parties from business, industry and public agencies who have entered into a consent order with EPA to conduct the remedial investigation and feasibility study under EPA oversight. The group consists of:

ATOFINA Chemicals, Inc.
Chevron U.S.A. Inc.
Gunderson, Inc.
Northwest Natural Gas
City of Portland
Port of Portland
Time Oil Co.
Tosco Corporation
Union Pacific Railroad Company
Oregon Steel Mills

Citizens Advisory Group: A group of community members who are volunteering time and effort to make sure community concerns are considered during the investigation and cleanup.

Technical Assistance Grantee: Willamette Riverkeeper received a grant from EPA to review technical information on the project and interpret and share it with the community.



United States
Environmental
Protection
Agency



Oregon
Department of
Environmental
Quality

USEPA Region 10 Community Involvement and Outreach
1200 Sixth Avenue, ECO-081
Seattle, Washington 98101-1128

PORTLAND HARBOR PROJECT UPDATE

***COME TO A PUBLIC
INFORMATION MEETING
ON MARCH 20, 2003***

Where to Find More Information

EPA Team Contact Information

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Tara Martich

Remedial Project Manager
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DEQ Team Contact Information

Fenix Grange

Project Coordinator
503-229-6590
grange.fenix@deq.state.or.us

Jim Anderson

Project Coordinator
503-229-6825
anderson.jim@deq.state.or.us

EPA's Portland Harbor web site:

<http://www.epa.gov/r10earth/>

DEQ's Portland Harbor website:

<http://www.deq.state.or.us/nwr/ph.htm>

Willamette Basin TMDL Development Monitoring (2000 – 2003)

General Background

- Willamette Basin contains 1,400 listed stream miles. Listed parameters for 9 subbasins include: Temperature, Bacteria, Dissolved Oxygen, Turbidity, Toxics, and Mercury.
- TMDL monitoring sites by year are depicted in table below.

Year	Temperature	Bacteria	Mercury	Other
2000	40 (DEQ) 125 (Partners)	20 (DEQ) 44 (Partners)		
2001	138 (DEQ) 250 (Partners)	18 (DEQ) 44 (Partners)		18 (DEQ)
2002	106 (DEQ) 250 (Partners)	25 (DEQ) 44 (Partners)	28 (DEQ)	
2003		47 (DEQ)	28 (DEQ)	10 (DEQ)

- Monitoring Data was collected collaboratively at over 1000 stream sites throughout the Willamette Basin encompassing about 20 separate Water Quality studies.
- Data collection collaborators included: USGS, USFS, BLM, ACOE, ACWA, NWPPA, PGE, and EWEB, Watershed Councils.

Special Project Case Study – Willamette Basin Mercury Study

Overview

Oregon DEQ is committed to developing Total Maximum Daily Loads (TMDLs) to address the parameters listed on the State's 1998 303(d) list. The listings for mercury in the Willamette extend from the Cottage Grove and Dorena Reservoirs (in the Coast Fork Subbasin) to the mouth of the Willamette River. DEQ based 303(d) mercury listings on the Health (fish consumption) Advisories issued by the OHD.

Study Objectives

Oregon DEQ designed the Willamette Basin Mercury Study to address 303(d) listings and describe the following objectives:

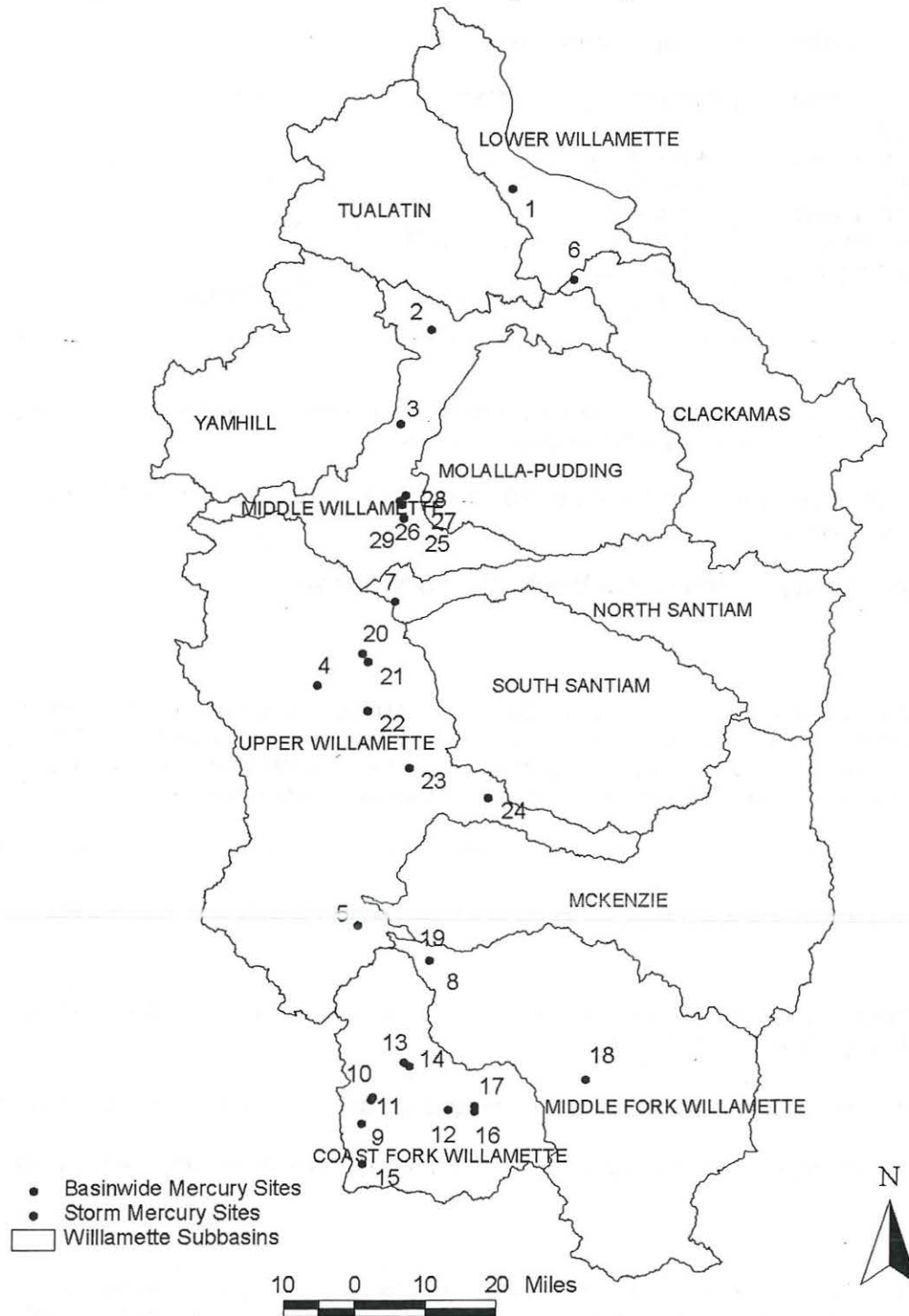
1. Describe the relationship between mercury in fish tissue and mercury in the water column for the development of a site-specific bioaccumulation factor.
2. Describe the relationship between methylmercury in water and total mercury in water and sediment.
3. Begin to identify and quantify the sources and loadings of mercury in the Willamette River system.

Monitoring

The Willamette Basin Mercury Study included monitoring water, sediment, and fish at 28 stream sites throughout the basin in 2002 and 2003 (See attached map). Ambient water monitoring occurred quarterly (September 2002, December 2002, March 2003, June 2003) and storm water monitoring occurred twice (January 2003, March 2003). Sediment (August 2002) and Fish (Summer 2003) monitoring occurred once.

Additional information regarding the Willamette Basin Mercury Study at:
<http://www.deq.state.or.us/lab/wqm/wbmercurystudy.htm>

Willamette Basin Mercury Study Sites 2002-2003



Watershed Assessment Monitoring Activities

- Ambient River Monitoring (larger streams)
- TMDL Development
- Oregon Plan (smaller streams)
- Coastal Environmental Monitoring and Assessment (Estuaries, Ocean)
- Western Environmental Monitoring and Assessment (smaller streams)
- Ambient Groundwater
- Landfills
- Volunteer Monitoring Support
- Ocean Beach Monitoring (bacteriological)
- Reference Sites (BPA)
- Spill Response
- Compliance

7/17/03 EDC Meeting, Tour handout

Ambient River Monitoring Network

- Statewide Coverage
- 151 sites statewide, 44 in Willamette Basin
- Sampling Design –Judgmental (Census)
- Integrator Sites
- Test for general indicators of water quality
- Excellent period of record, some sites sampled since 1949

Uses of Data: Status and Trends

- Identify streams not meeting water quality standards
- Determine long term trends in water quality
- Examples of where data is used
 - 303d List
 - 305b Report – Biennial Oregon Water Quality Status Report
 - Oregon State of the Environment Report
 - Oregon Progress Board Bench Mark Report
 - The Oregon Plan for Salmon and Watersheds Biennial Report

Uses of Data: TMDL

- Provides data for TMDL Development
- Provides data for evaluating TMDL implementation effectiveness

Field Parameters

- Dissolved Oxygen
- Percent Oxygen Saturation
- Alkalinity
- pH
- Specific Conductivity
- Turbidity
- Temperature

Laboratory Parameters

- Nutrients
 - Nitrogen: Nitrate, Ammonia, TKN
 - Phosphorous: Dissolved Ortho-phosphate, Total phosphate
- Chlorophyll a, Pheophytin a
- Biochemical Oxygen Demand (BOD5)
- Chemical Oxygen Demand (COD)
- Total Organic Carbon
- Total Suspended Solids, Total Solids
- *E. Coli* bacteria



Willamette River TMDL Overview

- Background
- Temperature
- Bacteria
- Mercury
- Stakeholder Involvement
- WQMP
- Schedule



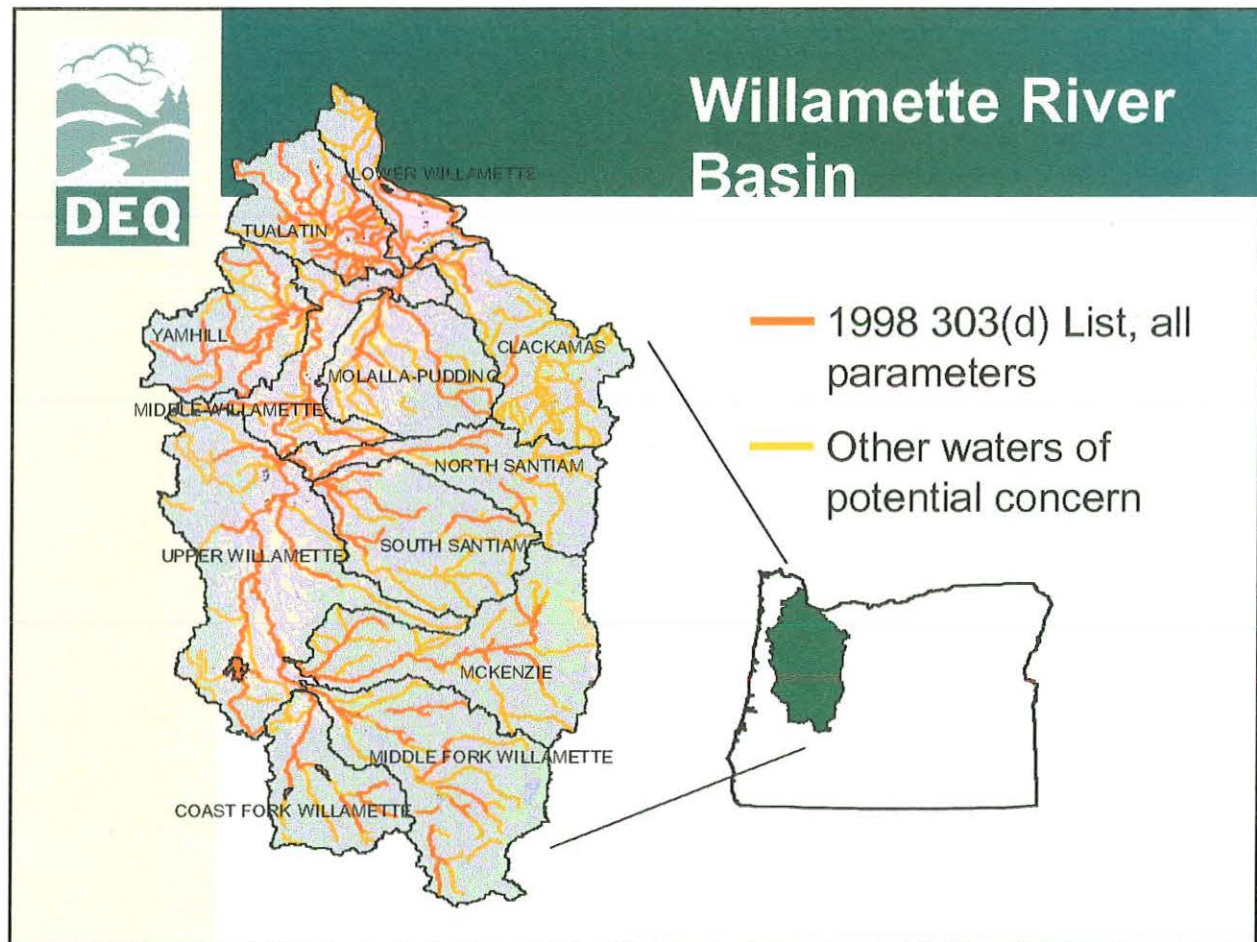
Background

- Expedited Schedule
- Legislature Commitments for Staffing
- Includes 9 of 12 subbasins
 - Tualatin completed in 2001
 - Yamhill and Molalla-Pudding are deferred
- 303(d) Listings
 - 1998
 - 2002



What this TMDL Does Not Address

- Portland Harbor Superfund Site
- Fish Skeletal Deformities
- Ross Island
- McCormick & Baxter





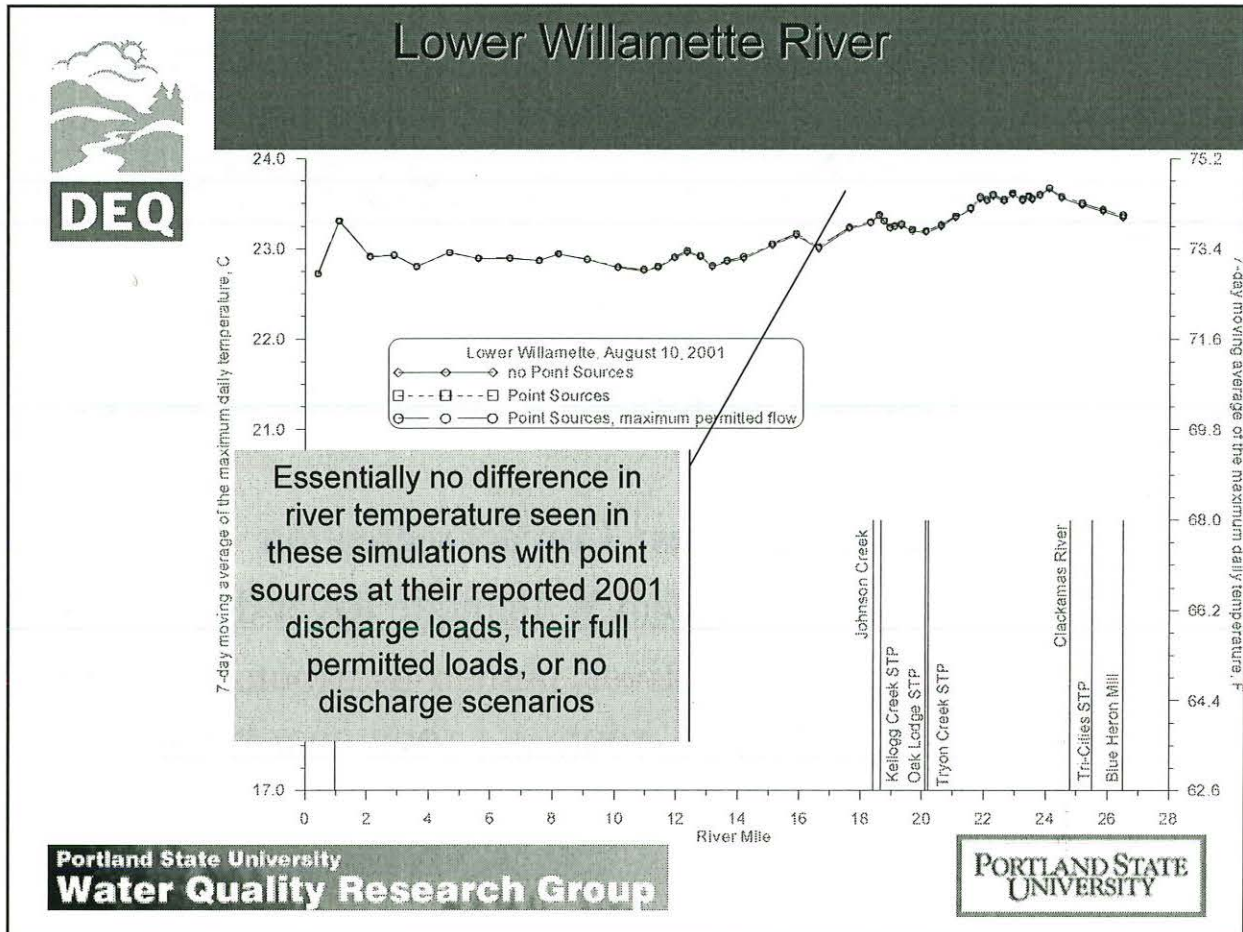
Temperature Background

- Multiple Modeling Approaches
- Collaborative Effort with:
 - PSU
 - USGS
 - Modeling Coordination Team
- Influence of Dams & Reservoirs



Willamette River Temperature TMDL Development

- **2000 Results**
 - DEQ 40 sites
 - BLM, USFS, WSC 125 sites
 - FLIR S. and N. Santiam Subbasins
- **2001 Results**
 - DEQ 83
 - BLM, USFS, ACWA, NWPPA, PGE, USACE, USGS 250 sites
- **2002 Results**
 - DEQ 50 sites
 - BLM, USFS, ACWA, WSC, NWPPA, PGE, USACE, USGS 250 sites
 - FLIR Coast Fork, Clackamas, Lower Willamette Subbasins and Mainstem Willamette





Bacteria TMDLs in the Willamette Basin

Background Information

- Pollutant identification: fecal coliform and E. coli bacteria
- Designated uses: Contact recreation
- Scope: Mainstem Willamette River downstream of Long Tom River; numerous tributaries were included on the 1996 and 1998 303(d) list



Bacteria TMDLs in the Willamette Basin

Possible Bacteria Sources

- Domestic wastewater treatment plants, meat or poultry processing facilities
- Combined or sanitary sewer overflows; feedlots (CAFOs), illicit sewage connections
- Wildlife, domestic animals, faulty septic systems, landfills, poor land application of manure or sludge



Bacteria TMDLs in the Willamette Basin

Recent Data Assessment

- Improvement in bacteria levels throughout the mainstem Willamette year round. Most ambient monitoring sites no longer meet 303d listing criteria
- Improvement also seen in Marys, Coast Fork and South Santiam Rivers.
- Smaller streams still demonstrate high bacteria levels.



Mercury in the Willamette Basin

Background Information

- ◆ Methylmercury is a potent neurotoxin that can cause damage to the brain and nervous system of small children and developing fetuses.
- ◆ Methylmercury, the more toxic form of mercury, is known to bioaccumulate in fish tissue.
- ◆ The Oregon Health Division has issued several fish consumption advisories in the Willamette Basin due to elevated levels of mercury in fish.



Mercury in the Willamette Basin

Unique Features of the Hg TMDL

- ◆ Water quality impairment based on fish consumption advisory, as opposed to standard exceedance.
- ◆ Mercury is a ubiquitous pollutant released into air and water from a variety of sources.
- ◆ Strong collaborative relationship with USEPA on mercury monitoring and TMDL development.
- ◆ Stakeholder involvement via Willamette River TMDLs Council.
- ◆ Obvious links to the Agency's Mercury Reduction Strategy.



Mercury in the Willamette Basin

Strategy for the Mercury TMDL

- ◆ Utilize a **Food Web Bioaccumulation Model** to establish a water column target that is protective of human health.
- ◆ Characterize the various sources of mercury in the Willamette Basin.
- ◆ Develop a strategy to implement mercury reduction activities with the overall goal of attaining water column targets.



Mercury in the Willamette Basin

Potential Sources of Mercury

- **Naturally occurring** in soils, volcanic rock and geothermal areas
- Use and disposal of **products** (thermometers, lights, dental amalgam)
- Burning of **fossil fuels** (coal burning utilities, incinerators, cement manufacturers)
- **Mining**-related activities
- Smelting processes and other **industrial** discharges
- Historic pesticide/**fungicide** application
- **Atmospheric** deposition



Mercury in the Willamette Basin

Next Steps

- ◆ Develop a framework for establishing mercury allocations given what we know about mercury sources.
- ◆ Work with Basin stakeholders to identify potential implementation activities.
- ◆ Elaborate a phased approach which would enable us to move forward with mercury reduction activities while filling existing data gaps.

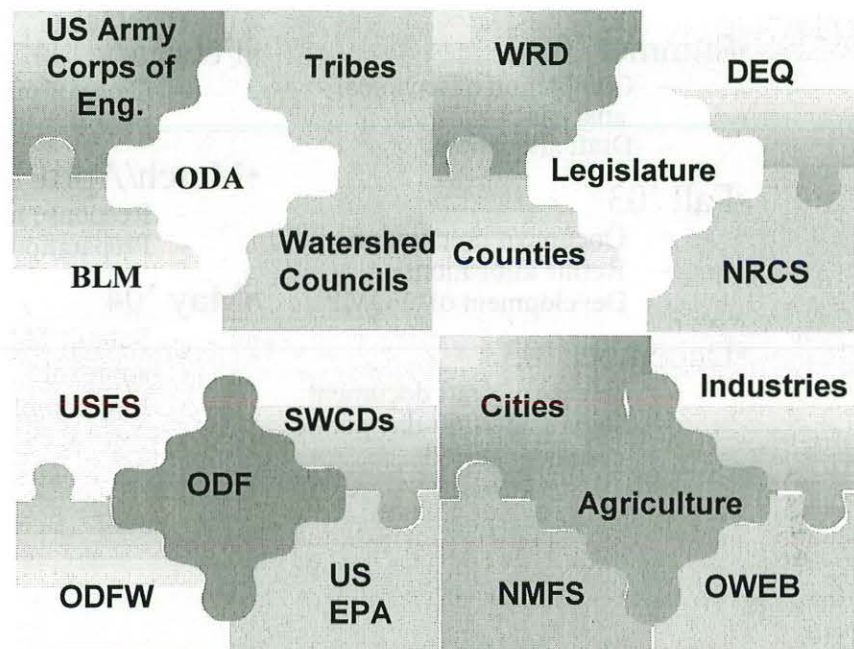


Stakeholder Involvement

- Council – 21 members
 - Agricultural
 - Corps of Engineers
 - Environmentalists
 - Industrial
 - Municipal
- Modeling Coordination
- Watershed Councils
- Federal Land Managers



WQMP / Potential Partners





Schedule

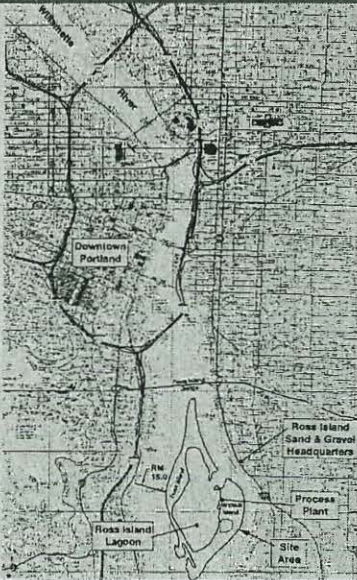
- Summer '03
 - Completion of technical analysis
 - Draft allocations
- Fall '03
 - Document preparation
 - Refine allocations
 - Development of WQMP
- December '03
 - Release of draft document
 - Beginning of 60-day public comment period
- February '04
 - Close of public comment period
- March/April '04
 - Response to Public Comments
 - Preparation of Final Report
- May '04
 - Submit TMDL to EPA for approval
 - Begin implementation process

Ross Island Sand & Gravel



DEQ

State of Oregon
Department of
Environmental
Quality



Overview

July 17, 2003

Ross Island



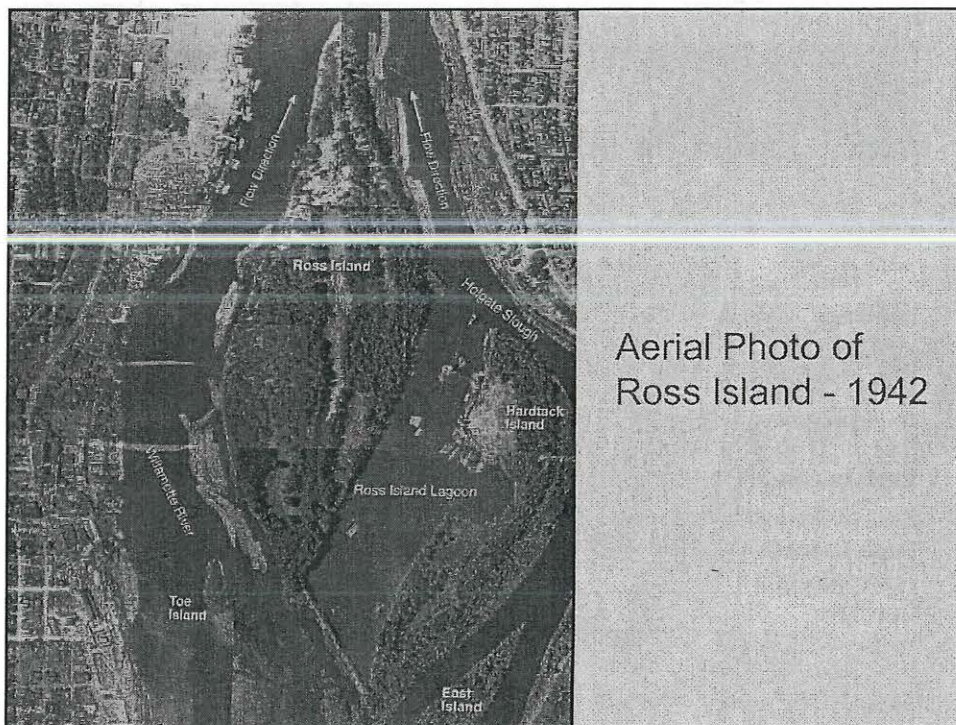
DEQ

State of Oregon
Department of
Environmental
Quality

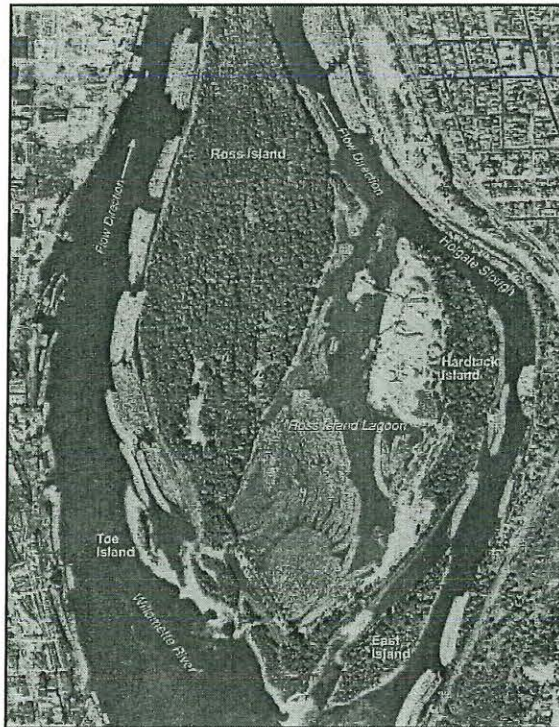
- Background/history
- Environmental studies
- Reclamation

Ross Island Chronology

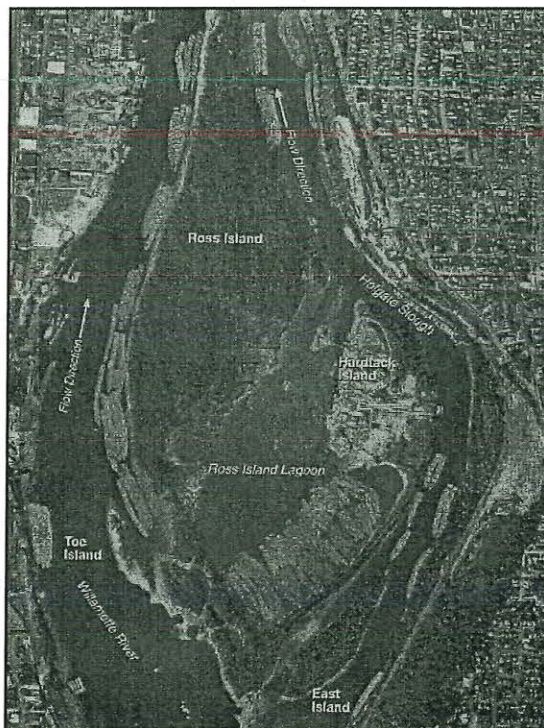
- July 1926 RISG acquires the islands and ownership is established over the area defined by the low water line surrounding the islands
- October 1967 RISG issued removal permit following effective date of Oregon's removal law
- 1972 RISG proposed to mine entire islands away - denied by Oregon AG, RISG proposed to connect the northern ends of the islands forming a private pond - denied by COE
- 1979 RISG's removal permit amended to include fill
- 1980 City of Portland issued Conditional Use Permit specifying reclamation details
- 1983 RISG began accepting fill materials from outside sources
- 1992 first confined disposal event of Port of Portland dredged sediments



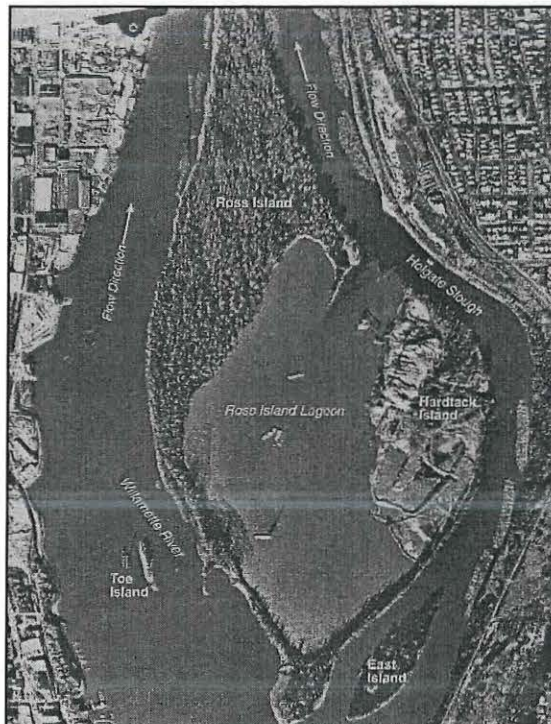
Aerial Photo of
Ross Island - 1942



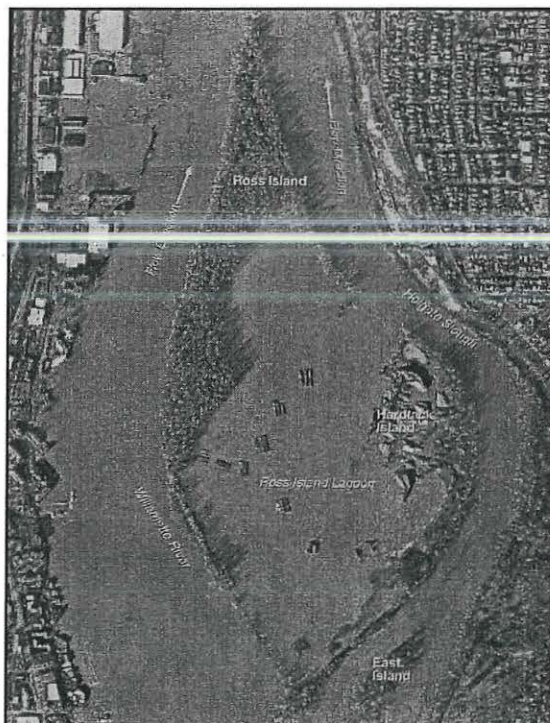
Aerial Photo of
Ross Island - 1957



Aerial Photo of
Ross Island - 1963

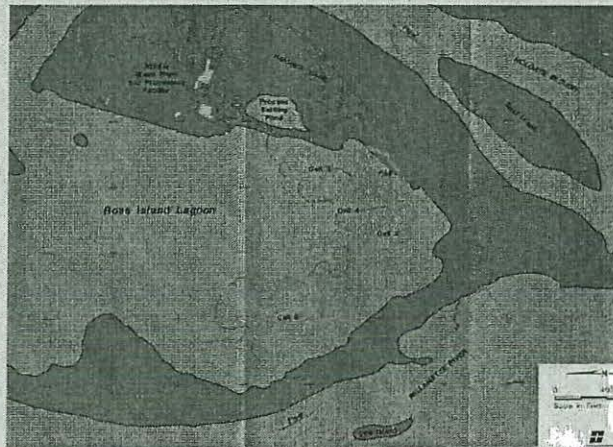


Aerial Photo of
Ross Island - 1980



Aerial Photo of
Ross Island – 1996
(during flood)

Port of Portland Study



Concerns Addressed:

Contamination movement through caps and sidewalls

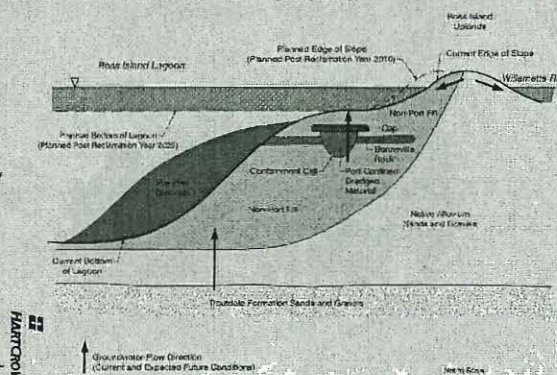
Contamination movement to groundwater below cells

Stability of cells considering erosion, seismic activity

Accuracy of placement of contaminated materials and cap

Changes in conditions over the long-term

Conceptual Cross Section of Ross Island Lagoon, In-Water Containment Cells, and Generalized Hydrogeology



Findings

- **Low potential for contaminant migration from disposal cells**
- **Physical stability of cells a concern**
- **No further investigation of cells warranted**
- **Ross Island responsible for long-term maintenance/management of cells**

RISG Broader Investigation

- **Fill characterization - upland and inwater**
- **Bioaccumulation evaluation**
- **Assess aquatic toxicity - confounding factors**
- **Fate and transport of contaminants**

RISG Broader Investigation

Issues requiring follow-up

- Elevated pH along the southern shore of the lagoon
- Upland concentrations potentially posing a threat due to erosion – limited area
- Elevated zinc and arsenic in upland soil in processing area – 1 location
- Elevated sediment concentrations in vicinity of breach and southern lagoon
- Potential groundwater migration issue in one shoreline area
- Elevated TPH
- Port material in Confined Aquatic Disposal Cells (CADs)
- Breach material – closed portion of settling pond

RISG Feasibility Study (FS)

FS in progress – expected to be completed January 2004

Pilot testing to evaluate cap material effectiveness for elevated pH in shoreline initiated June 2003

Sections 1 – 3 of FS completed and reviewed

Sections 4 and 5 (alternative development/screening) to be submitted August 2003

Reclamation Plan

Overview

- 22 acres of emergent wetland habitat – south end of lagoon
- 14 acres of shallow water habitat – north, west, and south portions of lagoon
- 4.5 million cubic yards of fill required

was going to be 20 million

Process

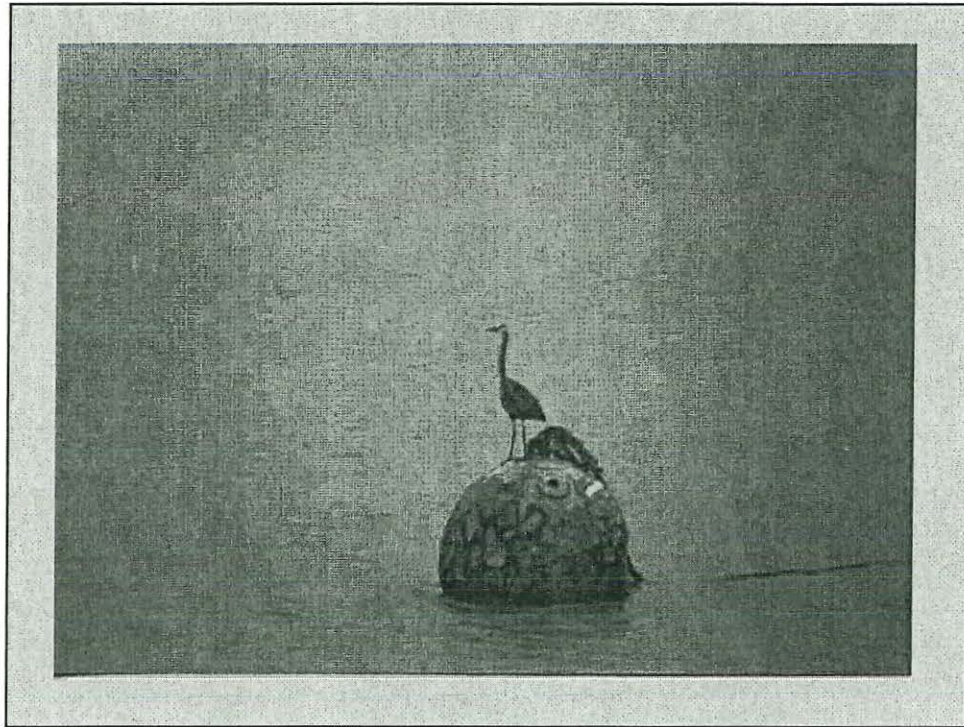
- Fall 2002 – proposed by reclamation committee
- June 2003 incorporated into DSL permit

Reclamation Plan

Fill Quality

Fill Evaluation Scope of Work – Attachment A of DSL Permit

- Provides process for determining if material proposed for reclamation fill can be safely placed in lagoon or upland areas without long-term management
- This material is considered Class A fill



Natural park.
wildlife preserve.
limited access.
- how??
no motor area??
- end of 2004
to get it looked
down

Minutes are not final until approved by the Commission.

Oregon Environmental Quality Commission Minutes of the Three Hundredth and Eleventh Meeting

**May 8-9, 2003
Regular Meeting¹**

The following Environmental Quality Commission (EQC, Commission) members were present for the regular meeting, held at the Department of Environmental Quality (DEQ, Department) headquarters building, Room 3A, 811 S.W. Sixth Avenue, in Portland, Oregon.

Mark Reeve, Chair
Tony Van Vliet, Vice Chair
Harvey Bennett, Member
Deirdre Malarkey, Member

Thursday, May 8, 2003

Chair Reeve called the regular meeting to order at approximately 2:00 p.m., and introduced Commission members, DEQ Director Stephanie Hallock, Assistant Attorney General Larry Knudsen serving as counsel to the Commission, and Commission Assistant Mikell O'Mealy. Agenda items were taken in the following order.

A. Action Item: Request for Dismissal of Contested Case No. WPM/SP-WR-00-188 regarding Case and Sons Logging, Inc.

The Commission considered a request from DEQ to dismiss a petition for review of a DEQ enforcement action against Case and Sons Logging, Inc., because the petitioner did not file exceptions to the proposed order as required by rule (OAR 340-011-0132(3)). Larry Knudsen, Assistant Attorney General, described the process for Commission review of contested cases, including requirements for filing exceptions and briefs. Mr. Knudsen explained that if a petitioner fails to file exceptions to a proposed order, the EQC is authorized to dismiss the petition. Mr. Knudsen asked Commissioners to declare any ex parte contacts or conflicts of interest regarding this case. All Commissioners declared that they had no ex parte contacts or conflicts of interest.

After discussion, Commissioner Van Vliet moved that the EQC dismiss the petition for review and uphold the proposed order. Commissioner Malarkey seconded the motion and it passed with four "yes" votes. Chair Reeve asked Mr. Knudsen to prepare the order on this action for the Director's signature on the Commission's behalf.

B. Action Item: Request for Dismissal of Contested Case No. AQ/AB-WR-01-082 regarding Fred Mendoza, doing business as MCM Company

The Commission considered a request from DEQ to dismiss a petition for review of a DEQ enforcement action against Fred Mendoza, dba MCM Company, because the petitioner did not file exceptions to the proposed order as required by rule (OAR 340-011-0132(3)). Larry Knudsen, Assistant Attorney General, described the process for Commission review of contested cases, including requirements for filing exceptions and briefs. Mr. Knudsen explained that if a petitioner fails to file exceptions to a proposed

¹ Staff reports and written material submitted at the meeting are made part of the record and available from DEQ, Office of the Director, 811 SW Sixth Avenue, Portland, Oregon 97204; phone: (503) 229-5990.

order, the EQC is authorized to dismiss the petition. Mr. Knudsen asked Commissioners to declare any ex parte contacts or conflicts of interest regarding this case. All Commissioners declared that they had no ex parte contacts or conflicts of interest.

After discussion, Commissioner Van Vliet moved that the EQC dismiss the petition for review and uphold the proposed order. Commissioner Malarkey seconded the motion and it passed with four "yes" votes. Chair Reeve asked Mr. Knudsen to prepare the order on this action for the Director's signature on the Commission's behalf.

C. Action Item: Contested Case No. AQ/AB-WR-02-059 regarding Pegasus Corporation

The Commission considered a contested case between DEQ and Pegasus Corporation, which appealed a proposed order that assessed the company a \$1,200 civil penalty for failing to use a Department-licensed asbestos abatement contractor at a facility it operates. Larry Knudsen, Assistant Attorney General, summarized the findings of fact made by the hearing officer and asked Commissioners to declare any ex parte contacts or conflicts of interest regarding the case. All Commissioners declared that they had no ex parte contacts or conflicts of interest. Bryan Smith, DEQ Environmental Law Specialist, presented arguments on behalf of the Department. No representative of Pegasus Corporation attended the meeting to present arguments.

Commissioners discussed the case with Mr. Knudsen and Mr. Smith. After consideration, Commissioner Van Vliet moved that the EQC uphold the proposed order. Commissioner Bennett seconded the motion and it passed with four "yes" votes. Chair Reeve asked Mr. Knudsen to prepare an order for the Director's signature on the Commission's behalf.

D. Discussion Item: Enforcement Rule Development Update

Anne Price, DEQ Administrator of the Office of Compliance and Enforcement, presented an update on the progress of revisions to DEQ's enforcement rules. Over the past two years, the Department incorporated the Commission's guidance in revising the rules to improve enforcement of Oregon's environmental regulations. At this meeting, Commissioners discussed approaches for making the rules more equitable, consistent and efficient, as well as plans for finalizing the rules in late 2003.

L. Rule Adoption: Temporary Rule Amending the Definition of "Underground Storage Tank"

Alan Kiphut, DEQ Environmental Cleanup Manager, proposed a temporary rule to amend the definition of "underground storage tank" to clarify when such tanks are regulated by DEQ. Mr. Kiphut explained that in Oregon, fuel tanks are regulated in one of two ways: the Oregon State Fire Marshal regulates above ground storage tanks and DEQ regulates underground storage tanks. A recent question about the regulation of certain tanks that are partially covered with earthen materials caused the Department to identify potential ambiguity in the current rules, and the temporary rule was developed to clarify tank regulations immediately. Mr. Kiphut described DEQ's plans to work with the State Fire Marshal and stakeholders later this year in the development of permanent rules that clearly distinguish between underground and above ground storage tanks.

Commissioners discussed the temporary rule change and options for the permanent rule with Mr. Kiphut. Commissioner Van Vliet moved that the Commission adopt the temporary rule as proposed and the accompanying Statement of Need and Justification. Commissioner Malarkey seconded the motion and it passed with four "yes" votes.

M. Action Item: Consider Authorization of Clean Water State Revolving Fund Bond Sale

Holly Schroeder, DEQ Budget Office Administrator, and Jim Roys, DEQ Budget Manager, asked the Commission to authorize DEQ and the State Treasurer to issue and sell up to \$3.1 million in state bonds to fund DEQ's Clean Water State Revolving Fund program as approved by the 2001 Legislature. Ms. Schroeder explained that the clean water loan program provides loans to public agencies for water pollution control projects, such as upgrades for sewage treatment systems. The program relies on the sale of Pollution Control Bonds to match federal funds that support the loans.

Commissioners discussed the bond sale with Ms. Schroeder and Mr. Roys. After consideration, Commissioner Malarkey moved that the Commission approve the resolution provided in Attachment A of the staff report to authorize the bond sale to support the program. Commissioner Van Vliet seconded the motion and it passed with four "yes" votes.

H. Director's Dialogue

Stephanie Hallock, DEQ Director, discussed current events and issues involving the Department and the state with Commissioners, including the status of state budget negotiations and key issues in the 2003 legislative session.

Friday, May 9, 2003

At 8:00 a.m., the Commission held an executive session to consult with counsel concerning legal rights and duties with regard to litigation against the Department. The executive session was held pursuant to ORS 192.660(1)(h).

Chair Reeve called the regular meeting to order at approximately 9:00 a.m. Agenda items were taken in the following order.

F. Approval of Minutes

Commissioner Van Vliet moved that the Commission approve draft minutes of the March 11, 2003, EQC meeting. Commissioner Malarkey seconded the motion and it passed with four "yes" votes. Commissioner Van Vliet moved that the Commission approve draft minutes of the January 30-31, 2003, EQC meeting, with the deletion of the word "of" on page 3 in the first paragraph of item G, as amended by Commissioner Malarkey. Commissioner Bennett seconded the motion and it passed with four "yes" votes.

G. Action Item: Consideration of Pollution Control Facilities Tax Credit Requests

Holly Schroeder, DEQ Budget Office Administrator, gave an overview of Pollution Control Facility Tax Credit requests, and introduced Maggie Vandehey, DEQ Tax Credit coordinator, to present applications to the Commission. Ms. Vandehey recommended that the Commission approve fifty two tax credit requests for technology and process investments that reduce environmental pollution. Ms. Vandehey also recommended that the Commission reissue one corrected tax credit certificate as presented in the staff report. Commissioners discussed the individual applications and the overall effect of the tax credit program on the State's general fund.

Commissioner Bennett moved that the Commission approve tax credit requests as recommended by the Department. Commissioner Van Vliet seconded the motion and it passed with four "yes" votes. Commissioner Van Vliet moved that the Commission reissue the corrected tax credit certificate as recommended by the Department. Commissioner Malarkey seconded the motion and it passed with four "yes" votes.

I. Informational: Update on Umatilla Chemical Agent Disposal Facility

Dennis Murphey, DEQ Chemical Demilitarization Program Administrator, and Sue Oliver, DEQ Senior Hazardous Waste Specialist, gave the Commission an update on the Umatilla Chemical Agent Disposal Facility, including the status of trial burns, the progress of a permit modification for the facility, and the function of other chemical demilitarization programs nationwide. Commissioners discussed recent issues, current activities, and plans for the facility with Mr. Murphey and Ms. Oliver.

E. Informational Item: Presentation of the 2001-2003 Oregon Plan Biennial Report

Geoff Huntington, Executive Director off the Oregon Watershed Enhancement Board (OWEB), and Jay Nicholas, OWEB Science and Policy Advisor, presented the 2001-2003 biennial report of the Oregon Plan for Salmon and Watersheds. Mr. Huntington and Mr. Nicholas described the progress of the Oregon Plan to date, as evaluated in the report, including investments in watershed restoration, water quality improvements and efforts to restore endangered fish species. Commissioners discussed the importance

of DEQ's role in the Oregon Plan to improve the quality of Oregon's rivers and streams, and thanked Mr. Huntington and Mr. Nicholas for their presentation.

J. Rule Adoption: Amendments to Asbestos Requirements

Andy Ginsburg, DEQ Air Quality Division Administrator, recommended Commission adoption of a permanent rule to provide businesses with relief from asbestos requirements that had proved problematic after they were put in place in early 2002. Mr. Ginsburg explained that to protect public health, DEQ regulates disposal of asbestos containing materials from demolition, construction, repair, and maintenance of public and private buildings. DEQ's asbestos rules are designed to prevent asbestos fiber release and exposure, and in January 2002, the rules were modified to be more protective of public health. Later in 2002, DEQ learned that some of the new regulations were difficult for businesses to interpret and use, and in December 2002, the Commission adopted a temporary rule to relieve businesses of some of the new requirements. Audrey O'Brien, Northwest Region Air Quality Manager, and Dave Wall, Northwest Region Asbestos Control staff, joined Mr. Ginsburg in the presentation.

After discussion with Mr. Ginsburg, Ms. O'Brien and Mr. Wall, Commissioner Van Vliet moved that the Commission adopt the proposed rule as recommended. Commissioner Bennett seconded the motion and it passed with four "yes" votes.

Public Forum

At approximately 11:30 a.m., Chair Reeve asked whether anyone in the audience wished to make general comments to the Commission. Karyn Jones and James Wilkinson, representing GASP, commented on the readiness status, the monitoring plan and the health risk assessment for the Umatilla Chemical Agent Disposal Facility. Commissioners discussed the facility with Ms. Jones and Mr. Wilkinson, and thanked them for their comments.

K. Rule Adoption: Clean Water State Revolving Fund

Mike Llewellyn, DEQ Water Quality Division Administrator, proposed rule revisions for DEQ's Clean Water State Revolving Fund program to allow funds to be used to address a broader range of water pollution problems, including nonpoint sources of pollution. DEQ's Clean Water State Revolving Fund program provides loans to public agencies for water pollution control projects. Mark Charles, DEQ Water Quality Division Manager, and Larry McAllister, DEQ Clean Water State Revolving Fund coordinator, joined Mr. Llewellyn in the presentation. Mr. McAllister explained that the changes would expand DEQ's loan program beyond its historic focus on wastewater treatment facilities to target the water quality benefit of each proposed project. In addition, the revisions were designed to make loans more affordable and attractive to public agencies, and more available for streamside restoration work to support the Oregon Plan for Salmon and Watersheds.

After discussion with Mr. Llewellyn, Mr. McAllister and Mr. Charles, Commissioner Van Vliet moved that the Commission adopt the proposed rules, with corrections to grammatical errors noted by the EQC that do not change the meaning of the rule. Commissioner Bennett seconded the motion and it passed with four "yes" votes.

N. Commissioners' Reports

Commissioners gave no reports at this meeting.

Chair Reeve adjourned the meeting at approximately 12:30 p.m.

State of Oregon
Department of Environmental Quality

Memorandum

Date: June 26, 2003
To: Environmental Quality Commission
From: Stephanie Hallock, Director *S. Hallock*
Subject: Agenda Item B, Rule Adoption: Title V Permitting Program CPI Fee Increase
July 17, 2003 EQC Meeting

Department Recommendation The Department recommends that the Environmental Quality Commission (Commission) adopt rule revisions to increase Title V Operating Permit Program fees by 4.59 percent as presented in Attachment A.

Need for Rulemaking This proposed fee increase is needed to pay for projected cost increases in the Oregon Title V Operating Permit Program, which permits and assures compliance for the largest stationary air pollution sources in Oregon. Costs to implement and administer the program are projected to increase 12.6 percent in fiscal year 2004 due to inflation and increases in personnel service costs that will apply to all state agencies. The proposed increase, together with existing fund balance, will be adequate to fund the program through 2004.

Except for last year, Title V permitting fees have increased each year since the Department received Full Program Approval from EPA in 1993. A fee increase was not proposed last year because the program was expected to be adequately funded based on projected end of year fund balance and projected FY 2003 revenues.

As presented later in this memorandum, Oregon statute provides for Title V Permitting Program fee increases consistent with the Consumer Price Index (CPI).

Effect of Rule This proposed rule increases fees for all Oregon Title V Operating Permit Program sources to match the 2002 national CPI. The Department projects that 119 sources will be subject to Title V in FY 2004. Attachment D, the Statement of Need and Fiscal and Economic Impact for this proposed rulemaking, provides more information on the types of sources affected and the projected fee increases for these sources.

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Dept. Environmental Quality

Rev 12/02

The table below shows the effect of a 4.59 percent fee increase for the types of fees sources pay.

Fee Type	Current Fee	Proposed Fee
1) Annual Base Fee	\$2,977	\$3,116
2) Annual Emission Fee (per ton)	\$34.72	\$36.30
3) Special Activity Fees:		
a) Administrative Revision	\$298	\$312
b) Simple Modification	\$1,191	\$1,247
c) Moderate Modification	\$8,932	\$9,349
d) Complex Modification	\$17,863	\$18,699
e) Ambient Air Monitoring Review	\$2,392	\$2,493

- Commission Authority** The Commission has authority to take this action under ORS 468.065, ORS 468A.040, and ORS 468A.315. ORS 468A.315 specifically allows the Commission to increase Title V fees based on the CPI.
- Stakeholder Involvement** As in previous years, the Department discussed the key elements of this proposed fee increase with Title V source representatives, including the Association of Oregon Industries and Northwest Pulp and Paper, prior to the formal public comment period. A formal advisory committee was not convened because no policy issues were examined or needed to develop the proposed rule.
- Public Comment** A public comment period extended from February 18, 2003 to March 28, 2003 and included a public hearing in Portland. As provided in Attachment B, the Presiding Officer's Report, the Department received no public comment in response to this proposed rulemaking.
- Key Issues**
- The 4.59 percent fee increase represents a two-year CPI adjustment since fees were last increased in July 2001. The Department did not propose a fee increase in 2002 because the projected end of year fund balance was sufficient to fully fund the program in FY 2003.
 - The Department's statutory authority to increase fees by the CPI is the sole means of assuring that the Title V Permitting Program is sufficiently funded to pay for all direct and indirect costs of the program, as required by the federal Clean Air Act. Although the combination of current program fund balance and projected CPI increases is expected to adequately fund the program through the 2003-2005 biennium, the Department anticipates

that staff reductions or an increase in the base fee level may be needed to assure the program is fully funded beyond 2005. The Department intends to seek additional streamlining opportunities and conduct a work load analysis of the program during the coming biennium.

Next Steps

Sources subject to the Oregon Title V Operating Permit Program pay fees each year. As in previous years, the new fees will be collected through the program's existing billing system. Permittees will be invoiced for the new fees in late July, 2003.

This proposal will be filed with the Secretary of State, and submitted to EPA as a program update as soon as possible after adoption by the Commission. This rulemaking does not require amending Oregon's State Implementation Plan because the Department has Full Program Approval from EPA to implement and administer the program. The Rule Implementation Plan is available upon request for more information.

Attachments

- A. Proposed Rule Revisions
- B. Presiding Officer's Report on Public Hearings
- C. Relationship to Federal Requirements Questions
- D. Statement of Need and Fiscal and Economic Impact
- E. Land Use Evaluation Statement

Available Upon Request

- 1. Legal Notice of Hearing
- 2. Cover Memorandum from Public Notice
- 3. Rule Implementation Plan

Approved:

Section:

Patricia Vernon

Division:

Andrew Ginsburg

Report Prepared By: Scott Manzano

Phone: (503) 229-6821

Attachment A

State of Oregon DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal for Oregon Title V Operating Permit Fee Increase

Proposed Rule Changes

340-220-0030

Annual Base Fee

The Department will assess an annual base fee of \$2,9773,116 for each source subject to the Oregon Title V Operating Permit program. The fee covers the period from November 15 of the current calendar year to November 14 of the following year.

Stat. Auth.: ORS 468 & ORS 468A

Stats. Implemented: ORS 468 & ORS 468A

Hist.: DEQ 20-1993(Temp), f. & cert. ef. 11-4-93; DEQ 13-1994, f. & cert. ef. 5-19-94; DEQ 12-1995, f. & cert. ef. 5-23-95; DEQ 22-1995, f. & cert. ef. 10-6-95; DEQ 7-1996, f. & cert. ef. 5-31-96; DEQ 9-1997, f. & cert. ef. 5-9-97; DEQ 12-1998, f. & cert. ef. 6-30-98; DEQ 10-1999, f. & cert. ef. 7-1-99; DEQ 14-1999, f. & cert. ef. 10-14-99, Renumbered from 340-028-2580; DEQ 8-2000, f. & cert. ef. 6-6-00; DEQ 6-2001, f. 6-18-01, cert. ef. 7-1-01; DEQ 7-2001, f. 6-28-01, cert. ef. 7-1-01

340-220-0040

Emission Fee

(1) The Department will assess an emission fee of \$34.7236.30 per ton to each source subject to the Oregon Title V Operating Permit Program.

(2) The emission fee will be applied to emissions from the previous calendar year based on the elections made according to OAR 340-220-0190.

Stat. Auth.: ORS 468 & ORS 468A

Stats. Implemented: ORS 468 & ORS 468A

Hist.: DEQ 20-1993(Temp), f. & cert. ef. 11-4-93; DEQ 13-1994, f. & cert. ef. 5-19-94; DEQ 12-1995, f. & cert. ef. 5-23-95; DEQ 22-1995, f. & cert. ef. 10-6-95; DEQ 7-1996, f. & cert. ef. 5-31-96; DEQ 9-1997, f. & cert. ef. 5-9-97; DEQ 12-1998, f. & cert. ef. 6-30-98; DEQ 10-1999, f. & cert. ef. 7-1-99; DEQ 14-1999, f. & cert. ef. 10-14-99, Renumbered from 340-028-2590; DEQ 8-2000, f. & cert. ef. 6-6-00; DEQ 6-2001, f. 6-18-01, cert. ef. 7-1-01; DEQ 7-2001, f. 6-28-01, cert. ef. 7-1-01

340-220-0050

Specific Activity Fees

The Department will assess specific activity fees for an Oregon Title V Operating Permit program source as follows:

(1) Existing Source Permit Revisions:

(a) Administrative* -- \$298312;

(b) Simple -- \$1,1911,247;

(c) Moderate -- \$8,9329,349;

(d) Complex -- \$17,86318,699;

(2) Ambient Air Monitoring Review -- \$2,3922,493.

*includes revisions specified in OAR 340-218-0150(1)(a) through (g). Other revisions specified in OAR 340-218-0150 are subject to simple, moderate or complex revision fees.

Stat. Auth.: ORS 468 & ORS 468A

Stats. Implemented: ORS 468 & ORS 468A

Hist.: DEQ 20-1993(Temp), f. & cert. ef. 11-4-93; DEQ 13-1994, f. & cert. ef. 5-19-94; DEQ 12-1998, f. & cert. ef. 6-30-98; DEQ 10-1999, f. & cert. ef. 7-1-99; DEQ 14-1999, f. & cert. ef. 10-14-99, Renumbered from 340-028-2600; DEQ 8-2000, f. & cert. ef. 6-6-00; DEQ 6-2001, f. 6-18-01, cert. ef. 7-1-01; DEQ 7-2001, f. 6-28-01, cert. ef. 7-1-01

Attachment B

State of Oregon

Department of Environmental Quality

Memorandum

Date: April 2, 2003

To: Environmental Quality Commission

From: Scott Manzano

Subject: Presiding Officer's Report for Rulemaking Hearing
Title of Proposal: Title V Permitting Program CPI Fee Increase
Hearing Date and Time: March 25, 2003, beginning at 3:00 p.m.
Hearing Location: 811 SW 6th Avenue, Room 3A, Portland OR.

The Department convened the rulemaking hearing on the proposal referenced above at 3:00 p.m. One person attended the meeting; there was no oral or written testimony, and the hearing was closed at 3:30 p.m.

The Department received no written or oral comment in response to this proposed rulemaking.

Attachment C

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal for Oregon Title V Operating Permit Fee Increase

Relationship to Federal Requirements

Answers to the following questions identify how the proposed rulemaking relates to federal requirements and potential justification for differing from federal requirements. The questions are required by OAR 340-011-0029.

- 1. Are there federal requirements that are applicable to this situation? If so, exactly what are they?**

Yes. Title V of the federal Clean Air Act and EPA rules (40 CFR Part 70) require that Title V fees fully pay for the cost of the Title V program. Federal law requires that fees be increased to keep pace with inflation. Federal law also specifies which sources must obtain Title V permits. This rulemaking does not differ from the federal requirement.

- 2. Are the applicable federal requirements performance based, technology based, or both with the most stringent controlling?**

Not Applicable

- 3. Do the applicable federal requirements specifically address the issues that are of concern in Oregon? Was data or information that would reasonably reflect Oregon's concern and situation considered in the federal process that established the federal requirements?**

Yes. The federal fee requirement assures that sources subject to Title V pay for the permitting program instead of the general public.

- 4. Will the proposed requirement improve the ability of the regulated community to comply in a more cost effective way by clarifying confusing or potentially conflicting requirements (within or cross-media), increasing certainty, or preventing or reducing the need for costly retrofit to meet more stringent requirements later?**

Not Applicable

5. Is there a timing issue which might justify changing the time frame for implementation of federal requirements?

Not Applicable

6. Will the proposed requirement assist in establishing and maintaining a reasonable margin for accommodation of uncertainty and future growth?

Not Applicable

7. Does the proposed requirement establish or maintain reasonable equity in the requirements for various sources? (level the playing field)

Not Applicable

8. Would others face increased costs if a more stringent rule is not enacted?

Not Applicable

9. Does the proposed requirement include procedural requirements, reporting or monitoring requirements that are different from applicable federal requirements? If so, Why? What is the "compelling reason" for different procedural, reporting or monitoring requirements?

Not Applicable

10. Is demonstrated technology available to comply with the proposed requirement?

Not Applicable

11. Will the proposed requirement contribute to the prevention of pollution or address a potential problem and represent a more cost effective environmental gain?

Not Applicable

Attachment D

Oregon Title V Operating Permit Fee Increase

DEPARTMENT OF ENVIRONMENTAL QUALITY

Chapter 340

Proposed Rulemaking

STATEMENT OF NEED AND FISCAL AND ECONOMIC IMPACT

Title of Proposed Rulemaking:	Oregon Title V Operating Permit Program CPI Fee Increase
Need for the Rule(s)	<p>This proposed rule amendment is necessary to fund projected cost increases in the Oregon Title V Operating Permit Program (the Program) for fiscal year 2004 (July 1, 2003 – June 30, 2004). Costs to implement and administer the Program are expected to rise in FY 2004 due to personal service cost increases and inflation. In addition, because of an unanticipated cost increase to personal services that will affect all state agencies, the Department projects that the Program's overall costs will increase 12.6 percent in FY 2004.</p> <p>To respond to the projected increase in Program cost, the Department is proposing to increase fees 4.59 percent, which represents a CPI adjustment from FY 2002, when Program fees were last increased. The proposed increase will not fully compensate for projected cost increases if 12.6 percent in FY 2004; those costs will be paid for from the Program fund balance to assure the Program remains fully funded as required by EPA.</p>
Documents Relied Upon for Rulemaking	<p>Documents relied upon to provide the basis for this proposal include:</p> <ol style="list-style-type: none"> 1) 2001-2003 Biennium Legislatively Approved Budget 2) 2003-2005 Biennium Agency Request Budget 3) Fiscal Year 2004 Projected Title V Revenue 4) Oregon Department of Administrative Services Consumer Price Index Projections (November 2002) 5) Federal Clean Air Act Amendments of 1990 6) Oregon Statutes ORS 468.065, ORS 468A.040, and ORS 468A.315 <p>Copies of these documents can be reviewed at the Department of Environmental Quality's office at 811 S.W. 6th Avenue, Portland, Oregon.</p>
Fiscal and Economic Impact	
Overview	<p>This proposed rule ensures that the Department will have adequate funding to administer and implement the Oregon Title V Operating Permit Program, which applies to the largest point sources of air pollution in Oregon. The Department received full Program Approval from the U.S. Environmental Protection Agency (EPA) in 1993, effectively delegating program authority from EPA to the State of Oregon. Oregon statute provides for fee increases according to the Consumer Price Index (CPI) in order to maintain the Program as approved.</p>
General public	<p>The General public is not expected to be affected except for the possibility that fees are passed through, which may result in modest increased costs for products or services from Title V sources.</p>

Small Business	Most Title V sources are large businesses. However, several small businesses like fiberglass reinforced plastic manufacturers, and smaller wood product and cabinet surface coating operations are subject to the permitting program because their potential emissions are high enough to trigger Title V thresholds. For these sources, the Department expects the proposed increase will have a very small effect on yearly operating costs. As provided below, this proposal would increase fees \$297 for a source that emits 100 tons per year.
Large Business	All Title V sources pay an annual Base Fee, and an annual Emission Fee (per ton of pollutant). For this proposal, Base fees will increase \$139; emission fees will increase \$1.58/ton in fiscal year 2004. Approximately 65 percent of Title V sources emit between 100 to 1000 tons of regulated pollutants per year. The proposed fee increase on these facilities would be from \$297 to \$1719 for FY 2004 assuming no permit modifications or ambient air modeling is needed.
Local Government	Currently, Coos County and Metro are the local government agencies that are required to have a Title V operating permit. Considering the 4.59 percent increase, Coos County would pay projected annual fees of \$9,541 for FY 2004, an increase of \$419 over current fees; Metro would pay \$17,748 for FY 2004, an increase of \$779 over current fees. These projections assume emissions are the same in comparative years.
State Agencies	Oregon State University and Oregon Health Sciences University are currently the only state agencies required to have Title V operating permits. Oregon State University would pay projected annual fees of \$10,195 in FY 2004, an increase of \$448 over current fees. For FY 2004, Oregon Health Sciences University would pay annual fees of \$19,419 an increase of \$853 over current fees. These projections assume emissions are the same in comparative years.
DEQ	The Department of Environmental Quality will not incur any additional costs nor will any personnel adjustments be required to implement this proposed rulemaking. Although the Department expects that the proposed increase will generate additional revenue to fund the Program in FY 2004, the proposed increase is not projected to meet the 12.6 percent increase in program costs. The difference between expected revenue and program cost in FY 2004 will be made with existing program fund balance.
Other agencies	No other agencies will be affected by this proposed rulemaking.
Assumptions	Estimated revenue forecasts and expenditures are based on the assumption that all facilities subject to the Program have been identified, and that facility emissions will remain at the same level as in previous years. The Department projects 119 sources will be subject to Title V permitting and fee requirements in FY 2004.
Housing Costs	The Department has determined that this proposed rulemaking will have no effect on the cost of development of a 6,000 square foot parcel and the construction of a 1,200 square foot detached single family dwelling on that parcel.
Administrative Rule Advisory Committee	An Advisory Committee was not convened to help develop these rules because no policy issues needed to be resolved. The Department met with Title V source representatives in December 2002 to discuss the need for this rulemaking proposal.

Prepared by

Scott Manzano
Printed name

February 7, 2003
Date

Approved by DEQ Budget Office

Holly Schroeder
Printed name

12 Feb 2003
Date

Attachment E

State of Oregon DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal for Oregon Title V Operating Permit Fee Increase

Land Use Evaluation Statement

1. Explain the purpose of the proposed rules.

Costs of implementing and administering the Title V Operating Permit Program in Oregon have increased due to inflation. The Oregon Operating Permit program is required to be fully funded by fees from all sources subject to Title V of the federal Clean Air Act in order to retain federal approval status. An increase in the fees charged is necessary to implement the program and maintain self supporting status.

The fee increase will not result in an increase in staff. Regulated facilities will pay more for each ton of regulated air pollution released, and for annual compliance assurance work and permit modification work. The fee increase is based on a 4.59 percent increase in the U.S. Consumer Price Index since the last rule adoption.

2. Do the proposed rules affect existing rules, programs or activities that are considered land use programs in the DEQ State Agency Coordination (SAC) Program?

Yes ☒ No ☐

a. If yes, identify existing program/rule/activity:

The proposed rule affects Oregon's federal Operating Permit Program, which regulates air emissions from major industrial sources.

b. If yes, do the existing statewide goal compliance and local plan compatibility procedures adequately cover the proposed rules?

Yes ☒ No ☐ (if no, explain):

The proposed rules would be implemented through the Department's existing stationary source permitting program. An approved land use compatibility statement is required from local government before an air permit is issued.

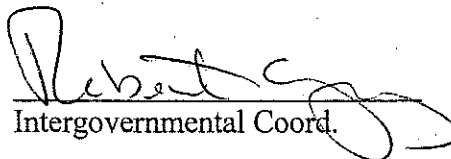
c. If no, apply the following criteria to the proposed rules.

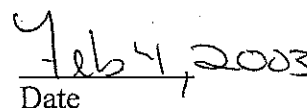
Not applicable

3. If the proposed rules have been determined a land use program under 2. above, but are not subject to existing land use compliance and compatibility procedures, explain the new procedures the Department will use to ensure compliance and compatibility.

Not Applicable


Division


Intergovernmental Coord.


Date Feb 4, 2003

State of Oregon
Department of Environmental Quality

Memorandum

To: Environmental Quality Commission

Date: July 16, 2003

From: Stephanie Hallock, Director

Subject: Director's Dialogue

Budget Update

The 2003 legislative session continues to be dominated by the state budget. Legislative leaders are meeting frequently, but no agreement has been reached on key budgets including funding for K-12 education, Human Services including the Oregon Health Plan, and Public Safety. Daily meetings of up to 30 legislators, legislative staff and Governor's office have been replaced by meetings of the Governor, Speaker and Senate President. The need to agree on revenue raising measures will make final agreement, and legislative adjournment, more difficult. The caucuses must provide the three-fifths votes for revenue raising measures.

The House Speaker has referred 10 placeholder budget bills to the House Special Budget Committee, which can pass budget bills to the House Floor without having them pass out of the Joint Ways & Means Committee. The Speaker has indicated that this is a "fallback" if budget negotiations continue at a stalemate.

The Joint Ways & Means Committee and subcommittees continue to meet. Some agency budgets have been approved, generally in cases where there is little or no General Fund, or where agreement has been reached with the legislative leadership and the Governor. Examples of natural resource agency budgets that have passed the Legislature include Oregon Parks and Recreation, Oregon Department of Energy, and Oregon Department of Fish and Wildlife. A number of natural resource agency budgets have had work sessions, but have not yet passed out of the Ways & Means Natural Resources Subcommittee, including DEQ, Department of Land Conservation and Development, Department of Agriculture, Oregon Watershed Enhancement Board, Division of State Lands, and the Department of Forestry.

Even for agency budgets that have passed, there may still be end-of-session budget balancing bills that affect all agencies across the board. For example, some legislators are still looking at using other fund ending balances in various accounts, either as one-time money or as sources of bonding to raise more revenues.

July 1 marked the beginning of the new fiscal year and the 2003-05 biennium. DEQ is one of many state agencies without a legislatively approved budget for 2003-05. In order to fund operations for these agencies beginning, the Legislature passed House Bill 5065, a "continuing resolution," to provide the authority and appropriations to agencies without approved budgets through July 31, 2003. Since the Legislature is unlikely to adjourn before the end of July, future continuing resolutions will probably be authorized one week at a time. The State Treasurer recently raised concerns about cash flow available to pay state expenses if the budget is not balanced soon, and the Department of Administrative Services is developing information on cash flow issues and options available to the Legislature.

DEQ's budget work session

In mid-June, DEQ's budget had a three-day work session with the Ways & Means Natural Resources Subcommittee. Although our budget did not pass the Subcommittee, only a few unresolved issues remain and it's clear that the overall attitude toward DEQ is positive. The main unresolved issues are funding for Community Solutions Team and Environmental Partners for Oregon Communities. While we hope that both these activities will be funded, it is more realistic that only one of these programs, or parts of them, will be funded.

The items listed below were "gaveled out" and will likely stand:

Continue TMDL and Oregon Plan for Salmon and Watersheds

- Fund \$1.38 million for Oregon Plan biomonitoring, steelhead supplement, volunteer monitoring, and Willamette TMDL with federal Pacific Coast Salmon Recovery Funds.
- Fund \$3.375 million for statewide Total Maximum Daily Load (TMDL), nonpoint source and monitoring work with Ballot Measure 66 Operating Fund.

Continue Hazardous Waste Business Assistance, \$808,000 General Fund. Last year, we assisted 360 businesses and trained 500 individuals in safe hazardous waste management. Loss of this General Fund would mean 50% fewer businesses receiving technical assistance. The initial Co-Chairs' budget proposed to cut this funding, but after stakeholders voiced their support, the Co-Chairs recommended continuing this work.

Convert Clean Water State Revolving Fund Loans debt service payments from General Fund to self-financing from the Fund interest. The Governor's Revised Budget recommended cutting \$4.75 million in General Fund and to be replaced with self-financing. Self-financing reduces DEQ's capacity to make loans to communities for wastewater treatment plant upgrades, but without this General Fund cut, other DEQ programs would have been cut. Self-financing has been agreed to by EPA, is being done in other states, and is acceptable to bond counsel and the Department of Administrative Services.

Continue Vehicle Inspection Program. In 2001, the Legislature approved limited-duration state employee status for all Vehicle Inspection Program staff. Previously, half of the staff were state employees and half were contract employees through a personnel agency. This session, there have been efforts to privatize the program. The Subcommittee approved our policy package to continue 50 limited-duration state employees and 20 permanent state employees.

Laboratory Rent Increase. Portland State University has increased DEQ's rent for the laboratory space on its campus. The Subcommittee approved most of the requested funding to pay for this rent increase, but denied "bridge space" rent that would have paid for additional off-site office space for lab staff.

Relocation of DEQ/Health Lab. The Subcommittee recommended approval of \$6 million other funds capital construction limitation for purchase of a building suitable for retrofitting for use as a laboratory for DEQ and the Department of Human Services Public Health. Funds will be derived from the sale of Certificates of Participation by the Department of Administrative Services (DAS), and DAS must request limitation to complete the project from the legislative Emergency Board.

DEQ and DHS are expected to pursue all possible federal sources of funding for the project. House Bill 5004, the mechanism for the \$6 million Certificates of Participation, passed the House floor and is now going to the Senate.

Work funded by Federal Funds or Other Funds. The Subcommittee approved all policy packages supported by Federal Funds or Other Funds. The majority of these policy packages allow continuation of current work – for example, TMDL implementation, drinking water protection, the La Pine on-site study, and pollution control tax credits.

General Fund cuts. The Subcommittee approved the following cuts to DEQ's proposed budget. These are in addition to cuts already taken, as summarized in Attachment A, an April 2003 status report.

- Air Quality Business Assistance, \$63,000 General Funds, 0.18 FTE. Reduces pre-permitting assistance to new or expanding businesses.
- Environmental Cleanup, \$432,000 General Funds, 2 FTE (**Note: The Subcommittee approved a shift of these positions to federal funding.**)
- Open Burning, \$210,000 General Funds, 1.5 FTE. Reduces investigation of open burning complaints by one-third.
- Water Quality non-point source policy coordinator, \$240,000, 1 FTE. Reduces coordination with federal and state agencies.
- TMDL Development position, \$170,000 General Funds, 1 FTE. Cuts base statewide TMDL work.
- Elimination of 10 vacant positions and \$141,000 in General Funds (and \$400,000 in Other Funds).

Adjustments for agency-wide reductions. All agencies have taken reductions in the elimination of merit and cost-of-living increases and the reduction of inflation allowances for the 2003-05 biennium, as well as reduced charges from the Department of Justice and Department of Administrative Services as a result of reductions made in those agencies' budgets.

Legislation Update

Progress has been made on a number of priorities held by legislators at the start of the session, included PERS reform; economic development stimulus; regulatory reform/streamlining; and a transportation package to fund bridge repair and other maintenance. Major PERS legislation has been enacted. House Bill 3120, now in Conference Committee, sets up a regulatory streamlining advisory committee through the Department of Consumer and Business Services. Senate Bill 771 seeks to institutionalize state agency coordination and cooperation on transportation projects. Specifically, it directs regulatory agencies to provide technical assistance on permitting and approval processes for transportation projects, expediting decisions in the most cost-effective and timely manner, consistent with legal requirements. The Governor has signed this bill.

The transportation funding and economic development bill, House Bill 2041, has passed the House and the Senate Revenue Committee. The bill includes a new tax credit that goes into effect after the 2003-05 biennium, to be administered by DEQ for purchase of truck engines that meet new EPA standards for lower diesel emissions.

A number of other bills addressing economic development are still in play, including Senate Bill 467 which creates the Community Solutions Team in statute, creates a process to identify "market ready" sites for industrial development, and requires the Oregon Economic and Community Development Department to develop a statewide economic development plan in consultation with local governments and businesses. This bill passed the Senate Transportation and Economic Development Committee and is now in Ways & Means. House Bill 2691, signed by the Governor, modifies certain land use restrictions to promote development of abandoned mill sites for industrial use. The bill allows extension of sewer lines outside of Urban Growth Boundaries to serve these sites (normally prohibited by state land use law).

Legislation seeking new environmental protection programs has not moved forward. The biggest environmental debates this session have centered on timber harvest, the state's land use program, and wetlands.

DEQ has been tracking a couple hundred bills, but only a handful of these have moved forward and directly affect the agency.

House Bill 2644 continues fees at the Arlington hazardous waste disposal site and lowers fees on large quantities of waste from cleanup sites. The bill has passed the House and Senate and will be signed by the Governor shortly. There was concern about this bill from U.S. Ecology, which operates a hazardous waste site in Idaho, and the Idaho DEQ because they feel the lower fee category might put that site at a competitive disadvantage. In response to that concern, the bill was modified to have a March 2004 implementation date, giving Idaho an opportunity to make a similar change when its legislature meets next year.

HB 2652 increases the maximum pollution control tax credit from 35 to 50 percent, adds biodiesel production facilities as eligible pollution control facilities, and increases the Business Energy Tax Credit for renewable energy facilities. The bill passed the House and is now in the Senate Revenue Committee, but the Governor's office has voiced concerns about increasing the percentage of pollution control and business energy tax credits.

HB 3013 relates to land use approval of gravel mining operations. It clarifies that Department of Geology and Mineral Industries permits for gravel mines rely on DEQ air quality standards for regulation of dust and particulates; DEQ is not the implementer or enforcer of these permits. The bill has passed the House and Senate and has been assigned to Conference Committee.

HB 3175 extends the sunset of the Green Permits statute and program to January 2008; clarifies that this program is discretionary for the agency; clarifies that it is to be fully funded by cost recovery from Green Permit applicants; and increases the application deposit from \$5,000 to up to \$25,000. The Governor has signed this bill.

House Bill 3637 was introduced late in the session by the beer distributors to allow them to dispose of glass they receive back under the bottle bill. Economical markets to recycle glass from rural areas are more difficult to find, but there are options for glass, such as use in road construction, in many rural counties. The bill passed one committee but died after strong opposition from DEQ and the Association of Oregon Recyclers, and attention from the media.

House Bill 3645 is a "likely to pass" bill brought forward by Waste Management. The bill allows, but does not require, DEQ to approve the addition of liquids in landfills. The company would like to dispose of large quantities of sediments at its Arlington solid waste disposal site. The addition of liquids to landfills in dry areas can be done in an environmentally sound manner.

Senate Bill 196, the hazardous waste bill introduced by DEQ, passed out of its first committee and was tentatively approved by the Ways and Means Natural Resources Subcommittee. The bill increases hazardous waste fees to pay for some of DEQ's hazardous waste work. The Subcommittee removed provisions directing civil penalty money to DEQ to be used for hazardous waste business assistance, but it also maintained General Fund support for this assistance, so the two together were considered a budgetary compromise. Final approval is anticipated when DEQ's budget is approved.

HB 5004 is the DAS capital construction bill, and includes \$6 million in certificates of participation to fund purchase of an existing building for relocation of the DEQ and Public Health laboratories. This bill has passed the full Ways & Means Committee and the House Floor.

HB 5060 ratifies DEQ's air and water permit fee increases previously approved by the 2001 Legislature. The fees needed to be ratified for timely issuance of air and water permits. The bill has passed the Ways & Means Natural Resources Subcommittee and awaits action by the full Ways & Means Committee when DEQ's budget is approved.

Senate Bill 419 was introduced by one part of the dry cleaning industry. Industry representatives, Senator Harper (who owns a dry cleaning facility in Klamath Falls) and DEQ reached agreement on bill language after several negotiations. The bill rearranges the fees for dry cleaners to provide more money for cleaning up contaminated sites, and shifts fee collection from the Department of Revenue to DEQ. The bill passed both houses and was signed by the Governor.

Senate Bill 751 addresses potential future state funding to clean up contaminated sediments in Portland Harbor. The bill was amended in committee to DEQ's satisfaction, has passed the Senate and is now in the House Rules Committee. Some continue to have major concerns with the bill, including Senator Carter, OSPIRG and Willamette Riverkeeper. In its present form, SB 751:

- Does not change cleanup laws or liability for cleanup.
- Allows, but does not obligate, the state to pay any of the Superfund site's cleanup costs.
- Adds cleanup of Portland Harbor contaminated sediments as one of many authorized uses of the state Pollution Control Fund, but does not provide any money. The new use of this Fund is not inconsistent with other authorized uses, such as cleanup of state Orphan Sites.
- Creates a Willamette River Cleanup Authority comprised of the Governor and four legislators to receive periodic reports and make recommendations on bonding to pay for all or a portion of contaminated sediment cleanups.

SB 912 removes the 2004 requirement for glass containers to have 50% recycled content (the current standard is 35 percent). DEQ agrees with proponents that the 50% requirement may no longer realistic or relevant. Recycling groups would like to keep the 50% requirement but postpone its date until 2008, and the glass industry seems fine with this. The bill is in the Senate Rules Committee.

Raising National Awareness and Support for Laboratory Preparedness

In May, I reported to you on the efforts of Mary Abrams, DEQ Laboratory Administrator, to raise awareness in Washington D.C., of the need to fund laboratory preparedness and chemical terrorism response nationwide. In early June, Mary completed a second series of meetings in the continuing search for federal funds to support the move of DEQ's Lab (currently housed at Portland State University) to a new, combined facility with the state Department of Human Services Public Health Lab. This joint lab would be a regional resource and key component in emergency response, uniquely positioned to provide both chemical and biological analytical support for potential terrorist threats in the Pacific Northwest.

While in D.C. in June, Mary attended the annual Association of Public Health Laboratories meeting and met with members of Oregon's delegation, staff for key House and Senate Committees, and EPA management officials in the offices of Homeland Security and Environmental Information. Continuing to Chicago, Mary attended the Association of Food and Drug Officers annual meeting to discuss the possibility of a national laboratory response network that would include all state and federal labs in the environmental, agricultural, food safety, and public health domains.

In April, Mary worked with congressional staffers and members of Oregon's delegation to craft a request for a \$10 million appropriation in the Homeland Security budget, which would be the first of a three year appropriation, for a total of \$40 million. The House appropriations bill did not include this request, but we are continuing to work on the Senate side and we expect progress on this after the August Congressional recess. Mary continues to work with federal and state laboratory directors to develop the concept of a national laboratory network, which would support the creation of regional labs nationwide, including ours. Mary is in Seattle this week meeting with regional directors and in D.C. next week meeting with national directors. EPA and the states of Washington and Idaho have already sent letters Senators and to me supporting our creation of a central regional lab for the Northwest and the idea of a national network.

Columbia Navigation Channel Deepening

On June 23, the Department released its water quality (Section 401) certification for the proposal to deepen the Columbia River federal navigation channel. The Army Corps of Engineers (Corps) proposes to deepen the channel by an additional three feet to 43 feet from River Mile 3 at the mouth of the Columbia to River Mile 106 at the Vancouver-Portland Interstate-5 Bridge.

DEQ certified the project as meeting water quality standards subject to a number of conditions, the most significant of which are summarized in Attachment B. Oregon's Department of Land Conservation and Development and the Washington Department of Ecology also conditionally certified the project. Had the Corps been dissatisfied with any conditions in DEQ's certification, it could have appealed to the EQC by July 13. The Corps did not file an appeal. Assuming it does not appeal the other certifications, the Corps is expected to issue a "record of decision" (internal findings) in August. If a lawsuit challenging that decision is not filed, and if project funding comes through in the Congressional budget, work toward channel deepening in line with state conditions could begin.

Agreement Signed for Powerdale Hydroelectric Decommissioning

In June, DEQ, along with other state, federal and local agencies, the Warm Springs Tribes and non-government organizations, signed an agreement to decommission the Powerdale Hydroelectric project on the Hood River and remove the diversion dam in 2010. You may recall that in March

2000, the EQC toured an Oregon Department of Fish and Wildlife (ODFW) fish counting station on the Hood River that worked in conjunction with the Powerdale project. Built in 1922-23, this project includes a hydro-electric unit and diversion dam a few miles upstream of the confluence with the Columbia River, and provides power to the City of Hood River area. Because of the high cost of operating the hydro-electric unit (i.e., management of high sediment loads from Mt. Hood and necessary fish screening to protect down-migrating salmonids), PacifiCorp decided to decommission the facility when its Federal Energy Regulatory Commission (FERC) license came up for renewal in March 2000. ODFW and the Warm Springs Tribes, however, asked to continue operating the fish counting station, which relies on the diversion dam, to complete studies on salmonid production and life history.

The decommissioning agreement will allow conclusion of fish monitoring studies, will protect fish passage, and will ensure compliance with the Hood River temperature TMDL and address other water quality issues. The agreement is now being submitted to the Federal Energy Regulatory Commission for approval, which could come as early as summer 2004. We believe approval is likely.

Executive Team Visioning Retreat

In May, I reported to you on the first of three "visioning" retreats held by DEQ's Executive Management Team discuss the future of the agency and how to fulfill our vision to work cooperatively with all Oregonians for a healthy, sustainable environment. On June 24, the EMT held a second retreat to continue our discussions and focus specifically on the legacy we would like to leave. From this meeting came a stronger commitment to do more to empower our employees and develop our managers into leaders. New ideas emerged about the need to create a stronger environmental message and that supports development of a science and information center. Guests at our second retreat included Pat Allen, Director of the Regulatory Streamlining Office, and Jeff Allen, Executive Director of the Oregon Environmental Council. The EMT is planning a third retreat next week to begin integrating these ideas with the next steps for DEQ's Strategic Directions. In August, we will share ideas with you and seek your input during an all-day EMT-EQC retreat (held during the first day of your August 14-15 EQC meeting).

Evaluating the Wood Chipper Pollution Control Facilities Tax Credit

During consideration of Pollution Control Facilities tax credit requests in May, the Commission raised questions about the environmental value of the tax credit that applies to the purchase of wood chippers. This credit has now been available for nearly four years. I have asked staff to evaluate how the credit has been used and its effectiveness in reducing air pollution, and we'll report back to you on this evaluation this fall. Attachment C provides some background on why the wood chipper credit was initially proposed, how it fits into DEQ's Air Quality program, and what we plan to do to research the effectiveness.

DEQ Cuts – status as of April 2, 2003

- The Governor's Balanced Budget (GBB) contains 23% less General Fund (GF) than the 2001 Legislatively approved budget.

	2001-03 Adopted	2003-05 GBB
Total Budget	\$304,195,824	\$273,889,568
GF/LF	\$43,3710,346	\$34,965,688
FTE	865.17	821.19

- 30 FTE cut due to reductions in GF.
- The additional "all cuts scenario" of \$5.6M (requested by the Department of Administrative Services on April 1, 2003) would result in another 4 FTE cut; if the additional debt service cut is not allowed by EPA the cut would be 26 FTE.
- Overall impact of cuts to date: These cuts have reduced our capacity to do work beyond strict regulatory compliance. Activities that have become associated with "good government," including complaint response and technical assistance, are now limited to the most serious cases, with the result that government will be seen as less responsive.
- Economic development impacts of cuts: With the loss of technical assistance and other "customer service" activities, new and existing businesses will not have the benefit of DEQ assistance in planning and developing new sites or expanding existing operations.
- If we had not been able to self-finance debt service in the Clean Water State Revolving Fund (SRF) Loan Program, there would be 10 additional FTE lost.

Detailed Impacts of Cuts

Cut in GBB (total \$8.7M):

- **Total Maximum Daily Loads (TMDLs):** DEQ will not meet 2007 Oregon Plan deadline; the 2010 deadline specified in the Consent Decree may be compromised. Cut 3.5 FTE already. This cut has a significant impact on economic development. TMDLs lead to waters that meet standards; drinking water, fish, irrigation uses are protected through TMDLs and carry an economic value. Additionally, when water bodies are listed as having impaired water quality, new or increased discharges are not permitted until a TMDL is completed.

- **CST:** DEQ will significantly curtail participation in Community Solution Team projects. We are currently involved in 175 projects; DEQ is project lead or is providing primary research and technical assistance for 51% of these projects.
- **Clean Water State Revolving Fund Loan Program:** DEQ will have \$300,000 less to loan to communities each year for wastewater treatment plant upgrades.
- **Water Quality monitoring network:** 20% less sampling will be done for the Oregon Plan; less data available to assess water quality and restoration efforts.
- **Wastewater permitting:** More out-of-date permits, fewer inspections, and less compliance assurance. This program was already operating with 12 fewer FTE than recommended by EPA's workload model, and already has the worst backlog in the country for major sources. This cut increased the understaffing to 14 FTE.
- **Green Permits:** No more outreach, meaning eligible businesses may not hear about the program; no technical assistance for applicants. We spent 1000 hours last year reaching businesses and providing technical assistance.
- **Groundwater:** Fewer statewide groundwater assessments, less technical assistance and implementation of groundwater protection rules (protecting drinking water supplies), guidance development, and public outreach and education efforts.
- **Air Quality monitoring network:** No more lead sampling in the state; 50% fewer monitors for respirable particulate (PM10, e.g. from woodstoves, outdoor burning, industry, wind-blown dust); and no more one-time PM10 monitoring for communities that suspect potential problems.
- **Agency Management:** Reduced oversight of \$13 million a year in procurement and contracting.

Potential "all cuts scenario" new reductions \$5.6M: (submitted to DAS on April 1, 2003)

- **Clean Water State Revolving Fund Loan Program:** DEQ will have \$790,000 less to loan to communities each year for wastewater treatment plant upgrades (for a total reduction of \$1.1M per year).
- **Open burning:** One-third of open burning complaints will not be investigated, resulting in increased public exposure to particulate, odors, and possible toxic fumes.
- **Volunteer monitoring:** No more support to the 100 local watershed councils monitoring water quality in their communities.
- **Non-point source coordinator:** Eroding our ability to work with agricultural and timber communities to find effective solutions to rural water quality problems.
- **Additional TMDL development position:** Further contributes to the delay of TMDL completion.

Columbia River Navigation Channel Deepening Project

Summary of major conditions in DEQ Water Quality certification

- **Turbidity** – Visually monitored 100 feet downstream from dredging or in-river disposal. Activities modified if turbidity seen. Turbidity restricted to no more than 10 percent above background immediately adjacent to upland disposal site to protect migrating juvenile salmonids.
- **Dissolved Oxygen** – Monitored 100 feet downstream from dredging or in-river disposal. No level to be below 6.0 mg/l as an absolute minimum. If approach this level, modify or stop operation.
- **Toxics** – Sediments have been appropriately characterized in channel as coarse-grained, low carbon, low organics. Testing has indicated that the likelihood of contamination is extremely low. Sediments outside channel, in turning basins outside 600 foot perimeter of channel, and side slope sediments need sampling and analysis prior to dredging.
- **Sludges and Bottom Deposits** – Are not allowed outside designated disposal areas.
- **Timing** – Allowed year-round in navigation channel. Areas outside channel restricted to in-water work windows between November 1 and February 28 annually.
- **State Oversight** – States (WA and OR) maintain ongoing oversight of the project through adaptive management team. Data and study results fed through team with decisions being made by consensus on ongoing operations. Dispute resolution process established. In the event disputes cannot be resolved consensually, States retain ultimate regulatory authority to determine operations.

The Corps is to establish a publicly accessible website for posting collected data relating to turbidity, dissolved oxygen and toxics, as well as the results of ongoing studies, such as for crab and sturgeon. Allows for public and agency auditing of data.

Report to Environmental Quality Commission at discretion of the Director.

- **Ocean Disposal** – Lies outside the State of Oregon three-mile territorial limit. Water quality certification remains silent on this issue.
- **Period of Issuance** – Five years. Two years deepening, followed by three years of maintenance. Certifications required at five yearly intervals after that.
- **Enforcement** – Certification can be amended or revoked by the Director for violations.
- **Appeal Process** – The applicant (Corps) has an administrative right of appeal to the Environmental Quality Commission. All other parties may pursue appeals through County Circuit Court.

Background on the Wood Chipper Pollution Control Tax Credit

The wood chipper tax credit was adopted in 1999 to provide a non-regulatory incentive to reduce or eliminate open burning. It is one component of our comprehensive, statewide, open burning strategy that includes public outreach and regulatory restrictions. Open burning is a significant "area" source of air pollution, and contributes to problems such as air toxics, visibility impairment, regional haze, fine particulates and nuisances.

For years, the Department has worked with local communities to reduce smoke from residential and commercial open burning, including considerable public outreach to encourage burning alternatives. Open burning is allowed, however, in places where alternatives are often unavailable or expensive. Even in areas where it is banned, illegal burning continues and agencies have limited enforcement staff to respond. DEQ's resources were further reduced by 1 FTE this legislative session (or about 1/3 of the staff available to conduct open burning outreach and complaint response), and local governments are facing similar budget pressures.

The easiest way to dispose of woody debris is by burning. Often, it is not possible for a home owner to physically handle or transport woody material, resulting in the need for on-site disposal. When transport is possible, material will likely end up in a land fill or be dumped illegally (access to biomass utilization facilities is generally very limited). The best non-burning alternative for on-site disposal is chipping because it reduces the volume of the woody debris, generates a useful product for home gardening, and allows the material to decompose effectively. The tax credit program provides an incentive that complements our education and outreach efforts to encourage the public to use alternatives to open burning.

At this point, we know that some dealers use the tax credit in promotional materials to encourage the sale of wood chippers, and each year hundreds of people purchase chippers and receive the credit. We also know that some people have used the tax credit to purchase commercial scale chippers to provide a service to customers seeking an alternative to burning. We don't know, however, whether these individuals and businesses would have purchased the chippers anyway, and whether they used the chippers to avoid open burning. The Air Quality Program is sending a questionnaire to those who received wood chipper tax credits to evaluate these and related issues, including geographic use within and around areas burn ban areas. As I mentioned, we will report back to you on the results of this survey later this year.

- (2) Prescribe by rule the manner in which a motor vehicle pollution control system shall be tested for certification. The rules may prescribe a more rigorous inspection procedure in the areas designated under ORS 815.300 (2)(a), including any expansion of such boundary under ORS 815.300 (2)(b), in order to reduce air pollution emissions in those areas of the state. No such rule shall require testing for certification more often than once during the period for which registration or renewal of registration for a motor vehicle is issued. No rule shall require testing for certification of a motor vehicle that is exempted from the requirement for certification under ORS 815.300.
- (3) Issue certificates of approval for classes of motor vehicle pollution control systems which, after being tested by the commission or by a method acceptable to the commission, the commission finds meet the criteria adopted under subsection (1) of this section.
- (4) Designate by rule classifications of motor vehicles for which certified systems are available.
- (5) Revoke, suspend or restrict a certificate of approval previously issued upon a determination that the system no longer meets the criteria adopted under subsection (1) of this section pursuant to procedures for a contested case under ORS 183.310 to 183.550.
- (6) Designate suitable methods and standards for testing systems and inspecting motor vehicles to determine and insure compliance with the standards and criteria established by the commission.
- (7) Except as provided in ORS 468A.370, contract for the use of or the performance of tests or other services within or without the state. [Formerly 468.375; 1993 c.791 s.3]

468A.370 Cost-effective inspection program; contracts for inspections. The Environmental Quality Commission shall determine the most cost-effective method of conducting a motor vehicle pollution control system inspection program as required by ORS 468A.365. Upon finding that savings to the public and increased efficiency would result and the quality of the program would be adequately maintained, the commission may contract with a unit of local government or with a private individual, partnership or corporation authorized to do business in the State of Oregon, for the performance of tests or other services associated with conducting a motor vehicle pollution control system inspection program. [Formerly 468.377]

468A.375 Notice to state agencies concerning certifications. The Department of Environmental Quality shall notify the Department of Transportation and the Oregon State Police whenever certificates of approval for motor vehicle pollution control systems are approved, revoked, suspended or restricted by the Environmental Quality Commission. [Formerly 449.963 and then 468.380]

468A.380 Licensing of personnel and equipment; certification of motor vehicles.(1) The Environmental Quality Commission by rule may:

- (a) Establish criteria and examinations for the qualification of persons eligible to inspect motor vehicles and motor vehicle pollution control systems and execute the certificates described under ORS 815.310, and for the procedures to be followed in such inspections.
- (b) Establish criteria and examinations for the qualification of equipment, apparatus and methods used by persons to inspect motor vehicles and motor vehicle pollution control systems.
- (c) Establish criteria and examinations for the testing of motor vehicles.
- (2) Subject to rules of the commission, the Department of Environmental Quality shall:
- (a) Issue licenses to any person, type of equipment, apparatus or method qualified pursuant to subsection (1) of this section.
- (b) Revoke, suspend or modify licenses issued pursuant to paragraph (a) of this subsection in accordance with the provisions of ORS 183.310 to 183.550 relating to contested cases.
- (c) Issue certificates of compliance for motor vehicles which, after being tested in accordance with the rules of the commission, meet the criteria established under subsection (1) of this section and the standards adopted pursuant to ORS 468A.350 to 468A.385 and 468A.400. [Formerly 468.390]

468A.385 Determination of compliance of motor vehicles.(1) The Environmental Quality Commission shall establish and maintain procedures and programs for determining whether motor vehicles meet the minimum requirements necessary to secure a certificate under ORS 815.310.

(2) Such procedures and programs include, but are not limited to, the installation of a certified system and the adjustment, tune-up, or other mechanical work performed on the motor vehicle in accordance with the requirements of the commission. [Formerly 468.395]

468A.387 Operating schedules for testing stations.(1) The Department of Environmental Quality shall establish flexible weekday operating schedules for testing stations that conduct motor vehicle pollution control system inspections described under ORS 468A.365 that extend the hours of operation to 9 p.m. for some testing stations for some days of the week.

(2) After determining the hours of operation for testing stations under subsection (1) of this section, the department shall advertise the hours of operation in as many ways as practicable, including but not limited to:

- (a) Enclosing information about the hours of operation in all mailings and notices related to motor vehicle emission testing and motor vehicle registration renewal notices;
- (b) Posting the hours of operation at Department of Transportation field offices;
- (c) Broadcasting public service announcements; and
- (d) Using appropriate Internet and other electronic media services that may be available. [1999 c.475 s.2]

468A.390 Designation of areas of the state subject to motor vehicle emission inspection program.(1) If the need for a motor vehicle pollution control system inspection program is identified for an area in the State of Oregon Clean Air Act Implementation Plan, then the Environmental Quality Commission, by rule, shall designate boundaries, in addition to the areas specified in ORS 815.300 (2)(a) and (b), within which motor vehicles are subject to the requirement under ORS 815.300 to have a certificate of compliance issued under ORS 468A.380 to be registered or have the registration of the vehicle renewed.

(2) Whenever the Environmental Quality Commission designates boundaries under this section within which vehicles are subject to the requirements of ORS 815.300, the commission shall notify the Department of Transportation and shall provide the Department of Transportation with information necessary to perform the Department of Transportation's duties under ORS 815.300. [Formerly 468.397]

468A.395 Bond or letter of credit; remedy against person licensed under ORS 468A.380; cancellation of license.(1) Any person



7/18/03 EQC Meeting, Item C Handout

Oregon

Theodore R. Kulongoski, Governor

Department of Environmental Quality

811 SW Sixth Avenue
Portland, OR 97204-1390
503-229-5696
TTY 503-229-6993

June 23, 2003

Colonel Richard W. Hobernicht
U.S. Army Corps of Engineers
P.O. Box 2946
Portland, OR 97208-2946

Dear Colonel Hobernicht:

The Department of Environmental Quality (DEQ) has reviewed the U.S. Army Corps of Engineers' (Corps) requests for water quality certification, dated September 4, 2002, November 26, 2002 and March 28, 2003. The Corps Portland District proposes to deepen the Columbia River Navigation Channel between River Mile (RM) 3.0 and RM 106.5, including the area adjacent to Port of Portland Terminal 6 in the Oregon Slough. The federally authorized channel in this reach is 40 feet deep and 600 feet wide. Deepening will be accomplished by dredging restricting shoals consisting of naturally occurring sedimentary material to a depth of 43 feet. Up to five feet of overdepth dredging and 100 feet of overwidth dredging may occur in selected high volume shoal areas.

DEQ has reviewed the project and made the findings in the attached *Findings and Evaluation Document*.

CONDITIONS

Dredging

The following conditions shall apply to the dredging component of this project:

Timing

Dredging may be conducted year-round in the existing federal navigation channel. However, dredging in areas outside the 600-foot designated navigation channel including turning basins, berthing areas and any overwidth dredging outside the 600 foot channel must adhere to ODFW in-water work periods approved by state and federal fishery management agencies. These periods are described in: *Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources*.

No obstruction or impediment to fish passage is to occur.

Turbidity

All dredging of sediments shall be conducted so as to minimize siltation and turbidity in the Columbia River. Turbidity shall not exceed 10 percent above natural stream turbidities, except where allowed by OAR 340-41-0205(2)(c). This rule states, in part, that limited duration activities necessary to accommodate essential dredging, and which cause the turbidity standard to be exceeded may be authorized provided all practical turbidity control techniques have been applied and a Section 401 water quality certificate has been granted.

Turbidity shall be measured during in-water dredging and recorded at a minimum every two hours during periods of active dredging. The designated person attending the monitoring equipment shall be responsible for notifying the project foreman of any exceedance of the turbidity standard. Monitoring points shall be 100 feet upstream (representative background), 100 feet downstream, and at the discharge point. A turbidimeter is to be used. Recorded turbidity of greater than 10 percent at a point 100 feet below the discharge point is an exceedance of the standard. If a 10 percent exceedance of the background level occurs at 100 feet below the project site, the applicant is required to modify or stop the activity causing the problem and continue to monitor every two hours.

Dissolved Oxygen

During dredging activity in areas outside the bounds of the 600-foot wide navigation channel, including turning bays outside the 600-foot channel, side slopes of the channel, and the 100 foot overwidth dredging area, dissolved oxygen levels shall be measured and recorded at a minimum, every two hours, during periods of active dredging. If dissolved oxygen levels fall below 6.5 mg/l, the applicant is required to modify the activity and continue to monitor every two hours. If dissolved oxygen levels fall below 6.0 mg/l as an instantaneous concentration, work shall stop until dissolved oxygen levels return above 6.0 mg/l. The designated person attending the monitoring equipment shall be responsible for notifying the project foreman of any exceedance of the dissolved oxygen standard. Monitoring points shall be 100 feet downstream, and at the discharge point.

Best Management Practices

Dredging operations shall be conducted employing Best Management Practices (BMP's) which minimize disturbance or siltation to adjacent habitat or waters.

If a bucket dredge of any type, including but not limited to grab or clamshell, dipper, dragline, or backhoe bucket, is used, all digging passes of the bucket shall be completed without any material, once in the bucket, being returned to the wetted area. No dumping of partial or full buckets of material back into the project area will be allowed. No dredging of holes or sumps below maximum depth and subsequent redistribution of sediment by dredging, dragging, or other means will be allowed. All large man-made debris observed in dredged materials shall be removed prior to flow lane disposal and transported to an appropriate disposal site.

In order to help control turbidity, hopper and pipeline dredges shall be operated with the intake head at or below the surface of the sediments being removed during all periods of operation. Reverse purging of the intake line shall be kept to an absolute minimum. Should purging be necessary, the intake line shall be raised no more than three feet from the bottom. If water is pumped through the dragheads to flush out the hopper dredge bins, the heads shall be at least 20 feet below the water surface.

Toxics Sampling and Analysis

Sampling of sediments throughout the entire depth of dredging and analysis for toxic and metal contaminants shall be conducted prior to dredging for those areas to be dredged outside the 600-foot wide federal navigation channel, including turning basins and berthing areas. Sampling and analysis shall be conducted in accordance with the *Dredged Material Evaluation Framework* (DMEF). Results shall be provided to the Adaptive Management Team (AMT) detailed below. Dredging and disposal of sediments from these areas shall be conducted in accordance with the directions of the AMT. Any such sampling and analysis shall be conducted such that the Adaptive Management Team receives the results not less than 30 calendar days prior to dredging in the area sampled.

Spills

Petroleum products, chemicals, or other deleterious waste materials shall not be allowed to enter waters of the State. All fuel hoses, oil drums, oil or fuel transfer valves and fittings, shall be checked regularly for drips or leaks, and shall be maintained in order to prevent spills into State waters. In the event of any discharge of oil, fuel, or other chemicals into State waters, or onto land with a potential to enter State waters, containment and cleanup shall begin immediately and be completed as soon as possible. Spills into State waters, or onto land with a potential to enter State waters, shall be reported immediately to the Oregon Emergency Response System, phone (800) 452-0311.

Dredging by Others

The conditions in this certification are binding upon the Corps and any agent or contractor that the Corps may retain to undertake any or all parts of this project.

Disposal

The following conditions shall apply to the disposal component of this project:

Upland Disposal

The following conditions are provided to protect outmigrating juvenile salmonid smolts.

Upland disposal sites shall be large enough to accommodate the quantity of material and water to be placed there in order to allow adequate settling. Return water turbidity from any constructed cell or upland site shall not exceed 10 percent above the turbidity in the Columbia River immediately adjacent to the disposal site. If the disposal cells

contain weirs, they shall be maintained at a height that allows no more than three inches of overflow water from the cell.

Adequate settling time is to be allowed in the upland settling basins to ensure that turbidity levels in-river are maintained at or below the ten percent water quality standard.

Use filter bags, sediment fences, silt curtains, leave strips or berms, or other measures sufficient to prevent movement of spoils. These measures shall be inspected and maintained daily to ensure their proper function.

In-River Disposal

In-River disposal shall be conducted in accordance with the turbidity, dissolved oxygen and best management practices detailed above.

Flowlane disposal within Oregon waters in areas deeper than 65 feet around River Mile 5 and between River Miles 27 and 42 is not allowed. The Corps shall not conduct flowlane disposal of materials from the construction of this project, or of subsequent maintenance materials from this project, in estuarine waters deeper than 65 feet until the results of ongoing sturgeon studies have been obtained, have been fully evaluated by the Adaptive Management Team, and a determination made as to whether these areas may be used.

No in-river disposal is to occur between River Miles 35 and 75 during peak eulachon (smelt) outmigration downstream from the eulachon spawning areas.

No bottom accumulation of sediments shall be allowed outside designated disposal or ecosystem restoration projects. The Corps shall ensure that sediments disposed in-river disperse in a uniformly thin layer.

General Conditions

The certification is valid for five years from the date of issuance. DEQ assumes this will cover initial construction for two years and three years of maintenance dredging. Continuing maintenance dredging beyond the five year term of this certification will require separate certifications every five years, as in the past.

DEQ reserves the right to modify, amend or revoke this certification, as necessary, in the event new information indicates that dredging/disposal activities are having a significant adverse impact on State water quality or critical fish resources.

A copy of this certification letter shall be kept on the job site and be readily available for reference by the Corps, DEQ, contractors, and other appropriate state and local government inspectors.

This certification is provided in respect to the project represented in the above letters of application. It remains valid for the dredging and disposal activities associated with the project as specified. The certification is invalid if the project is operated in a manner not consistent with the project description.

Failure to comply with the conditions of this certification may lead to revocation of the certification.

DEQ requires site access on day of request.

The applicant shall notify DEQ of any change in the ownership, scope, or construction methods of the project subsequent to certification.

Reporting

The Corps shall develop and maintain a publicly accessible web page upon which data collected as a result of the conditions in this certification relating to turbidity, dissolved oxygen and toxics shall be posted. Data shall be posted in as close to real-time as possible. The web page should be constructed similarly to the Corps' web page that reports hourly total dissolved gas and associated data from the various Columbia River hydropower projects.

At the discretion of the Director, the Corps shall provide such reports to the Environmental Quality Commission, or such other forums as the Director shall determine appropriate, on the progress and execution of this project. The Director will provide adequate notice of such reports, which shall be not less than 30 days.

Adaptive Management

Where conditions of this order require adaptive management, an Adaptive Management Team (AMT) will be used to review and/or develop data, information or issues, and to arrive at a consensus regarding how to respond. The AMT will consist of three teams: a technical team, a management team and a dispute resolution team.

The technical team will review research, monitoring and other data, information and issues relevant to the adaptive management conditions, and determine actions to be taken in response to such data, information and issues. In addition, the technical team will coordinate with the federal adaptive management process created under the Biological and conference opinions.

The technical team will act by consensus. In the event that the team is unable to achieve a consensus within a reasonable time under the circumstances, any member of the team may refer the matter to the management team.

The management team will review matters referred by the technical team and provide oversight to the technical team and the Corps in order to help coordinate the requirements of the state and federal agencies related to the project. The management team will act by consensus. In the event that the team is unable to achieve a consensus within a reasonable time under the circumstances, any member of the team may refer the matter to the dispute resolution team.

The dispute resolution team will review matters referred by the management team. The dispute resolution team will act by consensus. In the event that the team is unable to achieve a consensus within a reasonable time under the circumstances, the matter in

question shall be resolved by the federal or state agency or agencies with regulatory jurisdiction.

Each team will include one or more members from DLCD, DEQ, WDOE and the Corps. The members of the dispute resolution team will be the Directors of the state agencies, and the Commander of the Portland District of the Corps. The members of the other teams will be designees of the state agencies and the Commander of the Portland District of the Corps. The state agencies will designate one person to coordinate the activities of the teams, which responsibility will be rotated between the two states over time. The teams will consult with local governments, Indian Tribes, other state and federal agencies, and involve the public, as appropriate under applicable state and federal laws and policies.

A group may act by consensus where no member of the group formally opposes the particular action in question.

No provision of this condition is intended to or does alter or supercede the authorities or duties of DEQ, the Oregon Department of Land Conservation and Development (DLCD), or the Washington Department of Ecology relating to the project. In addition, this condition is not intended to, and does not alter, limit, or repeal any authorities of DEQ, DLCD or WDOE to revoke, suspend, or modify their respective § 401 water quality certifications or coastal zone decisions, or to request remedial action, seek mediation, or to request supplemental coordination with respect to the construction and continued operation of the Project.

OTHER APPLICABLE PROVISIONS OF STATE LAW

The applicant will comply with the following conditions of the DLCD conditional concurrence for the Project, which the Director has determined are necessary to comply with water quality related requirements of other state and local agencies and that are other appropriate requirements of state law according to Section 401 of the federal Water Pollution Control Act. The following conditions are directly related to the following beneficial uses: salmonid fish rearing, resident fish and aquatic life, and fishing.

Dungeness Crab

- (i) The Corps will conduct additional study of crab entrainment to assess seasonal variations and salinity influence on entrainment rates, and to assess differences among various class sizes (e.g. age 0+, 1+, 2+).
- (ii) The Corps shall continue with its efforts to develop a crab distribution and salinity model and shall use the best available model as a management tool for scheduling dredging and disposal in the lower estuary to avoid and minimize entrainment and adverse effects of disposal.
- (iii) The Corps will develop and adhere to a crab mitigation strategy designed to avoid and minimize entrainment of Dungeness crab. The strategy shall specify impact thresholds and compensatory mitigation contingencies for unavoidable impacts to Dungeness

crab, and shall be developed through the adaptive management process.

- (iv) Hydraulic dredging and flowlane disposal occurring below River Mile 17 and in known or suspected areas of overall high crab abundance, shall be conducted during seasons or river conditions of least crab abundance. The seasons or river conditions of least abundance shall be determined through entrainment sampling at dredging sites correlated with real-time flow and salinity data or through application of a salinity-crab model once a final, scientifically rigorous model is available.

Sturgeon

- (i) The Corps shall continue to utilize the bi-state sturgeon work group to identify and carry out appropriate mitigation measures pending various sturgeon study outcomes.
- (ii) The Corps shall adjust dredging and disposal operations as appropriate, and as indicated utilizing the adaptive management process specified above, if results of the on-going sturgeon telemetry studies indicate negative response in sturgeon behavior to dredging and disposal operations.
- (iii) The Corps shall study the long-term response of sturgeon to habitat changes in deepwater habitat areas (>-50 ft. depth) generated or reasonably likely to be generated from planned flowlane disposal.

Eulachon (Smelt)

No in-water disposal should occur during the period of peak eulachon outmigration (between the 8th and 20th weeks of the year) downstream from identified spawning areas (River Miles 35-75). If in-water disposal is essential during the period of peak outmigration, then the Corps shall further study the potential for eulachon losses as a result of dredged material disposal impacts as determined through the adaptive management process specified above. Appropriate mitigation measures shall be developed based on the study outcomes, as determined through the adaptive management process specified above.

Salmonids

- (i) The Corps shall comply with the Best Management Practices, including timing windows, for dredging and disposal identified in the project Biological Assessment and referenced in the federal Endangered Species Act Biological Opinions for the project, unless modified through the federal adaptive management process to further avoid and minimize impacts to salmonids.
- (ii) In the event that substantial, unauthorized deviations from the Best Management Practices occur during dredging and disposal operations, the Corps shall document the occurrence(s) along with the response and

- remedies implemented. This information will be made available upon request and will be shared through the adaptive management process.
- (iii) The Corps shall provide DLCD with all reports, meeting notices, monitoring and research data, management findings, and other similar information generated under the federal adaptive management process outlined in the project Biological Assessment, the Biological Opinions issued by NOAA Fisheries and U.S. Fish and Wildlife for the project, and the Implementation Plan for the Biological Opinions.
 - (iv) The Corps shall provide at least 30 days prior notice regarding issues and actions coming before the federal adaptive management team so that it is possible for the state to provide meaningful input to the federal adaptive management process outlined in the project Biological Assessment, the Biological Opinions issued by NOAA Fisheries and U.S. Fish and Wildlife for the project, and the Implementation Plan for the Biological Opinions. In addition, the Corps will report in a timely manner on all issues considered and actions taken through the federal adaptive management process.

Flowlane disposal shall be restricted as follows

- (a) Flowlane disposal within Oregon waters in areas deeper than 65 feet around Columbia River Mile 5 and between Columbia River Mile 27 to 42 is not authorized. The Corps shall not conduct flowlane disposal of materials from the construction of this Project, or of subsequent maintenance materials from this Project, in estuarine waters deeper than 65 feet until and unless an exception or change to the Clatsop County depth policy has been granted by the county.
- (b) Flowlane disposal within Washington waters in areas deeper than 65 feet between Columbia River Miles 27-42, 54-56, and 72-73 shall not be conducted unless it is carried out in accordance with applicable regulatory decisions of the State of Washington. Flowlane disposal in this vicinity shall be modified or halted if monitoring or research findings indicate negative impacts to sturgeon, an Oregon Coastal Zone resource, through direct disposal impacts or long-term changes in bottom habitats. If such impacts are documented, modified flowlane disposal shall be allowed only as determined through the adaptive management process specified above.
- (c) All flowlane disposal shall be monitored to assess at a minimum: changes in estuarine sedimentation and bathymetry and potential direct and indirect effects of disposal on estuarine species.

Placement of dredged materials at the Miller-Pillar ecosystem restoration site is not authorized under this decision. The Corps shall dispose of the dredged material slated for the Miller-Pillar site at an alternative location or locations. The Corps shall notify DLCD in writing of the alternative site or sites selected, and a supplemental consistency determination shall be submitted for any alternative site or sites that is subject to the Oregon Coastal Management Program and that has not been evaluated by DLCD through this review.

The Corps may complete the estuarine enhancement component of the Project at Lois Island, subject to the following requirements:

(a) The estuarine enhancement component of the Project at Lois Island must be carried out as described in the following documents, except as specifically modified by the terms of this condition: the Plan Elements for Restoration of Tidal Marsh Habitat at Lois Island Embayment/Response to Oregon Division of State Lands, 6/2/2003; the Implementation Plan (for meeting the terms and conditions contained in the Biological Opinion), 3/2003; chapter 4 of the FSEIS; and section 8 of the Biological Assessment, 12/2001. In the event of a conflict between the requirements of these documents, they shall take precedence in the order listed.

(b) Pipeline dredging of material from the temporary construction sump to the Lois Island enhancement component of the Project will occur during the November 1 and February 28 in-water work period.

(c) The overall goal of the Lois Island enhancement component of the Project is to enhance 191 acres of habitat, as intertidal marsh suitable for salmonid rearing. In carrying out this component of the Project, the Corps must achieve a long-term improvement of existing estuarine functional characteristics, while also ensuring that the existing biological productivity of the estuary is maintained. The primary functional characteristics that must be improved for this component of the Project are habitat for juvenile salmonid rearing. The biological productivity and functions that must be maintained are the productivity and functions that result from the Select Area Fishery program at Tongue Point.

(d) The overall goal of the Lois Island enhancement component of the Project will be achieved when, using the following success criteria, as measured over a one-year period at least two years after completion of construction of this component of the Project:

- (i) dredged material is placed at a target elevation of approximately 6.5 feet mean lower low water (MLLW); final elevations will be based on elevation surveys of existing tidal marsh habitat (control area) adjacent to the enhancement area, as set forth in Ecosystem Restoration Feature (ERF) 1 of the Implementation Plan;
- (ii) tidal marsh plant cover is at least 75 percent of the plant cover at control sites, as set forth in ERF 1 of the Implementation Plan;
- (iii) benthic invertebrate productivity is at least 75 percent of the levels measured at control sites, as set forth in ERF 1 of the Implementation Plan;
- (iv) juvenile salmonid/fisheries occurs at levels at least 75 percent of the level at control sites, as set forth in ERF 1 of the Implementation Plan;
- (v) the biological productivity of the Select Area Fishery program in the at Tongue Point has been maintained, by increasing spring chinook production at the Young's Bay and Blind Slough terminal fisheries sites by 500,000 smolts at each site, by distributing the existing coho salmon production at Tongue Point between the Young's Bay and Blind Slough sites, and by evaluating water quality and conducting a test fishing

sampling program at the potential future select area fishery site in Grant Slough (directly upstream of the current Blind Slough site) as specified in the letter from ODFW to DLCD and DEQ dated May 30, 2003.

(e) Monitoring. Final identification of elevations, staging, construction plans and control sites will be provided at least three months prior to the start of construction of this component of the Project. A pre-project report for baseline success criteria (ii)-(iv) at control sites, per (d) above, shall be provided at least three months prior to the start of construction of this component of the project. A post-construction report of at least three cross-sections for as-built elevations shall be provided within three months following the completion of construction of this component of the Project. Following completion of the construction of this component of the Project, monitoring reports for each of the success criteria (ii)-(iv), per (d) above, shall be provided in at least years 2, 6, and 10 as provided in ERF 1 of the Implementation Plan.

(f) Adaptive Management. In the event that one or more of the success criteria have not been achieved within six years of completion of construction of this component of the project, the Corps will, within 6 months, present proposed actions to achieve the criteria, which actions may include (but which are not limited to) those actions set forth in ERF 1 of the Implementation Plan. The Corps will develop its proposed actions using the adaptive management framework set forth in this decision. If, following that process and any other process required by law, DLCD determines that the proposed actions will not achieve the success criteria, the state's consistency concurrence is revoked.

(g) In the event that the Corps elects not to proceed with the Lois Island component of the project, it shall dispose of the dredged material slated for the Lois Island site at an alternative location or locations. The Corps shall notify DLCD in writing of the alternative site or sites selected, and a supplemental consistency determination shall be submitted for any alternative site or sites that is subject to the Oregon Coastal Management Program and that has not been evaluated through this review.

Dredging of the Astoria turning basin shall occur during the standard in-water work window of November 1 through February 28 unless a waiver of the standard timing window is approved by DLCD after consultation with relevant agencies.

Sediments from within the Astoria turning basin shall be tested in accordance with the *Dredged Material Evaluation Framework* (DMEF) prior to dredging. Sediment testing results shall be provided to DLCD, DEQ, City of Astoria, and Port of Astoria prior to dredging. Any materials exceeding DMEF thresholds shall be disposed of at an upland site approved by DEQ and in accordance with any other applicable local, state, and federal requirements.

Dredged materials from the Astoria turning basin that are deemed suitable for in-water disposal shall not be disposed of in a location or manner that is contrary to the conditions of this concurrence decision.

CONDITIONS ARE NOT SEVERABLE

The conditions in this water quality certification are a comprehensive package. In the event that any condition or conditions of this certification is found to be invalid by a court with jurisdiction to review this certification, the certification in its entirety is revoked when the order of such court becomes final and any pertinent appeal periods have ended.

NOTICE OF OPPORTUNITY FOR CONTESTED CASE HEARING

You have the right to a contested case hearing before the Environmental Quality Commission regarding this certification and the conditions included in the certification. The hearing will be conducted pursuant to OAR 340-011-0097 to 340-011-0131 and the applicable provisions in ORS 183.413 to 183.470 and OAR 137, division 003. To exercise this right, you must file a written request for contested case hearing and an answer within 20 calendar days from the date of service of this notice. The answer must comply with the requirements set out in OAR 340-011-0107.

A request for a contested case hearing and answer must be sent to: Stephanie Hallock, Director, Oregon Department of Environmental Quality, 811 S.W. Sixth Avenue, Portland, Oregon 97204. Following the receipt of a request for a hearing, you will be given additional information regarding the conduct of the proceedings and notified of the time and place of the hearing.

In addition, you may request information about the possible use of alternative dispute resolution opportunities under ORS 183.502, including mediation or any other collaborative problem-solving processes.

CERTIFICATION

DEQ hereby certifies that this project complies with the federal Clean Water Act and state water quality standards, if the above conditions are adhered to during this project.

Sincerely,



Michael T. Llewelyn
Administrator
Water Quality Division

7/18/03 EDC Meeting, Item C Handout.

WILLAMETTE VALLEY FIELD BURNING

ACRES BURNED BY YEAR

RULE LIMIT: 65,000 acres

2002: 51,374 acres

2001: 52,934

2000: 50,801

1999: 49,998

1998: 46,299

Source: OR Dept of Agriculture, Field Burning Program



State of Oregon
Department of
Environmental
Quality

FACT SHEET
Draft Permit for
Storage of Hazardous Wastes
at the
Umatilla Chemical Depot
EPA I.D. No. OR6 213 820 917

The Department of Environmental Quality (DEQ or Department) has today issued a Draft Permit for Storage and Management of Hazardous Wastes at the Umatilla Chemical Depot (UMCD). UMCD is a U.S. Army facility that has been operating since 1941 as an ordinance supply depot and, since 1980, as a storage facility for chemical agent munitions and chemical agent-filled bulk containers operating under the interim status requirements of the federal Resource Conservation and Recovery Act (RCRA). Interim status requirements allowed facilities in operation at the time the RCRA regulations became effective to continue operating until they could complete the permit application process and receive a RCRA Permit. The Draft Permit proposes the general and special conditions that, upon review and revision as necessary, could form the basis for Department issuance of a finalized Permit for Storage and Management of Hazardous Wastes at UMCD. Issuance of a finalized Permit will ensure that the U.S. Army must comply with all applicable state and federal regulations for the safe storage and management of hazardous wastes at UMCD.

To encourage public participation in the review of this Draft Permit, the Department has scheduled a 60 day Comment Period for submission of written comments and a Public Hearing during which oral comments may be made. This Fact Sheet provides information about the Draft Permit and UMCD, why the Draft Permit has been issued, waste management activities at the UMCD that are regulated by the Draft Permit, important issues and how they are addressed in the Draft Permit, how the Draft Permit will be reviewed and finalized, and how members of the public may participate in the review process and/or obtain additional information.

Location and Purpose of the Umatilla Chemical Depot

The Umatilla Chemical Depot (UMCD) is located in northeastern Oregon, about seven miles west of Hermiston, Oregon (about 185 miles east of Portland, Oregon). The mailing address is 78072 Ordnance Road, Hermiston, OR 97838-9544. The UMCD is also the site of the Umatilla Chemical Agent Disposal Facility (UMCDF), a hazardous waste treatment facility that will use four incinerators to destroy the stockpile of chemical agent-filled munitions and bulk items stored at UMCD.

The U.S. Army began operations at the Umatilla Chemical Depot (UMCD) on October 14, 1941. The Department of Defense authorized activities at UMCD to receive, store, maintain, and distribute conventional and chemical munitions to the Department of Defense agencies. The UMCD served as a munitions storage and distribution facility operated and maintained by the U.S. Army from 1941 through 1994 when the last of the conventional munitions and explosives were shipped to other facilities. The U.S. Army's only remaining mission at UMCD is the maintenance of a stockpile of approximately 3,717 tons of chemical warfare agent contained in

the 220,599 munitions and bulk items that have been stored at the UMCD since they were shipped there between 1962 and 1969. The chemical agent munitions and bulk items stored at UMCD represent approximately 12 percent of the original U.S. stockpile of chemical agent, some of which has already been destroyed in demilitarization facilities located on Johnston Atoll and at Tooele, Utah. In accordance with the requirements of U.S. Public Law 99-145 and its successors, the U.S. chemical agent stockpile, including those items stored at UMCD, is destined for destruction under the terms and conditions of an international treaty signed by the U. S. and over 140 other nations.

The three chemical warfare agents stored at UMCD are in liquid form. The nerve agents¹ ("GB" and "VX") are contained in munitions, such as rockets, projectiles, and land mines, and in bulk items, such as spray tanks, bombs, and "ton containers." The blister agent² ("HD," also referred to as "mustard") is stored only in ton containers. The munitions have fuses, bursters, boosters, or other explosive or propellant charges (inclusively referred to as "energetic components" or "energetics") included in their assemblies. The bulk items do not have assembled energetic components. The specific items stored at UMCD, as indicated by the U.S. Department of Defense when the information was declassified in June 1996, include the following:

Munition	Agent	Quantity	Agent Tons
115 mm rocket (M55)	GB	91,375	488.86
115 mm rocket warhead (M56)	GB	67	.36
115 mm rocket (M55)	VX	14,513	72.57
115 mm rocket warhead (M56)	VX	6	.03
115 mm projectile (M121/A1)	GB	47,406	154.07
115 mm projectile (M121/A1)	VX	32,313	96.94
8 - inch projectile (M426)	GB	14,246	103.28
8 - inch projectile (M426)	VX	3,752	27.20
500 - lb bomb (MK 94)	GB	27	1.06
750 - lb bomb (MC-1)	GB	2,418	265.98
Landmines	VX	11,685	61.35
Spray tanks (TMU-28B)	VX	156	105.77
Ton containers	HD	2,635	2,339.52
Totals		220,559	3,717.38

¹ Nerve agents are organo-phosphate chemical compounds that attack the central nervous system and cause loss of control of body motor functions. They are among the most toxic materials known to man and exposure to them in very small dosages can very quickly cause serious injury or death. The primary pathways for exposure are by vapor inhalation or by absorption through the eyes or skin.

² Blister agents are sulfur-based chemical compounds that cause casualties through blistering of the skin, attacking the eyes, and damage to the respiratory system. Exposure to small concentrations can cause very severe burns or destruction of tissue, but there is no pain on initial contact and symptoms develop 4 to 24 hours afterward. In general, the higher the exposure concentration, the shorter the time until symptoms appear. Exposure can occur by vapor inhalation or by contact on any part of the body.

Background Information

Prior to the implementation of the federal Resource Conservation and Recovery Act (RCRA) in 1980, chemical agent stockpile storage operations were conducted in accordance with Army regulations. Shortly after the RCRA regulations became effective, the U.S. Army, on June 30, 1980, submitted an initial notification (referred to as a "Part A" application) indicating that UMCD would operate as a RCRA facility. Since that date the storage of waste chemical munitions and agent-related wastes generated by stockpile maintenance operations have been conducted in accordance with both Army regulations and the interim status requirements of the Code of Federal Regulations, Title 40, Part 265 (40 CFR 265).

The RCRA regulations also allowed individual States to be granted authorization by the U.S. Environmental Protection Agency (EPA) to establish and operate their own hazardous waste programs for enforcement of the RCRA requirements. As the basis for Oregon's state program, the RCRA regulations (with some modifications) were adopted into the Oregon Administrative Rules (OAR). Authorization of Oregon's RCRA program had not been finalized when EPA and the Oregon state agency that later became DEQ jointly issued the Army a Hazardous Waste Storage Site License on April 22, 1983. That License permitted storage of non-agent-related hazardous wastes in Building 203, but did not address the storage of chemical agents, which continued to be governed by the RCRA interim status requirements. Although the EPA/DEQ issued License expired on April 21, 1988 and has not been renewed or replaced, its requirements and other applicable RCRA regulations still govern operation of the Building 203 hazardous waste storage facility.

The chemical munitions storage activities at UMCD are directly linked to, but separate from, the munitions demilitarization activities that are also occurring at UMCD. In 1995 the U. S. Army submitted a detailed "Part B" Hazardous Waste Treatment Permit Application for construction and operation of the Umatilla Chemical Agent Disposal Facility (UMCDF), a demilitarization facility located at UMCD that will use controlled, high temperature incineration for the destruction and disposal of chemical munitions and bulk items in the UMCD stockpile. The U.S. Army uses the term "demilitarization" to refer to all the activities involved in draining the chemical agents from the munitions or bulk containers, destruction of the liquid agent, disassembly of the munitions and removal of the explosive and propellant parts (the "energetic components"), destruction of the energetics, and decontamination of the remaining metal parts, cases, and containers. In February 1997, the Environmental Quality Commission (EQC) and the Department issued a Hazardous Waste Storage and Treatment Permit (HW Permit) to the U. S. Army³ to build and operate the UMCDF. Construction of UMCDF started in June 1997 and is now complete. The UMCDF is currently in a "start-up"⁴ phase using surrogate chemical feeds to

³ There are three "Permittees" named on the UMCDF HW Permit. The U.S. Army Umatilla Chemical Depot and the U.S. Army Project Manager for Chemical Stockpile Disposal (PMCSO) are named as Owner and Operator of UMCDF. Washington Demilitarization Company (the Army's construction and operations contractor) is named as a co-operator of UMCDF.

⁴ Start-up is an operational phase that involves testing of the incinerators and associated systems, components, instruments, and support equipment using surrogate chemicals (selected to be similar to chemical agents in their combustion characteristics) and other waste feeds (such as heavy metals and ash materials similar to those found in

test the incinerators and associated systems. The incinerator systems must successfully pass formal testing requirements using surrogate feeds before a second "start-up" phase of hazardous waste treatment operations involving chemical agent can begin.

In parallel with on-going activities at the UMCD, UMCD continues to operate the hazardous waste storage units for the waste chemical munitions and agent-related wastes in areas of the facility referred to as K-Block, I-Block and J-Block. The storage operations remain under RCRA interim status regulations, as those regulations have been adopted and incorporated into the Oregon Administrative Rules (OAR). Due to recent revisions, the OAR requirements are more comprehensive and impose more stringent standards for chemical agent storage than the adopted federal RCRA regulations. In accordance with the revised OAR 340-101-0030, effective March 2001, all chemical agent munitions and bulk items were declared hazardous waste and are now regulated as such. Previously, only munitions (such as the M-55 rockets) that had been declared by the U.S. Army to be waste were subject to RCRA regulation. The revised OAR-340-104-1201, also effective March 2001, imposes more stringent containment requirements to prevent agent release and requires management of all munitions storage units in accordance with a Storage Unit Operations and Management Plan (SUOMP) approved by the Department. Since these revised rules became effective, the SUOMP has been implemented at UMCD and all storage units in K-Block and I-Block used for chemical agent munitions and bulk item storage are now equipped and operated with improved containment systems.

Why the Draft Hazardous Waste Storage Permit Is Being Issued

The issuance of a RCRA Part B Hazardous Waste Storage Permit for UMCD will complete the RCRA permitting process begun in 1980, update all UMCD hazardous waste storage activities, and end the reliance on interim status requirements that were never intended to be the basis of longer-term facility regulation. This current phase of the permitting process began in March 1999 when the U.S. Army submitted a Part B Storage Permit Application to make the Depot a fully regulated hazardous waste storage facility. The March 1999 Application was the subject of substantial review and discussion with the U.S. Army, who decided that significant changes were necessary. The March 1999 Application was withdrawn by the U.S. Army in September 1999. On February 28, 2000 a revised Part B Storage Permit Application was submitted. The February 2000 Application has undergone extensive review by the Department, including the issuance of several notices of deficiency and the resolution of major environmental and operational issues with the U.S. Army. The Draft Permit issued by the Department for public comment, described in this Fact Sheet, is the basis for finalization and issuance of the UMCD RCRA Part B Hazardous Waste Storage Permit. Attachment A to this Fact Sheet is a public notice that was mailed to interested parties to identify the dates of the scheduled public comment period and public hearing related to the issuance of the Draft UMCD RCRA Part B Hazardous Waste Storage Permit and the locations of information repositories where additional information about the project can be obtained. Complete copies of the Draft Permit and the February 2000 UMCD RCRA Part B Hazardous Waste Storage Permit Application are available for review at the information repositories.

the chemical agent munitions feedstock) to assess their performance under conditions representative of the more difficult ranges of normal operation.

Hazardous Waste Storage Facilities and Functions Regulated by the UMCD Draft Permit

Storage operations at UMCD are conducted in three facility areas, or storage unit groupings, and manage three distinctly different waste types. All UMCD storage activities and functions, and the administrative management and record-keeping associated with these functions, are regulated through the provisions of the Draft Permit. The Standard Conditions and General Facility Conditions applicable to the UMCD storage operations are addressed in Modules I and II of the Draft Permit. Special Conditions applicable to storage operations in the three facilities, the movement of the munitions and associated wastes to UMCD for treatment, and closure of the emptied storage units and correction of any residual contamination, are addressed in five additional Modules. The facilities and operational activities or concerns addressed by Special Conditions in Modules III through VII of the Draft Permit are briefly described below:

Building 203 Storage Facility. The Building 203 facility provides permitted storage for hazardous wastes generated from the UMCD administrative and base support functions, such as the medical clinic, vehicle maintenance, painting, signage, carpentry and other supporting maintenance activities. The hazardous wastes handled through Building 203 are shipped to off-site RCRA-permitted TSDFs. No wastes associated with any chemical warfare agent can be handled through Building 203.

K-Block/I-Block Storage Facility. The K-Block and I-Block facilities are the locations of the 119 individual permitted storage units in which chemical agent-filled munitions and bulk items are stored in accordance with the very strict chemical surety⁵ requirements mandated by U.S. Army regulations. All munitions and bulk items now in K-Block and I-Block will be stored there until they can be removed and transported to the UMCD for processing and treatment. In the event that munitions or bulk items transported to UMCD are rejected because they require special processing, those items would be returned to K-Block or I-Block. All of the munitions and bulk items are stored in "igloos," which are approximately 25-feet by 80-feet in floor size, have concrete floors and end walls, and have roofs that are half-cylindrical in shape and covered with two to three feet of earth.

K-Block is the location of the 89 earth-covered igloos serving as storage units for munitions and bulk items containing the nerve agents GB and VX. In addition, the K-Block facility includes an analytical laboratory, two 90-day storage units, and other buildings housing the operations, supplies and equipment needed to support hazardous waste storage operations. K-Block would also be the facility used for storage of any other wastes requiring strict chemical surety requirements (referred to in the Draft Permit as "high level wastes") that might be generated during stockpile maintenance or transport operations.

The I-Block facility is another, separate grouping of earth-covered igloos, 30 of which are designated as storage units for ton containers containing the blister agent HD (commonly called mustard). The K-Block and I-Block facilities are located within separate double-fenced compounds guarded at all times by well-armed security personnel authorized to use deadly force.

⁵ The Chemical Surety Program is a system of safety and security control measures used by the U.S. Army since 1977 to ensure that all operations involving chemical agents are conducted in a safe, secure, and reliable manner. The requirements of the Chemical Surety Program are identified in Army Regulation (AR) 50-6.

J-Block Storage Facility. The J-Block facility includes the group of 14 earth-covered igloos operated as permitted storage units for agent-related, or potentially agent-related, wastes generated in the course of operations and maintenance activities conducted in K-Block and I-Block. J-Block stores only wastes that have been decontaminated or have residual agent contamination levels that allow them to be managed under less stringent U.S. Army chemical surety requirements (referred to in the Draft Permit as "low level wastes"). The agent-related wastes in J-Block are being stored pending future processing through the UMCDF and cannot be sent to any other RCRA-permitted treatment, storage or disposal facility (TSDF) without the prior written approval of the Department.

Removal of Munitions from Storage and Transport to UMCDF. The removal of stockpile items from storage and their transport to UMCDF for demilitarization represents the crucial linkage between storage operations and disposal operations. Safe and effective conduct of the removal, loading, transport, unloading, and transfer of custody for the items requires employment of well-trained personnel using well-developed standard operating procedures, well-maintained equipment, and roadways determined to be fully adequate for the heavy axle loadings exerted by the loaded transport vehicles.

Unit Closure and Corrective Action. The lack of UMCD missions other than chemical munitions storage means that as the hazardous waste management units are emptied, they become inactive and subject to closure. During storage operations or the closure process, it is possible that areas of hazardous waste contamination subject to corrective action may be identified. The framework for handling of closure and corrective action is described, but recognizes that development of more definitive closure planning must occur close to the time at which closure will commence.

Significant Issues Addressed in the Draft Permit

The chemical agent munitions and bulk items stored at UMCD are stored there pending their removal and transport to UMCDF, which has been built for, and will be operated under, a separate HW Permit for their destruction. Consequently there must be consistency between the two permits in many aspects, and especially in areas or activities where there is interaction or interface. Due care has been attempted in the Draft Permit to ensure that work hours for munitions transfer, transfer of custody requirements, joint response to emergency situations, and the many other interrelated activities, are handled in a manner that is consistent with existing requirements in the UMCDF HW Permit. A number of other significant issues are also addressed in the Draft Permit:

Permit Modification. Because the UMCD Permit will be an operating document, modifications can be expected to occur over the duration of the project. For example, modifications will be required if there are alterations or additions to the originally permitted facilities, new information becomes available to the Permittees or to the Department, or if there are new regulations that apply to the facility. As indicated by the rule revisions described in a previous section, there have already been a number of significant changes in munitions storage operations that have occurred during the RCRA Part B Permit Application process. Condition IC defines how changes to the Permit can be made.

Duration of Permit. Condition IG provides ten years until permit expiration and the need for a new permit application to renew the permit. Considering that the UMCDF is in the start-up process, ten years should allow for completion of agent destruction. Condition IH provides for continuation in force of the existing Permit and all its conditions in the event that issuance of a new Permit has not been completed by the expiration date.

Construction Certification. A construction quality assurance program is not required by 40 CFR 264.19 for a facility that does not include treatment operations and is not a landfill. Condition IR provides for construction certification of newly constructed waste management units, but exempts existing units identified in the Draft Permit and improvements to containment systems of existing units installed under the terms and conditions of the SUOMP.

Operational Limitations During Severe Weather. In the evaluation of severe weather conditions, Condition II.A.4 specifies use of the D2Puff⁶ Model for use in predicting whether an agent plume with an agent concentration sufficient to cause a one percent chance of death outside the UMCD boundary could be produced by the work activity planned. The worst accidents or other unplanned events that have a realistic possibility of occurring during the work activity must be evaluated. The work activity cannot be conducted if the weather conditions could cause an agent release from the worst single accident or other event to extend beyond the UMCD boundary.

Waste Import and Export. Condition II.B.1 declares that UMCD is not authorized to accept hazardous waste or chemical agent items, except reject munitions returned from UMCDF. Condition II.B.2 makes it mandatory for UMCD to transfer all chemical agents and agent-contaminated materials to UMCDF for processing and treatment. Condition II.C.4 requires that any agent-related wastes transferred to any off-site facility other than UMCDF must be agent-free (based on criteria in the UMCD Waste Analysis Plan) and have the prior written approval of the Department.

Closure. Condition II.J addresses closure of the hazardous waste management units when they are no longer in use. Because the detailed requirements for unit closure will be better known nearer the time closure becomes necessary, Condition II.J.1 requires that a revised and more detailed Closure Plan must be submitted for Department review and approval at least 180 days prior to the start of closure activities. Condition II.J.5 applies the general closure performance standard specified in 40 CFR 264.111 to all UMCD closure activities and, in addition, applies the more specific closure performance standard of 40 CFR 264.1202 to the units used for munitions storage. Condition II.J.6 requires certification of the closure of each management unit when closure requirements have been successfully completed. Condition II.J.8 requires that any units that cannot be clean closed by removal of hazardous wastes and hazardous waste contamination must be closed as a landfill.

Updating Application Documentation. Since the Permit Application and supporting documentation was determined to be substantially complete, there have been a number of

⁶ The D2Puff Model is a computer program that predicts how existing weather conditions (wind direction and speed, temperature, humidity, etc.) will affect the dispersion of agent that might be released by an accident or incident occurring at a specified location on the UMCD site. The program calculates whether the greatest quantity of agent that could be released from the worst realistic event that could occur (called the Maximum Credible Event) during the planned work activity could result in agent concentrations in the air beyond the UMCD boundary sufficient to cause a 1% chance of death to an exposed healthy adult (referred to as a 1% Lethality standard). The D2Puff Model is a more sophisticated computer program for making these predictions than the D2P2 Model that it replaced.

organizational, regulatory, and other changes. In addition, to improve security, the ton containers containing HD were relocated from K-Block to I-Block. Consequently, some information in the application documents needs to be updated. Condition II.O requires the submittal of a permit modification for this purpose within 120 days of issuance of the Permit.

Building 203 Storage. Module III addresses the hazardous waste storage operations in Building 203, which can include wastes from any UMCD support operations, but cannot include wastes generated from agent operations. The conditions of Module III continue the facility capacity limits established at the time the facility was initially licensed in 1983, and the requirements of 40 CFR 264, Subparts A through I, which apply to a waste storage facility for handling of wastes in containers.

J-Block Storage. Module IV addresses hazardous waste storage operations in J-Block. Condition IV.A.1 identifies the 14 igloos in J-Block designated for storage only of containerized agent-contaminated wastes in accordance with 40 CFR 264, Subparts A through I, as applicable. Condition IV.A.2 limits the degree of agent-contamination allowed in J-Block by requiring that wastes stored there meet the "low level waste" criteria defined in Module I. Condition IV.A.4 requires the use of secondary containment⁷ for liquid waste storage and limits the total quantity of liquid waste in any storage unit to 21,780 gallons. Condition IV.A.5 establishes segregation requirements for liquid and solid wastes, for wastes by type of agent contamination, and for incompatible wastes. Condition IV.A.6 removes the storage restrictions of 40 CFR 268.50, allowing the containerized wastes in J-Block to be stored for longer than the one year period that is normally the maximum time allowed for hazardous waste storage.

K-Block and I-Block Storage. Module V addresses the hazardous waste storage operations in K-Block and I-Block and focuses on the 119 igloos used for munitions storage and regulated under 40 CFR 264, Subpart EE as those federal requirements have been made more comprehensive and more stringent by OAR-340-101-0030 and OAR-340-104-1201 through rules changes that became effective in March 2001. Condition V.A.2 identifies the 89 K-Block igloos designated for storage of nerve agent-filled munitions and bulk items while Condition V.A.3 designates the 30 I-Block igloos storing ton containers of blister agent. Condition V.A.5 mandates operation of the K-Block and I-Block storage units in accordance with the SUOMP and makes it an enforceable Attachment of the Draft Permit. Condition V.A.6 mandates the use of drain plugs, sealing improvements, and vapor containment devices on all chemical agent storage units, specifies minimum quarterly inspections of the containment system, and requires that all operational components and system elements must be maintained fully functional at all times. Condition V.A.7 removes the storage restrictions of 40 CFR 268.50, allowing the chemical agent-filled munitions and bulk items in K-Block and I-Block to be stored for longer than one year.

Removal of Munitions from Storage and Transport to UMCDF. Module VI addresses removal of stockpile items from storage and their transport to UMCDF for destruction. Condition VI.A.1 requires all aspects of the removal and transport operations to be done in accordance with written Standard Operating Procedures (SOPs) and Condition VI.A.2 requires that these operations only

⁷ Secondary containment is an additional means of catching and holding any leaks or spills that might come from the waste containers. Building 203 uses a specially designed floor that is sealed to retain liquids and divided into quadrants by berms. The floors of the igloos are not sealed or bermed, so the drums of liquid waste in J-Block are stored on spill pallets that will hold more than the largest single waste container placed on them. Most of the spill pallets used in J-Block hold over 100 gallons each.

employ adequately trained and certified personnel. Copies of the SOPs relating to movement of the stockpile items and documentation of the personnel training and certification requirements and procedures must be provided to the Department at least 60 days prior to the start of stockpile movement operations. Condition VI.A.3 limits movement operations to daylight hours and Condition VI.A.4 requires that the roads used for transport must be capable of safely handling the maximum vehicle loads that can occur. Documentation substantiating that the roads have been determined to be fully capable of safely sustaining maximum transport loads must be provided to the Department at least 60 days prior to the start of movement operations. Condition VI.A.5 requires that all munitions and bulk items, except the very large spray tanks, be transported in Enclosed Onsite Containers (EONC) and that the EONC door seals be tested for secure closure prior to any movement of the transport vehicle. The spray tanks are stored in sealed shipping containers, which will also be used during transport.

Corrective Action Requirements. Module VII addresses how any new areas of hazardous waste contamination that might be found would be handled. The Department must be notified of any new releases or discovered areas of contamination that require corrective action. Corrective action requirements for any new releases or areas will be satisfied under the terms of an existing Federal Facility Agreement (FFA) developed in accordance with Section 120(e)(2) of the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The existing CERCLA FFA for UMCD, dated September 19, 1989 and effective October 31, 1989, is the means by which several previously identified areas of contamination at UMCD are being corrected.

Opportunities for Public Comment

The Department invites public comment on the proposed Draft UMCD Hazardous Waste Storage Permit. Written comments may be submitted to the Department at any time within the comment period and a Public Hearing has been scheduled to provide opportunity for oral comment. If deemed necessary because of a high level of public interest in the Draft Permit, the Department may choose to extend the public comment period or schedule additional public hearings, or both.

The Department will review and consider all oral and written comments received during the comment period. Department staff will then prepare a finalized UMCD Hazardous Waste Storage Permit (final HW Storage Permit) by making revisions to the Draft Permit as deemed appropriate. Department staff will also prepare a report to the Department Director and to the Administrator of the Department's Chemical Demilitarization Program (CDP) providing recommendations regarding issuance of a final HW Storage Permit. The staff report will include the Department's response to all significant comments received during the open public comment period. The Department may decide to issue the final HW Storage Permit, as proposed or with changes, or may decline to issue the proposed final HW Storage Permit. A decision on issuance of a final HW Storage Permit will be made by the CDP Administrator, in consultation with the Department Director, and is anticipated within 60 days of staff report submittal.

How to Submit Comments on the Draft Permit

The public comment period on this Draft Permit will remain open from July 14, 2003 through 5:00 p.m. on September 15, 2003. Written comments may be submitted by e-mail, fax, or regular mail any time during the comment period, provided the comment is received by the Department no later

than 5:00 p.m. on September 15. E-mail comments should be submitted to cdp@deq.state.or.us and include the words "Public Comment" in the subject line. Comments submitted by facsimile transmission should be sent to (541) 567-4741. Comments sent by regular mail should be addressed to Mr. Dennis Murphey, Administrator, Chemical Demilitarization Program, 256 E. Hurlburt, Hermiston, Oregon 97838. There will be one opportunity for the public to provide oral comments to the Department: August 28, 2003 in Hermiston, Oregon (Good Shepherd Medical Center, 610 N.W. 11th, information session beginning at 7:00 p.m. followed by the public hearing at 7:45 p.m.).

For More Information

For more information about this Draft Permit, or for information on UMCD or UMCDF, please contact the Chemical Demilitarization Program, Hermiston office of the DEQ at (541) 567-8297 or toll free in Oregon (800) 452-4011 (ask to be connected to the Hermiston office) or by E-mail: cdp@deq.state.or.us. The Department's Chemical Demilitarization Program has prepared fact sheets providing more information about chemical weapons storage at UMCD and the demilitarization processes to be used at UMCDF. The following fact sheets are available upon request:

- ❖ Storage and Management of Hazardous Waste (February 2003, also available in Spanish)
- ❖ Public Participation (February 2003, also available in Spanish)
- ❖ Hazardous Waste Storage Permit Application (February 2003, also available in Spanish)
- ❖ Modification of a Hazardous Waste Permit (February 2003, also available in Spanish)
- ❖ Metal Parts Furnace (February 2003, also available in Spanish)
- ❖ Liquid Incinerator (February 2003, also available in Spanish)
- ❖ Dunnage Incinerator (February 2003, also available in Spanish)
- ❖ Deactivation Furnace System (February 2003, also available in Spanish)
- ❖ Rocket Processing (February 2003)
- ❖ Projectile Processing (February 2003)
- ❖ Mine Processing (February 2003)
- ❖ Bulk Item Processing (February 2003)

Attachments

- A. Public Notice: Request for Comments and Notice of Public Hearing.

ATTACHMENT A

PUBLIC NOTICE: REQUEST FOR COMMENTS AND NOTICE OF PUBLIC HEARING

Draft Hazardous Waste Storage Permit for Umatilla Chemical Depot

Notice issued: July 14, 2003

Written Comments Due: Comments must be received no later than 5 p.m., September 15, 2003

Hearing date: August 28, 2003

Hearing time: 7:00 pm
Information session: 7:00 pm
Formal hearing: 7:45 pm

Hearing location:
Conference Room 1
Good Shepherd Medical Center
610 NW 11th Street
Hermiston, OR 97838

Name of Permit Writer: Nick Speed
Phone: (541) 567-8297, ext. 29 or Toll Free in Oregon (800) 452-4011 (ask to be connected to the Hermiston office).

How can I submit comments?
DEQ accepts comments by mail, fax and email. Use the following information to choose how to submit your comments.

Mailing address:
Address mailed comments to:
Dennis Murphey, Administrator
Chemical Demilitarization Program
256 E. Hurlburt Ave., Suite 105
Hermiston, OR 97838

Fax: (541) 567-4741

E-mail: cdp@deq.state.or.us

(E-mail comments will not be acknowledged immediately. If there is a

delay between servers, e-mails may not be received before the deadline.)

What are DEQ's responsibilities?

The Oregon Department of Environmental Quality (DEQ) is the regulatory agency that helps protect and preserve Oregon's environment. DEQ is responsible for protecting and enhancing Oregon's water and air quality, for cleaning up spills and releases of hazardous materials, and for managing the proper disposal of hazardous and solid wastes. One way DEQ does this is by requiring permits for certain activities. This Draft Permit indicates how DEQ proposes that hazardous wastes, including the chemical agent munitions and bulk items, would be managed at the Umatilla Chemical Depot.

The purpose of this notice is to invite you to express your comments on this Draft Permit, either by speaking at a hearing, or by submitting comments in writing. You may do both.

What is proposed?

DEQ proposes to issue a Hazardous Waste Storage Permit to bring ongoing storage and management of hazardous wastes at UMCD under the current and comprehensive requirements of the Oregon Administrative Rules (OARs). The OARs are based on adopted federal regulations implementing the Resource Conservation and Recovery Act (RCRA), but include requirements that are more stringent. The Draft Permit identifies the specific conditions that DEQ proposes to include in a UMCD Hazardous Waste Storage Permit.



State of Oregon
Department of
Environmental
Quality

Chemical
Demilitarization
Program
256 E. Hurlburt Avenue
Hermiston, OR 97838
Phone: (541) 567-8297
(800) 452-4011
Fax: (541) 567-4741
Contact: Nick Speed
www.deq.state.or.us

DEQ Item No. 03-1224

Permit type: Hazardous waste storage only. This Permit does not provide for or allow any treatment of hazardous wastes.

Permit expiration: The duration of the Permit would be for ten (10) years from the date of issuance.

Who is the applicant?

The Umatilla Chemical Depot (UMCD) is an ordnance facility owned and operated by the U.S. Army. The base Commander is the representative of the U.S. Army who signed the Permit Application.

Where is the facility located?

UMCD is located along Interstate Highway I-84 directly south of Umatilla and Irrigon, and about 6 miles south west of Hermiston, OR. UMCD is about 185 miles east of Portland. The mailing address for UMCD is:
Umatilla Chemical Depot
Attn.: SCBUL-CO
Hermiston, OR 97838

Are there special conditions in this permit?

There are a number of special conditions, most of which are due to the great care that must be exercised in the storage and handling of the chemical warfare agent-filled munitions and bulk items stored at UMCD and managed as hazardous waste. Some of the special conditions are needed to ensure that the chemical agent items will be safely transferred to the Umatilla Chemical Agent Disposal Facility (UMCDF) for destruction. Destruction of the chemical agent items is governed by the UMCDF Hazardous Waste Treatment Permit issued in 1997.

What are the known health effects of the hazardous wastes at UMCD?

The most toxic of the hazardous wastes managed at UMCD are the three chemical warfare agents contained, as liquids, in the stored munitions and bulk containers. The two nerve agents "GB" (also called Sarin) and "VX" are among the most toxic chemical substances

known to man. Extremely small dosages of either GB or VX can quickly cause serious injury or death by inhalation, or by absorption through the skin or mucous membranes. Small amounts of the third chemical agent, the blister agent "HD" (also called mustard), can cause severe disabling injuries or death through blistering of the skin, attacking the eyes, and damage to the respiratory system. Symptoms from HD exposure can take 4-24 hours to develop, with generally less time delay for higher dosage exposure.

Who is affected?

Property owners and residents in the vicinity of UMCD are most directly affected, along with those who might be in a downwind direction if a major release of chemical agent should occur.

Compliance history: UMCD is a large quantity generator of hazardous wastes and is currently subject to quarterly compliance inspections by DEQ. In the twenty years that DEQ has conducted UMCD inspections, numerous non-compliance issues have been noted, most of a relatively minor nature. Correction of compliance issues has always been promptly made by UMCD. There has been one formal enforcement action in the last ten years. For additional information on UMCD compliance, contact DEQ's CDP office in Hermiston at (541) 567-8297.

What other DEQ permits are required?

UMCD has three water quality permits addressing general water quality and on-site waste water treatment systems; an air quality permit; and a solid waste landfill closure permit.

What legal requirements apply?

UMCD is subject to the federal hazardous waste regulations of RCRA and RCRA enforcement authority has been delegated to the State of Oregon. Oregon imposes additional and more stringent hazardous waste management requirements under OAR-340-101-0030, OAR-340-104-1201, and other state rules.

Which of the facility's activities are not under DEQ's jurisdiction?

Base facility functions and activities are conducted primarily under U.S. Army regulations. With two significant exceptions, the activities that have direct potential for environmental consequences are under DEQ regulation. Management of polychlorinated biphenyls (PCBs) is regulated directly by U.S. EPA and pesticide use is under the jurisdiction of the Oregon Department of Agriculture. Responsibility for worker safety regulation is split between U.S. OSHA and Oregon OSHA.

What similar activities take place in the vicinity of the facility?

There are no similar activities near-by. UMCD is the only facility in Oregon that stores chemical warfare agents, and one of only eight in the U.S. The nearest similar facilities are located in Tooele, UT; Pine Bluff, AR; and Anniston, AL.

What other facilities does this owner operate?

The U.S. Army operates numerous other base facilities, including other ordnance depots, both within the U.S. and in other countries.

What happens next?

DEQ will review and consider all comments received during the hearing and comment period to determine if changes or additions to the Draft Permit should be made. DEQ may decide to issue the permit as proposed or modified, or to deny issuance of the permit.

How can I review documents and get more information?

You can review the Draft Permit, the Fact Sheet and the Permit Application at the Chemical Demilitarization Program (CDP) Office of DEQ. For a review appointment or to arrange to receive a copy of the Fact Sheet, call the CDP office in Hermiston at (541) 567-8297.

Copies of the Permit Application, the Draft Permit, the Fact Sheet, and other

related project documents are available at each of the following information repositories:

Hermiston Public Library
235 E. Gladys Avenue
Hermiston, OR 97838
(541) 567-2882

Mid Columbia Library (Kennewick Branch)
1620 S. Union St.
Kennewick, WA 99336
(509) 586-3156

Pendleton Public Library
502 S.W. Dorion Avenue
Pendleton, OR 97801
(541) 966-0210

Portland State University Library
951 S.W. Hall, Fifth Floor
Portland, OR 97204
(503) 725-4617

Accessibility information

DEQ is committed to accommodating people with disabilities at our hearings. Please notify DEQ of any special physical or language accommodations or if you need information in large print, Braille or another format. To make these arrangements, contact the DEQ office in Hermiston at (541) 567-8297.

People with hearing impairments may call DEQ's TTY number, (503) 229-6993.



State of Oregon
Department of
Environmental
Quality

**Umatilla Chemical Demilitarization Program
Status Update
Environmental Quality Commission
July 18, 2003
(Agenda Item D)**

Umatilla Chemical Demilitarization Program

Permit Modifications: The Department is currently processing 17 Hazardous Waste Permit (HW Permit) Modification Requests, including 11 Class 1 and six Class 2 modifications. The Class 2 modifications include:

- The proposed Liquid Incinerator #1 GB Agent Trial Burn Plan;
- A request to use the Unpack Area in the Container Handling Building to process leaking munitions. The current process calls for using the Toxic Maintenance Area in the Munitions Demilitarization Building to handle any transport containers arriving from the storage area with leaking munitions inside;
- A request to change how the pollution abatement system carbon filters are monitored for agent;
- The proposed Performance Test for the Brine Reduction Area ;
- A request to revise the management practices in the agent collection tank system; and
- A request to install a permanent tanker load-out station for off-site shipments of liquid brine from the pollution abatement systems (in lieu of processing in the Brine Reduction Area).

Staff departure: Ann Mayes, our public information officer, has left DEQ and the Hermiston area to return to Florida. We wish Ann the best of luck in her new endeavors. We will be posting a state-wide recruitment later this month to fill Ann's position as quickly as possible. In the mean time, we appreciate the offers of assistance from Nina DeConcini and the Headquarters staff to help us with public information needs that arise in the interim.

Umatilla Chemical Depot Draft Storage Permit: The Umatilla Depot has been operating as a RCRA "interim status" facility since 1980. On July 14 the Department issued a Draft Hazardous Waste Storage Permit that will be open for public comment until September 15, 2003. I would like to thank Nick Speed of the Hermiston staff for his outstanding efforts in reviewing the Depot's Part B Permit Application, drafting the storage permit, and preparing the associated public documents.

UMCDF Surrogate Shakedown and Trial Burn Status

Liquid Incinerators: The surrogate trial burn of Liquid Incinerator #1 (LIC1) was completed on February 8, 2003. The Department is reviewing the LIC1 Trial Burn Report (submitted on May 8, 2003) and expects to issue a letter within the next few weeks requesting additional information and clarification. The Surrogate Trial Burn Report must be approved by the Department prior to the introduction of chemical agent into the furnace. Liquid Incinerator #2 (LIC2) has completed some shakedown activities. Both liquid incinerators are currently shut down.

Metal Parts Furnace: UMCDF started surrogate waste feed for the first time to the Metal Parts Furnace (MPF) on Thursday, July 17, 2003.

Deactivation Furnace System: The surrogate shakedown phase of the Deactivation Furnace System (DFS) began on February 11, 2003. Surrogate testing activities have shown that UMCDF is at times exceeding some of the metal emission limits mandated by the HW Permit and the Maximum Achievable Control Technology (MACT) rules. The Department issued an order to the UMCDF Permittees to stop hazardous waste feed to the DFS on April 4, 2003. Resumption of waste feed was allowed on April 28. Subsequent testing showed that some metals limits were again being exceeded and the Department issued another "stop feed" letter on June 24. The letter listed three key issues that the Department believes must be resolved before it will authorize re-start of hazardous waste feed to the DFS:

- "Assurances that the planned surrogate feed mixture, including metals feed quantities, is an accurate representation of the projected agent munition feed characteristics;
- "A reasonable and defensible explanation for the continued (and sometimes puzzling and inconsistent) metal emissions problems from the UMCDF, including those that occur during non-hazardous waste feed situations; and
- "A clearly defined and agreed upon strategy to resolve the ongoing compliance issues associated with metals emissions and allow the Permittees to proceed with surrogate testing of the furnaces in a manner that supports chemical agent operations."

The Department expected a submittal from UMCDF this week to address the information required in the first two bullets listed above. The third bullet calls for the Department and UMCDF to agree upon a strategy that allows DFS testing to proceed even though some emission limits are being exceeded. It appears that the only way to keep some DFS metal emissions within the limits, as measured before the carbon filter system, is to limit the waste feed rate to a level that could ultimately restrict the processing of M-55 rockets to less than 10/hour. Although rarely achieved, the permitted processing rate for M-55 rockets at UMCDF is 40/hour.

The Permittees recently submitted a letter pointing out minor language differences (yet significant to the interpretation) between analogous permit conditions in the HW Permit modules governing shakedown and trial burns (Module VI) and "normal [agent] operations" (Module VII). Discussion with Brett McKnight, the DEQ Manager of the Umatilla program when the HW Permit was first drafted, indicates that the Department expected that some of the emission limits in Module VI would be exceeded during surrogate testing and trial burns. Both Modules VI and VII require the Permittees to immediately notify the Department if there are exceedances. However, in the case of surrogate testing operations, the Department did not originally intend that exceedances would be considered permit violations (provided that the exceedances were not of a level that would pose a threat to human health and the environment).

As noted earlier, UMCDF must demonstrate compliance with HW Permit emission limits at a point before the flue gas stream enters the pollution abatement system carbon filter systems (PFS). Test results indicate that the DFS (at a reduced feed rate) could meet both MACT and RCRA emission limits if UMCDF was able to "take credit" for the PFS by moving the compliance point to after the carbon filters. However, the HW Permit condition that requires UMCDF furnaces meet emission limits prior to entering the PFS was specifically required by the Commission when it approved the UMCDF HW Permit in 1997. The Department believes that changing the requirement would be a major permit modification requiring Commission approval—a process that could take seven to eight months.

The MACT standards were promulgated several years after the UMCDF Permit was issued and are more stringent than previous emission limits. Consequently, the Department believes it is appropriate for UMCDF to take credit for the PFS for the purposes of demonstrating compliance with MACT and that no permit modifications would be needed.

The emission limits in the UMCDF HW Permit were originally calculated by extrapolating emissions data from tests done at the Johnston Atoll facility, and were fully expected to be revised once on-site data could be generated. The dilemma this situation is posing for both the Department and the Permittees is that new emission limits cannot be proposed and evaluated for risk until the DFS testing and trial burn phase is completed. Consequently, to operate the DFS at a surrogate and metals feed rate equivalent to the desired rocket feed rate means that UMCDF must continue to notify the Department every time an exceedance is noted, and provide information to show that the exceedance was not a health or environmental threat. The Department does not believe that the exceedances seen during DFS testing to date posed any threat to human health or the environment, especially considering the short duration of the tests and the fact that the flue gases are cleaned further by the carbon filtration system before release to the atmosphere.

The Department and the Permittees continue to have discussions about the path forward for both the DFS specifically, and the start of chemical agent operations generally. It appears that even if UMCDF "takes credit" for the PFS when demonstrating compliance with the MACT standards, and HW Permit emission limits are eventually revised upward, processing of M-55 rockets in the DFS will still be limited to a rate below what was originally anticipated. The first GB "rocket campaign" will be treating over 91,000 rockets in the DFS, approximately 3000 of which are thought to contain gelled GB agent.

Other Topics of Interest

CSEPP: The annual emergency exercise of the Chemical Stockpile Emergency Preparedness Program (CSEPP) was held on June 3 and by most accounts was a success. The Governor is expected to request that the CSEPP Executive Review Panel be re-convened on August 21 to go over the results of the test exercise and provide an update to the Governor's office on the CSEPP readiness status.

"GASP," the local Hermiston organization, recently sent a letter to Governor Kulongoski requesting an "investigation into the [CSEPP] and its continued fulfillment of U.S. Army Hazardous Waste Permit Requirements." After then-Governor Kitzhaber informed the Commission in 2002 that he had determined that "an adequate emergency response program is in place and fully operational," the only remaining HW Permit condition related to CSEPP is one that requires semi-annual updates be sent to the Department. To our knowledge the Governor's office has not yet responded to the letter.

Date: June 26, 2003

To: Environmental Quality Commission

From: Stephanie Hallock, Director *S. Hallock*

Subject: Agenda Item E, Action Item: Decision on Modification of the Umatilla Chemical Agent Disposal Facility (UMCDF) Hazardous Waste Permit to Incorporate Conditions Requiring Operation of the Brine Reduction Area
July 17-18, 2003 EQC Meeting

Department Recommendation The Department recommends that the Commission approve a modification of the Umatilla Chemical Agent Disposal Facility (UMCDF) Hazardous Waste Storage and Treatment Permit No. ORQ 000 009 431 (HW Permit) to require operation of the Brine Reduction Area as described in Alternative 1 on page 9 of this staff report.

The modification adds conditions II.B.4., II.B.5., II.B.6., and II.B.7. to Section II.B ["Receipt of Offsite and Shipment of Onsite Waste"] and Condition D.13 to Section D of Attachment 6 ["Requirements for Commencement of Shakedown Period II (Agent) on the First Incinerator"] in the UMCDF HW Permit. The modification establishes the criteria that UMCDF must meet in order to ship pollution abatement system (PAS) brines to an off-site hazardous waste treatment/disposal facility in lieu of on-site treatment. The modification also requires that the Brine Reduction Area (BRA), which is designed to evaporate liquid waste streams into reduced quantities of a solid salt residue (see page 3 for additional information), be operational and ready to process PAS brines prior to the start of chemical agent operations. Attachment A of this staff report contains the full text of the proposed HW Permit conditions.

Background In January/February 2002 (see pages B-13 through B-20 in Attachment B), the Department became aware of the U. S. Army's intent to pursue the off-site shipment of UMCDF PAS brines for treatment and disposal due to delays in getting the Brine Reduction Area operational. The Department expressed its displeasure with this planned approach and emphasized that it was inconsistent with previous commitments made by the U. S. Army.

On May 7, 2002, the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) sent a letter to the Commission expressing their concern with the U. S. Army's apparent plans to ship PAS brines off-site for treatment and disposal. CTUIR indicated that this approach was a direct

contradiction of previous commitments made by both the Army and DEQ. They requested that the Commission respond to CTUIR's concerns and indicate what actions would be taken to ensure that UMCDF PAS brines were not shipped off-site for treatment and disposal. A copy of the May 7, 2002 letter from CTUIR was included in the information package sent out for public comment (see page B-21 in Attachment B).

To gain a better perspective and understanding of PAS brine management issues, the Commission held a briefing session on July 26, 2002 to gather information regarding the current UMCDF strategy for managing PAS brines. The Commission invited representatives of CTUIR, GASP (a local environmental group), and the UMCDF Permittees¹ to speak at the session. In addition, Department staff briefed the Commission on the existing requirements of the UMCDF HW Permit, and on the history of commitments by, and discussions with, the UMCDF Permittees regarding operations of the Brine Reduction Area and off-site shipments of PAS brines. A complete transcript of the July 26, 2002 briefing session is included as Attachment C of this staff report.

The two key pieces of information presented to the Commission were 1) the UMCDF Permittees have no plans to operate the Brine Reduction Area during systemization and testing activities (including all surrogate shakedown and trial burn periods), but do intend to operate the BRA as much as possible during chemical agent operations; and 2) the UMCDF HW Permit does not explicitly require treatment of PAS brines in the Brine Reduction Area, or prohibit their shipment for off-site treatment and disposal once they have been determined to be agent-free in accordance with the UMCDF Waste Analysis Plan.

On August 21, 2002, the Commission issued a response (see page B-23 in Attachment B) to the CTUIR expressing its own "frustration and disappointment with the apparent lack of desire by the U. S. Army and its contractors to fulfill previous commitments..." The Commission also acknowledged that UMCDF's current planned brine management strategy was a significant departure from all previous discussions with Department staff. As a follow-on action, the Commission stated that it would consider the status of the Brine Reduction Area when making its final decision on whether or not to authorize the start of chemical agent operations. The Commission further stated that the Department would prepare a "proposed modification to the UMCDF HW Permit specifically addressing the operation of the Brine Reduction Area and off-site shipment of PAS brines."

¹ There are three "Permittees" named on the UMCDF HW Permit. The U.S. Army Umatilla Chemical Depot and the U.S. Army Project Manager for Chemical Stockpile Disposal (PMCSO) are named as Owner and Operator of UMCDF. Washington Demilitarization Company (the Army's construction and operations contractor) is named as a co-operator of UMCDF.

The Department prepared draft HW Permit conditions and opened a public comment period on November 1, 2002. A public notice was sent to all persons on the Umatilla Project mailing list, and a detailed Fact Sheet was prepared. (A copy of the Fact Sheet was previously transmitted to the Commission on November 4, 2002, and is included here as Attachment B.) The Fact Sheet included background information on the issue, a copy of the originally proposed HW Permit conditions, copies of various recent correspondence on the issue, and a discussion of the types of information the Department was looking for to allow a full evaluation of all brine management strategies.

The Department held a public hearing in Hermiston on December 4, 2002 and received four oral comments. Two of the comments were supportive of the proposed modification, while the other two opposed the proposal. A transcript of this oral testimony is included in Attachment D.

The Department received a total of seven written comments by December 23, 2002 when the public comment period closed. (Copies of written comments received were previously transmitted to the Commission on January 17, 2003, and included here as Attachment E.) Five of the comments were opposed to the proposed modification, while two of them were supportive of the proposal. The Department reviewed all of the oral and written comments received during the comment period.

**Description and
Status of BRA
Operations**

The purpose of the Brine Reduction Area is to evaporate away the water in the brines generated by the incinerator pollution abatement system(s), leaving behind only a dried salt-like waste residue. The PAS brines are generated as part of the process of cooling off and cleaning the exhaust gases from each of the UMCDF incinerators/furnaces. Once the brines reach a certain density due to the particulates removed from the exhaust gases, they can no longer be efficiently used in the PAS and are pumped to the Brine Reduction Area for processing. The evaporation process (considered "treatment" under RCRA) significantly reduces the quantity of hazardous waste that must be shipped off-site for disposal.

It is estimated that the volume of PAS brine generation will range from approximately 9,000-53,000 gallons per day (equivalent to two to twelve tanker trucks per day) depending on the specific chemical agent and munition(s) being processed at UMCDF. The Brine Reduction Area has four 40,000 gallon storage tanks to hold PAS brines awaiting further treatment.

Among other chemical demilitarization facilities, only the Johnston Atoll Chemical Agent Disposal System (JACADS) actually operated its Brine Reduction Area. The BRA was constructed at the Tooele Chemical Agent Disposal Facility (TOCDF), but its use was discontinued early in the

systemization and testing phase. It was never operated during chemical agent operations. The U. S. Army has no plans to use the BRA at chemical agent incinerator facilities in Arkansas and Alabama, where brine will be shipped off-site for disposal.

Construction on the UMCDF Brine Reduction Area is essentially complete. The UMCDF BRA is currently undergoing final systemization, with a target of late July 2003 to be fully operational and ready to process PAS brines. Since the BRA was initially permitted in February 1997, its design and configuration have undergone a large number of changes, including:

- At least 96 "Engineering Change Proposals," representing almost 400 individual engineering changes made during construction and systemization; and
- A total of 13 Permit Modification Requests, including seven Class 2 modifications and six Class 1 modifications.

Many of the changes are a result of operational experience at JACADS, and early problems noted during systemization and testing at TOCDF. Most changes have been focused on improving Brine Reduction Area operational performance and efficiency. Two of the more significant alterations to the permitted design that are relevant to the current situation are:

- ◆ The Brine Reduction Area was constructed with less processing capacity than initially proposed by the Permittees and permitted by the Commission as the treatment unit for PAS brines; and
- ◆ A tanker loading station has been constructed as part of the Brine Reduction Area that was not part of the originally permitted system.

**Potential
Processing
Capacity
Limitations**

A number of potential situations have been identified that could result in brine processing capacity becoming a limiting factor in UMCDF operations and adversely impacting the destruction of chemical agent and chemical agent munitions if all PAS brines are required to be processed in the Brine Reduction Area. In general, the following types of situations have been identified:

- The BRA is unavailable to process brines due to maintenance/repair needs, both routine/preventative and unplanned breakdowns;
- The BRA can only process at a fraction of its full capacity because metals concentrations in the brine are higher than expected, and full processing would exceed either the metals feed limits or emission rate limits in the HW Permit; and
- The incinerator pollution abatement systems are generating more brine than the BRA can handle at times when the BRA tank storage capacity is already full.

The Brine Reduction Area systems tend to require high levels of maintenance. Based on operational experience from JACADS, it is likely that the BRA will be available for processing only 70-80% of the time. Projected brine generation figures indicate that, with maximum processing availability at the high end of this range, there should be no impacts on any of the various munition/agent campaigns² planned at UMCDF. At the low end of this availability range, two specific munition campaigns (750 lb. GB bomb and HD ton container) may be affected slightly.

Brine metals issues are probably the most significant limitation concern. Based on the current metal emission rates in the HW Permit and expected metals removal efficiency of the BRA PAS, brine feed rates will likely need to be restricted below the maximum capacity for most munition campaigns. With the exception of the 750 lb. GB bomb, 155mm GB/VX projectile, M55 GB rocket and 8" GB/VX projectile campaigns, these brine feed restrictions should not affect actual munitions processing. For these six campaigns, the primary emission issues appear to be those associated with boron and phosphorus, both of which are relatively non-toxic. The Department is currently reviewing a separate Class 2 Permit Modification Request from the Permittees related to the BRA Performance Test Plan that proposes increasing the emission limits for these two constituents. If these limits are increased, it does not appear that brine metals will be a limiting operational factor. Because available characterization data show significant variability of metals concentration in PAS brines, the issue of brine feed rates may need to be addressed on a frequent basis.

Several operational situations could potentially generate higher than expected brine quantities. Most are related to times when the incinerators are idling and not actually processing chemical agent munitions, but are still at high temperatures requiring the pollution abatement systems to be operational. If the BRA can be maintained at its maximum processing capacity, it should be able to handle this "excess" brine generation. However, there are still uncertainties in the projected brine generation quantities, and it is not always possible to maintain the BRA at full capacity.

The Permittees continue to evaluate a number of options to mitigate some of the limitation concerns identified here. They are examining different ways of operating the incinerator pollution abatement systems more efficiently to generate less brine, as well as looking at improvements that

² The UMCDF will destroy several different types of chemical agent weapons, including rockets, bombs, land mines and projectiles, as well as bulk storage containers. In addition, there are three different types of chemical warfare agents [nerve agents GB (also known as Sarin) and VX, and blister agent HD (commonly referred to as mustard gas)] that are contained within the various munitions. Only one type of chemical agent will be processed at any given time, and each type of munition is processed separate from others. Each category of munitions processing (e.g. HD ton containers, GB M55 rockets, VX 155mm projectile, GB 750 lb. bomb, etc.) is considered to be a separate "campaign."

can be made in the BRA PAS to better control emissions. Additional BRA capacity is being considered, as is the possibility of some preliminary filtering of the metals from the brine prior to processing in the BRA. The Department continues to stay informed of the latest developments on this issue and expects that the Permittees will implement those "fixes" which are reasonable. The extent of the potential problem will be much clearer once the UMCDF has completed its BRA Performance Test, scheduled for Fall 2003.

**Revisions to the
Originally
Proposed HW
Permit
Modification**

In response to public comments, as well as subsequent discussions with the UMCDF Permittees, and upon advice of legal counsel, the Department has revised the HW Permit modification as originally proposed. (See Attachment A for the full text of the revised proposed modification.)

Proposed condition D.13 (originally proposed as D.12, but renumbered to accommodate other changes subsequently made to the HW Permit) of Attachment 6 has been revised to clarify that the Brine Reduction Area must be operational and ready to process PAS brines generated only from agent operations, not all brines (such as those from systemization or surrogate testing). It has also been revised to remove the requirement that the Brine Reduction Area be "fully tested" prior to the start of chemical agent operations. The HW Permit allows UMCDF to operate the BRA in a "shakedown period" for up to 720 hours before conducting the formal Performance Test. The UMCDF will still be required to have the Brine Reduction Area operational and ready to conduct shakedown operations prior to the start of chemical agent operations. The Department will ensure that the BRA has been properly systemized and tested as part of the agent operations startup approval process.

As originally proposed, condition II.B.4. in Module II of the HW Permit would have required that all (with no exceptions) PAS brines generated during chemical agent operations be processed in the Brine Reduction Area. Condition II.B.4. has been revised, and new condition II.B.5. added, to allow the off-site shipment of PAS brines only when specified criteria are met. The specific criteria are included as part of condition II.B.5. New conditions II.B.6. and II.B.7 were also added to define the notification and record-keeping process that UMCDF will be required to follow for the off-site shipment of PAS brines once the criteria in II. B.5. have been met. In summary, such off-site shipments will be allowed only when it can be shown that they are necessary to avoid slowing down the destruction of chemical agent or chemical agent munitions/bulk items.

Key issues identified by the Department and/or commenters are presented below, with a discussion of how the Department resolved the issue.

Key Issues

1. *Approval of the proposed HW Permit modification could slow down the destruction of chemical agent and chemical agent munitions/bulk items, therefore increasing the risk to human health and the environment due to extended storage of the chemical weapons stockpile.*

The Permittees and other commenters argue that the permit modification as originally proposed would potentially slow down the destruction schedule for the Umatilla chemical agent inventory. If all PAS brines must be processed in the Brine Reduction Area, then chemical agent processing will need to be curtailed any time there is insufficient Brine Reduction Area processing capacity. Commenters also expressed concern that the proposed permit modification places a higher priority on the processing of the PAS brines, which represent a relatively low environmental risk, instead of maintaining focus on the destruction of the more toxic chemical agents and chemical agent munitions/bulk items.

The Department agrees that the overall focus on destruction of the highly toxic chemical agents and chemical agent munitions/bulk items should not be superceded by an inordinate focus on the processing of PAS brines. To resolve these issues, the Department has revised the originally proposed permit modification to allow limited shipment of PAS brines off-site for treatment and disposal at a permitted RCRA³ Subtitle C hazardous waste management facility while still requiring that the Permittees process as much brine as possible in the Brine Reduction Area without constraining chemical agent destruction.

2. *The Department and Commission lack the regulatory authority to modify the UMCDF HW Permit as proposed.*

The Permittees and some other commenters argue that the Department and the Commission lack the regulatory authority to unilaterally modify the UMCDF HW Permit. The Associated Oregon Industries expressed concern about the policy and precedent being set by this proposed modification, stating that the Department would be hindering business investment in Oregon by making its "regulatory impositions unpredictable." The Department does not agree that it lacks the regulatory authority to modify the UMCDF HW Permit as proposed here.

Upon Department request, the Department of Justice (DOJ) reviewed the legal issues raised by the Permittees and concluded that the Commission and the Department clearly have broad authority to regulate the treatment, storage, and disposal of hazardous waste. Oregon Revised Statute (ORS) 466.010 states that the Legislative Assembly's purpose is to "protect the public health and safety and environment of Oregon to the maximum extent

³ The Resource Conservation and Recovery Act (RCRA) established the federal regulations governing the management of hazardous and solid waste. Subtitle C is the specific section of RCRA dealing with the management of hazardous waste. The RCRA regulations have been adopted into Oregon state law.

possible,” and to “exercise the maximum amount of control over actions within Oregon relating to hazardous waste and PCB⁴ transportation and treatment or disposal.”

Federal regulations (as adopted by Oregon) require that unilateral modifications to a HW Permit must be based on a determination that sufficient cause exists to warrant such action. 40 CFR §270.41(a)(1) gives the following criteria as justification for permit modification:

“There are material and substantial alterations or additions to the permitted facility or activity which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit.”

UMCDF’s recent decision to pursue the off-site shipment of PAS brines for treatment and disposal is a significant change to the brine management activities described in the UMCDF HW permit application. The Department and Commission have always expected that the Brine Reduction Area would process all PAS brines, and have operated under such an understanding throughout the permitting and construction of the UMCDF.

3. *The proposed permit modification provides no additional protection of human health and the environment due to the relatively low toxicity of the PAS brines and the low risk associated with their shipment to an off-site hazardous waste disposal facility.*

The Permittees and other commenters argue that requiring processing of the PAS brines in the Brine Reduction Area is inappropriate because they are low toxicity liquids that can be safely transported to an off-site facility. The Department agrees that the PAS brines have a lower toxicity than the actual chemical agents and chemical agent munitions, and thus, has revised its original proposal to ensure that brine processing in the Brine Reduction Area is not prioritized above the destruction of chemical agent.

The Department does not believe, however, that PAS brines should not be processed in the Brine Reduction Area simply because they can “safely” be transported to an off-site facility. PAS brines are a hazardous waste and are expected to have potentially significant concentrations of heavy metals, which are harmful to both human health and the environment. There is also no question that, although it may be possible to perform off-site transportation of this liquid waste in a safe manner, there is even less potential environmental risk associated with the transportation of the dried brine salts that result from operation of the BRA. Operation of the Brine Reduction Area will not only significantly reduce the overall quantity of hazardous waste that must be shipped off-site for disposal, but will ensure that the majority of that waste is shipped as a solid, thus reducing even further the risk of harmful spills to the

⁴ PCB stands for polychlorinated biphenyls, which are a specific type of organic chemical and hazardous substance that have their own unique management regulations and standards.

environment. Therefore, the Department believes it is appropriate to require that the Brine Reduction Area be operated to maximum capacity and that it be ready to process PAS brines prior to the start of chemical agent operations.

**EQC Action
Alternatives**

1. *Modify the UMCDF HW Permit in accordance with the Department's recommendation to add conditions II.B.4., II.B.5., II.B.6. and II.B.7. (Module II), and condition D.13 (Attachment 6). The new HW Permit conditions require the UMCDF Permittees to process all PAS brines in the Brine Reduction Area except for situations where they can document that limited off-site shipments for treatment and disposal are necessary to avoid slowing down the destruction of chemical agent and munitions. The new HW Permit conditions also require that the UMCDF Brine Reduction Area to be operational and ready to process PAS brines prior to the start of chemical agent operations.*

The Department believes there is sufficient justification for the proposed modification and recommends that the Commission modify the UMCDF HW Permit as proposed. The proposed modification, as revised after consideration of comments received during the public comment period, will explicitly require the Permittees to process PAS brines generated from chemical agent operations in the Brine Reduction Area, unless they can clearly show (on a case-by-case basis) that limited off-site shipments are necessary to avoid adversely affecting chemical agent destruction operations.

The Department believes the proposed modification addresses the primary concerns expressed by the majority of the commenters and interested Umatilla Project stakeholders. Operational flexibility that allows the possibility of off-site shipments of PAS brines when it is necessary to avoid slowing down the destruction of chemical agent is consistent with the desired approach advocated by the Permittees and several other commenters. The requirements establishing specific criteria that more tightly control the details and logistics of those off-site shipments should address the concerns of other commenters, such as CTUIR (see Attachment F for a copy of a CTUIR letter to the U. S. Army expressing their current stance on the issue of off-site shipment of PAS brines) and Morrow County, both of whom supported the original proposal. The Department does note that the proposed modification does not fully address the concerns expressed by GASP in their public comments, which indicated that the originally proposed modification should be adopted, even if it resulted in schedule delays for the destruction of chemical agent.

2. *Modify the UMCDF HW Permit to add conditions II.B.4. and D.13. only (as originally proposed—see Attachment B), which would require all PAS brines to be processed in the Brine Reduction Area regardless of impacts*

to the agent destruction schedule. It would also require the Brine Reduction Area to be operational and ready to process PAS brines prior to the start of chemical agent operations.

This alternative could potentially extend both the continued storage of chemical agent munitions/bulk items, as well as the agent destruction schedule. Available information indicates that the Brine Reduction Area, when operated at expected efficiencies and processing capacities, can likely handle expected brine generation quantities. However, for some munition campaigns, there is an increased probability that Brine Reduction Area processing capacity would limit the agent destruction rate. Chemical agent destruction would also be curtailed when the Brine Reduction Area is inoperable for extended periods of time due to unexpected maintenance and repair.

Although this was the Department's original proposal, additional information received through public comments indicates that this would not be a preferred alternative. The Department has concluded that it is necessary to allow UMCDF some flexibility in the management of brines to avoid unwarranted delay in the destruction of the chemical agent stockpile due to temporary unavailability of the BRA.

3. *Take no action.*

This alternative would provide the Commission and Department no direct control over the management of PAS brines. Since the UMCDF HW Permit does not currently require that PAS brines be processed in the Brine Reduction Area, the Permittees would be able to operate the system at their own discretion. Although the Permittees have committed that they will operate the Brine Reduction Area to the maximum extent possible, there would be no requirement to do so, and they could ship the PAS brines off-site for treatment and disposal at any time of their choosing.

Since the U. S. Army has not operated the Brine Reduction Area at the Tooele Chemical Agent Disposal Facility, and does not currently plan to operate those systems at either the Anniston Chemical Agent Disposal Facility or the Pine Bluff Chemical Agent Disposal Facility, it is not unreasonable to be concerned that commitments by local UMCDF management might be superseded if such commitments are not required by the HW Permit.

**Rationale and
Next Steps**

The Department has recommended Alternative 1 because it believes that there is sufficient cause and justification to modify the UMCDF HW Permit to include these new requirements.

Requiring that PAS brines be processed in the Brine Reduction Area to the

maximum extent possible will ensure that the UMCDF is operated as was originally presented to and permitted by the Commission. Allowing the flexibility of limited off-site shipment of PAS brines to a RCRA Subtitle C hazardous waste management facility for treatment and disposal, when necessary to avoid slowing the chemical agent destruction process, will avoid placing a higher priority on the processing of PAS brines, which represent a lower risk to human health and the environment than the chemical agents themselves. The proposed modification also clearly lays out the criteria that the Permittees must meet to employ the provided flexibility.

If the Commission approves the proposed modification (with or without changes), the Department will notify the UMCDF Permittees, finalize the changes to the HW Permit and issue updated pages to everyone who maintains a copy of the UMCDF HW Permit. The public will be sent a Notice of Decision and this staff report will serve as the Department's response to public comments.

Attachments

- A** Additional Conditions Proposed for UMCDF HW Permit
- B** Fact Sheet for the Proposed Modification of Hazardous Waste Storage and Treatment Permit for the Umatilla Chemical Agent Disposal Facility, Permit Modification No. UMCDF-02-039-BRA(EQC), "Required Operation of the Brine Reduction Area." [DEQ Item No. 02-1844]
- C** Transcript of July 26, 2002 EQC Briefing Session [DEQ Item No. 02-2122]
- D** Transcript of Oral Testimony Received December 4, 2002. [DEQ Item No. 02-2093]
- E** Written Comments received related to Proposed Permit Modification No. UMCDF-02-039-BRA(EQC).
- F** Copy of April 2003 CTUIR Letter to UMCDF Regarding the Off-Site Shipment of PAS Brines [DEQ Item No. 03-0743]

Available Upon Request

- Engineering Report Prepared for U.S. Army Program Manager for Chemical Demilitarization "Assessment of UMCDF Brine Generation and Treatment/Disposal Options," dated December 16, 2002. [DEQ Item No. 03-0373]
- Copy of DEQ presentation slides from July 26, 2002 EQC briefing session. [DEQ Item No. 02-0315]
- Copy of CTUIR presentation slides from July 26, 2002 EQC briefing session. [DEQ Item No. 02-0316]
- Transmittal memorandum from Sue Oliver (Acting Administrator, DEQ Chemical Demilitarization Program) to the Environmental Quality

Commission and Stephanie Hallock (Director). Transmitted eight documents related to public comments received on Proposed Permit Modification No. UMCDF-02-039-BRA(EQC). [DEQ Item No. 03-0074]

- Hearings Officer Report, Public Hearing held December 4, 2002 in Hermiston, Oregon. [DEQ Item No. 02-2011]

Approved:

Author(s): Thomas G Beam

Program: Dennis Murphey /

Report Prepared By: Thomas G. Beam, Sr. Environmental Engineer

Phone: (541) 567-8297

ATTACHMENT A

Additional Conditions Proposed for UMCDF HW Permit

Permit Modification UMCDF-02-039-BRA(EQC)

Conditions II.B.4., II.B.5., II.B.6. and II.B.7. (Module II)

and

Condition D.13 (Attachment 6)

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[Text in shaded boxes is provided for information only.]

The underlined text below will be added to Module II of the UMCDF Hazardous Waste Storage and Treatment Permit (ID No. ORQ 000 009 431) under the headings shown in bold. Permit Conditions II.B.1. through II.B.3. already exist in the HW Permit.

MODULE II—GENERAL FACILITY CONDITIONS

II.B. RECEIPT OF OFFSITE WASTE AND SHIPMENT OF ONSITE WASTE

- II.B.4. Except as allowed by Permit Condition II.B.5., the Permittee shall process all UMCDF pollution abatement system brines generated from the treatment of chemical agent, or chemical agent-contaminated materials, in the brine Reduction area in accordance with Module V of this Permit.
- II.B.5. The Permittee may ship pollution abatement system brines to an off-site RCRA Subtitle C permitted hazardous waste management facility when:
- i. The Permittee has determined and documented, in accordance with Permit Conditions II.B.6. and II.B.7., that a shortage of available Brine Reduction Area processing and/or storage capacity will inhibit the destruction of chemical agent or chemical agent munitions/bulk items;
 - ii. The Permittee has taken reasonable measures to minimize the quantities of generated brine;
 - iii. The Permittee has taken reasonable measures to maximize available Brine Reduction Area processing and/or storage capacity; and
 - iv. The Permittee limits off-site shipments of pollution abatement system brines to the quantity necessary to avoid slowing the destruction of chemical agent or chemical agent munitions/bulk items.
- II.B.6. The Permittee shall provide verbal or written notification to the Department of each off-site shipment of pollution abatement system brines prior to loading the brine into the transport vehicle. Such notification shall include estimates of the quantities of brine to be shipped, the schedule for shipment and reason why off-site shipment is necessary.
- II.B.7. The Permittee shall maintain records for each off-site shipment of pollution abatement system brines demonstrating compliance with the requirements of

Permit Condition II.B.5. These records shall be maintained as part of the Facility Operating Record, in accordance with Permit Condition II.I.

The underlined text below will be added to Attachment 6 of the UMCDF HW Permit under the headings shown in bold. Conditions D.1. through D.12. already exist in the HW Permit.

ATTACHMENT 6-- Requirements for Commencement of Unit and Facility Operations

D. Requirements for Commencement of Shakedown Period II (Agent) on the First Incinerator

D.13. The Permittee must have the Brine Reduction Area operational and ready to treat pollution abatement system brines generated from agent operations.

ATTACHMENT B

Fact Sheet
for the
Proposed Modification of the
Hazardous Waste Storage and Treatment Permit
for the
Umatilla Chemical Agent Disposal Facility
Permit Modification No. UMCDF-02-039-BRA(EQC)
“Required Operation of the Brine Reduction Area.”
(DEQ Item No. 02-1844)



State of Oregon
Department of
Environmental
Quality

FACT SHEET

02-1844

**Proposed Modification of the
Hazardous Waste Storage and Treatment Permit
for the
Umatilla Chemical Agent Disposal Facility
(Permit No. ORQ 000 009 431)**

**Permit Modification No. UMCDF-02-039-BRA(EQC)
"Required Operation of the Brine Reduction Area"**

Introduction

In February 1997, the Environmental Quality Commission ("Commission" or EQC) and the Department of Environmental Quality ("Department" or DEQ) issued a Hazardous Waste Storage and Treatment Permit (HW Permit) to the United States Army¹ to build and operate the Umatilla Chemical Agent Disposal Facility (UMCDF). Construction of UMCDF started in June 1997 and is now essentially complete. A systemization² and surrogate "shakedown"³ (i.e. testing) phase is now underway to ensure that all UMCDF systems (e.g. incinerators and their associated pollution abatement systems) are working properly prior to the start of actual chemical agent destruction operations.

When the UMCDF HW Permit was issued in February 1997, the Commission and Department believed that all brines generated by each incinerator pollution abatement system (PAS) (during both surrogate testing and chemical agent destruction operations) would be treated in the Brine Reduction Area (BRA). The BRA was permitted as a miscellaneous treatment unit in the HW Permit for just such a reason. The existing UMCDF HW Permit does not explicitly require all PAS brines be treated in the Brine Reduction Area.

The proposed modification will add a HW Permit Condition requiring the UMCDF Permittees to utilize the Brine Reduction Area for treatment of all brines generated by the incinerator pollution abatement systems during chemical agent destruction operations. The DEQ is also proposing the addition of a HW Permit Condition requiring the UMCDF BRA be fully tested and operational prior to the start of chemical agent destruction operations. This Fact Sheet describes the proposed modification and provides background information concerning the basis for the proposed modification.

Attachment A is a copy of the public notice that was mailed to interested parties and contains detailed information concerning information repositories and public hearings related to the proposed modification. Attachment B contains copies of several letters documenting recent developments with respect to the strategy for managing the PAS brines in the Brine Reduction Area. Attachment C is a list of Permit Modification Requests that have previously been submitted by the UMCDF Permittees related to the design and operations of the BRA.

¹ There are three "Permittees" named on the UMCDF HW Permit. The U.S. Army Umatilla Chemical Depot and the U.S. Army Project Manager for Chemical Stockpile Disposal (PMCS D) are named as Owner and Operator of UMCDF. Washington Demilitarization Company (the Army's construction and operations contractor) is named as a co-operator of UMCDF.

² Systemization is a pre-operational testing phase that involves testing components, instruments, and associated equipment using non-hazardous materials and waste feeds (such as simulated munitions filled with ethylene glycol to test conveyors, controls, and feed mechanisms).

³ Hazardous waste regulations allow a facility to operate with permitted waste feeds for up to 720 hours (equivalent to 30 days at 24 hours/day operation) prior to conducting actual "trial burn" tests. This period is known as a "shakedown" period. Because of the extreme toxicity of chemical warfare agents, UMCDF is required to first test the incineration systems with surrogate waste feeds (chemicals not as toxic as the chemical warfare agents, but more difficult to burn) prior to beginning shakedown operations with actual chemical warfare agents.

Location and Purpose of UMCDF

The UMCDF is located in northeastern Oregon at the Umatilla Chemical Depot, about seven miles west of Hermiston, Oregon (about 175 miles east of Portland, Oregon). The address is 78072 Ordnance Road, Hermiston, OR 97838-9544. The UMCDF is a hazardous waste treatment facility that will use four incinerators to destroy a stockpile of chemical warfare agents that has been stored at the Umatilla Chemical Depot (UMCD) since 1962.

The chemical agents stored at UMCD include nerve agents and blister ("mustard") agents in liquid form. Nerve agents ("GB" and "VX") are contained in munitions, such as rockets, projectiles, and land mines, and in large containers, such as spray tanks, bombs, and "ton containers." Mustard agent is stored only in ton containers.

Description of the UMCDF

UMCDF includes two liquid injection incinerators to destroy liquid nerve and blister agents. In addition to the liquid incinerators there are two other high temperature furnaces that will be used for thermal treatment of metal parts ("Metal Parts Furnace") and destruction of explosives and propellants ("Deactivation Furnace System"). All container handling, munitions disassembly, and incinerator loading will be conducted within an enclosed building. Emissions from the building and the incinerators will be directed through pollution control systems before being released to the atmosphere. Computer controls will shut down waste feed to the incinerators if proper operating conditions are not maintained or if chemical agent is detected in the exhaust from any of the four incinerators. Liquid brines that are generated by the incinerator pollution abatement systems as they cool and clean the exhaust gases are pumped to a separate treatment facility ("Brine Reduction Area") located nearby, where all the liquid is evaporated off, leaving behind only a salt residue for off-site disposal.

Proposed Modification to the UMCDF HW Permit

Because the UMCDF HW Permit is considered an operating document, modifications are expected to occur over the duration of the project. For example, modifications are required if there are alterations to the originally permitted facility, if new information becomes available to the Permittees or to the Department, or if there are new regulations that apply to the facility. There have already been over 160 modifications made to the HW Permit at the request of the Permittees.

The proposed modification will add two new conditions to the UMCDF HW Permit. The new Permit Conditions will require the UMCDF Permittees to treat all incinerator PAS brines generated during chemical agent destruction operations in the Brine Reduction Area, and require the BRA be fully tested and operational prior to the start of chemical agent shakedown operations for the first UMCDF furnace to feed chemical agent.

The Department proposes to add one Permit Condition to Module II ("General Facility Conditions") of the HW Permit in a section titled "Receipt of Offsite Waste and Shipment of Onsite Waste" (Condition II.B.). The Department proposes to revise Condition II.B. by adding Permit Condition II.B.4. as indicated by the underlined text below:

- II.B. RECEIPT OF OFFSITE WASTE AND SHIPMENT OF ONSITE WASTE
- II.B.1. The Permittee is not authorized to accept and therefore shall not receive hazardous waste, chemical agent, or munitions containing chemical agents from offsite, except from the UMCD.
- II.B.2. Any chemical agent-related material and/or demilitarization waste being transferred to an off-site RCRA Subtitle C permitted hazardous waste disposal facility (or RCRA Subtitle C permitted smelting facility in the case of munition casings) must meet the agent-free criteria as defined in Attachment 2 of the Permit.

II.B.3 The Permittee shall process, in accordance with this Permit, all chemical agents, and chemical agent-contaminated materials currently stored or otherwise located at the Umatilla Chemical Depot.

Proposed Text
Addition →

II.B.4. The Permittee shall process all brines generated by each UMCDF pollution abatement system from the treatment of chemical agent, or chemical agent-contaminated materials, in the Brine Reduction Area Subpart X miscellaneous treatment units in accordance with the requirements of Module V of this Permit.

The Department also proposes to add one Permit Condition to Attachment 6 ("Requirements for Commencement of Unit and Facility Operations") of the HW Permit in a section titled "Requirements for Commencement of Shakedown Period II (Agent) on the First Incinerator" (Section D). The Department proposes to revise Section D by adding Permit Condition D.12 as indicated by the underlined text below (Permit Conditions D.1. through D.11. are current, existing requirements that are shown in abbreviated format to provide convenient context for the reader):

D. REQUIREMENTS FOR COMMENCEMENT OF SHAKEDOWN PERIOD II (AGENT) ON THE FIRST INCINERATOR

Prior to commencing a Shakedown Period II (Agent) for the first incinerator, or by the date specified, the Permittee must complete all of the following:

D.1. The Permittee must implement a waste/munitions tracking procedure and system approved by the Department.

D.2. The Permittee must...

D.11. The Permittee must have written notification from the Environmental Quality Commission authorizing the start of agent shakedown operations.

Proposed Text
Addition →

D.12. The Permittee must have a fully tested and operational Brine Reduction Area (40 CFR 264 Subpart X Miscellaneous Treatment Units) ready to treat all brines generated from operation of the incinerator pollution abatement systems.

Regulatory Basis to Modify UMCDF HW Permit

Regulations regarding the permitting and operation of hazardous waste treatment, storage, and disposal facilities are known as the "Resource, Conservation and Recovery Act" (RCRA) regulations. They are contained in Title 40 of the Code of Federal Regulations (CFR). In accordance with the RCRA regulations, the State of Oregon has been authorized by the U.S. Environmental Protection Agency to implement its own hazardous waste program. Oregon has adopted RCRA regulations as Oregon Administrative Rules.

In accordance with 40 CFR §270.41, the Department/Commission may not modify the UMCDF HW Permit unless sufficient cause [as defined in 40 CFR §270.41(a) and (b)] exists to warrant such action. If the Department/Commission determines that sufficient cause exists to modify the UMCDF HW Permit, a draft Permit must be prepared and processed in accordance with the applicable requirements of 40 CFR Part 124, Subpart A.

The Department believes that sufficient cause, based on two of the criteria listed in 40 CFR §270.41(a), does exist to warrant a modification of the UMCDF HW Permit to require that all PAS brines generated during chemical agent destruction operations be treated in the Brine Reduction Area, and that the UMCDF Permittees be required to have the BRA fully tested and operational prior to the start of chemical agent shakedown for the first incinerator. These two applicable causes for modification are:

- 40 CFR §270.41(a)(1) -- *"There are material and substantial alterations or additions to the permitted facility or activity which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit."*
- 40 CFR §270.41(a)(2) -- *"The Director has received information. Permits may be modified during their terms for this cause only if the information was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and would have justified the application of different permit conditions at the time of issuance."*

At the time the UMCDF HW Permit was issued in February 1997, the Commission and Department did not believe there was any question as to whether the Brine Reduction Area would be used to treat all PAS brines generated during UMCDF operations. All information provided by the U.S. Army during the permitting process indicated they planned to process all brines (including those generated during surrogate operations) through the BRA, and not pursue off-site shipment and disposal. As a result, the HW Permit was issued without any explicit requirements for UMCDF to treat its brine on-site in the Brine Reduction Area, although language in the Waste Analysis Plan (Attachment 3 of the HW Permit), Permit Condition V.A.7. and Section D-9 of the Permit Application indicates that the brines were to be treated in the BRA. One of the key issues surrounding the debate over the issuance of the HW Permit was the desire to treat everything possible on-site and minimize any off-site waste shipments. If the Commission and Department had foreseen the possibility that the UMCDF Permittees would pursue other brine management strategies, specific requirements very similar to those being proposed at this time would have been included in the UMCDF HW Permit.

During the original permitting process, the UMCDF project timeline was portrayed in a very sequential manner that proceeded from the construction phase to systemization activities to facility operations. Based on the information available to the Commission and Department at that time, it was expected that all treatment units, including the Brine Reduction Area, would be ready prior to the start of facility operations. As the UMCDF project experienced delays in the construction schedule, the systemization and testing schedule underwent significant compression to try and mitigate some of the delay. In addition, the Permittees have proposed numerous facility changes to improve the design and operational efficiency of various treatment units (including the BRA). As a result, the Department is concerned that the Brine Reduction Area may not be fully operational to support the planned start of chemical agent operations. Once again, if the Commission and Department had foreseen this possibility, they would have included HW Permit Conditions requiring a fully operational BRA prior to authorizing the start of facility operations.

Additional Background Information and Discussion

A summary overview of the recent developments regarding operation of the Brine Reduction Area to treat PAS brines can be found by a review of the correspondence provided in Attachment B of this information package. Information available when the original HW Permit was issued indicated that the BRA had sufficient capacity to treat all the brines generated by the pollution abatement systems. All subsequent permit modification requests submitted by the UMCDF Permittees that proposed operational or design changes to the Brine Reduction Area (see Attachment C) continued to indicate that both surrogate and agent brines would be treated in the BRA. Since the Brine Reduction Area was operated only for a limited time at the Tooele Chemical Agent Disposal Facility (TOCDF) in Utah, the Department made every effort to stay informed of operational plans for the BRA at UMCDF. It was not until February 2002, that the Department became aware of the Army's plans to revise their brine management strategy as a way to help mitigate additional delays that had been experienced in the project schedule. The proposed modifications to the HW Permit will allow the UMCDF Permittees to continue shipping brines generated during surrogate operations off-site for disposal at a permitted hazardous waste management facility, but still require the BRA be ready to process all brines from chemical agent operations. While this is a departure from the original intent, the Department believes this is a reasonable approach that continues to provide appropriate protection of human health and the environment.

Potential Impacts of Proposed Changes

At this time, the Department has insufficient information to fully quantify the potential impacts of these proposed changes on UMCDF operations. However, it is possible to qualitatively discuss the potential impacts.

If the Brine Reduction Area has sufficient operational capacity to handle the expected generation quantities of PAS brines, then the proposed changes should have little or no impact on UMCDF operations. The proposed changes would implement explicit requirements that are already consistent with the UMCDF Permittees' current plans to have the BRA ready for processing of PAS brines generated during chemical agent operations.

If, however, it is determined that the Brine Reduction Area has an operational capacity lower than the generated quantities of PAS brines, the proposed permit modification could potentially impact UMCDF operations depending on what additional brine waste management approaches are implemented. The Department believes that if the existing Brine Reduction Area has insufficient operational capacity, the UMCDF Permittees will have to examine the following alternative waste management approaches (either individually or in combination):

- Increase on-site brine storage capacity to compensate for the lower treatment capacity;
- Increase BRA operational capacity to handle expected brine generation quantities;
- Reduce chemical agent destruction rates so that brines are only generated in quantities that the BRA can accommodate; or
- Pursue off-site shipment of brines generated during chemical agent operations for disposal at a permitted hazardous waste management facility.

Other alternative brine waste management approaches may also exist that the Department has not considered. Regardless, the Department does not have sufficient information to fully evaluate the potential impacts on UMCDF operations of any of these options.

If the proposed changes are not implemented, the UMCDF HW Permit will not include any enforceable requirement(s) to treat PAS brines in the BRA. The UMCDF Permittees have maintained that they intend to process PAS brines in the BRA during chemical agent operations, but lacking a specific requirement to do so, would be able to change their mind if they so desire. The Department estimates (based on the latest information available in the UMCDF Permit Application) that off-site shipment of PAS brines during chemical agent operations would be approximately 40,000 gallons per day at the maximum brine generation rate.

Opportunity for Public Comment

The proposed modification will add two conditions to the HW Permit (described on Page 3) requiring the UMCDF Permittees to treat all PAS brines generated during chemical agent destruction operations in the Brine Reduction Area, and the Brine Reduction Area to be fully tested and operational prior to the start of chemical agent operations for the first incinerator. **The Department, on behalf of the Commission, is seeking comment not only on the proposed language of the new Permit Conditions, but also on whether the public believes that there is a need to impose these additional requirements on the Permittees. In addition, the Department is seeking information that will allow a more complete assessment of the UMCDF operational impacts from these proposed changes. The Department is also seeking information that will allow a full evaluation of the alternative PAS brine waste management approaches outlined above (as well as any others that are identified), including a discussion of PAS brine management when the Brine Reduction Area is unavailable for treatment due to maintenance activities, repairs or unanticipated operational problems.**

The Department will review and consider all oral and written comments received during the comment period. Department staff will then prepare a report with a recommendation to the Environmental Quality

Commission. The report will include the Department's response to all significant comments received during the open public comment period. The Commission is anticipated to make a final decision on the proposed modification to the UMCDF HW Permit in March 2003 at its regularly scheduled meeting (March 20-21, to be held in the Portland, Oregon area). The Commission may decide to modify the HW Permit as proposed or with changes, or may decide against modifying the HW Permit.

How to Submit Comments on the Proposed Permit Modification

The public comment period on this proposed Permit Modification will remain open from November 1 through 5:00 p.m. on December 23, 2002. Written comments may be submitted by e-mail, fax, or regular mail any time during the comment period, provided the comment is received by the Department no later than 5:00 p.m. on December 23. E-mail comments should be submitted to mayer.ann@deq.state.or.us and include the words "Public Comment" in the subject line. Comments submitted by facsimile transmission should be sent to (541) 567-4741. Comments sent by regular mail should be addressed to Mr. Wayne C. Thomas, Administrator, Chemical Demilitarization Program, 256 E. Hurlburt, Hermiston, Oregon 97838. There will be an opportunity for the public to provide oral comments to the Department on December 4, 2002 in Hermiston, Oregon (Good Shepherd Conference Center, 610 N.W. 11th, beginning at 7:00 p.m.).

For More Information

For more information about this Permit Modification, or for information on UMCDF, please contact Ann Mayer, Chemical Demilitarization Program, Hermiston office of the DEQ [Phone 541-567-8297, ext. 25 or toll free in Oregon (800) 452-4011, E-mail: mayer.ann@deq.state.or.us]. The Department's Chemical Demilitarization Program has prepared numerous fact sheets about the chemical weapons destruction process at the Umatilla Chemical Depot, available upon request:

- ❖ Storage and Management of Hazardous Waste (June 2000, also available in Spanish)
- ❖ Public Participation (June 2000, also available in Spanish)
- ❖ Hazardous Waste Storage Permit Application (June 2000, also available in Spanish)
- ❖ Modification of a Hazardous Waste Permit (June 2000, also available in Spanish)
- ❖ Metal Parts Furnace (September 2000, also available in Spanish)
- ❖ Liquid Incinerator (September 2000, also available in Spanish)
- ❖ Dunnage Incinerator (September 2000, also available in Spanish)
- ❖ Deactivation Furnace System (September 2000, also available in Spanish)
- ❖ Rocket Processing (January 2001)
- ❖ Projectile Processing (January 2001)
- ❖ Mine Processing (January 2001)
- ❖ Bulk Item Processing (January 2001)

Attachments

- A Public Notice: Request for Comments and Notice of Public Hearing
- B Copies of Recent Correspondence Regarding Operation of the Brine Reduction Area
- C List of UMCDF Permit Modification Requests (PMR) Modifying the Design and Operation of the Brine Reduction Area

ATTACHMENT A

Copy of Public Notice

"REQUEST FOR COMMENTS AND NOTICE OF PUBLIC HEARING"

[DEQ Item No. 02-1833]

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Public Notice: Request for Comments and Notice of Public Hearing

Proposed Modification of the Hazardous Waste Storage and Treatment Permit for the Umatilla Chemical Agent Disposal Facility (UMCDF) (Permit NO. ORQ 000 009 431)

[Permit Modification No. UMCDF-02-039-BRA(EQC), "Required Operation of the Brine Reduction Area"]

Notice issued: November 1, 2002

Written comments due:
5:00 p.m., December 23, 2002

Hearing date: December 4, 2002

Hearing time: 7:00 p.m.
(DEQ staff will be available to answer questions before the hearing from 6:30-7:00 p.m.)

Hearing location:
Good Shepherd Conference Center
610 N.W. 11th
Hermiston, OR

How can I send comments?

The Oregon Department of Environmental Quality (DEQ) will accept both written and oral comments at the hearing listed above, or written comments by mail, fax or e-mail as shown below.

Contact Name:

Ann Mayes, Public Information Specialist
Hermiston DEQ office

Phone: (541) 567-8297 ext. 25, or
Cellular (541) 561-6332, or
toll free in Oregon (800) 452-4011

Mailing address:

Oregon DEQ
Chemical Demilitarization Program
256 E. Hurlburt Avenue
Hermiston, OR 97838

Fax: (541) 567-4741

E-mail: mayes.ann@deq.state.or.us

(Please include "Public Comment" in the subject line. E-mail comments will be acknowledged as soon as possible. The DEQ is not responsible for delays between servers that result in missed comment deadlines.)

What are DEQ's responsibilities?

DEQ is the regulatory agency that helps protect and preserve Oregon's environment. DEQ is responsible for protecting and enhancing Oregon's water and air quality, for cleaning up spills and releases of hazardous materials, and for managing the proper disposal of hazardous and solid waste. One way DEQ does this is by requiring permits for certain activities.

A Hazardous Waste Storage and Treatment Permit (HW Permit) for UMCDF was issued by the DEQ and the Environmental Quality Commission [EQC] (DEQ's policy and rule-making board) in February 1997. It is DEQ's responsibility, under the direction of the EQC, to process permit modification requests and to ensure that UMCDF complies with requirements of the HW Permit.

Who are the UMCDF Permittees?

There are three Permittees named on the UMCDF HW Permit. The U.S. Army Umatilla Chemical Depot and the U.S. Army Project Manager for Chemical Stockpile Disposal (PMCS) are named as Owner and Operator of UMCDF. Washington Demilitarization Company (the Army's construction and operations contractor) is named as a co-operator.

What kind of facility is this?

The UMCDF is a hazardous waste storage and treatment facility that will use four incinerators to destroy a stockpile of chemical warfare agents that has been stored at the Umatilla Chemical Depot (UMCD) since 1962. The chemical agent stockpile at UMCD includes about 3,717 tons of nerve agents ("VX" and "GB") and blister ("mustard") agents in liquid form.

Nerve agents are contained in munitions, such as rockets, projectiles and land mines, and in large containers, such as spray tanks, bombs and "ton containers." Mustard agent is stored only in ton containers. All of the chemical warfare agents are highly toxic.

**Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting**



State of Oregon
Department of
Environmental
Quality

Office of the
Director
Chemical
Demilitarization
Program
256 E. Hurlburt Ave.
Hermiston, OR 97838
Phone: (541) 567-8297
(800) 452-4011
Fax: (541) 567-4741

Contact: Ann Mayes

DEQ Item No. 02-1833

www.deq.state.or.us

Where is the facility located?

The UMCDF is located in northeastern Oregon at the Umatilla Chemical Depot, about seven miles west of Hermiston, Oregon (about 175 miles east of Portland, Oregon). The address is 78072 Ordnance Road, Hermiston, OR 97838-9544.

What changes are proposed?

The DEQ is proposing to modify the UMCDF HW Permit to add a Permit Condition that will require all incinerator pollution abatement system brines generated during chemical agent destruction operations be treated onsite in the Brine Reduction Area (BRA). The DEQ is also proposing to add a Permit Condition that will require UMCDF to have a fully tested and operational BRA prior to the start of chemical agent operations for the first incinerator.

How do I get more information and review pertinent documents?

You can review documents related to the proposed permit modification and the UMCDF at the Hermiston DEQ office (please call ahead for an appointment) or at one of the following information repositories:

Hermiston Public Library
235 E. Gladys Avenue
Hermiston, OR 97838
(541) 567-2882

Mid Columbia Library (Kennewick Branch)
1620 S. Union St.
Kennewick, WA 99336
(509) 586-3156

Pendleton Public Library
502 S.W. Dorion Avenue
Pendleton, OR 97801
(541) 966-0210

Portland State University Library
951 S.W. Hall, Fifth Floor
Portland, OR 97204
(503) 725-4617

You can also call, write or e-mail the Hermiston DEQ office to have an information package sent to you by mail or electronic transmission.

The information package includes a Fact Sheet that describes the proposed changes, provides appropriate background information, and explains the impact and need for the proposed changes.

Interested parties are invited to provide comments on any or all of the proposed changes to the UMCDF HW Permit.

What happens next?

After completion of the public comment period the DEQ will review and consider all oral and written comments received during the comment period. DEQ staff will prepare a report with a recommendation to the EQC on whether to approve the proposed modification. The report will include the DEQ's response to all significant comments received during the public comment period.

The EQC is anticipated to make a final decision on the proposed modification at its regularly scheduled meeting on March 21, 2003 to be held in the Portland, Oregon area. The EQC may decide to modify the HW Permit as proposed or with changes, or may decide against modifying the HW Permit.

Accessibility information

DEQ is committed to accommodating people with disabilities at our hearings. Please notify DEQ of any special physical or language accommodations or if you need information in large print, Braille or another format. To make these arrangements, contact Ann Mayes at (541) 567-8297 ext. 25, cellular (541) 561-6332, or toll free in Oregon at (800) 452-4011.

People with hearing impairments may call DEQ's TTY number, (503) 229-6993.

ATTACHMENT B

Copies of Recent Correspondence Regarding Operation of the Brine Reduction Area

- Letter, dated February 1, 2002, Wayne C. Thomas, DEQ, to UMCDF Permittees "Off-site Shipment of PAS Liquids (Brines) Prior to the Start of Chemical Agent Operations" [DEQ Item No. 02-0165]
- Letter, dated February 8, 2002, Stephanie Hallock, DEQ, to James L. Bacon, PMCD [DEQ Item No. 02-0226]
- Letter, dated March 5, 2002, UMCDF Permittees to Mr. Wayne C. Thomas, DEQ "Off-Site Shipment of Pollution Abatement System (PAS) Wastewater" [DEQ Item No. 02-0324]
- Letter, dated May 7, 2002, Gary I. Burke, CTUIR, to Ms. Melinda Eden, EQC [DEQ Item No. 02-0704]
- Letter, dated August 21, 2002, Melinda S. Eden, EQC, to Gary I. Burke, CTUIR "Response to May 7, 2002 CTUIR Letter Regarding Operation of the UMCDF Brine Reduction Area and Off-Site Shipment of Pollution Abatement System Brines" [DEQ Item No. 02-1380]

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Oregon

John A. Kitzhaber, M.D., Governor

Department of Environmental Quality

Eastern Region

Hermiston Office

256 E Hurlburt

Hermiston, OR 97838

Phone: (541) 567-8297

FAX: (541) 567-4741

TTY: (503) 229-6993

February 1, 2002

Lieutenant Colonel Frederick D. Pellissier
Commander
Umatilla Chemical Depot
Attn.: SCBUL-CO
Hermiston, OR 97838

Mr. Loren D. Sharp
Project Manager
Washington Demilitarization Company
78068 Ordnance Road
Hermiston, OR 97838

Mr. Don E. Barclay
UMCDF Site Project Manager
Project Manager for Chemical Stockpile Disposal
78072 Ordnance Road
Hermiston, OR 97838

Re: Off-site Shipment of PAS Liquids (Brines)
Prior to the Start of Chemical Agent
Operations
Umatilla Chemical Agent Disposal Facility
ORQ 000 009 431
DEQ Item No. 02-0165 (27.05)

Dear LTC Pellissier, Mr. Barclay, and Mr. Sharp:

The Department of Environmental Quality (Department) has reviewed the information discussed with Permittees at the January 30, 2002 meeting concerning Umatilla Chemical Agent Disposal Facility's (UMCDF's) decision to pursue off-site shipment, treatment and disposal of incinerator "pollution abatement system (PAS) liquids" until the start of chemical agent operations planned for February 2003.

The Department acknowledges that the current, existing UMCDF Hazardous Waste (HW) Treatment and Storage Permit (ID No. ORQ 000 009 431) does not specifically prohibit the Permittees from managing these wastes using the described approach. The Department is also unaware at this time of any specific federal Resource Conservation and Recovery Act (RCRA) hazardous waste regulations (40 CFR Parts 260-266, 268, 270-273, 279-282, 148, and 124), or Oregon hazardous waste rules (OAR 340-100 through 340-120) that prohibit this approach.

However, this waste management approach is not preferred, and directly contradicts the implied approach presented by the U.S. Army and its contractors to the Department and Oregon's citizens since the beginning of the UMCDF environmental permitting process. "PAS liquids" have always been consistently referred to as "brines," and slated for treatment in the Brine Reduction

Area (BRA), regardless of whether they are generated during systemization activities, surrogate operations or chemical agent operations. The introduction to Module V of the HW Permit even identifies one of the primary treatment objectives of the BRA as that of reducing the brines and wastewaters (i.e. "liquids") from the PAS by at least 80% by weight. HW Permit Condition V.A.1.i. provides additional reference to planned processing of brines during both surrogate and chemical agent operations.

The inconsistency exhibited by this decision is further reinforced by the following examples:

- The U.S. Army's Revised Final Environmental Impact Statement "*Disposal of Chemical Agents and Munitions Stored at Umatilla Depot Activity, Oregon*" (November 1996) includes language (Section 2.2.3.3) indicating that 1) "The hazardous wastes would consist mainly of ash residue from the furnace systems and dried salts from process and PAS liquids"; 2) "No liquid hazardous process waste would be generated by or shipped from the proposed disposal facility"; and 3) "The only liquid discharge from the facility would be domestic sewage..."
- The March 1996 UMCDF RCRA Part B Hazardous Waste Permit Application (used by the Department to develop the initial UMCDF HW Permit issued in February 1997) contains language (Section D-9) which describes other wastewater streams (e.g. boiler blowdown, water softener regeneration, separator condensate) as "brines" that will be processed in the BRA.
- The current Permit Application includes language in Section D-9 that was proposed by the Permittees in the Class 2 Permit Modification Request UMCDF-99-018-BRA(2) [approved 10/19/99], and which states that both hazardous [waste] and non-hazardous [waste] brines will be generated in three distinct phases (prior to surrogate trial burns, during surrogate trial burns and during chemical agent operations), and that these brines will be processed through the BRA. This same information was presented during the required public information meeting held by the Permittees. These "brines" represent the same "PAS liquids" identified in the Permittees' current planned approach.
- On December 13, 2001 and January 8, 2002, the Department met with UMCDF staff to discuss alternate BRA operational approaches that maintained compliance with the HW Permit and applicable regulations, while accommodating UMCDF's need to process quantities of brine generated during systemization activities and surrogate operations. The Permittees' desire to hold these discussions indicates that within the last month, UMCDF still planned to process and treat all these "PAS liquids" in the BRA.

Finally, the Permittees are reminded that HW Permit Condition II.I.1.ii. requires submittal to the Department of annual waste minimization/pollution prevention certifications (in accordance with 40 CFR §264.73) that proposed treatment, storage or disposal methods are the most practicable ones available to minimize threats to human health and the environment.

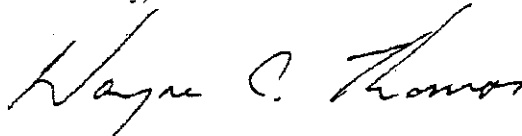
The Department is extremely concerned that this type of change represents a shift in priorities for the U. S. Army and its contractors. It appears that the Permittees place a larger emphasis on

LTC Pellissier, Mr. Barclay and Mr. Sharp
February 1, 2002
DEQ Item No. 02-0165 (27.05)
Page 3

attempting to maintain the current planned operational schedule than on fulfilling commitments made previously to the State of Oregon and its citizens.

If you have any questions concerning this matter, please contact me at (541) 567-8297, ext. 21.

Sincerely,



Wayne C. Thomas
Administrator
Chemical Demilitarization Program

Cf: Environmental Quality Commission
Thomas Beam, DEQ Hermiston
Mark Daugherty, UMCD
Stephanie Hallock, Director-DEQ Portland
Catherine Massimino, USEPA Region X
Dave Nylander, WDC
Sue Oliver, DEQ Hermiston
Wendell Wrzesinski, PMCSO

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Oregon

John A. Kitzhaber, M.D., Governor

Department of Environmental Quality

811 SW Sixth Avenue

Portland, OR 97204-1390

(503) 229-5696

TTY (503) 229-6993

February 8, 2002

02-0226

Mr. James L. Bacon

Program Manager for Chemical Demilitarization (PMCD)

ATTN: SFAE-CD-Z, Building E4585

Corner of Hoadley and Parrish Roads, Edgewood Area

Aberdeen Proving Ground, Maryland 21010-5401

STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY

RECEIVED

FEB 11 2002

Dear Mr. Bacon:

HERMISTON OFFICE

During my twelve years of involvement with the Chemical Demilitarization Program, Army and Department of Defense representatives repeatedly have stated that "safety and environment" are the number one priority for the Umatilla Chemical Agent Disposal Facility (UMCDF). I am, however, concerned that schedule pressures to begin surrogate operations may compromise safety and compliance with the hazardous waste permit.

Recently, Army site representatives requested that DEQ modify the Independent Engineer Facility Construction Certification (FCC) process in order to achieve the planned facility startup date. The independent FCC process was a critical aspect in granting approval of the hazardous waste permit in 1997. An independent certification of the final as-built configuration of UMCDF provides the state with assurance that the thousands of engineering changes made to the UMCDF design have been approved, implemented and documented. Although the Department does not want to unnecessarily delay the start of UMCDF, we cannot modify this permit requirement simply to accommodate the Army's concerns about schedule.

At public and private meetings in the past seven years, the Army has reiterated a commitment to: process liquid brines on-site using the Brine Reduction Area; identify secondary waste treatment technologies; and, to leave no legacy wastes behind. This commitment has provided assurance that the Army is prepared to meet its obligation to protect citizens and the environment, and to comply with permit conditions.

The Brine Reduction Area is not used at the Tooele facility, and the Army apparently does not intend to use it at the facilities in Alabama or Arkansas. Not using the Brine Reduction Area means shipping millions of gallons of liquid wastes off-site for further treatment or disposal. The Army has always assured the citizens of Oregon that all liquid wastes will be treated on-site, and yet just recently UMCDF informed the Department that liquids generated during surrogate testing will, in fact, be shipped to an off-site facility. Despite the Army's past commitments to resolve the issues of treatment and disposal of secondary wastes, both the Department and the Environmental Quality Commission are disappointed that the Army is not meeting the schedule developed in 1999 to resolve the secondary waste issues.

We are very concerned about the potential for "legacy wastes" remaining at the Umatilla Chemical Depot after the chemical weapons have been destroyed. Disposal of secondary waste has not yet been resolved and does not appear to be a priority for the Army. It is difficult to understand how the Army can expect the state to support facility startup with this issue unresolved. Our concern about legacy wastes was clearly communicated to you in a letter dated September 24, 1999 from Carol Whipple, then-Chair of the Environmental Quality Commission.

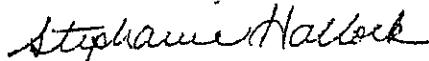
Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting

Mr. James Bacon
February 7, 2002
Page 2 of 2

The primary mission given to the Department and the Environmental Quality Commission by the Governor of the State of Oregon is the maximum protection of human health and the environment. In our public outreach activities DEQ has consistently communicated the message that the Army is also committed to ensuring public safety. It is my hope that we can continue to voice this message to the surrounding communities.

The beginning of surrogate operations at UMCDF will be a significant milestone for the project and an integral step toward the planned start of chemical agent operations in February 2003. Critical issues will continue to emerge that will challenge the Army and the State of Oregon to work together to seek acceptable solutions. I must emphasize that the success of moving the Umatilla project forward has been due in large part to our unwavering commitment to the public and permit processes expected by the citizens of Oregon. We will continue to fulfill that commitment, and we expect to do that in partnership with the Army, not in conflict.

Sincerely,



Stephanie Hallock
Director

cc: Governor John Kitzhaber
Environmental Quality Commission members
Wayne Thomas, Administrator, Chemical Demilitarization Program, DEQ
Don Barclay, UMCDF Site Manager, Program Manager for Chemical Demilitarization
LTC Pellissier, Commander, Umatilla Chemical Depot
Loren Sharp, Site Project Manager, Washington Demilitarization Company



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
PROGRAM MANAGER FOR CHEMICAL DEMILITARIZATION
UMATILLA CHEMICAL AGENT DISPOSAL FACILITY
78072 ORDNANCE ROAD
HERMISTON, OREGON 97838

02-0324

MAR - 5 2002

Project Manager
for Chemical Stockpile Disposal

ENV-02-0034

SUBJECT: Umatilla Chemical Agent Disposal Facility (UMCDF) Hazardous Waste Permit
(ORQ 000 009 431) - Off-Site Shipment of Pollution Abatement System (PAS) Wastewater

Wayne C. Thomas, Program Administrator
Chemical Demilitarization Program
Oregon Department of Environmental Quality
256 East Hurlburt Avenue, Suite 105
Hermiston, Oregon 97838

STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY
MAR 05 2002

Dear Mr. Thomas:

HERMISTON OFFICE

References:

Letter, Department of Environmental Quality (DEQ), DEQ Item No. 02-0165(27.05), dated February 1, 2002, subject: Off-site Shipment of PAS Liquids (Brines) Prior to the Start of Chemical Agent Operations.

The Permittees sincerely appreciate the opportunity to discuss this important matter with you on January 30, 2002. We feel the open discussion led to a mutually agreed upon management approach in regards to the Brine Reduction Area (BRA). In addition, we appreciate the regulatory analysis recognizing our management approach is supported by regulation and the Permit. We are writing this letter in response to the issues identified in the letter referenced above.

We are systemizing and preparing the Brine Reduction Area (BRA) to support brine treatment during agent operations. Processing PAS liquids on site that are generated prior to agent operations would delay agent operations startup and increase the risk associated with continued agent storage. We recognize the option of shipping PAS liquids off-site is not your preferred approach, but for wastes generated prior to the commencement of agent destruction it is a prudent course of action that will avoid what is now projected to be a four-month delay of agent operations startup.

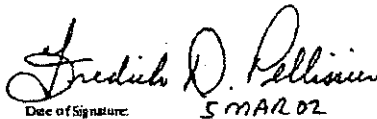
In reference to your concern that we are changing our priorities. Our priority was and remains maximum protection to the public. In this context, we provide maximum protection to the public by ensuring agent destruction operations are our focus and are not delayed by issues presenting little to no public risk.

We will safely and expeditiously destroy the chemical warfare munitions stored at the Umatilla Chemical Depot in an environmentally sound manner. Our top priority is to eliminate the risk of chemical weapons storage to the citizens of Oregon. Our concern regarding the maintenance of an aggressive schedule is evidence we are committed to fulfilling our commitment to the community that wants the chemical weapons stockpile expeditiously destroyed. Our efforts to date reflect our commitment to maintaining schedule along with maintaining excellence in safety and environmental compliance. We share your commitment to move the Umatilla project forward in partnership and look forward to the Department's continued cooperation and commitment to work through the regulatory process.

A copy of this letter is being provided to the members of the Environmental Quality Commission, 811 SW Sixth Avenue, Portland Oregon, 97204; and Ms. Stephanie Hallock, Director, Oregon Department of Environmental Quality, 811 SW Sixth Avenue, Portland Oregon, 97204.

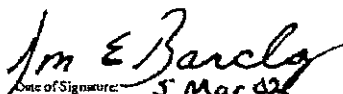
If you have any questions, please call our technical point of contact, Mr. Wendell Wrzesinski, (541) 564-7053.

Sincerely,


Date of Signature: 5 MAR 02

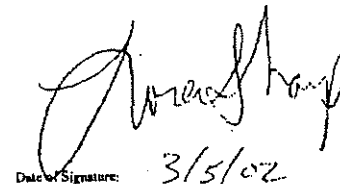
Frederick D. Pellissier
Lieutenant Colonel, USA
Commander

*CERTIFICATION STATEMENT


Date of Signature: 5 MAR 02

Don E. Barclay
UMCDF Site
Project Manager

*CERTIFICATION STATEMENT


Date of Signature: 3/5/02

Loren D. Sharp
Washington Demilitarization Company
Project Manager

*CERTIFICATION STATEMENT

Enclosures

*I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION ACCORDING TO A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting



GENERAL COUNCIL
and
BOARD OF TRUSTEES

CONFEDERATED TRIBES
of the

02-0704

Umatilla Indian Reservation

P.O. Box 638
PENDLETON, OREGON 97801
Area Code 541 Phone 276-3165 FAX 276-3095

7 May 2002

STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY
RECEIVED
MAY 08 2002

Ms. Melinda Eden
Chair, Environmental Quality Commission
c/o Department of Environmental Quality
811 SW 6th Ave.
Portland, OR 97204

HERMISTON OFFICE

Dear Madam Chair;

I am writing to express my grave concern over a recent development at the Umatilla Chemical Agent Disposal Facility (UMCDF). It has come to my attention that the United States Army is now contemplating not operating the brine reduction area (BRA) at the UMCDF. This fact was confirmed by Mr. Wayne Thomas, director of the Department of Environmental Quality (DEQ) Hermiston office, at a 1 May 2002 public meeting in Hermiston, Oregon. It appears that the Army is now pursuing off-site shipment of brine liquids for treatment and disposal. In fact, a representative of the Washington Demilitarization Company stated candidly to one of our staff members after the May 1st public meeting that no operating the BRA was an option since off-site shipment of liquid waste was not explicitly prohibited in the facility's Hazardous Waste Treatment and Storage Permit (HW Permit). Mr. Wayne Thomas has confirmed the fact that the HW Permit does not explicitly prohibit off-site shipment of liquid brine in a letter to the UMCDF Permittees dated 1 February 2002.

Sadly, a policy of no off-site shipment of liquid waste has been verbally stated numerous times to our Board of Trustees (BOT) by both the Army and by the DEQ. In fact, the DEQ has been so strong on this issue that it was our understanding that the permit had enforceable language to ensure this policy was followed. It should be noted that no off-site shipment of liquid waste, along with the Army's commitment to not leaving legacy waste at the site, were two important policies that have allowed the BOT to support the incineration project. The former issue is important to our people since there is a high probability that waste will travel through our

(Continued)

TREATY JUNE 9, 1855 ♦ CAYUSE, UMATILLA AND WALLA WALLA TRIBES

Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting

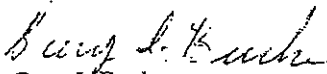
Melinda Eden, EQC Chair
7 May 2002
Page 2

reservation and so represents a risk to our homeland. Clearly the risk of environmental contamination is increased if liquid waste, rather than solid waste, is accidentally spilled. The importance of the later issue arises from our desire to make use of the lands for traditional purposes once the base is closed.

I would remind you that the Confederated Tribes represent a culture where the spoken word is as important as the written word. Our history, our heritage, our way of life is preserved and taught in the spoken word. Hence, it is very disturbing to us when we are misled by the words of others. It raises serious doubts in our minds of the Army's ability to accurately represent their intentions. Does this move by the Army indicate that they will also renege on their agreement to not leave legacy waste at the site? Will the Army not pursue full closure and restoration of the UMCDF site at the end of the demilitarization campaign? These are questions that the BOT and the EQC must now consider as policy makers for our peoples.

In closing, I am requesting a response from your office on what actions the EQC is taking, or intends to take, to ensure the Army holds to their word on not shipping liquid wastes off-site, particularly the liquids from the pollution abatement system.

Sincerely;



Gary I. Burke
Chairman, CTUIR Board of Trustees

Cc:

Armand Minthorn, Member, CTUIR-BOT
Richard Gay, Acting Manager, CTUIR-ESTP
Rod Skeen, Chemical Engineer, CTUIR-ESTP
Wayne Thomas, Oregon DEQ
File

ENVIRONMENTAL

QUALITY

STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY
RECEIVED

AUG 28 2002

August 21, 2002

Gary I. Burke, Chairman
Board of Trustees
Confederated Tribes of the Umatilla Indian Reservation
P.O. Box 638
Pendleton, OR 97801

HERMISTON OFFICE

Re: Response to May 7, 2002 CTUIR Letter Regarding Operation of the UMCDF Brine Reduction Area and Off-Site Shipment of Pollution Abatement System Brines

Dear Chairman Burke:

I would like to thank Armand Minthorn and Dr. Rod Skeen for speaking on behalf of the Board of Trustees during the Environmental Quality Commission meeting on July 26, 2002. We were prompted to schedule the briefing session when we received your letter of May 7, 2002, expressing the concerns of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) related to the operation of the Brine Reduction Area at the Umatilla Chemical Agent Disposal Facility (UMCDF) and off-site shipment of liquid waste for disposal. Your letter requested a response from the Commission "on what actions the EQC is taking, or intends to take, to ensure the Army holds to their word on not shipping liquid waste off-site, particularly the liquids from the pollution abatement system."

First, let me assure you that the Commission understands your frustration and disappointment with the apparent lack of desire by the U.S. Army and its contractors to fulfill previous commitments made to the State of Oregon regarding the operation of the Brine Reduction Area. Throughout the entire life (15+ years) of the UMCDF project, the U.S. Army has consistently conveyed the message that all pollution abatement system (PAS) liquids (i.e. brines) would be processed in the Brine Reduction Area, and that no significant quantities of liquid waste would be shipped to off-site hazardous waste disposal facilities.

At the July 26 briefing session, the Commission heard from representatives of CTUIR, GASP, and the UMCDF Permittees (U.S. Army and its contractor, Washington Demilitarization Company). In addition, Department of Environmental Quality (DEQ) staff briefed the Commission on the existing requirements of the UMCDF Hazardous Waste Permit, and on the history of commitments by, and discussions with, the UMCDF Permittees regarding operation of the Brine Reduction Area and off-site shipments of PAS brines.

The U.S. Army clearly stated that it has no plans to operate the Brine Reduction Area during systemization and testing activities, including the surrogate shakedown and trial burn periods. They claimed that the use of available resources to prepare the Brine Reduction Area for operations during surrogate testing would adversely affect scheduled activities and preparations to begin chemical agent operations. This approach by UMCDF is a significant departure from plans discussed with DEQ staff as recently as



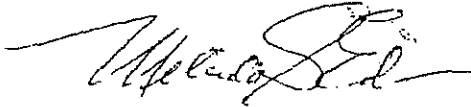
811 SW Sixth Avenue
Portland, OR 97204-1390
(503) 229-5696

early 2002. The Army did indicate that UMCDF intends to operate the Brine Reduction Area during chemical agent operations.

The Environmental Quality Commission believes that a fully functional Brine Reduction Area is vital to the over-all success of the UMCDF in completing its mission of destroying all chemical warfare agent, munitions and secondary waste stored at the Umatilla Chemical Depot. The UMCDF Brine Reduction Area must be fully tested and operational to support the start of chemical agent operations. The Commission expects to take the operational status of the Brine Reduction Area into account when deciding whether or not to authorize the start of UMCDF chemical agent operations, currently scheduled for Summer 2003. As an immediate measure, DEQ is preparing a proposed modification to the UMCDF Hazardous Waste Permit specifically addressing operation of the Brine Reduction Area and off-site shipment of PAS brines. DEQ expects to have this proposed modification available for public comment in September 2002, and present it to the Commission for final decision in December 2002.

The Commission appreciates and shares the substantive environmental and safety concerns raised by CTUIR on this issue, and we welcome a continued dialogue with you and your staff to address any future concerns that you may have regarding the Umatilla Chemical Agent Disposal Facility.

Sincerely,



Melinda S. Eden, Chair
Environmental Quality Commission

Cf: Environmental Quality Commissioners
Stephanie Hallock, DEQ Director
Chris Dearth, Office of the Governor
Wayne C. Thomas, DEQ Hermiston
LTC Frederick D. Pellissier, Commander, Umatilla Chemical Depot
Don E. Barclay, UMCDF Site Project Manager, Project Manager for Chemical
Stockpile Disposal
Ronald W. Garner, Project General Manager, WA Demilitarization Company
Karyn Jones, GASP

ATTACHMENT C

List of UMCDF Permit Modification Requests (PMR) Modifying the Design and Operation of the Brine Reduction Area

- Class 1 PMR UMCDF-98-007-BRA(1R) "Subpart X Engineering Drawings", submitted 6/22/98. Approved 8/4/98.
- Class 1 PMR UMCDF-98-015-BRA(1R) "Secondary Containment for the Subpart X Units in Section D-9, Miscellaneous Units", submitted 9/24/98. Approved 4/5/99.
- Class 2 PMR UMCDF-99-002-BRA(2R) "Brine Surge Tank System (BRA)", submitted 1/27/99. Approved 8/17/99.
- Class 2 PMR UMCDF-99-018-BRA(2) "Brine Reduction Area Subpart X Treatment Unit Performance Test", submitted 5/11/99. Approved 10/19/99.
- Class 2 PMR UMCDF-99-028-BRA(2) "Design of the Brine Reduction Area System", submitted 8/31/99. Approved 12/18/00.
- Class 1 PMR UMCDF-99-035-BRA(1R) "Clarification of the Brine Reduction Area Installation Certification Permit Condition", submitted 9/16/99. Approved 10/29/99.
- Class 2 PMR UMCDF-01-005-BRA(2) "Brine Reduction Area Operating Conditions and Certified Design Changes", submitted 2/27/01. Approved 10/15/01.
- Class 1 PMR UMCDF-01-032-CONS(1R) "Update of RCRA-Only Specification Sections 11510, BRA Drum Dryers, 11522, Brine Reduction Area Pollution Abatement System (BRA PAS), and 11524, BRA Evaporator Package", submitted 1/2/02. Approved 1/25/02.
- Class 1 PMR UMCDF-02-018-BRA(1R) "Brine Reduction Area (BRA), and BRA Pollution Abatement System (BRA PAS) Design Changes", submitted 8/20/02. No DEQ decision yet.
- Temporary Authorization Request (TAR) UMCDF-02-034-BRAT(TA) "Waste Transfer Modification to the Brine Surge Tank", submitted 10/1/02. Approved 10/10/02. Expires 4/9/03.

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ATTACHMENT C

Transcript of EQC Briefing Session
(DEQ Item No. 02-2122).

July 26, 2002

“Operation of Brine Reduction Area at the Umatilla Chemical Agent
Disposal Facility”

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CONDENSED TRANSCRIPT

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY MEETING

Friday, July 26, 2002

R E V I S E D

BE IT REMEMBERED THAT pursuant to the Oregon Rules of Civil Procedure, the Oregon Department of Environmental Quality Meeting was taken before Tamara Ross, Certified Shorthand Reporter in the State of Oregon and Licensed Notary in the State of Oregon, on Friday, July 26, 2002, commencing at 8:52 a.m. at the Oregon Department of Quality Agency: 811 S.W. 6th Avenue, Conference Room 03A, Portland, Oregon.

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<p>1 OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY MEETING</p> <p>2</p> <p>3</p> <p>4</p> <p>5 Friday, July 26, 2002</p> <p>6</p> <p>7</p> <p>8 REVISED</p> <p>9</p> <p>10</p> <p>11 ---</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18 BE IT REMEMBERED THAT pursuant to the Oregon Rules 19 of Civil Procedure, the Oregon Department of 20 Environmental Quality Meeting was taken before Tamara 21 Ross, Certified Shorthand Reporter in the State of Oregon 22 and Licensed Notary in the State of Oregon, on Friday, 23 July 26, 2002, commencing at 8:52 a.m. at the Oregon 24 Department of Quality Agency, 811 S.W. 6th Avenue, 25 Conference Room 03A, Portland, Oregon.</p> <p>Page 1</p>	<p>1 update on these issues. We'll be leaving here 2 and heading back to our offices to meet with 3 the Army to work on these this afternoon.</p> <p>4 Specifically, they're dealing 5 with two separate issues that relate to 6 differential pressures. And one of those items, 7 we're anticipating permit modification this 8 afternoon. And the second item, we're expecting 9 a response to a permit modification that we 10 received on Monday. And we had indicated some 11 deficiencies to the Army and the material they 12 had given to us and have been working at -- and 13 that will come in also this afternoon with the 14 additional information. So those are the two 15 remaining items that need to be resolved before 16 operations begin. So that's where we are.</p> <p>17 A second issue I'd like to 18 mention is that there was recently a chemical 19 exposure at the Tooele (phonetic) facility on 20 July 15th. Two workers were doing some 21 maintenance work and were exposed to GB nerve 22 agents. I mention this because obviously, we 23 are very interested in any accidents that happen 24 at chemical demilitarization facilities. The 25 Department has been fortunate to have the Army</p> <p>Page 3</p>
<p>1 PORTLAND, OREGON; 2 FRIDAY, JULY 26, 2002 3 8:52 A.M. 4 PROCEEDINGS</p> <p>5 CHAIR: Ready? Environmental 6 Quality Commission is back in session. And 7 we're proceeding with Agenda Item H, during which 8 I understand we're to receive briefings from DEQ, 9 The Tribes, the Army, and Washington Demil and 10 GASP. Mr. Thomas?</p> <p>11 MR. THOMAS: Good morning. 12 Madam Chair, members of the Commission, for the 13 record, my name is Wayne Thomas. I'm the 14 administrator of the Umatilla Chemical 15 Demilitarization Program. With me today is Tom 16 Beam my left and Sue Oliver on my right. They 17 will be presenting the materials on behalf of 18 the Department.</p> <p>19 Before we move into the 20 informational item, I'd like to give you a 21 status report on the operations at Umatilla. As 22 of this morning, the facility has not commenced 23 hazardous waste operations. There are two issues 24 that we are actively working with the contractor 25 and the Army on. About an hour ago, we got an</p> <p>Page 2</p>	<p>1 accept our request to be part of that 2 investigation. And last Monday, July 22nd, I 3 went to the Tooele facility; spent a day 4 observing the investigation.</p> <p>5 I'm pleased to report that the 6 Army has an excellent team of very skilled folks 7 working on this. They're doing a very thorough 8 job. And we look forward to continuing our 9 participation and observing the investigation. I 10 won't go into any details of the investigation 11 at this point because they're still developing 12 what happened. But from what I -- I observed 13 last Monday, they're on the right path to 14 identifying the cause of the problem. And there 15 will be direct implications to operations at 16 Umatilla coming out of the investigation.</p> <p>17 CHAIR: Wayne, what's the 18 physical condition of the people who were 19 exposed?</p> <p>20 MR. THOMAS: As of last Monday, 21 the report was that all of the workers are okay. 22 One of the workers had symptoms from GB agent 23 exposure, myosis of the eyes, which is 24 pinpointing of pupils, and a significant drop of 25 greater than 25 in colinesterate level, which is</p> <p>Page 4</p>

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<p>1 a response to nerve agent exposure. 2 I will tell you that the 3 workers who were -- The two workers who were 4 directly involved spent three and-a-half hours in 5 the decon chamber being scrubbed with caustic 6 solution and cold water. They went through quite 7 a hellacious time getting agent off their bodies. 8 So -- And all of that, we hope to see 9 captured fully in the report that will come out 10 in a few weeks. But I'm happy to say that the 11 workers are okay. 12 CHAIR: All right. Thank you. 13 MR. THOMAS: The last item I'd 14 like to report on -- We have a new employee in 15 the program. Ann Mayes, whose here today, is our 16 new Public Information Officer and will be 17 providing information to the Commission. 18 Hopefully, Ann stood up for -- 19 CHAIR: She stood up. 20 MR. THOMAS: So we look forward 21 to having her work with you on the project. 22 That said, Madam Chair, I'll move into the 23 information line of this morning. 24 CHAIR: Thank you. 25 MR. THOMAS: We're here today</p> <p style="text-align: right;">Page 5</p>	<p>1 summary description of the brine reduction area 2 and the purpose it serves within the facility at 3 Umatilla. 4 The primary purpose of the brine 5 reduction area is to collect and process brines 6 that are accumulated from the pollution abatement 7 system from the four incinerators. In this 8 pollution abatement system, the brines are used 9 to cool the exhaust gases. And once they have 10 become too particulate laden -- too dense to be 11 efficiently pumped through the system -- they're 12 jetted over to the brine reduction area for 13 storage and further processing. 14 Once over the brine reduction 15 area, the brines are heated to evaporate off the 16 water, leaving behind the dry salty residue of 17 the particulates from the brines. And then 18 those brines are shipped off site to a hazardous 19 waste disposal facility as hazardous waste. And 20 most of the ones I'm talking about here are on 21 slides three through nine in your packet and 22 includes a number of pictures that I'll reference 23 as well. 24 Briefly, the brine reduction 25 area itself consists of four 40,000 gallon tanks</p> <p style="text-align: right;">Page 7</p>
<p>1 to provide information to the Commission on the 2 operation of the brine reduction area at the 3 Umatilla Chemical Agent Disposal Facility. 4 There's a packet of materials that's been put 5 together that should be before you. It's a 6 series of slides with some letters attached to 7 that and other correspondence. We're here 8 because the -- Actually, the origination of the 9 issue was the result of the correspondence from 10 the Confederated Tribes of the Umatilla Indian 11 Reservation. And in response to their request 12 at the last Commission meeting, I recommended and 13 the Commission agreed to seek information today 14 on what's happening with the brine reduction 15 area. So here we are. With that, I'll turn 16 it over to Tom Beam to kind of walk you through 17 the purpose of the brine reduction area. And 18 subsequently, we'll move into introductions of 19 speakers from the other groups. 20 MR. BEAM: Good morning, Madam 21 Chair. Good morning, members of Commission. 22 For the record, my name is Tom Beam. I'm an 23 environmental engineer for the Department's 24 chemical demilitarization program. I want to 25 spend a few minutes and just briefly go over a</p> <p style="text-align: right;">Page 6</p>	<p>1 that are used to store the brine generated from 2 the pollution abatement system. A note here: 3 The brines are tested in the tanks to determine 4 that they're agent-free before they're processed 5 in the brine reduction area. 6 CHAIR: What if they're not? 7 MR. BEAM: The current -- as I 8 understand it, the Army's current procedures -- 9 if the brine -- the brines in the tanks are not 10 agent-free is to add additional decon solution or 11 caustic to neutralize the agent. In a sense, 12 dilute it down to -- so the concentration below 13 the agent-free level. That is actually an issue 14 that hasn't totally been addressed at the site. 15 But that -- That's the process that they've 16 indicated that they will use. 17 CHAIR: Thanks. 18 MR. BEAM: One -- From the 19 tanks themselves, the brines are pumped over to 20 what we call flash evaporators. And basically 21 all that does is just -- It concentrates the 22 brines. It evaporates off a certain amount of 23 water until the brines reach a density or 24 concentration that is -- that maximizes the 25 efficiencies of the second treatment unit, which</p> <p style="text-align: right;">Page 8</p>

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July 17-18, 2003 EQC Meeting

1 is the drum dryer.
2 In the drum dryer is where the
3 final moisture is removed. And I think I have
4 another slide later on to talk about the drum
5 dryer. But basically, the drum dryer evaporates
6 everything -- the rest of the water off -- and
7 leaves behind the salt residue, which is then
8 collected for disposal.

9 Another piece of equipment in
10 the brine reduction area for after the drum
11 dryers for the gasses themselves is what we call
12 is knockout boxes. It's one last basically wide
13 spot in the pipe with obstructions that allow
14 the gas to hit against it and knock out the
15 particulate before it hits to the pollution
16 abatement system for the brine itself -- for the
17 brine reduction area itself.

18 What you'll see on slides five
19 and six are some pictures of, like, the brine
20 storage tanks that I mentioned; 40,000 gallon
21 tanks; four of them. They all sit inside of a
22 secondary containment system that -- And all of
23 this has been, you know, certified appropriately
24 at this point. Page six is a picture of the
25 flash evaporator. It -- It's hard to visualize

Page 9

1 And then the final step is
2 once, you know, the salts are scraped off of the
3 drum dryers, they're collected, and they're sent
4 off to a processing area where they're packaged
5 or shipped off site for disposal. The exhaust
6 gases themselves are then exhausted out to a
7 solution abatement system for the brine reduction
8 area which consists of bag house and bag filters
9 and monitoring on the stack.

10 CHAIR: And Tom, these pictures
11 are from Umatilla. Right?

12 MR. BEAM: Yes.

13 CHAIR: Okay.

14 MR. BEAM: These are Umatilla
15 pictures, right, Sue?

16 MS. OLIVER: Yes.

17 CHAIR: Just checking.

18 MR. BEAM: No. Yeah. These
19 are actual pictures I think we took during our
20 inspections of these units. And I think that
21 basically covers a brief description, unless
22 there are some questions.

23 CHAIR: Any questions at this
24 point from the Commission?

25 MR. BENNETT: Question.

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1 exactly what it is, but it's basically a bunch
2 of heating tubes. The brine comes in and goes
3 through a number of heating tubes to evaporate
4 all it can until it reaches a proper
5 concentration.

6 Slides seven and eight talk
7 about the drum dryers. I think I mentioned
8 basically how the drum works. It's a little
9 hard to visualize. I think you're -- your pages
10 -- Your page eight may be a little clearer than
11 my little one here. You should see two little
12 circles that have been drawn on the picture that
13 are meant to -- they basically -- If you want
14 to visualize it, it's like two drums laying
15 horizontally. And then they both rotate in on
16 each other. And then the liquid is poured into
17 the area between the two drum dryers, which is a
18 little triangular area above the drums. And
19 then as it -- The steam is injected inside of
20 these drums; heats up the drums. The salt --
21 The liquid dries on the surface. The residue,
22 cakes on the surface of the drum. And as it
23 rolls around to the other side, there's a knife
24 -- a lathe that scrapes the stuff off of the
25 drums.

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1 CHAIR: Commissioner Bennett.
2 MR. BENNETT: If you started
3 with the agent that's 100 percent, whatever was
4 wrong with something that would be released, what
5 percentage are you at when it's in this stage
6 here in the drums?

7 MR. THOMAS: Well, at this
8 point in time, the actual concentrations that
9 would be determined to be agent-free have not
10 yet been resolved. The Army had submitted a
11 permit modification a couple years ago to define
12 those numbers. And when we approved that, we
13 dictated lower levels, which they are now
14 appealing. And we're going through the appeals
15 process to establish what that final
16 concentration will be.

17 CHAIR: Can you answer the
18 question, though, in the range of what the Army
19 has requested, as opposed to what the Department
20 has requested?

21 MR. THOMAS: The Army's values
22 that are by liquid matrix, I believe -- correct
23 me if I'm wrong, Sue -- were 15 parts per
24 billion. Did I get that right?

25 MS. OLIVER: Yes.

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<p>1 MR. THOMAS: Yes.</p> <p>2 MR. BEAM: And the numbers that</p> <p>3 we directed them to use were eight parts per</p> <p>4 billion.</p> <p>5 MR. BENNETT: Beginning with a</p> <p>6 product that would be how many parts per</p> <p>7 billion?</p> <p>8 MR. THOMAS: Starting with pure</p> <p>9 agent.</p> <p>10 MR. BEAM: Starting with pure</p> <p>11 agent. That would be a billion to one parts.</p> <p>12 CHAIR: A billion to one.</p> <p>13 MR. BENNETT: And down to</p> <p>14 prescribed levels of eight, did you say?</p> <p>15 MR. BEAM: Eight is the number</p> <p>16 that we directed, yes.</p> <p>17 MR. BENNETT: Then define</p> <p>18 "brine."</p> <p>19 MR. BEAM: In the pollution</p> <p>20 abatement system, you have the very hot exhaust</p> <p>21 gasses coming off of the incinerators. The</p> <p>22 brine is the -- It's a combination of processed</p> <p>23 water and sodium hydroxide caustic solutions that</p> <p>24 is injected -- or is poured into the pollution</p> <p>25 abatement system to cool the gasses.</p> <p style="text-align: right;">Page 13</p>	<p>1 storage tanks to be processed.</p> <p>2 MR. BENNETT: If you take the</p> <p>3 water from whatever source it's coming from --</p> <p>4 wells or otherwise -- and we look at the brine</p> <p>5 as it's going through, a lot of the material is</p> <p>6 material that would be in that water naturally.</p> <p>7 MS. OLIVER: Water softening.</p> <p>8 MR. THOMAS: Water treatment.</p> <p>9 MR. BEAM: Good point. I</p> <p>10 almost forgot that. The water which is -- I'm</p> <p>11 may get this wrong, but I believe that the water</p> <p>12 that is put into the pollution abatement system</p> <p>13 goes through a water softener system first to</p> <p>14 remove the majority of that mineral content.</p> <p>15 MR. BENNETT: Thank you.</p> <p>16 MS. OLIVER: If I may add</p> <p>17 something -- Sue Oliver with the program. The</p> <p>18 other purpose for the brines and the pollution</p> <p>19 abatement system -- Why you wouldn't just use</p> <p>20 straight up water is you use a caustic to</p> <p>21 neutralize the acid gas; the nitrous oxide and</p> <p>22 sulfur in the airstream from the incinerators.</p> <p>23 MR. BENNETT: Okay.</p> <p>24 CHAIR: Any other questions? I</p> <p>25 was looking at you to continue, but we are in a</p> <p style="text-align: right;">Page 15</p>
<p>1 Probably one primary contributor</p> <p>2 to the amount of brine would be in the quench</p> <p>3 tower, which is the first piece of equipment on</p> <p>4 the pollution abatement system, where you</p> <p>5 basically have a big old long tower, and the gas</p> <p>6 is coming at the bottom, and you're spraying all</p> <p>7 kinds of water from the top. The liquid goes</p> <p>8 down. Air comes up.</p> <p>9 And then all of the -- And then</p> <p>10 each of the various components of the pollution</p> <p>11 abatement system have varying stages where well</p> <p>12 water is sprayed in to get the gasses cooled</p> <p>13 down before they get to damage the equipment at</p> <p>14 a higher temperature.</p> <p>15 And each of the pieces of the</p> <p>16 pollution abatement system -- The water is</p> <p>17 drained off into a low point into a sump. And</p> <p>18 in that process, they have the -- They have</p> <p>19 monitors which measure the density of the brine.</p> <p>20 And when it achieves a certain level -- and I</p> <p>21 believe it's currently set at about 1.08 specific</p> <p>22 gravity -- It's determined that that has too</p> <p>23 much particulate in it for the pumps to safely</p> <p>24 and efficiently continue to pump the brine</p> <p>25 around. And that's when it's jetted over to the</p> <p style="text-align: right;">Page 14</p>	<p>1 question made at this point. Okay. Mr. Thomas?</p> <p>2 MR. THOMAS: Thank you, Madam</p> <p>3 Chair. With that, I'd like to introduce the</p> <p>4 Confederate Tribes of the Umatilla Indian</p> <p>5 Reservation to make a short presentation. Doctor</p> <p>6 Rod Skeen and Armand Minthorn from Board of</p> <p>7 Trustees.</p> <p>8 CHAIR: Thank you.</p> <p>9 CHAIR: Tony, can you hear?</p> <p>10 VICE CHAIR: Yes.</p> <p>11 CHAIR: Sorry. I forgot to</p> <p>12 warn everybody that Commissioner Van Vliet was</p> <p>13 on the phone. So he heard the first part of</p> <p>14 that presentation and will be with us until</p> <p>15 noon. Not that I'm suggesting that the -- that</p> <p>16 this particular agenda item continue until noon.</p> <p>17 Tony, we've been handed a</p> <p>18 presentation from the Tribe entitled "Brine</p> <p>19 Production & Treatment." So --</p> <p>20 VICE CHAIR: Okay.</p> <p>21 MR. REEVE: You'll get your</p> <p>22 copy in the mail.</p> <p>23 VICE CHAIR: Good.</p> <p>24 CHAIR: Gentleman, good morning.</p> <p>25 MR. MINTHORN: Good morning.</p> <p style="text-align: right;">Page 16</p>

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July 17-18, 2003 EQC Meeting

1 My name is Armand Minthorn. I'm a member of
2 the Board of Trustees for the Confederated Tribes
3 of Umatilla. With me, I have Rod Skeen, one of
4 our scientists. I want to first express the
5 Tribe's gratitude to be here today to have our
6 voice heard by this Commission. In the past,
7 the Tribes have been here and made testimony and
8 cited our concerns. The Tribes have certain
9 responsibilities. And the Environmental Quality
10 Commission and its charge -- I believe we both
11 have similar responsibilities.

12 Because of the shared
13 responsibilities, I think it's important that we
14 both continue to maintain a foresight. And in
15 establishing and maintaining a foresight, I think
16 we can continue to operate and continue to have
17 a hope that this environment that we do live in
18 is going to be in some way inherited by future
19 -- future generations to be clean.

20 Today, I wanted to read into
21 the record the Tribe's letter followed by some
22 comments. But today, I want to express on
23 behalf of the Chairman of the Tribe, Gary Burke
24 (phonetic), his appreciation and future
25 expectations of the Commission and the Tribe and

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1 letter to the UMCDF permittees dated February 1,
2 2002. Sadly, policy of no off-site shipment of
3 liquid waste has been verbally stated numerous
4 times to our Board of Trustees by both the Army
5 and the DEQ. In fact, DEQ has been so strong
6 on this issue that it was our understanding that
7 permit had enforceable language to ensure this
8 policy was followed."

9 "It should be noted that no
10 off-site shipment of liquid waste, along with the
11 Army's commitment to not leaving legacy waste at
12 the site were two important policies that have
13 allowed the Board of Trustees to support the
14 incineration project. The former issue is
15 important to our people since there is a high
16 probability that waste will travel through our
17 reservation and so represents a risk to our
18 homeland. Clearly, the risk of environmental
19 contamination is increased if liquid waste rather
20 than solid waste is accidentally spilled. The
21 importance of the latter issue raises -- arises
22 from our desire to make use of the land for
23 traditional purposes once the base is closed."

24 "I would remind you that the
25 Confederated Tribes represent a culture where the

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1 how we partner to work in a common realm and
2 goal.

3 So today, for the record, "Dear
4 Madam Chair, I am writing to express my grave
5 concern over a recent development at the Umatilla
6 Chemical Agent Disposal Facility. It has come
7 to my attention that the United States Army is
8 now contemplating not operating the brine
9 reduction area at UMCDF. This fact was
10 confirmed by Mr. Wayne Thomas, Director of the
11 Department of Environmental Quality Hermiston
12 office at a May 1, 2002 public hearing in
13 Hermiston, Oregon. It appears that the Army is
14 now pursuing off-site shipment of brine liquids
15 for treatment and disposal. In fact, a
16 representative of the Washington demilitarization
17 company stated candidly to one of our staff
18 members after the May 1st public hearing that
19 not operating the BRA was an option since
20 off-site shipment of liquid waste was not
21 explicitly prohibited in the Facility's hazardous
22 waste treatment and storage permit."

23 "Mr. Wayne Thomas has confirmed
24 the fact that the HW permit does not explicitly
25 prohibit off-site shipment of liquid brine in a

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1 spoken word is as important as the written word.
2 Our history, our heritage, our way of life is
3 preserved and taught in the spoken word. Hence,
4 it is very disturbing to us when we are mislead
5 by the words of others. It raises series doubts
6 in our mind of the Army's ability to accurately
7 represent their intentions. Does this move by the
8 Army indicate that they will also renege on
9 their agreement to not leave legacy waste at the
10 site? Will the Army not pursue full disclosure
11 and restoration of the UMCDF site at the end of
12 the demilitarization campaign? These are
13 questions that the Board of Trustees and the EQC
14 must now consider as policy makers for our
15 peoples."

16 "In closing, I'm requesting a
17 response from your office on what actions the
18 EQC is taking or intends to take to ensure that
19 the Army holds to their word on not shipping
20 liquid waste off-site; particularly the liquids
21 from the pollution abatement system. Sincerely,
22 Gary Burke, Chairman, Board of Trustees."

23 So in closing, Madam Chair, this
24 creates an awkward situation. Because we have
25 an entity saying one thing and doing another.

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1 This creates only uncertainties. This only
2 creates impressions. We do not have any
3 definite facts. We have heard words from the
4 Army that they will not ship liquid waste off
5 site. The Tribes in the past have stressed
6 their deep concern about our treaty resources and
7 the trust responsibility that the Army has to
8 the Tribes. And today, as we're making
9 testimony, we're doing it as a sovereign nation.
10 And we also express and reiterate the concern we
11 have before with prior testimony. But today,
12 our words and the Chairman's letter here -- We
13 are again reiterating and restating. And the
14 Tribes are now very seriously considering
15 opposing off-site shipment of brine.

16 There has been no definite
17 indications from the Army on how this would be
18 disposed of. If these are going to be shipped
19 off site, then it's going to put my people, my
20 resources at risk. But because of the
21 uncertainties of the Department of Defense, this
22 creates a very awkward position. So the Tribes
23 today are stating for the record that we are
24 very seriously considering opposing. So these
25 are our concerns, Madam Chair and Commission.

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1 rates that are laid out in the RCRA permit.
2 And the third is can the current brine
3 reduction, or BRA, handle the anticipated brine
4 that's being produced? Is the design capable,
5 theoretically, of handling it? And so those are
6 the three issues.

7 Turning to slide three, how
8 toxic is the liquid brine? This was the most
9 difficult of the three questions to really
10 address in the amount of time that we had to
11 prepare for this. What I tried to do was
12 number one, look at this material compared to,
13 say, the drinking water standard. So this would
14 be -- If I were to look at this slide -- and a
15 lot of numbers here. I've tried to highlight
16 the important ones in red and orange.
17 Basically, listed in that first column are the
18 -- the metals that -- the toxic metals. Most
19 of these that will be present in the brine.
20 I've looked at the maximum that have been
21 measured at the JACADS Toxic Facility. That's
22 the second column. I took those numbers and
23 computed per 7,000 gallon tanker truck that might
24 be driving down the freeway how much of each
25 metal, if they were to -- to concentrate it,

Page 23

1 And now I want to turn it over briefly to Rod
2 Skeen. Thank you.
3 CHAIR: Thank you, Mr. Minthorn.
4 Mr. Skeen?
5 MR. SKEEN: I'm Rod Skeen. I'm
6 a staff member with the Tribes. I put 15
7 slides before you, and I have five minutes to go
8 through it. So two 20 ounces copies and a
9 double latte, and we'll get through this. What
10 I really want to do today is -- I'm not going
11 to go over all these slides. A lot of them
12 are background information for your edification.
13 I'll give you the bottom line.

14 What I tried to do with this is
15 to generate some information to allow -- Well,
16 just what the decision that sits before us in
17 context, I believe. The question -- three
18 questions on slide two that I tried to address
19 is number one: How toxic is this liquids brine
20 compared to other things that are being shipped?
21 How much brine is going to be generated per day
22 and potentially can be shipped? And I tried to
23 break that down on the emission campaign.
24 Again, these are all projections based on the
25 designs and the projected munitions processing

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1 would actually be in that truck. That's the
2 next column. So things that are greater than a
3 pound, I've highlighted on bold. So like
4 aluminum: There's 3.9 pounds potentially at the
5 highest concentration that's been measured.

6 Then looking at the aqueous
7 concentration though that's represented in that
8 first column, how does that compare to the
9 drinking water standard? Well, clearly the
10 material is -- is going to be above the drinking
11 water standard. So I've listed in the third
12 column the drinking water standard. In the --
13 the last two columns, what I've done then is
14 looked at if this material -- a whole tanker
15 truck were to drop into, say, the Umatilla
16 River, which is fairly close to the site, taking
17 the daily average high and low flows, which --
18 If you look at the next level, you see it
19 fluctuates a lot. But basically, looking at
20 those -- the highs and lows -- I've tried to
21 say if the whole truckload were to drop into the
22 river, would that generate a concentration above
23 a drinking water standard? The answer is at
24 high flows, with the exception of two things
25 that are in orange, no, it would not. At a

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1 low flow, yes, a lot of these would be. Okay?
2 So that -- that again would just sort of set
3 the -- set the level of how much material is
4 actually represented in this brine of these toxic
5 metals.

6 Now, you need to understand that
7 a lot of these metals are highly cumulative. So
8 once they enter a water system, they stay and
9 they accumulate. These are a lot of the things
10 that -- I don't know if you've seen the recent
11 fish tissue study that's been done, and looking
12 at materials that are accumulating in fish within
13 the Columbia River. These are a lot of same
14 materials; so thereby, cumulative.

15 The next -- Or skip over to
16 slide five. The other thing I tried to do was
17 then say, okay. But let's look at what's
18 actually being emitted from the facility.
19 There's a permitted allowance for metals going up
20 the stack. So if I assume that things are
21 being emitted at that allowable levels (sic), how
22 many -- Then what's the comparison between the
23 amount that's being produced in the brine per
24 day and the amount being produced in the air per
25 day.

Page 25

1 because there's different processing rates. And
2 again, we're going off the RCRA design, and
3 there's some variations and densities and all
4 kinds of things. But just trying to get a
5 maximum/minimum level. Essentially, what it
6 boiled down to are the two things that are shown
7 on your slide in yellow. And that is at
8 maximum requirements, which is the mustard agent
9 ton container processing, which generates up to
10 2,000 pounds of brine per hour theoretically,
11 there's -- That would translate to somewhere
12 between 20 and 25 tanker trucks per day. And
13 then there's a minimum amount under the M55
14 rockets with VX in them that's two tankers per
15 day. Now, yesterday, I got numbers for TOCDF.
16 And they're shipping off, over the last month, I
17 believe it was, a couple tanker trucks a day.
18 So this kind of lays in again. That was rocket
19 processing, I believe.

20 So in comparison, I didn't get
21 numbers on truck traffic. But we're able to get
22 numbers on the amount of train carloads of
23 hazardous material that's shipped daily through
24 Umatilla County. It works out to be 50 train
25 cars per day. Trains are -- cars are much

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1 And so on slide five, the last
2 two columns, if you look at it, that's pounds
3 per day being produced in a brine -- And this
4 is a worst case. This is the highest flow rate
5 that you'll get through the munitions process.
6 And again, theoretically based on the regular
7 design. And how much will come out in the air.
8 And you'll notice that if the plan is emitting
9 just at its permit limits, that with the
10 exception of the two things that are in red,
11 more is being generated in the gas stream than
12 in the -- the water. So yeah. That
13 indicates -- so those two are an indication of
14 -- Anyway, it's an indication that more material
15 is going to be coming out in -- and could
16 potentially be coming out in the airstream --
17 not saying it will -- but could potentially be
18 coming out in the airstream than's actually being
19 generated in the brine. Okay? So it kind of
20 sets it in context of what could be happening.

21 Again, they're not going to be
22 emitting their emission limit, I don't think.
23 But that is what happens. So the next question
24 is how much brine is going to be generated per
25 day? This was a difficult question to address

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1 bigger than trucks. At the maximum amount of
2 shipment, say it's 20 trucks per day. You're
3 below the hazardous amount of material that's
4 already being shipped through the county. But
5 it's still a substantial amount potentially going
6 up the freeway.

7 So -- And then the last
8 question that I wanted to address is can the
9 current BRA handle the anticipated brine
10 production? I don't want to walk you through
11 all the numbers and bore you to death. But
12 basically, I tried to from the design documents
13 estimate the capacity of the brine reduction area
14 if it's running 24/7 and estimate the brine
15 production rates per munition pipe.

16 Now, the next slide's going to
17 have a lot of numbers on the table. And I'll
18 try to avoid blurring your eyes on those. But
19 if you skip over slide eight, which is already
20 covered -- That is what's in the brine reduction
21 area. What it's made of. Slide nine shows
22 essentially how I evaluated design capacity.
23 Very simply, I just looked at the evaporators
24 and drum dryers, computed how much water could
25 be removed from each evaporator, each drum dryer,

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1 how much salt products could be produced, and
2 that -- Then summing those things gives you how
3 much feet it can process; so pretty simple
4 analysis.

5 Slide ten: The number that's
6 important at the bottom. I break it down by
7 drum dryer; by evaporator. But what's important
8 at the bottom is the BRA capacity is about
9 26,000 pounds per hour. It doesn't mean a lot
10 to you, but remember that number: 26,000.
11 Because we'll compare it to a few things.

12 Slide 11, we can skip over.
13 Just realizing at the bottom -- I did a
14 comparison using the same analysis with JACADS.
15 Basically, what slide 11 tells us is my rough
16 analysis comes up with numbers that are
17 reasonable. So we can -- It's kind of a
18 verification of the approach I took.

19 Slide 12 was then able to look
20 at -- Okay. So now I know how much can the BRA
21 handle; about 26,000 pounds per hour. What
22 about brine production rates? And again,
23 different munitions have different production
24 rates. So slide 12 listed my assumptions. But
25 essentially, I took the desired munitions

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1 So if you run down that column
2 of numbers, you see that the BRA can handle,
3 theoretically -- is designed to handle all the
4 brine that's being produced. This includes the
5 water that's being uniquely generated at our
6 facility because of the pollution filter system,
7 which is not represented at any of the other
8 facilities that are being built now. That's an
9 important point.

10 With the exception now of the
11 two items that are in red -- have a red
12 background -- the 750 pound bombs and the
13 mustard containing ton containers will produce
14 brine at a capacity faster than can be processed
15 in the BRA if they operate at 100 percent of
16 their intended munitions processing capacity.

17 CHAIR: That's what I was just
18 going to ask you. If the feed rate or the
19 production process is -- is slowed, would that
20 change these numbers?

21 MR. SKEEN: Oh, yes. Yes. If
22 it's slowed -- If you cut it in half, this
23 number's cut in half. Again, this is all linear
24 scaling. And it's a little bit of an
25 oversimplification. Please understand.

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1 processing rate, broke the munitions down into
2 various components, fed those to the furnaces,
3 operated the furnaces at whatever capacities that
4 that represents. So if I was only operating the
5 -- If I only needed 35 percent, say, on the DFS
6 -- because that was what the feed rate was being
7 generated -- then I'd say that only 35 percent
8 of the total brine that could be produced if the
9 DFS was being produced with the exception there's
10 a minimum amount of brine produced by the
11 furnace running idle. And I set that at the
12 minimum. So if it dropped below that minimum
13 idle, I just said the system was operating at
14 minimum idle.

15 Having said all that, the next
16 slide, 13, has a lot of numbers on it. Look
17 at the last column. That's the important
18 column. The last column shows the percentage of
19 the BRA capacity -- about 26,000 pounds per hour
20 -- that will be used, theoretically, for each of
21 these munitions being processed. So for example,
22 M55 rockets with GB at the top requires only 29
23 percent of the BRA capacity. So it only
24 produces 7,713 pounds per hour. That's 29
25 percent of that 26,000.

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1 CHAIR: I understand.

2 MR. SKEEN: Even operations
3 aren't necessarily linear in their function.
4 But it's a good way to get a handle around it.
5 So then the next issue comes up -- One of the
6 things that the facility wants to do though, and
7 is right in doing, is processing secondary waste
8 during munitions campaign; maximizing thier
9 furnace time. Most of the secondary waste
10 that's going to be provided by volume will go
11 through the metal parts furnace.

12 So the next slide, slide 14,
13 was my attempt at capturing that. What I did
14 here was say, "Okay. Let's assume that the metal
15 parts furnace is running 100 percent capacity all
16 the time -- 24/7 -- all the time for every
17 munition campaign." That's going to have a
18 certain amount of brine production associated
19 with it. And if you'll notice the fourth
20 column, labeled "MPF brine production", that
21 number is set at 10,675. That's the maximum
22 brine production and pounds per hour that I
23 computed from the design; the ripper design. So
24 I just left that number in the system. So
25 again, this assumes that the MPF is operating at

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1 100 percent capacity. Then use that and
2 computed that column, "percent of capacity."
3 Let's say if I was doing that, now am I going
4 to exceed my BRA capacity? You'll notice the
5 numbers are much closer now to 100 percent, but
6 still -- They're still below 100 percent with
7 the exception of the 750 pound bombs and ton
8 containers. So the story doesn't change. But
9 substantially more of the BRA capacity would be
10 used in those cases.

11 The important thing to realize
12 in this analysis is this is the BRA operating
13 24/7 -- 100 percentile -- and the incinerators
14 operating 24/7; no down time associated with it.
15 So again, it's an oversimplification, but I
16 didn't have good data to compute down time.

17 And so -- So what are the
18 conclusions from all of this? Well, three
19 questions I asked. The first one is slide 15.
20 How toxic is the liquid brine? Well, it is
21 above drinking water standards. It contains
22 metals in it that bioaccumulate; can cause liver
23 problems. And some of them have neurological
24 damage; can cause neurological damage. However,
25 we should note that there is for the most part

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1 all of the brine over what whatever time it took
2 to handle it. The issue is storage then?
3 MR. SKEEN: The issue is
4 storage?

5 MR. BENNETT: It would be
6 storage.

7 MR. SKEEN: Why would it be
8 storage?

9 MR. BENNETT: Well, because
10 you'd accumulate on your way to eventually
11 handling it.

12 MR. SKEEN: That would -- that
13 is true if the brine reduction area could not
14 process the brine at the rate at which -- at
15 which it's being generated, which, as I've
16 calculated, it seems that it ought to be able
17 to.

18 MR. BENNETT: I'm just looking
19 at the system.

20 MR. SKEEN: Right.

21 MR. BENNETT: And assuming it's
22 going to be processed there --

23 MR. SKEEN: Uh-huh.

24 MR. BENNETT: The argument could
25 be what they need is an additional facility.

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1 less metals in the brine than is permitted at
2 the maximum air emissions from the plant on
3 pound per day basis, and it is less hazardous
4 than any of the materials currently being shipped
5 through Umatilla County.

6 How much brine will be generated
7 at the UMCDF? Well, my estimate is somewhere
8 between two and a maximum of 25 tanker trucks
9 per day if operating 24/7 at their projected
10 munitions processing rates. And all -- That is
11 all material being shipped off site; BRA
12 operating none. And the next thing is can the
13 current brine reduction area handle the
14 anticipated brine production? Well, based on the
15 RCRA design, it does appear that it can. The
16 current BRA ought to be able to handle all the
17 brines, provided the system operates as designed.
18 And that was the information that -- that I had
19 prepared and that I wanted to present into the
20 record to help make the decision.

21 CHAIR: Thank you very much.
22 Questions or comments from the Commission?
23 Commissioner Bennett?

24 MR. BENNETT: Based on this,
25 and if time wasn't the issue, you could handle

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1 MR. SKEEN: Uh-huh. To
2 increase processing rates. Yeah.

3 MR. BENNETT: To decrease
4 processing rates.

5 MS. HALLOCK: Added storage.

6 MR. THOMAS: Added storage
7 facility?

8 MR. SKEEN: Yeah. Okay. I
9 understand.

10 MR. BENNETT: That's what I
11 said.

12 MR. SKEEN: I understand where
13 you're going with that.

14 MR. BENNETT: Thank you.

15 CHAIR: Commissioner Reeve? Oh.
16 I misread you. Other questions or comments?
17 Thank you very much. And we'll make sure that
18 Commissioner Van Vliet gets copies of these
19 presentations as well. We appreciate your
20 coming.

21 MR. THOMAS: Next, we have Joe
22 Keating speaking on behalf of GASP (phonetic) and
23 Oregon Wildlife Federation.

24 MR. KEATING: Good morning.
25 I'm Joe Keating. I'm affiliated with Oregon

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1 Wildlife Federation. And Karen Jones has a -- a
2 family emergency -- medical family emergency, or
3 she would be here making this presentation. And
4 she asked me to make this presentation on her
5 behalf.

6 Speaking on behalf of GASP,
7 Oregon Wildlife Federation, Karen Jones, and
8 others, we agree with the Umatilla's concern
9 about the Army's plan to eliminate the brine
10 reduction area and the transport of liquid waste.
11 The malfunctions in the brine reduction --
12 reduction area are one of the issues you failed
13 to address in our original comments during the
14 permitting process and during our request for
15 revocation.

16 We sought to address all our
17 concerns in this form. And finding none, we now
18 are seeking relief through our collective court
19 actions to stop this dangerous State-sanctioned
20 plan. We have, in fact, warned you -- EQC and
21 DEQ numerous -- numerous communications that the
22 Army never intended to construct and operate
23 the incinerators and their related systems as
24 proposed and permitted in February 1997.

25 The dunnage incinerator and the

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1 the art pollution abatement systems which will
2 undergo extensive testing before operations
3 commence", end of quote. We can only hope that
4 you now see this is simply not true.

5 Answer these questions: Is
6 off-site shipment now best available technology?
7 Is neutralization for mustard agents best
8 available technology? Are carbon filters the
9 best available -- best available controlled
10 technology? The bottom line is this: What you
11 permitted in 1997 significantly differs from what
12 was built, from how it will operate, and
13 ultimately from what Oregon is left with after
14 the Army abandons the bunkers.

15 There is no excuse for the
16 Army's effort to mislead the public about
17 functions of major components and systems in the
18 Umatilla facility. What's shameful, however, is
19 the state of Oregon's complacency about these
20 actions. If the DEQ and EQC do not reassess
21 the Umatilla facility with all changes finally --
22 finally laid out on the table, then the public
23 process for issuing the permit and the best
24 available technology determinations will have been
25 a complete sham.

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1 brine reduction area are perfect examples. Both
2 of these systems were central to resolving the
3 secondary waste problems at Umatilla, which would
4 help Oregon avoid the Hanford syndrome, where
5 liquid waste remained homeless for generations,
6 where the threat continues despite ongoing
7 promises.

8 The army has known about
9 dunnage, incinerator, and brine reduction area
10 problems since their discovery during testing
11 operations at the Johnston atoll and the Tooele
12 Utah incinerators. Yet they assured us that
13 Umatilla burners are third or fourth generation
14 and integrated state-of-the-art lessons learned
15 facilities that would not be -- not be a
16 dangerous neighbor. This is simply not true.
17 Hundreds of major modifications have been made to
18 the facility, including those where the installed
19 modifications don't match the drawings in the
20 files.

21 Based on Army assurances and
22 staff recommendations, you found incineration as
23 a best available technology. This determination,
24 you said, is because, quote, "The proposed
25 facility uses engineering controls and state of

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1 Allowing the Army to so
2 manipulate the process and substantially
3 recreate the facility without repermitting and
4 without a best available technology analysis is a
5 violation of both Federal and State law.
6 Furthermore, it is an outrage for those in a
7 leadership position to continue to cajole us into
8 believing in a magic rainbow called incineration.
9 The public's right to review and have hearings,
10 including contested case hearings, on the real
11 Umatilla facility must not be cavalierly tossed
12 aside.

13 CHAIR: Hold on a second, Mr.
14 Keating. We lost Commissioner Van Vliet. And
15 reconnecting with him is a bit --

16 MR. KEATING: We can't have
17 that.

18 CHAIR: Can you hear us?

19 VICE CHAIR: Yes, I can.

20 MS. MALARKEY: Can you go back
21 a paragraph?

22 MR. KEATING: I sure can. I
23 can start over.

24 CHAIR: Mr. Keating from GASP
25 and Oregon Wildlife Federation is making his

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1 presentation. He's going to go back about a
2 paragraph to catch you up.
3 VICE CHAIR: Okay.
4 MR. KEATING: If the DEQ and
5 EQC do not reassess the Umatilla facility with
6 all changes finally laid out on the table, then
7 the public process for issuing the permit and
8 the best available technology determination will
9 have been a complete sham. Allowing the Army to
10 so manipulate the process and substantially
11 recreate the facility without repermitting and
12 without a -- a new best available technology
13 analysis is a violation of both Federal and
14 State law. Furthermore, it is an outrage for
15 those in a leadership position to continue to
16 cajole us into believing in a magic rainbow
17 called incineration. The public's right to
18 review and have hearings, including a contest
19 case hearing on the real Umatilla facility must
20 not be cavalierly tossed aside. Would you like
21 me to repeat that one? No.
22 CHAIR: We heard it both times.
23 MR. KEATING: Okay. Good.
24 When thinking of the manipulations perpetrated by
25 the Army and condoned by the DEQ, I cannot help

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1 the Army, Mr. Bob Nelson, Don Barclay, and Dave
2 Nylander with Washington Demil Company.
3 CHAIR: Good morning.
4 MR. BARKLEY: Morning. For the
5 record, my name is Don Barclay. I'm the
6 Umatilla disposal site Project Manager. And with
7 me is Mr. Dave Nylander.
8 MR. NYLANDER: Washington Demil
9 Company (phonetic). I regret that -- Ron
10 Garner, the Project Manager who intended to be
11 here today, would like to have been. But he's
12 actively involved in doing the checklist leading
13 up to the final stages of preparation for
14 shakedown.
15 CHAIR: Thank you.
16 MR. BARKLEY: And Mr. Bob
17 Nelson.
18 MR. NELSON: I'm here for
19 Colonel Pellissier. He's at a Commander's
20 conference back east.
21 MR. BARKLEY: I appreciate the
22 opportunity to visit with you again. It's
23 always an Honor for me to be here and be able
24 to talk about -- about my project. I have a
25 -- just a few short slides on page two.

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1 but think of the television program What's My
2 Line? Will the real Umatilla facility please
3 stand up? We ask that you reopen the permit,
4 along with the best available technology
5 analysis, and allow the public to see and
6 comment for the first time on the real Umatilla
7 facility.
8 In closing, we appreciate the
9 invitation to present testimony. And we will
10 only hope that this courtesy will continue when
11 we bring our concerns to your attention. Thank
12 you.
13 CHAIR: Thank you, Mr. Keating.
14 Questions or comments from the Commission? Okay.
15 Thank you very much.
16 MR. KEATING: Thank you.
17 CHAIR: May I ask -- Do you
18 intend to testify also at 11:30 during the
19 public forum? Or was this your --
20 MR. KEATING: This is my
21 presentation.
22 CHAIR: All right. Thank you
23 very much.
24 MR. THOMAS: Thank you, Joe.
25 At this time, Madam Chair, representatives from

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1 Purpose: I do want to provide you just a brief
2 update on where we stand with the project and,
3 as you requested, discuss the brine reduction
4 area and water management. And -- and of equal
5 importance to me is -- is the solution to make
6 sure I think the commission and the citizens of
7 this state, elected officials, and all those who
8 have played a hand at -- at bringing the project
9 to the point that it is today.
10 Page three from the schedule
11 management perspective, these -- These are kind
12 of three of the areas that I -- Okay. Is that
13 better? Thanks. My focal point's primarily
14 from the schedule management perspective. As Mr.
15 Thomas indicated earlier, we're at a very
16 monumental point in the project.
17 Ron Garner, the WC Project
18 Manager, is staying behind today to try to bring
19 the facility to completion so that we can start
20 the surrogate testing. As -- as Wayne said, we
21 have a couple of administrative issues still
22 remaining. But the people are ready. The
23 process is ready. The training has been
24 completed. Our procedures are in place. We
25 conducted a final management walk-through

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1 yesterday afternoon to -- to ensure that -- that
2 everything was in place. And we are -- We are
3 that close. We're not picking a day yet, but
4 we're within days of selecting a date.

5 I've put together a call-down
6 list, Madam Chair, so that prior to the
7 beginning of the surrogate shakedown process, I
8 will be calling the key Oregon contacts and
9 notifying them that it's getting ready to start.
10 So I'm very proud of this moment.

11 Safety: Given where we are,
12 we're starting the testing process. We're well
13 on our way to destroying the stockpile. And
14 that's a place where we want to be. And we
15 take that serious. That's my priority, is to
16 eliminate the risk to the public.

17 Environmental stewardship: Very
18 pleased to be where we are today. We -- Last
19 time I was here, we were talking about start-up
20 permit modification requests. Those actions that
21 went into that modification request. The
22 permittees have completed. The State has issued
23 a start-up letter; a very monumental day. The
24 Governor issued a CSEPP letter and other
25 contributions from the public.

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1 since construction began. And I've noted as
2 I've talked with members of the community that
3 that's been a misunderstood concept. There were
4 many that thought, for whatever reason, that no
5 hazardous waste left that facility. That is not
6 true. It has left the facility since the
7 beginning of construction; most if it solid, but
8 some -- Much of it liquids as well. And those
9 are shipped off site in accordance with the
10 environmental regulations in accordance with the
11 permit. And they do go to permitted treatment
12 storage and disposal facilities. So I just
13 wanted to make sure that I clarified that.

14 And we basically have two types
15 of waste: Agent-contaminated waste, and that
16 that's not agent-contaminated. I refer to it as
17 "not agent-contaminated." You may hear
18 agent-free terminology used for that as well.
19 But the agent-contaminated waste is processed
20 through our four incineration systems. And only
21 the residue from that process leaves the
22 facility.

23 The waste water that we're
24 referring to past brine -- I call it waste
25 water. It's past brine. I don't want to get

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1 Environmental stewardship as well
2 -- We are effectively managing hazardous waste,
3 as we're going to talk about one element on the
4 next chart. Our secondary waste permitting
5 commitments that we have made are -- are in
6 place and progressing. We're coming upon the
7 one September charcoal technology commitment. We
8 realize that, and we will make that date as
9 well. And we do have the contracts in place
10 for hazardous waste management.

11 And public acceptance. One of
12 the key issues in managing this project is
13 managing expectations. I believe that's part of
14 why we're here discussing this today. Continue
15 to go after that, learning of some of the
16 concerns within the public about water
17 management. I've been meeting with and met with
18 the CTUIR Moral County -- County as well to
19 discuss this. But the basic message to me
20 remains to -- from the public to get rid of it.

21 On page four, I just wanted to
22 step through this as a reminder. Down in the
23 cloud on the bottom, hazardous waste is currently
24 being managed on site and off site. Hazardous
25 waste has been shipped off site from the project

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1 tripped up on words. It's brine and salt water
2 with metals contents in it. That material is
3 used in our -- in our incineration gas scrubbing
4 system to remove chlorine; to cool the stack
5 gasses. And we do use sodium hydroxide water
6 mixture in that liquid flow stream to draw out
7 the chloride. And that -- The sodium in the
8 sodium hydroxide is mixed with the chlorine, and
9 that produces salt. So that's why it's called
10 brine.

11 That brine currently is -- is,
12 as you see, coming out of the agent-contaminated
13 waste. As Wayne said earlier, or Sue, it must
14 be agent-free or non agent-contaminated before it
15 can go to the brine reduction area. And once
16 straight through the brine reduction area, it
17 would leave the facility as a salt. But again,
18 hazardous waste has been managed at the facility
19 since the beginning of construction, and it has
20 left the facility since the beginning of
21 construction; both in liquid state and solid
22 state.

23 CHAIR: What kind of liquids
24 have been shipped off site?

25 MR. BARKLEY: Solvents,

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1 generally; contaminated fuel oils, hydraulic
2 fluids, calcium hydroxide, solvent cleaners,
3 chloroform. Various materials we use in the
4 process. Unused paint, I believe, is one
5 category as well.
6 CHAIR: That goes out in 55
7 gallon drums, doesn't it?
8 MR. NYLANDER: Dave Nylander
9 with Washington. It goes out in a variety
10 forms. It could go out in drums. It could go
11 off in boxes. It's containerized for DOE
12 regulations for shipment with disposal at
13 regulated landfills.
14 MS. MALARKEY: But it's not non
15 agent-contaminated. I mean, it is --
16 MR. BARKLEY: It has not been
17 contaminated with agent. But it is outside of
18 that ellipse.
19 MS. MALARKEY: So if I were a
20 layman -- I guess I am -- I did -- If I didn't
21 know what hazardous waste was, I would probably
22 assume it was agent-contaminated.
23 MR. BARKLEY: Excellent point.
24 Let's spend just a minute for that. For the
25 material that is not -- has not been

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1 MR. BARKLEY: I'm sorry.
2 MS. MALARKEY: I'm not sure
3 everyone understands that distinction.
4 MR. BARKLEY: Make sure if I
5 draw everyone's perspective back.
6 MR. NYLANDER: If I could, I'd
7 like to clarify on the agent context of this;
8 Dave Nylander with Washington demil. The
9 agent-contaminated material is a hazardous waste.
10 It's all a hazardous waste. It's just the
11 characteristics that are in it defines how you
12 manage it. And agent-contaminated is no
13 different than mercury-contaminated or anything
14 else. It's the characteristic that makes it a
15 hazardous waste.
16 MS. MALARKEY: Thanks.
17 MR. BARKLEY: The material
18 leaving this circle -- It's actually an oval
19 defined as agent-contaminated waste. Again as we
20 stated earlier, it must be -- meet the
21 agent-free before it can leave.
22 CHAIR: Whatever that turns out
23 to be. Excuse me. Commissioner Reeve?
24 MR. BARKLEY: Yes, ma'am.
25 However we define it to be.

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1 contaminated with agent and is a hazardous waste
2 -- Let's take a solvent, for example. If I
3 bring in a container, I would ship into the
4 facility -- Let's take the surrogates. Okay?
5 Good example. That's where we are today.
6 Surrogate material is in a liquid state, and it
7 is shipped into the facility in totes or -- or
8 an unusual drum. Okay? It's not a hazardous
9 waste because it's coming in for us to use. It
10 is a hazardous material, however. Now, once it
11 -- we bring it onto the facility and start using
12 it for its intended purpose, it becomes a
13 hazardous waste. So there's no toxicological or
14 chemical change that takes place in defining --
15 converting this material from a material to
16 waste. It's just an administrative point in --
17 in time. Okay? And that's an example of how
18 something that's a material we're using becomes a
19 hazardous waste. Solvent is the same thing. We
20 would bring solvent in to clean machinery. And
21 then when we collect the solvent afterwards, it's
22 now no longer good for its intended use. So
23 it's defined as a hazardous waste. We didn't
24 change it or make it more toxic.
25 MS. MALARKEY: I know that.

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1 CHAIR: Well, however it
2 ultimately is defined.
3 MR. BARKLEY: That's correct.
4 I meant "we" collectively.
5 CHAIR: Okay. Thank you.
6 MR. BARKLEY: Thank you.
7 Sorry. Then on page five, coming to the BRA
8 reduction area, two faces of the brine reduction
9 area systemization -- that's the phase we're in
10 now. That's the testing phase leading to agent
11 operations, where we prove that facility can work
12 as it's designed. The brine reduction area
13 testing and preparation is underway. I do have
14 the staff hired to operate the brine reduction
15 area. They are in the training process. They
16 are testing the brine reduction area. The --
17 The evaporator systems prior to the brine
18 reduction areas were discussed earlier.
19 The pollution abatement system
20 for the brine reduction area -- That system is
21 being placed on line. It is on our schedule,
22 which is -- which is available for review.
23 Those activities are on our schedule to be
24 completed prior to agent operations. It is not
25 operational today. And the -- the pollution

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1 abatement liquid -- liquids or brines that we're
2 generating today in testing the liquid
3 incinerator and that we will generate for the
4 surrogate -- during the surrogate process for the
5 liquid incinerator and the follow-on incinerators
6 is not being processed through the brine
7 reduction area. It is being shipped off site to
8 a wastewater treatment facility. And as -- as
9 the previous speaker indicated, the toxicity of
10 this material is a little worse than drinking
11 water. Okay? So that material is being managed
12 as a -- as a hazardous waste in accordance with
13 the record of rules. It is going -- it is
14 going to a permitted treatment storage and
15 disposal facility.

16 CHAIR: Where is that, Mr.
17 Barclay?

18 MR. BARKLEY: In Kent,
19 Washington. To date, we have shipped 63 --

20 MR. NELSON: Correct.

21 MR. BARKLEY: Truckloads of the
22 -- the pollution abatement system's brines or
23 wastewater to that facility.

24 MR. NYLANDER: Past due was
25 about four thousand to forty-five thousand -- or

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1 CHAIR: What's the chemical
2 difference in terms of the metals that Dr. Skeen
3 talked about, in terms of the -- what's in the
4 brine liquid compared with the surrogate brines
5 and agents brines? In other words, at the end
6 of the process.

7 MR. BARKLEY: Okay. Let me
8 divide it into three sections. Okay? Prior to
9 the introduction of surrogate material -- Okay?
10 The pollution abatement system would be utilized
11 to cool the stack as sits.

12 CHAIR: Uh-huh.

13 MR. BARKLEY: Okay? The metal
14 content during this period comes primarily from
15 metals being leached from the incinerator
16 operculum. Okay? So very -- very low metal
17 content. I believe "CAD" means -- chromium --
18 chromium is the primary metal during the
19 presurrogate time frame.

20 Now, during the surrogate time
21 frame, part of that testing process is to spike
22 the surrogate feed with metals. So then the
23 metal content in this would more approximate what
24 Dr. Skeen indicated in his charts. Okay? So
25 we expect the metals content in the wastewater

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1 4,500 gallons.

2 CHAIR: Each?

3 MR. NYLANDER: Yes.

4 MR. BARKLEY: And the decision
5 point that we reached with this was -- back
6 earlier this year was -- was the focus -- to
7 focus on the agent destruction systems. We were
8 at a point in our scheduled management where the
9 liquid incinerator readiness -- the liquid
10 incinerator operational readiness would be
11 accomplished prior to the operation readiness of
12 the brine reduction area.

13 And as a -- as the management
14 decision point was do we delay the liquid
15 incinerator readiness for two to three months and
16 add the two to three months schedule extension
17 to the start-up of agent operations in order to
18 process the nonagent wastewaters through the
19 brine reduction area? And given the commitment
20 to safely and expeditiously approach the
21 construction, the decision was made since there
22 was -- there were alternative methods for
23 managing that wastewater, to exercise those
24 options and not further cause a delay to the
25 agent operational start date.

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1 during the surrogate process to be greater than
2 the presurrogate process. Okay? Am I saying
3 that correctly? Go ahead, Dave.

4 MR. NYLANDER: Let me add a
5 little bit. During the spiking process, the
6 intent is to demonstrate our emission
7 capabilities. So the spiking in the metals will
8 actually be much higher than when we're actually
9 in agent operations.

10 CHAIR: Okay.

11 MR. BARKLEY: The next phase is
12 during agent operations. And we will not be
13 spiking with metals. It would be the -- again,
14 the leaching from the refractory at the furnaces,
15 plus the metals and the metal parts, munitions
16 and the agent, which we expect to be
17 significantly lower than those concentrations we
18 spiked during the surrogate process.

19 CHAIR: Commissioner Reeve?

20 MR. REEVE: When we toured the
21 facility -- I don't think it was the last time,
22 but perhaps the time before -- I remember
23 looking at some pretty complicated and impressive
24 charts describing the various time lines for
25 construction and for testing and all that sort

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1 of thing. And I thought I recalled having --
 2 seeing the BRAs as part of that overall
 3 schedule, and that it was scheduled to be
 4 completed by the time surrogate operations
 5 started so that the brine reduction area would
 6 be on line and working when the surrogate
 7 operations started.

8 Sounds like today, you're saying
 9 it's not there. And is that because of a
 10 conscious decision to not pursue it according to
 11 the original schedule? Am I wrong about the
 12 original schedule? Or has there been some other
 13 delay that's, you know, beyond your control?

14 MR. BARKLEY: When we went
 15 through this option evaluation earlier in the
 16 year -- And let me say I've been with the
 17 project 14 months now. So I wanted to go back
 18 through the process of what you're referring to.
 19 And I did go back to the early schedules. And
 20 -- and quite likely, you -- you -- I mean, I
 21 wasn't there.

22 But in the earlier schedules,
 23 the BRA was scheduled to be on line at -- at
 24 approximately the time of the surrogate start-up.
 25 The -- the systemization -- during the

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1 question?

2 MR. REEVE: I think so. Tell
 3 me if I understood it wrong. I understood it
 4 to be -- that as you focussed -- and there are
 5 a number of problems, obviously; happens on any
 6 range of projects at this type. You ended up
 7 believing that you needed to focus on certain
 8 things and not on others, and the brine
 9 reduction was lower down the list in terms of
 10 focus and keeping the schedule. So the schedule
 11 slipped on getting brine reduction up and going.
 12 Is that basically it.

13 MR. BARKLEY: That's correct.
 14 I guess it would be more appropriate, I guess,
 15 if I was talking to -- if I were talking to --
 16 Or when I talked to my leadership, I presented
 17 it in terms of I have many tasks to complete,
 18 and I do have to prioritize those tasks. And
 19 after the September 11th incident, there was a
 20 major shift in attention on -- on the chemical
 21 agent stockpiles, not only at Umatilla, but
 22 across the country. What we in the Army could
 23 do to be prepared as quickly as we could to
 24 destroy that agent material. And at that time,
 25 we had choices of what should we prioritize at

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1 systemization process, we did encounter
 2 difficulties in the systemizing the BRA. And --
 3 and that systemization process, of course, is to
 4 put those -- those furnace systems, the brine
 5 reduction area systems, and -- and the remainder
 6 of our 43 other major systems on line. And --
 7 and as part of that -- I mean, it is a
 8 difficult process. And we encountered
 9 difficulties with the brine reduction area. We
 10 encountered difficulties with the liquid
 11 incinerators. As you were probably aware, we
 12 ran into an instrumentation problem with --
 13 toward the early part of May with the liquid
 14 incinerator. And it basically took four, five,
 15 six weeks to resolve that. So as -- as we
 16 started encountering those difficulties -- and
 17 again, with the 9/11 situation, then we started
 18 shifting the focus toward getting the liquid
 19 incinerators ready as quickly as we could;
 20 getting the deactivation furnace ready as quickly
 21 as we could. And then stretch the brine
 22 reduction area systemization, according to the
 23 remaining time line, to be prepared between
 24 surrogate start-up and agent operations.

25 CHAIR: Does that answer your

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1 this point in time? And because we did have
 2 options for the management of wastewaters prior
 3 to agent operations, then we -- we shifted the
 4 focus on the liquid incinerators. Let's get
 5 the liquid incinerator and deactivation furnace
 6 started quickly as we possibly could. Because I
 7 didn't know what may come up in the future.
 8 Okay? And so we used the remainder of the
 9 scheduled time and resources to spread between
 10 that point in time and agent operations.

11 CHAIR: Commissioner Bennett --

12 MR. BARKLEY: So it was a
 13 reprioritization. I'm not trying to avoid that
 14 answer. There was a reprioritization of
 15 resources and tasks.

16 CHAIR: Commissioner Bennett?

17 MR. BENNETT: But it's still
 18 appropriate to say -- I'm asking you. This is
 19 a question -- that all parts of the system --
 20 the BRA will be part of the deactivation
 21 process.

22 MR. BARKLEY: I think the
 23 answer to that one is yes. The -- prior to
 24 start --

25 MR. BENNETT: I wasn't clear.

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<p>1 MR. BARKLEY: Okay. I have 43 2 major systems that I have to bring on line. 3 And those systems have to be on line before I 4 start agent operations, which began with the 5 liquid incinerator and the deactivation furnace 6 to destroy GB rockets. 7 MR. BENNETT: And in the end, 8 all of those systems will be there, including 9 the BRA. 10 MR. BARKLEY: You just jumped 11 to my next bullet. During agent operations, we 12 will be operational, and we use plan to use it. 13 MR. BENNETT: Thank you. 14 CHAIR: And so let me make sure 15 I have this correct. During surrogate 16 operations, you don't plan to use it. Is that 17 correct? 18 MR. BARKLEY: We plan to have 19 it -- That is correct. That is correct. 20 CHAIR: Okay. So -- 21 MR. BARKLEY: I did not plan to 22 use it to treat pollution abatement system brines 23 generated during the surrogate operations. We 24 will be using it and testing it to bring it on 25 line.</p> <p style="text-align: right;">Page 61</p>	<p>1 into the furnace. Only during the three day 2 mini burn, as we call it, which precedes the 3 trial burn, would we spike; and then during the 4 trial burn period itself. And the remainder of 5 the surrogate period, we would not be spiking. 6 So as Dave said, it is a very limited time. 7 And then once the furnace -- 8 Once we're completed with the liquid incinerator 9 surrogate process, we -- between the completion 10 of that and start of agent operations, we will 11 continue to operate that -- that furnace system 12 for training, for observation. But we'll be 13 using nonsurrogate material, like a glycol or 14 water. So the metals will be back down to the 15 presurrogate period; prespiking period. 16 CHAIR: Let me make sure that I 17 understand this. Did the Army and Washington 18 Demil previously commit to everybody -- everybody 19 being the public and this Commission and the 20 Department -- on numerous occasions that the 21 brine reduction system would be used, and that 22 what would be shipped would be salts, not 23 liquids, during the surrogate operations? 24 MR. BARKLEY: And Madam Chair, 25 having not been here during that time period, I</p> <p style="text-align: right;">Page 63</p>
<p>1 CHAIR: Okay. But what the 2 Tribe has said it's concerned about, if I 3 understood the Tribe correctly today, is the 4 metal concentration, which you have just told us 5 will be higher during surrogate operations than 6 agent operations. Is that correct? 7 MR. BARKLEY: That is correct. 8 CHAIR: Okay. Mr. Nylander. 9 MR. NYLANDER: Yes. I'd like 10 to clarify that the periods that we have the 11 metal spiking is just a very short duration. 12 It's just to demonstrate our emission over a 13 short period of time during a certain trial 14 burn. We have 720 hours to demonstrate our 15 circuit -- or shakedown, of which part of that 16 is to spike metals during the trial burn to get 17 the results back to demonstrate our emissions 18 standards being met. So the duration is very 19 short-term. 20 CHAIR: Okay. 21 MR. BARKLEY: There's two pieces 22 to the surrogate process for each furnace: 23 Shakedown, and then there's trial burn. The 24 shakedown is -- can last up to 720 hours. All 25 the three days of that, no metals will be spiked</p> <p style="text-align: right;">Page 62</p>	<p>1 can't answer that question. I don't know what 2 the commitments were made during that process. 3 During my review of this, in reading back 4 through the Environmental Impact Statement 5 process, my interpretation of that is -- is a 6 commitment to operate the BRA during an agent 7 operation. 8 The permit application and the 9 permit language obviously allow for the use of 10 the brine reduction area during the systemization 11 period and during the surrogate testing period. 12 And it's obvious that that's there. I cannot 13 say when -- whether anyone made that direct 14 commitment to only process that liquid on site 15 during that period. 16 MS. HALLOCK: Perhaps the DEQ 17 folks come back to question and answer the 18 question for you. Did we lose Tony again? 19 VICE CHAIR: I have a question. 20 CHAIR: Go ahead. 21 VICE CHAIR: Trying to get your 22 attention. 23 CHAIR: Yeah. You have it. 24 VICE CHAIR: I was going to ask 25 -- Is there any reason why the surrogate brine</p> <p style="text-align: right;">Page 64</p>

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1 cannot be stored, and then pushed through the
2 brine reduction unit when you're ready to test
3 the brine reduction unit?

4 MR. BARKLEY: We had several
5 options to consider. One was to exercise the
6 off-site shipment of the liquid material.
7 Another one was to stockpile the material on
8 site, and the other was to reprioritize the BRA
9 ahead of the -- and delay the agent operational
10 start date by -- I believe it was two to three
11 months. And the -- the balancing of those
12 issues, from my perspective as a Site Project
13 Manager, were to expeditiously reach the agent
14 destruction date. Because that is what the
15 Army's mission is for this project, is to
16 destroy the agent; remove the risk to the
17 public.

18 Legacy waste has been an issue.
19 I've been before you several times regarding
20 legacy waste and treatment of secondary waste.
21 And I know it's a serious issue. And so I
22 chose not to stockpile water on the depo to --
23 I would have to create permitted storage areas.
24 I'd have to do what the Johnson atoll did, and
25 develop or bring in containers -- or storage

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1 the BRA capacity can support the agent
2 destruction capacity. But as we -- if -- As we
3 look at how we can safety expedite the agent
4 destruction process, that could involve options
5 for shipping it off site. So I do not want to
6 leave an unclear commitment. We do -- we are
7 -- it is -- We'll be operational, and we plan
8 to use it. But I -- I cannot say and would
9 not offer that to you that sometime in the
10 future, we may not be discussing that option as
11 an option again.

12 CHAIR: Well, you can understand
13 our problem with this, Mr. Barclay. Because the
14 commitment has been in the past -- and I'm sure
15 staff will tell us whether it included during
16 surrogate operations -- that the brine liquids
17 would not be shipped off waste -- I mean off
18 site. I mean, I appreciate what the Tribe has
19 said today, and I appreciate what Mr. Keating
20 has said today. And I hope that you recognize
21 that at the very least, you have a public
22 perception problem around this issue.

23 MR. BARKLEY: I feel -- Yes, I
24 do. I feel like we've not managed the
25 expectations probably. I do.

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1 containers to store that material and run the
2 risk of this -- Even though it's water, it's
3 still hazardous waste. And run the risk of that
4 rupturing and leaking on the depo. So I was
5 balancing those three options, and chose the
6 option to expeditiously approach the agent
7 destruction date.

8 So to answer your question, it
9 could be stockpiled on site. But I do -- And
10 as the Project Manager, I do not think that's
11 the appropriate approach to take when there are
12 other safe options available.

13 CHAIR: Does that answer your
14 question, Commissioner Van Vliet?

15 VICE CHAIR: Yeah. Yeah.

16 MR. BARKLEY: And then in the
17 future, I don't want to create any -- You know,
18 I hope to be here in five to six years
19 destroying the agent, and still speaking with
20 you. And what I'm saying on that -- During
21 agent operations, we'll be operational and plan
22 to use it. I'm not saying that. We may not
23 be here discussing that again. The option of --
24 of exercising off-site shipment for liquid brines
25 in the future. As Dr. Skeen indicated, our --

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1 CHAIR: Well, and I'm sorry.
2 But to come and say because you weren't here,
3 these commitments weren't made, or you don't
4 know what commitments are is an unacceptable
5 response. And I'm going to have staff clarify
6 what the expectation was just for purposes of
7 this informational hearing. And I've put you on
8 the spot here, but this is a long-term project,
9 and you've been involved in it for a long time.
10 And I can't accept that answer. So -- any
11 other questions or comments of -- of the
12 Washington Demil and Army people at this point?

13 MR. BENNETT: Can I just
14 further what you're saying? No individual at
15 this table nor at your table is the continuum.
16 We're all going to change over time. But the
17 State of Oregon and the people here are not
18 going to. So to look at this through a project
19 is -- is wrong-headed, from my standpoint. Look
20 at that as Oregon and the people here. Then
21 the answer is how does this get done in the
22 safest way? The occurrence on September 11th gave
23 another impetus. But it doesn't change the
24 safety issue of people in Oregon.

25 MR. BARKLEY: That is the

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1 mission. That is the mission: To protect the
2 people of Oregon. To get rid of that risk.
3 MR. BENNETT: And that risk --
4 MR. BARKLEY: I agree with
5 that.
6 MR. BENNETT: Those are the
7 people of the future too.
8 MR. BARKLEY: Yes. Yes. And
9 my family are some of those people.
10 MR. BENNETT: But we all can
11 move to Nevada. Thank you.
12 CHAIR: Other questions or
13 comments? Thank you very much.
14 MR. BARKLEY: You're welcome.
15 I do want to thank everyone involved in this
16 project for making it success. This is
17 monumental point we've reached to begin the
18 surrogate process.
19 CHAIR: I agree with you.
20 MR. BARKLEY: Thank you.
21 CHAIR: Thank you. Director
22 Hal?
23 MS. HALLOCK: Just one point in
24 response. We can perhaps all move to Nevada with
25 the exception of the Tribe.

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1 area was operated at the Johnston atoll facility.
2 It is not operating at the Anniston, Alabama
3 facility, which is in cert operations at this
4 point. It's not in operation at TOCDF, the
5 Tooele, Utah facility, and is not expected to
6 operate at Pine Bluff, Arkansas. That facility is
7 still under construction.
8 Anniston transfers their brine
9 to a hazardous waste facility that makes it into
10 sludges and cement kiln dust for their waste
11 stabilization operation. So instead of using
12 what the facility would normally use, which is
13 straight up processed type water, they're making
14 use of the brines for their stabilization
15 operations.
16 Tooele ships the brine off site.
17 And it's going either for a deep well injection
18 or wastewater treatment plant. I mean, Utah DEQ
19 can't control what they're doing.
20 I wanted to touch briefly --
21 because the subject's come up a couple of times
22 before I move on -- the issue of this
23 agent-free. And at the other facility, brine is
24 considered suitable for off-site shipment if it
25 meets the Army's soldier's drinking water

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1 MR. BENNETT: Well, some of the
2 Tribe at different times probably was in Nevada;
3 back and forth. It was lines drawn later that
4 defined what the Tribe was.
5 CHAIR: Which is a topic for a
6 whole another --
7 MR. BENNETT: Someone else could
8 say that better say that than I.
9 CHAIR: Mr. Thomas?
10 MR. THOMAS: For the record,
11 Wayne Thomas. We would like to start this
12 portion of the presentation with the status of
13 the brine reduction area used at other chemical
14 demilitarization facilities. I'll ask Sue to
15 start us off with that on slide 11 in the DEQ
16 package.
17 MS. OLIVER: For the record,
18 this is Sue Oliver. And I am starting with
19 slide 11. You'll need a moment to find it.
20 There are no more pretty pictures to look at, so
21 -- I did a kind of survey of the different
22 states that have chemical demilitarization sites
23 and talked with them on and off over the last
24 couple of weeks.
25 Generally, the brine reduction

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1 standard. That has been accepted by other
2 states as -- No other state has the agent-free
3 requirement as we term it here in Oregon. So
4 the other states have accepted the soldier's
5 drinking water standard, which is 20 parts per
6 billion for the nerve agent, 200 parts per
7 billion for mustard.
8 Our issue here is -- briefly is
9 that we had originally agent-free as determined
10 by the lowest achievable detection level. And
11 that's the process that the Army went through to
12 present us with some new numbers to say, "This
13 is as low as we can get." We cannot say the
14 material has zero agent. We can't prove zero.
15 All we can do is say it's sub -- It's below
16 some point. Because this is as low as we can
17 measure.
18 So in all the facilities that
19 -- the material must have whatever the aid --
20 equivalent agent-free standard is. In the tank
21 -- tested in the tank before a batch of brine
22 is processed. And the brine reduction area is
23 not set up to accept agent-contaminated waste.
24 And the reality is there should never be agent
25 detected in the brine. It would be a very

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1 unusual occurrence. It's not a question it
 2 occurred to me to ask as I was talking to other
 3 sites that processed brine. But I'm not aware
 4 of any time where they've tested a tank load of
 5 brine and had detectable levels of agent.
 6 CHAIR: You mean before
 7 processing?
 8 MS. OLIVER: Before processing.
 9 CHAIR: Okay.
 10 MS. OLIVER: All the facilities
 11 requested testing before it goes through. In
 12 terms of the operational history of the brine
 13 reduction area, you've heard -- Mr. Keating did
 14 mention that -- the problems that they've had.
 15 From what I was able to find
 16 out, the brine reduction area itself seems to
 17 work fine. And they did operate it
 18 successfully at the Johnson atoll facility
 19 throughout. The primary reason that they've told
 20 the state of Alabama they're not going to
 21 operate it is an economic one. It's very labor
 22 intensive. It was operated at the Tooele
 23 facilities sporadically for a few years in on
 24 and off operation.
 25 In early 1998, they tried to

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1 other than we did talk to the EPA's Region 10
 2 person, Cathy Massimino, who you're familiar
 3 with. And she doesn't recall that they had
 4 those same types of troubles out there.
 5 In talking to the Utah DEQ, I
 6 was told that essentially, the BRA itself --
 7 excuse me for using the acronym. It makes
 8 people uncomfortable, but -- We don't laugh about
 9 it anymore. That -- that part was working fine.
 10 I mean, there was no -- It is a labor-intensive
 11 process. And the Army, in the end -- Once they
 12 determined what it was going to take to fix the
 13 bag house, said "It's more economical for us to
 14 ship this off site than it is to operate -- to
 15 repair the bag house; replace 800 and some
 16 filter bags and do the other things that need to
 17 be done." We do have a copy of the failure
 18 analysis of the bag house and have lists of
 19 recommendations that they had.
 20 MR. BENNETT: Madam Chair?
 21 CHAIR: Commissioner Bennett.
 22 MR. BENNETT: But given the
 23 location of Johnston Island, it wasn't very --
 24 MS. OLIVER: It would not have
 25 been more economical to ship off --

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1 really go into full bore with the brine
 2 reduction area. And during a compliance test
 3 for that process, which involves three test runs,
 4 they failed one of the test runs. And in the
 5 analysis of what was going on there, they
 6 discovered that the bag house, which is the
 7 primary pollution abatement system for the brine
 8 reduction area -- The bags were failing. The
 9 filter bags used inside this bag house. And
 10 there was a complete failure analysis done of
 11 that. A lot of problems were identified with
 12 the bag house itself, in terms of the selection
 13 of the filter material and the actual operation.
 14 Bag houses don't like a heavily moisture-laden
 15 gas stream. They would be -- Dry is better.
 16 Less than 5 percent is better, in terms of
 17 moisture tendency. And the gas stream being
 18 sent there tended to run anywhere from 10 to 15
 19 percent depending on the --
 20 CHAIR: So what's the difference
 21 between that situation and JCAD, where the brine
 22 reduction area was operated successfully.
 23 MS. OLIVER: I was unable to
 24 get ahold of the Region 9 person who was
 25 actually out at JCAD and has been for some time,

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1 MR. BENNETT: Having been on
 2 that island, I -- So it worked efficiently when
 3 it was at great distance.
 4 MS. OLIVER: It had to. And
 5 even if it didn't work efficiently, it was
 6 probably still cheaper for the Army to use it
 7 than trying too ship.
 8 MR. BENNETT: Thank you.
 9 That's what I was getting for.
 10 MS. OLIVER: In terms of
 11 quantities of liquid waste, as Dr. Skeen
 12 mentioned, that's a very difficult number to come
 13 up with because it is really widely variable,
 14 depending on how much furnaces are being operated
 15 and the nature of the material that's being
 16 treated.
 17 At the moment, Anniston, Alabama
 18 is expecting to ship two to three 4,000 gallon
 19 tankers off site per day when they have two
 20 furnaces operating. We've got a four-month
 21 average from Tooele, Utah. I put mine -- and
 22 calculated mine in gallons for a five-day work
 23 week instead of the seven days Dr. Skeen -- So
 24 we're talking 5,000 gallons tanker -- about
 25 three trucks a day.

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1 Umatilla itself is actually
2 permitted to process 1,000 gallons per hour
3 through the BRA drum dryers. So that's not the
4 total amount that would -- is going into the
5 system. Because if you recall, before the drum
6 dryers comes the flash evaporators that are also
7 removing a certain amount of water. But it's
8 been very difficult to come up with numbers.
9 Dr. Skeen did a lot of work on how many gallons
10 he thought would be generated, but it's very
11 variable, depending on what assumptions you're
12 going to use.

13 Tom's going to talk a little
14 bit about kind of we -- You mentioned in your
15 discussion with Mr. Barclay a few minutes ago
16 past Army commitments concerning the operations
17 of the BRA.

18 MR. REEVE: Before you get
19 there, one question for you, Sue. And that is
20 on the Tooele difficulties or problems that they
21 had, are -- Were those encountered early enough
22 so that they were -- they resulted in any design
23 changes or actual building changes at Umatilla?

24 MS. OLIVER: I did look into
25 that, Commissioner Reeve. One of the key

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1 I'll touch some of the high points here.
2 The outside shipment of liquid
3 waste -- We've been talking with the Army about
4 this certainly since I've been on the project
5 for almost four years. It's been a continuing
6 topic of discussion. And to my knowledge, any
7 discussions I've had, we have never been given
8 any indication that they planned to ship these
9 off site. In fact, you know, in the -- In the
10 letter, you'll see a reference there that as
11 recently as December of 2001 and January of 2002
12 this year, we were still holding discussions with
13 contractor's staff at the site trying to come up
14 with an approach to operate the BRA during
15 surrogate operation -- and in fact, during
16 systemization operations -- and find a way for
17 them to manage what -- At that time, they
18 expected to see higher quantities of liquids
19 during the systemization process while they were
20 testing.

21 So they were concerned that the
22 tank -- their -- The brine reduction area on the
23 tanks would have problems handling the capacity
24 of the extra water that would just be during
25 systemization. So we were talking about ways to

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1 recommendations was the selection of the bag
2 filter material. They used at Tooele a Teflon
3 coated polyester bag, which is not recommended
4 for the kind of gas treatment.

5 They also recommended improved
6 insulation around the bag house to keep the dew
7 point above -- They ran right at the level where
8 they were going to get condensation in the bag
9 house. As near as I can tell, going over our
10 current system specs, we have teflon coated
11 polyester bags. We do not have the recommended
12 Nomax (phonetic) or Teflon bags that were
13 recommend for this application. They have done
14 some of the insulating work on the duct work.
15 But it doesn't look to me like everything has --
16 has been implemented, in terms of bagging
17 improvements.

18 MR. BEAM: Thank you, Sue. For
19 the record, Tom Beam. I want to go over
20 briefly some of the Commission's concerns about
21 past commitments from the Army. In your packet
22 from DEQ in one of the back sections, you should
23 have a copy of a letter dated February 1st from
24 the Department to the Army which outlines some
25 of those commitments a little more specifically.

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1 actually facilitate their management of the brine
2 reduction area to handle that additional
3 capacity.

4 So as recently as January,
5 although we had certainly heard rumors as had
6 some -- Seen the history to the other side as
7 recently as January, all indications were that
8 they planned to continue systemization of the
9 BRA and have it operational for surrogate
10 operations.

11 As the letter will point out,
12 and as it's briefly bolded here on slide 14 of
13 our presentation, you can go back as far as the
14 Environmental Impact Statement and the original
15 hazardous waste permit application from the Army,
16 where it is very clear in the language that they
17 will operate the brine reduction area during
18 surrogate operations. It is only just recently
19 through a number of other administrative permit
20 modifications to update and revise technical
21 sections of the application where they have
22 proposed revising that language to include
23 language that may operate the brine reduction
24 area during the surrogate operations.

25 CHAIR: Well, Tom, this letter

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1 says that it will be operating during
2 systemization activity as well.
3 MR. BEAM: Correct. We -- I
4 was involved with -- probably on the order of 18
5 month's worth of on and off discussions with the
6 Army staff, the contractor staff, the Washington
7 demil company, trying to arrive at an approach
8 that would actually allow them to process all
9 the liquid brines generated from the pollution
10 abatement system, whether they were nonhazardous
11 or hazardous.

12 In fact, we spent considerable
13 time a couple of years ago trying to come up a
14 compliant approach that they could use to process
15 nonhazardous brine in the brine reduction area
16 while -- so that they wouldn't have to ship it
17 off site. So you're correct, Madam Chair. So
18 that -- I think that operate much covers -- I
19 think in basic the commitments we're aware of.
20 The letter outlines them in a little more
21 specific detail; the specific language.

22 MS. HALLOCK: Madam Chair, could
23 I ask a question of you or the Army? The
24 purpose of surrogate burns is to see if
25 everything works.

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1 those changes are completed.

2 CHAIR: And when are those
3 changes expected to be completed?

4 MR. BEAM: Well, the --
5 Currently, the latest schedule I received from
6 the permitting staff of the site is that we can
7 expect that permit modification request to come
8 in to us approximately mid August. And they
9 cannot implement those changes until they receive
10 approval for the changes. So it is likely to
11 be getting into the holiday season over the
12 winter before they will be able to actually
13 implement and install those changes in the brine
14 reduction area.

15 MR. REEVE: What sort of
16 changes are you -- are we talking about here?

17 MR. BEAM: Well, I'll try to do
18 this from memory. One example would be -- is
19 that because of the particulate-laden brine that
20 goes through the drum dryers, they're having
21 problems with scaling and settling out in the
22 pipelines. So in order to ensure they keep
23 proper flow rates through that, they're
24 installing a recirculation line into the piping
25 leading to these drum dryers to ensure that they

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1 MR. BEAM: Correct.

2 MS. HALLOCK: If the BRA were
3 not operated, at least during part of surrogate
4 operations, what was the alternative proposal to
5 make sure that it worked when we got to the
6 agent operations?

7 MR. BEAM: Well, actually --
8 Well, I mean, I suppose the Army could try to
9 answer that if they need to. Actually, we have
10 not received any specific proposals on the actual
11 approach they intend to take to ensure that it's
12 operational at the start of agent operation. In
13 fact, as, you know, the schedule here lays out,
14 it was only just in January where they make the
15 statement to us or sent us correspondence
16 indicating we don't plan to operate it during
17 the surrogate operations.

18 At this point in time, we are
19 actually expecting another permit modification
20 request to come in in the next couple of weeks
21 which will address additional design changes to
22 the brine reduction area that will allow it to
23 operate more efficiently. And so it is unlikely
24 that they would choose to complete systemization
25 or start testing of the brine reduction until

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1 can maintain a constant flow that will keep the
2 particulate from settling out.

3 Another one that I'm aware of
4 -- We haven't received the permit yet. But
5 another change I'm aware of is that currently,
6 the permit has a set limit for maximum feed rate
7 of brine to all three drum dryers combined.
8 It's a thousand eighty gallons just to all
9 combined. They have indicated that they intend
10 to propose corresponding feed rates to each
11 individual drum dryer as a better way of
12 controlling the operation. Those are the two
13 big ones that I can think of now. But there
14 are also -- one other one. On the pollution
15 abatement system for the brine reduction area, it
16 currently has a bypass damper. On the original
17 design, they were concerned about the temperature
18 of the glass damaging the bags in the bag
19 houses. And so they installed a bypass that --
20 If the temperature got too hot, it would open
21 the bypass damper as it was shutting down the
22 system so it would prevent damaging the bags
23 from heat.

24 Where with the new bag houses
25 -- As Sue indicated, we're not aware if they

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1 changed the bags themselves. But in the bag
2 houses, they have increased the temperature
3 resistance of the material. And so they are
4 going to be proposing the actual removal of that
5 bypass damper. So that potential source of
6 intermittent emissions to the atmosphere will
7 disappear. And those are the three I can think
8 of off the top of my head leave.

9 MR. REEVE: So you're not aware
10 for example, that they're changing the bags in
11 the bag houses.

12 MR. BEAM: We've not been
13 informed of any plans to change the bags at this
14 point.

15 MR. REEVE: Okay.

16 CHAIR: Go ahead.

17 MR. BEAM: Okay. After the --
18 move onto slide 15, which is -- I think we've
19 kind of heard that. So I'm on to 16. Thank
20 you, Sue. Sixteen attempts to address the
21 highlights of our current authority to regulate
22 the off-site shipment of liquid waste from the
23 MCDLF. The brines are considered residues of
24 chemical demilitarization. And therefore, they
25 are a State listed waste. That is certainly one

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1 this morning. It's probably gone a little
2 longer than I think we anticipated. But I think
3 it's been very productive. There's four, maybe
4 five points I'd make in summarizing where we
5 are.

6 The brine reduction area is the
7 permitted hazardous waste treatment unit that's
8 defined in the permit. As Tom indicated, the
9 current permit does not prohibit off-site
10 shipment of liquid waste from the facility. We
11 know that other facilities are not operating the
12 brine reduction areas. We also know the Army
13 has repeatedly stated to us as a Department, to
14 the Commission, and told public and to Tribal
15 government that they intend to operate the brine
16 reduction area to treat these wastes.

17 I did hear this morning a
18 different comment from Mr. Barclay: That the
19 Army, while they may intend to operate that
20 unit, leaves open the opportunity to come back
21 to the Commission in the future and ship waste
22 off site. I think that is a departure from the
23 position the Army has expressed to us in the
24 past and perhaps is symptomatic of where we are
25 and why we're here today.

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1 difference from, say, Alabama which does not have
2 a state code pertaining to demilitarization
3 residues.

4 CHAIR: So residue includes
5 liquid residue?

6 MR. BEAM: Yes, it does. So
7 these are -- Regardless of what other
8 characteristics or metals may be in these brines,
9 they are hazardous waste and they will need to
10 be disposed of at a proper waste disposal
11 facility. So the current permit does not
12 prohibit the outside shipment of liquid waste.

13 CHAIR: I know. We're not
14 talking about the what the permit requires here.

15 MR. BEAM: I understand.

16 CHAIR: We're talking about the
17 history of the thing.

18 MR. BEAM: Agreed. Just want
19 to make sure that we had this clear
20 understanding of the current authority under the
21 permit. And I think that was all that I had.
22 Turn it back over to Wayne to close this up.

23 MR. THOMAS: Thank you, Tom.
24 Wayne Thomas, for the record. Madam Chair,
25 Commissioners, you've heard a lot of information

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1 I think the concerns that we
2 hear from the communities in our quarterly
3 meetings with the tribal government is -- is
4 that there's an expectation from the community
5 that while we know there may be waste going off
6 site, that there are efforts in place and
7 commitments in place to reduce that as much as
8 practical. And that's why the brine reduction
9 area was a permitted unit: So we would not
10 have these liquid wastes going off site. The
11 same way we have the agent-free area -- the
12 secondary waste materially treated. I think
13 collectively, if we look at the facility, the
14 Army has the responsibility and has accepted the
15 responsibility through the permitting process or
16 the Environmental Impact Statement of not
17 shipping liquid wastes off site. What we're
18 hearing today is a softening in that position.
19 And that's why we are here: To put this issue
20 before the commission for your information.
21 Thank you, Madam Chair.

22 CHAIR: Thank you very much.

23 Other questions or comments of the Department at
24 this point?

25 VICE CHAIR: Madam Chair?

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<p>1 CHAIR: Commissioner Van Vliet. 2 VICE CHAIR: Wayne, if I'm 3 understanding what I've been listening this 4 morning, is -- It sounds before you can become 5 -- or start any agent burn, the brine reduction 6 unit has to be working. And in order to know 7 that it's working properly, you have to put 8 something through it, which tells me that you 9 ought -- You can't get away from then storing 10 some of the brine from surrogate burn in order 11 to test it. Am I correct? 12 MR. THOMAS: I think that's a 13 very logical comment, sir. The -- we do not 14 know right now -- We're not aware that the Army 15 has begun testing of the brine reduction area. 16 There are other -- other changes that has need 17 to go into place. And I hear the Army saying 18 that they fully intended to have this operational 19 before agent operations begin. We're not seeing 20 activity that indicates that that is going to 21 occur right now. 22 VICE CHAIR: Okay. Thank you. 23 CHAIR: Other questions or 24 comments? Okay. Commissioner Reeve. 25 MR. REEVE: I don't know. It's</p> <p style="text-align: right;">Page 89</p>	<p>1 planning on -- I mean, obviously, we'll have to 2 see if they come in with a request. We'll have 3 to deal with it at that time and look at all 4 the information. But I think it's a -- I would 5 have a real problem in opening that door and 6 going down that road of that kind of a 7 significant change, in terms of the principle of 8 the whole facility operating as a whole. And 9 that is the instruction of -- on-site treatment 10 and destruction of all the wastes; certainly the 11 munitions, but also the secondary wastes that 12 had come from it. And that includes the liquid 13 waste that we're talking about. That's -- I know 14 that doesn't require a response from you, Wayne. 15 But that's a comment. 16 MR. THOMAS: I appreciate the 17 comment. I think you summed the issue 18 perfectly. 19 MS. HALLOCK: Madam Chair? 20 CHAIR: Director Hallock? 21 MS. HALLOCK: Wayne, I wonder 22 if you could comment or clarify if it's 23 appropriate during the context of what's going on 24 right now -- the potential connection or lack 25 thereof between the definition of "agent-free"</p> <p style="text-align: right;">Page 91</p>
<p>1 just a comment that I'm -- I'm concerned about 2 the change in -- in the priority. And I'm 3 afraid that it's symptomatic. You know, it may 4 be understandable, but it's still a real problem 5 I think to the public and to other stakeholders 6 when difficulties, including economics about 7 building something, start to take precedence over 8 commitments and statements that are made 9 previously. 10 Frankly, from a purely -- purely 11 from a safety point of view, I think it's 12 probably reasonable to ship some liquids off site 13 during a surrogate burn time period. But that 14 doesn't take care of the issue of what kind of 15 commitments were made and statements were made in 16 order to get the -- the entire facility approved 17 and accepted by the public, as well as this 18 Commission, in the past. 19 And -- and I see leaving the 20 door open for coming back here and saying, "Even 21 during agent operations, we'd like to have the 22 door opened to ask -- ship waste off site", at 23 least to the extent the Army's listening to my 24 personal views on it, I think that's a 25 nonstarter if there -- if it's something they're</p> <p style="text-align: right;">Page 90</p>	<p>1 and the resolution of this issue and whether or 2 not that will be before the Commission again. 3 And if it's not appropriate given other 4 circumstances, fine. 5 MR. THOMAS: I would say there 6 is a relationship, in that we have to agree upon 7 a definition with the Army. But the fundamental 8 decision of operating the brine reduction area is 9 an independent decision of operating the 10 treatment unit that the Army has committed to 11 do. So while there is a relationship in 12 defining the number, it's not part of the 13 decision to fulfill their commitment. 14 CHAIR: I'd just like to say 15 that -- that Mark has succinctly and eloquently 16 summarized my position. I think I've made my 17 personal views about it clear during the course 18 of the hearing. And I need to add that, you 19 know, at the risk of sounding unpatriotic in 20 this atmosphere that I'm disturbed by the 21 repeated reference to the events of last 22 September as a -- part of a reason for not 23 getting the entire -- all of the components of 24 this facility ready on the previously, you know, 25 agonized over and frequently negotiated schedule.</p> <p style="text-align: right;">Page 92</p>

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<p>1 And that troubles me. In this state -- in 2 Oregon, the handling of the secondary waste has 3 always been an extremely important part of how 4 we viewed the whole project. And I'm not losing 5 sight of the fact that destruction of this 6 stockpile is the most important thing. But 7 we've always looked at this project as a whole. 8 And I am very disappointed that the Army is now 9 coming to us and apparently changing the way 10 they want to handle this waste. I think we owe 11 the Tribe a response. I'm not exactly sure what 12 the appropriate way of coming to that response 13 is. I think we've made our -- you know, made 14 our personal views pretty clear. And I don't 15 know how to proceed from here. Whether we just 16 need to have some internal discussions. If you 17 have any suggestions, Mr. Thomas or Ms. 18 Hallock, I'd appreciate hearing it. 19 MR. THOMAS: Madam Chair, I'd 20 recommend that the Department maybe, with input 21 from the Commission, of course, draft a letter 22 for your review, and you consider that as a 23 written response to the tribal government. 24 Because did you receive a written request. 25 CHAIR: Yes.</p> <p style="text-align: right;">Page 93</p>	<p>1 commitment is a commitment. And they should 2 abide by that and make sure that everything is 3 operational. 4 CHAIR: I always look at Mark 5 when I hear the intake of breath. 6 MR. REEVE: It wasn't 7 intentional. 8 CHAIR: Okay. 9 MR. REEVE: I think the idea -- 10 I think we should respond to the letter from the 11 Tribe. And I would ask for staff assistance in 12 moving down that road. 13 CHAIR: Okay. 14 MR. THOMAS: Then we'll do so. 15 CHAIR: All right. Thank you 16 very much. I appreciate very much the 17 attendance of representatives from all the 18 various stakeholders. I appreciate the Tribe's 19 letter and bringing this to our attention again. 20 And we will proceed from here. Thank you. 21 MR. THOMAS: One final note, 22 Madam Chair. I guess I'd have to say that we 23 really hope that by Monday, the plant will be up 24 and running. 25 CHAIR: Well, someone call us.</p> <p style="text-align: right;">Page 95</p>
<p>1 MR. THOMAS: And I think you 2 should document your response back. We're 3 certainly willing to take that action on -- 4 MS. MALARKEY: Would you want a 5 unanimous vote? 6 CHAIR: I'm not asking for a 7 vote. 8 MS. MALARKEY: But you may 9 understand we may -- I can't speak for the 10 Commission, but I would suspect we all agree. I 11 don't know how you put that in language. 12 CHAIR: Well, I think in the 13 process that's been suggested, each of us would 14 receive a draft -- a copy of a draft of this 15 letter -- and that might be an appropriate time 16 for each of us individually to have a 17 conversation with Wayne. And if we need to take 18 some public action at some point, perhaps because 19 we disagree, then -- then we could schedule 20 that at a later time. 21 Commissioner Van Vliet, does 22 this course of action sound appropriate to you? 23 VICE CHAIR: Sounds appropriate. 24 And I'm applying my eastern Oregon approach to 25 it. A handshake is a handshake, and a</p> <p style="text-align: right;">Page 94</p>	<p>1 MR. THOMAS: Well -- 2 CHAIR: Thank you. I -- I 3 think that it's appropriate to take another five 4 or ten-minute break at this point since we've 5 been discussing this for almost two hours with 6 the caveat that we have a lot of things to do, 7 and you're going to lose two of us -- one of 8 us at 12:00 and one of us at -- or two of us 9 at 2:15. So we need to march right along. 10 And that might mean a shortened lunch break. 11 (Meeting suspended at 11:07.) 12 . 13 . 14 . 15 . 16 . 17 . 18 . 19 . 20 . 21 . 22 . 23 . 24 . 25 .</p> <p style="text-align: right;">Page 96</p>

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Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting

ATTACHMENT D

Transcript of Oral Testimony Received
(DEQ Item No. 02-2093).

December 4, 2002

Public Hearing: Proposed Modification No. UMCDF-02-039-
BRA(EQC) "Required Operation of the Brine
Reduction Area"

Umatilla Chemical Agent Disposal Facility Hazardous Waste
Storage and Treatment Permit

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1 ORIGINAL

02-2093

2
3 PROPOSED MODIFICATION OF THE
4 HAZARDOUS WASTE STORAGE AND TREATMENT PERMIT
5 FOR THE
6 UMATILLA CHEMICAL AGENT DISPOSAL FACILITY
7 (Permit No. ORQ 000 009 431)
8
9

10 PUBLIC HEARING
11 BEFORE PRESIDING OFFICER PAUL DANIELLO
12

13 December 4, 2002

14 7:00 p.m.
15
16

17 Good Shepherd Health Care System
18 Hermiston, Oregon
19

20 STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY
RECEIVED

21 DEC 20 2002

22 HERMISTON OFFICE

23 BRIDGES & ASSOCIATES
24 Certified Shorthand Reporters
P. O. Box 223
25 Pendleton, Oregon 97801
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1 MR. DANIELLO: Good evening, everybody.
2 Welcome to Hermiston. I will now call the hearing to
3 order. My name is Paul Daniello. And I will be the
4 presiding officer for tonight's hearing.

5 The purpose of this hearing is to take
6 comments on the proposed modification to the Umatilla
7 Chemical Agent Disposal Facility's Hazardous Waste
8 Storage and Treatment Permit.

9 The Department proposes the following two
10 modifications to the permit: One, a condition that
11 will require all incinerator pollution abatement
12 system brines generated during chemical agent
13 destruction operations, that they be treated on-site
14 in the Brine Reduction Area, with the acronym known as
15 BRA.

16 Two, adding a condition that will require
17 the facility to have a fully tested and functioning
18 Brine Reduction Area prior to the start of chemical
19 agent operations for the first incinerator.

20 For the record, today is December 4, 2002.
21 Thank you for taking the time to share your comments
22 with the DEQ.

23 If you want to submit formal comments at
24 this hearing, please sign in and fill out the white
25 registration cards -- they're on the table at the back

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1 there -- so that we can have the correct spelling of
2 your name and your address.

3 You will receive a copy of the notice of
4 decision and the Department's response to your
5 comments.

6 If you want to be on the DEQ mailing list,
7 pertaining to this facility, please indicate that on
8 the registration card. I will call people to comment
9 in order of sign up.

10 This meeting is being tape recorded, and by
11 signing up to testify, you are consenting to be taped.
12 I'd also like to let you know that Oregon law
13 prohibits smoking while the meeting is in progress.

14 It is important to note that we are here
15 today because we want your comments on the proposed
16 modification to the Umatilla Chemical Agent Disposal
17 Facility Hazardous Waste Permit.

18 We appreciate your willingness to take the
19 time to get involved. And we will make sure that
20 everyone that wants to give formal comments has the
21 opportunity to do so. So, please come to the stand
22 when I call your name; and your comments will be
23 recorded.

24 I ask that you please respect the rights of
25 individuals who are making formal comments and do not

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1 interrupt when they are speaking.

2 You may submit oral or written comments at
3 tonight's hearing or send your comments by mail,
4 e-mail, or fax. The addresses and numbers for
5 submitting comments are included on the fax sheet
6 package that's on the back table, that includes the
7 Notice of Public Hearing.

8 The comment deadline for this modification
9 is 5:00 p.m. December 23rd, 2002. And it's important
10 to note that the Department must receive your comments
11 by 5:00 p.m. on December 23rd.

12 With that said, I think we'll begin hearing
13 witness testimony. So I'm going to ask the first
14 witness, Gary Olsen, to please --

15 MR. OLSEN: I would like to wait and be
16 at the end if that's okay.

17 MR. DANIELLO: Sure.

18 MR. OLSEN: Thank you.

19 MR. DANIELLO: Okay. So, Gary would
20 like to wait. Then I invite Casey Beard.

21 MR. BEARD: Good evening. I'm Casey
22 Beard. I'm here tonight speaking on behalf of
23 Morrow County in support of the proposed modifications
24 to the current permit language.

25 The operation of the Brine Reduction Area

1 is a matter of great importance to the Commissioners
2 and citizens of Morrow County.

3 We believe that this is an important
4 clarification so that there's no question of the
5 permit language, whether the Brine Reduction Area will
6 be built as originally intended and operated as
7 intended.

8 We think that this will provide assurance
9 to our Commissioners and our citizens, that in fact, a
10 regulatory plan will be established to ensure that the
11 incinerator facility is, in fact, operated as it was
12 permitted.

13 It will also create a precedent for future
14 issues such as proposals for concepts such as
15 chop-and-drop to ensure that the incinerator that is
16 built and operated is the incinerator that was
17 originally envisioned during the permitting process.
18 Thank you very much.

19 MR. DANIELLO: You're welcome. Thank
20 you, Casey.

21 Okay. Next I'd like to call James Wenzl.
22 Please come on up to the stand, James.

23 MR. WENZL: I want to make it perfectly
24 clear tonight I'm here representing myself. I'm in no
25 way representing WDC for the demilitarization project.

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1 I also represent my family. I do have my
2 wife's permission to speak today on her behalf. I'd
3 also like to make it clear that I'm a resident of
4 Hermiston, Oregon, and a taxpayer in Oregon.

5 I don't want to try and use the term "Army"
6 tonight, commonly referred to as the people who
7 operate the facility and own the facility. To me the
8 Army is the branch of service that men and woman are
9 out there protecting my right to speak here today. So
10 I'll refer to it as the Federal Government, because I
11 believe that's correct.

12 I'll try not to use the term DEQ, because
13 to me, locally, the DEQ is an entity of people who are
14 trying to do their job and trying to do it to the best
15 of their ability. So I believe I'll refer to it as
16 State Government, because that's really what it is.

17 So tonight we have an issue between the
18 Federal Government and the State Government, and
19 that's truly what it is.

20 There are two issues on the table: one's a
21 transportation of brine for disposal off-site; the
22 other one is to have the Brine Reduction Area up and
23 operational prior to chemical operations.

24 The first one I'd like to speak to is the
25 transportation and off-site disposal of brine. Brine

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1 is nothing more than saltwater. Simplistic terms,
2 that's exactly what it is.

3 It's contaminated with heavy metals through
4 the incineration process. That's a fact. The
5 quantity and the level of those metals are generally
6 measured in the parts per million range.

7 If you took a million ping-pong balls and
8 filled them in this room and colored 12 of them red,
9 that would typically represent a single characteristic
10 of a single type of metal. That's the amount we're
11 talking to.

12 I'm not a toxicologist, but I truly believe
13 the sodium in the brine is far more hazardous than any
14 of the metals associated with the brine.

15 The other point I'd to make is the state's
16 intent with the permit modification is to protect
17 human health and the environment.

18 I would disagree with that statement,
19 because to me that would infer that the regulations
20 already mandating the management, transportation, and
21 disposal of hazardous waste are found to be
22 inadequate.

23 I have 12 years of hazardous waste
24 management experience dealing with initial generation
25 of waste, transportation, and ultimate disposal.

1 And I assure you the regulations that the
2 state have out there, the Federal Government, the
3 Department of Transportation have out there, the local
4 counties and municipalities are all designed, all the
5 regulations, are designed to protect human health and
6 the environment; and they're extremely extensive.

7 When we look at the type of disposal that's
8 offered for the brine, there are several options that
9 are out there. There's wastewater recovery, which is
10 an option.

11 The state already recognizes, and the
12 hazardous waste generation feed process, that that is
13 a much more viable source for the disposal of
14 hazardous waste than solidification in a landfill.

15 If the Brine Reduction Area is used, the
16 salts will be dried, and they will be disposed of in a
17 hazardous waste landfill.

18 That is contrary to what Oregon state
19 statute is trying to do with keeping the amount out of
20 the landfill as much as possible; therefore, there is
21 a fee incentive for a generator of hazardous waste to
22 look at a wastewater disposal mechanism.

23 Trying to stipulate whether the brine is
24 treated on-site or whether the brine is shipped
25 off-site, the extensive regulations already provide

1 protection of human health and the environment for
2 off-site disposal.

3 Off-site disposal will offer economic
4 growth. Our new governor in this state is very big on
5 economic growth.

6 We have a lot of different facilities,
7 transporters, and other people involved in the
8 off-site disposal of this, which would give economic
9 growth to the area.

10 I took an opportunity to understand what
11 we're saying. The facility -- the Federal Government
12 is a large quantity generator of hazardous waste.

13 And the first intent of the permit mod is
14 to require a generator of hazardous waste to treat
15 that waste at their own facility.

16 That's a scary thought, because everything
17 that is designed to do right now is to control it,
18 generate it, and send it to a regulated facility.
19 That's exactly where the salt would go if the salt
20 were dried out in the Brine Reduction Area.

21 Protection of human health and of the
22 environment, the big scare I'll say, is the fact that
23 it's a liquid. And the shipment of liquid is somehow
24 different than the shipment of a solid.

25 I will probably give you that, that it is

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1 more dangerous because if you rupture a tanker of
2 liquid, you're going to have a liquid spill. The
3 rupture of container of solids, you're going to have a
4 solid spill, which is easier to clean up.

5 But I took the opportunity to understand
6 what the Department of Transportation was regulating
7 that material as. It is what they call a Class 9
8 Material. It is the most -- let me rephrase that.
9 It's the least regulated material by the Department of
10 Transportation.

11 They've provided an emergency response
12 guide number with the shipment of the material. It
13 sends me directly to a guide that any emergency
14 responder would use in the initial incident of a leak.

15 If the concern is a spill of a brine, the
16 emergency responders would open this. And the first
17 thing that they're to do is to call the emergency
18 response number on the shipping paper, which mandated
19 be provided.

20 The second thing they're to do is to
21 isolate the area to 30 feet. 30 feet. That's how
22 dangerous this is. Ten yards away, I keep people that
23 far away. To me it's pretty tame stuff.

24 The last point I'd like to make is, here,
25 that: If we're requiring generators to treat their

1 hazardous waste on-site, where will it stop?

2 Will the used oil people here who generate
3 their used oil during the week -- which is, by the
4 way, is not hazardous wastes -- what is collected and
5 gathered and taken to Portland and managed as a fuel?

6 Well, I'm sorry to tell you, but if there's
7 a spill of that tanker of oil going from here to
8 Portland along the Columbia River, they will have far
9 more environmental impacts than the brine will. And
10 that is just simply a fact.

11 If the hazards associated with the brine
12 are the concern, my only advice I can give to anybody
13 is "Don't drink it, and you'll be all right."

14 MR. DANIELLO: Thanks, James.

15 MR. WENZL: Thank you.

16 MR. DANIELLO: Okay. Next I'd like to
17 call Mr. Rod Skeen. Good evening, Rod.

18 MR. SKEEN: Good evening. Thank you.
19 I am Rod Skeen. I'm here to represent the Umatilla
20 Tribes, who sort of started this whole process with a
21 letter from the chairman of our Tribe board to the DEQ
22 on this issue.

23 Everything that's been stated so far about
24 the toxicity of the brine is absolutely true. When I
25 appeared before the EQC and gave a presentation, I

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1 provided slides to show that, in fact, the brine
2 really, when you look in the realm of what is
3 transported down the highway, represents a relatively
4 low risk.

5 It also, when you look in the comparison of
6 the permitted emissions from the plant -- it is in
7 terms of the amount of metals that are contained,
8 which are the primary hazardous materials,
9 carcinogenic metals essentially -- it's low compared
10 to for instance what's going to be permitted to come
11 out of the smokestacks if the plant operates with
12 maximum emissions at all times. So that's kind of a
13 caveat on that.

14 But the issue for the Tribe isn't
15 necessarily the toxicity of the brine. The issue for
16 the Tribe comes down to what the Army promised and
17 what was originally permitted.

18 If you look historically -- and this goes
19 back before any of us who are here. These are issues
20 that were promised before any of us, really, were part
21 of this project, this goes back into the early '90's.

22 What was promised was a system that would
23 result in, essentially, no liquid produced in the
24 plant being shipped off-site. Understanding that
25 there are liquids that are being shipped off-site,

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1 things that are brought in, solvents, and so forth.

2 But the basic processing materials that
3 would be left after the incineration process of the
4 chemical munitions would be solid materials including
5 the salt.

6 That particular approach was pushed very
7 hard, was stressed. And then we come to find out now,
8 ten or so years later, that in fact that there is a
9 decision, based on economics, that in fact that Brine
10 Reduction Area isn't going to be operated; there's a
11 desire not to operate it.

12 If you look at the economics, it probably
13 does make a lot of sense to send it off-site. It
14 would cost less.

15 But, again, what it comes back to for the
16 Tribe, for the Tribal board, and the reason why they
17 wrote the original letter was that the Army promised
18 up front before the Tribe, verbally, that that would
19 never happen. And now suddenly it's happening. Okay.

20 Now, from a Tribal perspective, not from my
21 perspective, but from a Tribal perspective, and what
22 our chairman stated in his letter was essentially that
23 verbal promises made are promises that need to be
24 kept.

25 You'll understand that the Umatilla Tribal

1 culture is an oral culture, they're not a written
2 culture. They don't write down their history. They
3 pass thier history down orally.

4 And so the spoken language to them is as
5 important as our national libraries. It is how they
6 transfer information.

7 So consequently, when an oral promise is
8 broken, it is to them as if -- well, as if you've gone
9 and burned down a library for us. You've gone and
10 burned down the Library of Congress.

11 I mean, substantial trust is lost;
12 substantial information is lost. And there's a great
13 inability to then maintain a working relationship with
14 the organization that broke their promise.

15 And that is where the Tribe is coming from
16 on this issue. It has little to do with the toxicity
17 of the waste.

18 I believe that had this issue had come
19 before the community and been discussed with the
20 community prior to, it sort of being made by the
21 Army's part on the charging forward, there may could
22 have even been some kind of dialog had gone and a
23 different decision had come out, it might have come
24 out of our board of trustees. I can't say that, I
25 don't know. I'm not a policymaker. But they

1 certainly would have entertained the ideas and looked
2 at it logically and discussed it.

3 But as our chairman stated in his letter,
4 and as one of our board members stated before the EQC,
5 and that's our last official policymaker's position on
6 this issue, is that the Tribe desires to see the BRA
7 operated and processed in these modifications that the
8 DEQ's proposed for the permit to go forward because it
9 holds the Army to their word.

10 And that's where the Tribe is coming from.
11 Again, all of these other arguments are correct and
12 true, technically. But it does, it comes back to an
13 issue of trust and it comes back to an issue of a
14 promise.

15 And the Tribe, at this point and at this
16 time, at the time of the writing of the letter wants
17 to see the Army held to their word. So, thank you
18 very much.

19 MR. DANIELLO: Thank you, Ron.

20 Gary. Gary Olsen.

21 MR. OLSEN: My name is Gary Olson. I
22 want to make it clear, too, that I'm an employee of
23 the Army. I work for the program manager for chemical
24 demilitarization facility.

25 I am in no way representing them this

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1 evening. I too am a resident of Oregon. And I'm here
2 in that respect.

3 And I wanted to say I have worked in the
4 environmental field for about 15 years. I have a
5 bachelor's degree in chemical engineering, a master's
6 in environmental engineering, and am a licensed
7 professional engineer.

8 I've worked on probably 20 different
9 Superfund and national priority list sites across the
10 country. So I've seen a lot of nasty things. And
11 that's not what we have out there from my aspect as a
12 citizen.

13 But what we do have is pretty scary. And
14 that is a lot of chemical munitions that are there,
15 that has really disrupted the lives of everybody in
16 the communities from the schoolchildren that have to
17 learn what to do in the case of an accident, to those
18 people that have to work out there.

19 And I wanted to say that I agree with what
20 Jim said in terms of the Federal and State Government,
21 to use those terms.

22 I believe that the Oregon Department of
23 Environmental Quality is doing its job, and
24 conscientiously as possible here. And so I will refer
25 to them, too, as the Federal and State Government.

1 I have some particular issues with this
2 permit modification because the main thing that I
3 think that the Army -- or that the Federal Government
4 needs to do out there is to destroy the weapons; and
5 they have an obligation to do that as fast as
6 possible, as safe as possible, with the least amount
7 of harm to the environment.

8 I personally believe, from my experience,
9 that this permit modification does more harm, has more
10 potential harm than good.

11 I will refer to the language here that was
12 handed out. The specific issue I have is with
13 Section II.B.4 on Page 3 of 6, where it says: The
14 Permittee shall process all brines through the
15 abatement system that are generated from that in the
16 Brine Reduction Area.

17 If this are the case, based on my
18 experience with a number of different chemical
19 processes, there will be some point in time that this
20 Brine Reduction Area may not be able to keep up with
21 the amount of brine generated from agent destruction.

22 Based on the language in this permit
23 modification, it would be necessary then for the
24 Federal Government to stop destroying the dangerous
25 weapons so that they could process brine.

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1 We've heard people say that the toxicity of
2 brine is not very much. The process of -- the
3 toxicity of agent, well, it far exceeds -- and the
4 risk far exceeds anything that you might find from the
5 brine.

6 I have particular issue with the way this
7 is written because it does not justify what the State
8 Government is protecting the residents from.

9 That's really the big issue here. What are
10 we being protected from here? Now, if we go back to
11 Page 5 of 6, there's four bullets that the Federal
12 Government need to look at.

13 The first bullet is: Increase on-site
14 brine storage. The second bullet is to: Increase the
15 operational capacity. These items, from my
16 experience, will cost a significant amount of money to
17 the taxpayers. And quite frankly, I don't know what
18 we're buying.

19 If the people who've already spoken, who
20 are very knowledgeable, agree that the toxicity of the
21 brine isn't very hazardous, then what are we buying
22 for our buck? Okay.

23 I believe that there is far greater use for
24 that taxpayer dollar than there is to be spent on
25 this.

1 I take particular issue to Bullet No. 3,
2 because this says that the Federal Government should
3 reduce chemical -- or could look at reducing the
4 chemical agent destruction rate. Again, this places
5 much more harm and potential danger to the public than
6 it does good.

7 The fourth bullet is a reasonable option.
8 This is an example of a business or a federal
9 organization conducting business in accordance with
10 all laws, rules, permit conditions in the State of
11 Oregon.

12 And the State of Oregon has said, "We don't
13 like the way you're doing that. Even though it's in
14 compliance, we want you to do it this other way."

15 If I were a business and I saw this coming
16 my way, I would be scared to death. And the economy
17 in the State of Oregon is one of the worst in the
18 country right now.

19 It's important that we not place any
20 roadblocks in front of industries that may be law
21 abiding by the laws of Oregon.

22 So, the other issue that I would like to
23 address is something about what the federal
24 commitments are to the people of Oregon.

25 There has been mention of commitments and

1 promises that the Federal Government has made. I as a
2 taxpayer fully want the Federal Government to live up
3 to its promises and commitments.

4 But I also understand that their
5 commitments need to be prioritized. And the greatest
6 commitment that I think the Federal Government has,
7 for me as a nearby resident, is to destroy the weapons
8 as fast, as safe, as cheap as possible with minimal
9 impact to human health and the environment.

10 This permit modification, I mean, would
11 address one of the commitments of processing the brine
12 to the BRA. But if that commitment interferes with
13 that first commitment of destroying the weapons, then
14 that needs to be prioritized.

15 And I fully expect, as a taxpayer, that the
16 Federal Government would prioritize those commitments
17 and do what's right. Thank you.

18 MR. DANIELLO: Thank you, Gary.

19 Any other witnesses that wish to offer
20 testimony tonight? I guess not. Let the record show
21 it is 1927 hours.

22 And if there's no other comments, I thank
23 you all for your attendance here. And wish you safe
24 travels home. The hearing is closed.

25 (7:27 p.m.)

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1 STATE OF OREGON)

2)
3 County of Umatilla)
4

5 I, Susanne Starkweather, do hereby certify
6 that at the time and place heretofore mentioned in the
7 caption of the foregoing matter, I was a Professional
8 Shorthand Reporter and Notary Public for Oregon; that
9 at said time and place I reported in stenotype all
10 testimony adduced and proceedings had in the foregoing
11 matter; that thereafter my notes were reduced to
12 typewriting and that the foregoing transcript
13 consisting of 20 pages is a true and correct
14 transcript of all such testimony adduced and
15 proceedings had and of the whole thereof.

16 Witness my hand at Pendleton, Oregon, on
17 this 28th day of December, 2002.
18

19
20
21 

22 Susanne Starkweather

23 Professional Court Reporter

24 Notary Public for Oregon

25 My commission expires: 12-26-2004

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ATTACHMENT E

Written Comments received related to Proposed Permit
Modification No. UMCDF-02-039-BRA(EQC).

DEQ ITEM NO.	TITLE	PAGE
02-2018	Comments of Mr. John Herron, Hermiston	E-1
02-2089	Comments of Mike and Denise Strong, Hermiston	E-11
02-2070	Comments of Mr. John Ledger, Associated Oregon Industries	E-13
02-2005	Comments of Mr. Casey F. Beard, Emergency Management Director, Morrow County	E-14
02-2119	Comments of Mr. Michael W. Brady, General Manager, Philip Services Corporation	E-15
02-2118	Comments of Ms. Karyn Jones and 8 individuals, representing G.A.S.P. and Oregon Wildlife Federation	E-17
02-2117	Comments from UMCDF Permittees	E-25

02-2018

December 6, 2002

DEQ Chemical Demilitarization Program
256 E. Hurlburt
Suite 105
Hermiston, OR 97838

STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY
RECEIVED

DEC 09 2002

HERMISTON OFFICE

Dear Sir or Madam:

SUBJECT: COMMENTS ON PROPOSED MODIFICATION OF THE HAZARDOUS WASTE STORAGE AND TREATMENT PERMIT FOR THE UMATILLA CHEMICAL AGENT DISPOSAL FACILITY (PERMIT NO. ORQ 000 009 431) [PMR #. UMCDF-02-039-BRA(EQC), "REQUIRED OPERATION OF THE BRINE REDUCTION AREA"]

After reviewing the referenced permit modification proposal submitted by the Department of Environmental Quality (DEQ)/Environmental Quality Commission (EQC), it is my belief that this is an unnecessary permit modification and should not be approved by the EQC. My beliefs are based on the laws that are already established by the Resource Conservation Recovery Act (RCRA) and adopted by the State of Oregon, that mandate how hazardous waste will be managed. The Umatilla Chemical Disposal Facility (UMCDF) is already required by permit to verify all brines meet the criteria for agent-free prior to processing the brines in the brine reduction area. I adamantly concur with the State of Oregon that hazardous wastes not meeting the agent-free criteria shall not be shipped offsite. However, in accordance with state and federal regulations, it is the generators responsibility to properly manage hazardous wastes in accordance with the existing regulations. Is it not implied, that by managing hazardous wastes according to all applicable regulations, this includes Department of Transportation, that this is an acceptable risk to the public? If so, why does DEQ/EQC feel the need to restrict a generators ability to manage hazardous waste in accordance with the existing regulations? In accordance with 40 CFR 270.41, cause must exist for DEQ to modify the permit. In doing so, DEQ must justify that the permit modification is necessary to protect human health and the environment. In this PMR, DEQ has put the burden on the generator to establish this basis.

As a citizen of Hermiston, Oregon, this is the wrong message to be sending to any hazardous waste generator or other entity that may need or has a permit with DEQ. At this time, Oregon is struggling with unemployment and seeking several initiatives to stimulate Oregon's economy (The Oregonian, November 20, 2002, "Group Suggests Initiatives to Spur Oregon's Economy"). It is my belief, that industry or business may be deterred from establishing businesses in Oregon if the regulatory climate is one that can administer rules selectively without justification. "The Oregonian" reported on December 3, 2002 Governor elect Kulongoskis' economic strategy and its plan to aggressively recruit new business. In the article by Ted Sickinger, he states; *"the policies mimic those that Governor Vic Atiyeh used to dig the state out of its economic hole in the early '80s, focusing on specialized, export-oriented businesses such as high-tech, specialty agriculture and sports apparel."* These industries generate hazardous wastes and must manage those in accordance with the applicable regulations. Industry and business come to Oregon knowing the rulebook they will have to follow. Business calculates whether

JOHN HERRON
325 SE 9TH DRIVE
HERMISTON, OR 97838

Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting

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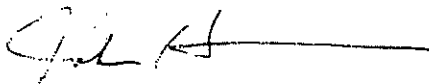
December 4, 2002

or not the rulebook will allow them to be successful. If the perception is that the state can discriminatively apply rules based on industry type without just cause, they may seek to establish their industry in other states.

The greatest risk to my family and I is from the continued storage of the chemical munitions. The risk of storage is considerably greater than that of incineration (*The U.S. Chemical Weapons Destruction Program: Views, Analysis, and Recommendations*, The Henry L. Stimson Center, 1994). This permit modification appears to place a greater priority on processing non agent-contaminated hazardous wastes than the destruction of chemical agent. As a citizen, I expect the DEQ/EQC to ensure that changes made to a permit, irregardless of the permit being associated with hazardous wastes, waste water, air or other environmental media, be issued with a basis that this modification is absolutely necessary to protect human health and the environment. In this case, the burden is on DEQ/EQC to provide the data that shows this is necessary to support the permit modification.

I look forward to receiving answers to my comments from the department.

Sincerely,



John Herron

Enclosure (2)

JOHN HERRON
325 SE 9TH DRIVE
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Group suggests initiatives to spur Oregon's economy

11/20/02

TED SICKINGER

Budget crisis or not, Oregon needs to invest in the foundations of its high-tech economy -- or risk watching it wither.

So insists a group of business leaders, educators, researchers and bipartisan politicians chartered by the 2001 Legislature to find ways to ease collaboration and increase "knowledge-based" economic development in the state.

The group, known as the Oregon Council on Knowledge and Economic Development, or OCKED, met Monday in Corvallis to give final approval to a broad set of recommendations that members say are crucial to the state's economic future, despite the potential sticker shock.

The council is recommending \$36 million in new state and federal spending to foster high-quality research and development in Oregon, speed the commercialization of technologies developed here, attract new sources of venture capital and develop a strategy to keep the state's work force on the leading edge.

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 Required Operation of the UMCDF BR/
 July 17-18, 2003 EQC Meeting

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Those broad-based goals are backed by specific recommendations that range from the establishment of nationally recognized "signature" research centers to offering income and capital-gains tax breaks to lure individual venture capitalists and entrepreneurs to Oregon.

The council will begin a full-court marketing press in coming weeks, hoping to convince legislators, newspaper editorial boards and Governor-elect Ted Kulongoski that the recommendations should be built into the new budget, despite the current fiscal crisis.

Economic development has become a top priority for business and political leaders as Oregon looks for a way out of its lingering recession, persistently high unemployment rate and deepening budget crisis. But the state has little discretionary money, or precedent, of investing in such initiatives.

Council members stressed that the recommendations focus on areas promising significant returns in terms of more, higher-paying jobs and an increased tax base.

"This is less than 1 percent of the discretionary part of the general fund," said Allen Alley, chairman of the council and chief executive of Tualatin-based Pixelworks, which makes chips that control video images. "That's not a huge commitment when you're talking about nurturing and growing the cornerstone of our economy. The return they can give far exceeds the investment we're asking to be made."

The council supports two longstanding priorities of the technology community: doubling the number of engineering graduates in the state and creating a top-tier engineering school, at a total cost of \$40 million.

The largest new initiative is \$10 million in state funds to create a signature research center, which the council hopes would attract an additional \$20 million in federal funds. The proposed pilot center would develop miniature devices and materials used in energy, environmental and biological systems.

Examples of such systems include fuel cells, automotive heating and cooling systems, bio sensors and microreactors for water purification and toxic-waste remediation.

The area was selected based on current research activities at Oregon universities, ties to existing industry and the potential to create new businesses and jobs.

"We can't out-M.I.T. M.I.T. or out-Stanford Stanford. We've got to go where they're not," said Jim Johnson, a council member and former Intel executive. "What we would be striving for is to become the leader or one of the top leaders in this area, with more researchers and more research dollars being expended here than anywhere else."

Some of the more controversial recommendations aim to enhance the investment climate in Oregon, namely a recommendation to eliminate the state's capital gains tax and a plan to offer tax breaks to individual venture capitalists and entrepreneurs who agree to live and invest here.

Oregon, said committee member and venture capitalist Scott Gibson, is considered a third-tier state in investment opportunities. And unless



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Oregon creates the right environment to attract world-class venture capitalists, it will undermine its ability to create successful start-ups such as Mentor Graphics and Sequent Computer Systems.

One potential program: eliminate income taxes for venture capitalists who can certify that they have invested \$2 million annually in Oregon and have access to untapped funds of at least \$80 million.

"What we're talking about is applying some of the same ideas that we've used to attract companies to individuals," Alley said. "Let's recognize that there's been a shift. In an economy where wealth is created by ideas, we're marketing our state to individuals rather than multinational companies. How do we attract and retain these individuals?"

A number of the council's recommendations have no cost, such as aligning the missions of the Oregon University System and the Oregon Economic and Community Development Department to focus on turning their ideas into viable sources of revenue.

Another example would have Oregon's public universities streamline approval of contracts so they can work more effectively with the private sector.

The committee also recommended a variety of proposals to enhance the competitiveness of Oregon's work force, from improving teacher training and increasing technology use in classrooms, to developing a roadmap for the state's work force based on high-demand occupations.

Council members acknowledged Monday that a marketing message would play a crucial role in garnering support in the proposals. Some, such as Gibson, openly said that they were unlikely to have the full spending plan approved.

Others, such as Johnson, said the state should spend the entire \$76 million -- including efforts to bolster engineering education -- or forget the whole thing.

"There isn't a CEO anywhere in the world who can't take less than 1 percent of his budget and focus it on their strategic future," Johnson said. "It's time for Oregon to make that decision. It's time for Oregon to rally around a solution."

Ted Sickinger: 503-221-8505, tedsickinger@news.oregonian.com

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News

Kulongoski developing his economic strategy % %head%%Economic plan developed on industrial land

12/03/02

TED SICKINGER

Behind closed doors, Gov.-elect Ted Kulongoski and business leaders are planning a return to aggressively recruiting new businesses, bolstering entrepreneurship and offering incentives for job creation. The developing strategy would shift Oregon's economic development efforts away from a decade of policies aimed at controlling growth and promoting rural development.

In many ways, the policies mimic those that Gov. Vic Atiyeh used to dig the state out of its economic hole in the early '80s, focusing on specialized, export-oriented businesses such as high-tech, specialty agriculture and sports apparel. These types of industries create higher-paying jobs and more taxes but typically reside in urban areas.

While acknowledging the limits of his economic influence and the current budget, Kulongoski insists much can be done -- and with little money.

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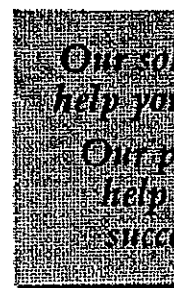
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"One thing I know," Kulongoski said last week, "I can't solve the financing side unless we grow the economy and create more living-wage jobs. That's the punchline to the whole thing: It is the economy."

Kulongoski has said for months that his No. 1 priority is to reignite Oregon's stalled economy and create jobs. But those campaign pledges were accompanied by few details or specific initiatives.

The broad outlines of a plan are falling into place. They take center stage Monday, when Kulongoski co-sponsors an economic summit at the Oregon Convention Center, where 650 business and legislative leaders will gather to discuss Oregon's economic future.

Kulongoski said his strategy includes short-term measures to stimulate economic activity.

That will be coupled with long-term efforts to overhaul the state's economic development department, to increase the availability of shovel-ready industrial-zoned lands, and to streamline regulations.

Out of the chute In the first weeks of the Legislature, Kulongoski said, he would unveil pragmatic measures to stimulate economic activity and to establish momentum. Those include a bonding measure to repair bridges -- possibly supported by an increase in the gas tax or vehicle registration fees -- and other transportation-related public works projects that could be supported by tolls.

His short-term playbook is being crafted by former Gov. Neil Goldschmidt and a transition team weighted heavily toward business executives. Goldschmidt, accompanied by a small band of government and business leaders, barnstormed the state before the election, holding closed-door meetings with area leaders.

The meetings, held under the banner of "Shortening the distance between a good idea and 'yes,'" generated a list of specific ideas that could be incorporated into a 90-day legislative plan.

Examples included streamlining the process governing the transfer of water rights, building a highway rest area south of Medford and developing more consistent marketing for state tourism.

The supply of and restrictive zoning on industrial land emerged as a consistent theme.

Business groups throughout the state want industrial land to receive the same land-use priority as farm and port land.

In the Portland metro area, that means more industrially zoned land to accommodate big manufacturers. In Medford, leaders envision rezoning some of the unused pear-packing plants and timber mills.

In Pendleton, the overwhelming wish was to improve access from Interstate 84 to the local airport and surrounding industrial land by building a road through farm-zoned land.

Goldschmidt told participants that Kulongoski could introduce a bill in the first weeks of the Legislature that addresses issues on specific plots of

**Required Operation of the UMCDF BRA
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land that Kulongoski said his transition team is now studying.

"It's not like he's going to wave some magic wand; we just want some help getting this through," said Tim O'Rourke, a Pendleton attorney. "I came out of the meeting feeling like these guys can really get some things done, but I'm curious as to what happens now, whether we're really going someplace."

The transition team also has formed a group to undertake a top-to-bottom review of the Oregon Economic and Community Development Department.

Kulongoski said he wanted to establish a clear objective for the department and to build a larger strategic reserve fund to recruit and retain businesses.

Marty Brantley, retired president of KPTV Portland and a member of the Portland branch of the 12th Federal Reserve District, leads the group. But recent comments by Goldschmidt may provide the best clues to its direction.

Addressing the Association of Oregon Counties two weeks ago, Goldschmidt said the state should redirect its economic development dollars back to recruiting and retention of businesses in urban areas, rather than improving rural infrastructure such as water and sewer systems, which has failed to create jobs.

Kulongoski said he agrees with that premise.

"Part of being smart and doing the best thing for Oregon is to recognize that when the large businesses and large urban areas of the state prosper, we generate the resources we need to make the investments in all of Oregon," he said.

"It's not that the investment in smaller communities isn't important, but it has to be viewed in total, and we have to do some things first."

Many rural communities are interested in seeing Kulongoski ease restrictions on timber sales to create jobs. In at least one meeting, Goldschmidt floated the idea of using the state's borrowing capacity to buy big tracts of federal forest lands in Oregon, then increasing timber sales to pay off the debt.

Kulongoski didn't address that idea but did say he was interested in strengthening the state's natural-resource industries.

"I'm running these ideas by a lot of people to make sure we can get some buy-in from them," Kulongoski said. "The Legislature is going to get focused very quickly on the numbers. If we can have a process in which we can start saying 'yes' together in the first 30 to 60 days, I think we'll be better off when these big philosophical issues come along that we may differ on."

Business Interests For the past year, a veritable alphabet soup of business organizations has studied the state's economy.

The mother lode of all recommendations will appear Monday. That's

Required Operation of the UMCDF BRA
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when the Oregon Business Council has invited 650 guests -- including Kulongoski and Sens. Gordon Smith and Ron Wyden -- to the Oregon Convention Center for the unveiling of its Oregon Business Plan.

OBC executive director Duncan Wyse said his group has worked on the plan for nine months. It has held focus groups throughout the state, tapped economic consultants and solicited research from other experts to identify Oregon's best economic opportunities and the barriers to them.

He described the resulting recommendations as "a strategic framework" that will help guide policy discussions on land use, technology transfer, K-12 and higher education, transportation, natural-resource policy, and public finance.

Included in the plan are recommendations issued last week by the Oregon Council on Knowledge and Economic Development, a group of business leaders, educators and politicians chartered by the 2001 Legislature to increase high-tech development.

The council's plan would spend \$76 million to bolster engineering education, to create "signature research centers," and to promote technology transfer from universities to the private sector.

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02-2089

Mike and Denise Strong
467 NE Montana Avenue
Hermiston, OR 97838

Ms. Sue Oliver, Acting Administrator
Chemical Demilitarization Program
256 E. Hurlburt
Hermiston, OR 97838

STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY
RECEIVED

DEC 23 2002

SUBJECT: Public Comment - Required Operation of the Brine Reduction Area

HERMISTON OFFICE

Dear Ms. Oliver,

I am submitting formal comments on the Department of Environmental Quality sponsored permit modification that will require the use of the Brine Reduction Area (BRA) at the Umatilla Chemical Agent Disposal Facility (UMCDF). These comments are being made as residents of Hermiston, Oregon.

I am familiar with a similar facility (Tooele Chemical Agent Disposal Facility or TOCDF) located in Tooele, Utah. In fact, the TOCDF has destroyed their entire stockpile of GB agent, which amounts to over 12 million pounds. This is 50% more than the entire stockpile at UMCDF. Not only are the UMCDF and TOCDF similar facilities, but the TOCDF also was faced with brine processing issues. The TOCDF has shipped brines off-site for treatment throughout the entire GB campaign.

The DEQ proposed requirement to process all brines at the UMCDF does not seem to be in the best interest of the residents of the area. I am concerned that the DEQ is drawing an arbitrary line and have not considered the implications of the action proposed. The shipment of brine in tankers over the highway does not represent any increase in meaningful risk. I would much rather accept the fact there would be additional tankers on the highway than continue to store chemical weapons.

The DEQ has acknowledged that there is nothing that prohibits the shipment of wastewater or brines (Wayne Thomas, 1 Feb 02). It appears that DEQ is much more interested in controlling commerce than protection of human health and the environment. Has DEQ performed a risk assessment that supports this PMR? This should be clearly stated.

I attended the public hearing on this issue and a commenter expressed that this was a dispute between state and federal government. If the DEQ wishes to pursue a course of punitive action against the federal government for not fulfilling commitments, then they should be much more forthcoming with this strategy. The UMCDF has stated that the BRA will be used. If the DEQ feels compelled to require use of the BRA, then simply require the UMCDF to have it operational for the start-up of agent operations. But please don't require the shutdown of agent operations due to any potential limiting factors from the BRA.

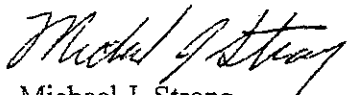
Required Operation of the UMCDF BRA
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I do find it somewhat disheartening that the strongest proponents to this action are people that live many miles away or in another state. Two of these proponents are in the process of leaving or have left their positions since the time when this was initially proposed.

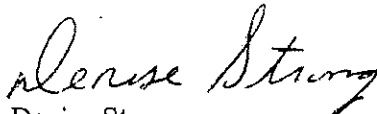
I would like two questions to be answered to justify this proposal:

- 1) What risk is DEQ eliminating, creating or extending as a result of this PMR?
- 2) How does this PMR support the DEQ Chemical Demilitarization Mission statement?
- 3) What other industrial facilities has DEQ required to treat all liquid waste and will this be a requirement for all industries in the future?

Please carefully consider the decision that you are making.


Michael J. Strong

I also support the comments that are being submitted.


Denise Strong

1149 Court Street NE
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December 19, 2002

Ms. Ann Mayes, Public Information Specialist
Oregon DEQ
Chemical Demilitarization Program
256 E Hurlbut Avenue
Hermiston OR 97838

FAX: 541-567-4741

Subject: Comments Concerning Permit Modification Number UMCDF-02-039-
BRA (EQC) "Required Operation of the Brine Reduction Area"

Dear Ms. Mayes:

Please accept these comments to this proposed permit modification.

Associated Oregon Industries is very concerned about the policy and precedent being set by this proposed modification.

The conditions of this proposed modification would prohibit the facility from shipping wastes off site even if done in full compliance with Oregon regulations, and then preclude them from using off site facilities that specialize in hazardous waste treatment. This change is being proposed despite permittee objections. The proposal itself contains no environmental, health or safety rationale or analysis supporting the proposed change.

We do not think DEQ should prohibit activity otherwise allowable when regulatory requirements are met. But beyond this, DEQ could do almost nothing worse to discourage business investment in this state than to make its regulatory impositions unpredictable or to impose restrictions on activity without demonstrated environmental, health or safety benefits.

Thank you in advance for your consideration of these comments.

Sincerely,

John Ledger
Legislative Representative

Environment, Natural Resources & Transportation

Required Operation of the UMCDF BRA
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MORROW COUNTY EMERGENCY MANAGEMENT

325 Willow View Dr. • P.O. Box 622
Heppner, OR 97836
(541) 676-5161
Fax (541) 676-9454

02-2005

December 4, 2002

Ms. Sue Oliver
Department of Environmental Quality
256 East Hurlburt, Suite 117
Hermiston, OR 97838

Dear Sue:

Morrow County strongly endorses the Department of Environmental Quality's (DEQ) proposed requirements to insure that the Brine Reduction Area is utilized as intended during the operation of the Umatilla Chemical Weapons Demilitarization Facility. Specifically, the Morrow County Court supports the DEQ permit modifications that require the following:

1. That all brines generated by the demilitarization process be treated to the "agent free" level in the Brine Reduction Area.
2. That the Brine Reduction Area must be completed and fully operational prior to the initiation of chemical agent trial burns.

Morrow County considers this to be a matter of great importance. Army officials have maintained that the Brine Reduction Area would be an integral component of the demilitarization facility. Army officials have repeatedly informed the Morrow County Commissioners that the incineration processes is based on fully proven, operational technology - to include the Brine Reduction Area. To not complete or use the Brine Reduction Area will be viewed as a breach of faith by Army officials, essentially creating a "bait and switch" approach to regulatory oversight and operation of the demilitarization facility.

Your consideration in this matter is greatly appreciated.

Sincerely,

A handwritten signature in cursive script, appearing to read "Casey F. Beard".
Casey F. Beard
Director

From: MAYES Ann
Sent: Monday, December 23, 2002 2:19 PM
To: FONSECA Stacy
Subject: FW: Public Comment

Hi Stacy,

This came in today. I have already confirmed receipt of the comments.

Thanks,
Ann.

-----Original Message-----

From: Brady, Mike [mailto:MBrady@contactpsc.com]
Sent: Monday, December 23, 2002 2:16 PM
To: MAYES Ann
Subject: Public Comment

December 23, 2002

Ms. Ann Mayes
Chemical Demilitarization Program
State of Oregon Department of Environmental Quality
256 E. Hurlburt
Hermiston, Oregon 97838

Transmitted by Electronic Mail: mayes.ann@dequ.state.or.us
<mailto:mayes.ann@dequ.state.or.us>

Subject: Public Comment on Permit Modification No. UMCDF-02-039-BRA (EQC)

Philip Services Corporation (PSC) is a worldwide leader in industrial outsourcing, waste management and transportation. We appreciate the opportunity to comment on the Proposed Modification of the Hazardous Waste Storage and Treatment Permit for the Umatilla Chemical Agent Disposal Facility (Permit No. ORQ 000 0009 431). We understand that the State of Oregon Department of Environmental Quality (DEQ) along with the Environmental Quality Commission (EQC) is proposing modifications to the Umatilla Chemical Agent Disposal Facility that will prevent the owner/operator from disposing of certain wastewater streams offsite.

PSC's Kent Facility is currently managing offsite wastewaters generated from the UMCDF trial burn process. The material is generated in the exhaust scrub process where water is used to cool and remove heavier particulates in the off gases generated during incineration. The resultant material contains low levels of metals, which are easily removed by precipitation and the resulted sludge is stabilized and sent to a Subtitle C landfill. The wastewater carries a "U" Code due to its source, but all organics are destroyed in the burn process, thus the wastewater is very low risk material..

STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY
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DEC 23 2002

HERMISTON OFFICE

At the Kent Facility, PSC maintains a Waste Minimization Plan and is currently developing and implementing an Environmental Management System (EMS) that will be consistent with ISO 14001 standards. Additionally, PSC is evaluating additional treatment methods and technologies to enhance capabilities and meet new federal wastewater treatment requirements. Shipment of this type of material to the Kent facility for treatment is a safe alternative to the delays and additional resources associated with onsite treatment.

PSC transports the wastewater in company-owned, licensed tankers and vacuum trucks. To date, we have managed more than 600,000 gallons of this material without incident. Our transportation group has an excellent safety record and has been moving hazardous waste in the Pacific Northwest for more than 20 years.

PSC has the resources and the expertise to safely manage this material and we welcome questions or inquiries regarding our operations, training or compliance history. Creating limitations to safe and effective disposal options would actually be counterproductive to DEQ and EQC's goal of minimizing the overall risk to human health and the environmental as stockpile destruction delays would be inevitable. In summary, we suggest DEQ and EQC allow flexibility in the proposed permit conditions to allow the continued shipment of low risk wastewater streams offsite.

Again, thank you for the opportunity to comment. Should you have any questions, please do not hesitate to call me at 1-800-547-2436.

Sincerely,

Michael W. Brady
General Manager
PSC
Washougal WA

FONSECA Stacy

From: OLIVER Sue
Sent: Monday, December 23, 2002 4:02 PM
To: 'Karyn J. Jones'
Cc: MAYES Ann; FONSECA Stacy; BEAM Tom G
Subject: RE: Comments MOD UMCDF02039BRA(EQC)

Your comments have been received Karyn.

Stacy, Please log these comments in for Permit Mod UMCDF 02-039-BRA(EQC) as being received today.

Thanks

(Merry Christmas Karyn!)

Sue Oliver
Oregon DEQ
Chemical Demilitarization Program
541-567-8297 (ext. 26)

-----Original Message-----

From: Karyn J. Jones [mailto:karynj@oregontrail.net]
Sent: Monday, December 23, 2002 3:47 PM
To: OLIVER Sue
Cc: Richard E. Condit; Stu Sugarman; J R Wilkinson
Subject: Comments MOD UMCDF02039BRA(EQC)
Importance: High

December 23, 2002

Ms. Sue Oliver, Acting Director

Chemical Demilitarization Program

Oregon Department of Environmental Quality

Eastern Region, Hermiston Office

256 E. Hurlburt

Hermiston, OR 97838

RE: Permit Modification No. UMCDF-02-039-BRA(EQC)

Required Operation of the Brine Reduction Area (BRA)

Umatilla Chemical Agent Disposal Facility (UMCDF)

DEQ Item No. 02-1844

Dear Ms. Oliver:

Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting

On behalf of GASP, the Oregon Wildlife Federation, myself, Merle C. Jones, Mark R. Jones, Susan L. Jones, Debra McCoy Burns, Stuart Dick, Jan Lohman, Judy Brown and Gail Horning, I submit the following comments, which are in response to the Department of Environmental Quality November 1, 2002, Request for Comments and Notice of Public Hearing for the referenced Permit Modification. The Department also established a comment deadline of 5:00 pm, on December 23, 2002, and we anticipate that our comments will be entered into the administrative record.

Let me begin by answering the essential question asked by the Department: *We fully believe, "there is a need to impose these additional requirements."* And in our opinion, the State has been too lax in enforcing provisions of the permit and this one must not "slide." Since the Department also is seeking information on the following, I will respond to them directly once general comments are complete:

1. The language of the new Permit Conditions.
2. Additional information "that will allow a more complete assessment of the UMCDF operational impacts from these proposed changes."
3. Information "that will allow a full evaluation of [outlined] alternative PAS brine waste management approaches."
4. PAS brine management schemes "when the [BRA] is unavailable for treatment."

General Comments:

1. *The Department in its Public Notice states that information on this proposed modification is available for review at the listed information repositories, which was not true.*

I received the Public Notice for this modification in the mail. When I and others went to the Hermiston and Pendleton Public Libraries to review the information as per the Notice, we were unsuccessful. This is not the first instance when the repositories are supposed to have information for review and did not or could not locate the pertinent documents.

Based on our observations the repositories do not receive financial support nor have they received document management rules to effectively inventory, maintain, or retrieve relevant information. We expect this is true for the other facilities; therefore, adequate resources and direction should be provided by the Department to the repositories to ensure complete, timely, and proper public access for information review.

Future public notices should be modified to also state on the first page the section now titled "What Changes are Proposed," rather than being two

Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting

sentences on the second page. This section therefore should receive top-billing and it should provide more detail.

I did finally receive the information packet after a direct plea to the Department's Hermiston staff, and I appreciate their initiative. The packet contained the following: 1) Fact Sheet; 2) Copy of Public Notice; 3) Copies of five recent [BRA] correspondences; and, 4) List of previous BRA permit modifications.

The five recent correspondences are summarily titled: the February 1, 2002, DEQ-Thomas letter to Permittees; the February 8, 2002, DEQ-Hallock letter to Army-Bacon; the March 5, 2002, Permittees letter to DEQ-Thomas; the May 7, 2002, Umatilla Tribes letter to EQC-Eden; and, the August 21, 2002, EQC-Eden letter to Umatilla Tribes.

According to the February 8, 2002, letter from Department Director Ms. Stephanie Hallock to Mr. James Bacon, Program Manager for Chemical Demilitarization, the Department has an "unwavering commitment to the public and permit processes" and I salute that statement. Given the electronic sophistication of the Department, however, there is no reason that this and other information is not available through the World Wide Web. Claims of national security are a ruse, particularly in this case.

Nevertheless, the Fact Sheet is informative and well written and its Attachments are relevant and valuable, yet we have the following observations about its contents.

2. The Department, in the Location and Purpose section on page 2 of 6, states in the first paragraph that the facility "will use four incinerators to destroy" the stockpile.

This section and the subsequent section "Description of the UMCDF" provide us proof that the State authorized removal of the Dunnage (DUN) incinerator. This is a "big deal."

3. The Department asked four questions through its Fact Sheet, as identified above, which clearly illustrates the need for a Class III permit modification process.

The exchange of letters between the Department and the Permittees document the divergent views on what "maximum protection to the public" means and this critical difference is short-changed by not requiring a Class III modification process.

In its February 1 letter, the Department's Chemical Demilitarization Program Administrator Mr. Wayne Thomas recounted to the Permittees the history of the Army's commitment to processing secondary wastes on-site, and that "it appears the Permittees place a larger emphasis on attempting to maintain the current planned operational schedule than on fulfilling commitments

made previously to the State of Oregon and its citizens."

The Permittees confirm this in their March 5 response when they state that they achieve maximum protection "by ensuring agent destruction operations are our focus and are not delayed by issues presenting little to no public risk." We couldn't disagree more with the Army's notion of maximum protection.

By focusing on schedule or costs other projects have ended with catastrophic results (e.g., Titanic and Challenger, to name obvious ones), and the Army's response reveals their cavalier disregard for public concerns because there is no other more hazardous undertaking than burning 3,717 tons (7,434,780 pounds) of chemical agent in the richest food production area in the Northwest. Maximum means highest degree and it means paying attention to "little risks."

The State's effort to compel the Permittees to "utilize the [BRA] for treatment of all brines generated" represents only one issue where the Army has back-peddled (e.g., DUN). These points are crystallized in the February 8, 2002, letter from Department Director Ms. Stephanie Hallock to Mr. James Bacon, Program Manager for Chemical Demilitarization, where she unequivocally states that "schedule pressures to begin surrogate operations may compromise safety and compliance with the hazardous waste permit." She continues on to recount other serious short-cuts the Army wanted (e.g., the Independent Engineer Facility Construction Certification process), yet her letter ends by extolling the partnership between the Army and the State. This coziness troubles us.

We believe that the Army's schedule and costs are secondary concerns when undertaking such a potential catastrophic activity, and we implore for a Class III permit modification process. This request is made because the contradictory definitions of "maximum protection to the public" reveals a deeper schism between the expectations of the Department and Oregon citizens, the issued permit, and the Army's finagling of words and its use of fear to maintain its objective.

4. The Department, through its Fact Sheet, does not identify what changes they implemented to avoid the problems revealed by BRA failures at the Tooele, UT, facility (TOCDF).

While the List of UMCDF-BRA Permit Modifications is a great aid, there is no summary of the changes that each represents nor is there a DEQ Item Number. In the future, we would appreciate these supplements and our access to those references.

As noted by the listed BRA modifications and the November 13, 2002, redirect testimony of Ms. Sue Oliver (V17B, pgs 85-88), the Department and the Permittee have made numerous UMCDF modifications based on TOCDF experiences. Ms. Oliver stated that they have "changed the type of bag" used

by the BRA to capture air emissions, and that "the Army folks and WDC could also learn by that in terms of the material you use to pre-coat the bags and that a long period of inactivity...that the material in the bags just started to degrade or in this case, the material turned to concrete and solidified."

It's unclear whether these changes represent minor modifications or wholesale redesign. Therefore, the State should sum the modifications to date and demonstrate the effectiveness of those modifications.

4. The failings of the BRA should have been apparent during the drafting of the permit.

We (Petitioners) documented the failings of the BRA to the Department in our April 14, 1997, Petition for Reconsideration, which was attached to the Department's May 8, 1997, staff report for the June 6, 1997, Environmental Quality Commission meeting. Furthermore, we submitted evidence of this during the public comment period.

On page 9 of our Petition, we state that "At present, the brine reduction area (BRA) is not operational at the [TOCDF]." To further underscore our concern, we then noted that "Operation and permit compliance of the BRA at JACADS was not demonstrated fully during [Operational Verification Testing]. The BRA did not function properly during OVT1 and OVT2, leading to large quantities of brine wastes to be handled, stored, and disposed of by shipping to the U.S."

We then offered this obviously ignored conclusion: "the Commission should anticipate that the BRA as planned by the Army will not function, requiring disposal of wastes that would have been treated by the BRA at other facilities. This change significantly alters the make-up of the proposed facility and requires additional risk analyses that consider the disposal activities absent the BRA."

5. To now force the operation of the BRA may in fact increase public risks because additional handling, storage, and disposal actions are required.

The Department is in a quandary because the BRA was certified by the Department and confirmed by the Environmental Quality Commission as Best Available Technology (e.g., mature and proven), which is now debunked.

The Department must undertake an aggressive analysis to complete a new risk paradigm that accurately reflects the build environment, something akin to the Independent Engineer Facility Construction Certification process mentioned by Ms. Hallock in her February 8 letter.

Let me restate the four questions to begin our structured responses:

1. The language of the new Permit Conditions.

2. Additional information "that will allow a more complete assessment of the UMCDF operational impacts from these proposed changes."

3. Information "that will allow a full evaluation of [outlined] alternative PAS brine waste management approaches."

4. PAS brine management schemes "when the [BRA] is unavailable for treatment."

6. Comments on the language of the new permit conditions.

While the new conditions listed as II.B.4. and D.12. appear complete, we're troubled that there isn't a definition in the permit for "brines." The U.S. Army Corps of Engineers in its Johnston Atoll Chemical Agent Disposal System (JACADS), Final Supplemental Environmental Impacts Statement (December 1988) used this definition: "Liquid mixture of inorganic salts resulting from chemical reactions within the pollution abatement system scrubbers." If this accurately reflects the Department's intention, it should be added to Section I.B., Definitions.

7. Additional information "that will allow a more complete assessment of the UMCDF operational impacts from these proposed changes."

The BRA has undergone major modifications and without a thorough report describing those changes it's unclear as how we can add to "a more complete assessment." This request clearly demonstrates the need for a Class III process where more information is revealed and analyzed, and where other resources can be utilized to fulfill this request. We believe however in the sincerity of the Department's request.

8. Information "that will allow a full evaluation of [outlined] alternative PAS brine waste management approaches."

It is unfortunate that this type of analysis wasn't conducted when we brought our BRA concerns to the Department in April 1997. Given that comment, the Fact Sheet outlined alternative management approaches that didn't consider the efforts of the Assembled Chemical Weapons Assessment (ACWA). The ACWA demonstrated four technologies that can successfully handle these types of wastes, and because the Department participated on the ACWA Dialogue it should be familiar with the available technologies and their demonstration test results. The ACWA web page can be found at www.pmacwa.org <<http://www.pmacwa.org>> and we encourage the Department to implement one or more of these technologies.

If I recall correctly, the Department and the Army convened a Secondary Waste Integrated Process Team (IPT), so where are their reports or conclusions? Why were they not tasked with producing outcomes for the questions asked by this Permit Modification? Why aren't their meetings open

to the public, their meeting notes or minutes published, or their usefulness evaluated? The Department should account for the IPT.

9. PAS brine management schemes "when the [BRA] is unavailable for treatment."

If the BRA is unavailable then we see these schemes: 1) storage capacity must equal potential or predicted demands; 2) incineration feed rates must match BRA process rates; and/or 3) alternative technologies must be deployed to provide services. If BRA through-put equals zero, than incineration operations should also equal zero. There are other possible options, but these three represent our comments.

In conclusion, we fully believe there is a need to impose these additional requirements and we support the Department in its efforts to ensure that secondary waste management capabilities are on-line before the commencement of agent disposal operations. At the same time, we remain baffled that the State needs to force the Army to fulfill its promises to Oregon citizens, to its as-sold incineration product, and to its permit.

We further expect that the Department will dismiss the Army's definition of "maximum protection" by implementing a Class III modification. By taking the extra steps now through a Class III, we can minimize any confusion where Oregon stands on maximum protection. And since the Department also revealed the removal of a major system (DUN) without consideration of its full range of systematic secondary waste impacts, this is *the* opportunity for Department Director Hallock to demonstrate her leadership and her "unwavering commitment to the public and permit processes" by engaging the public through full disclosure. If you have any questions, please feel free to contact me at 541/567-6581.

Sincerely,

Karyn J. Jones, Director

GASP

C.C.

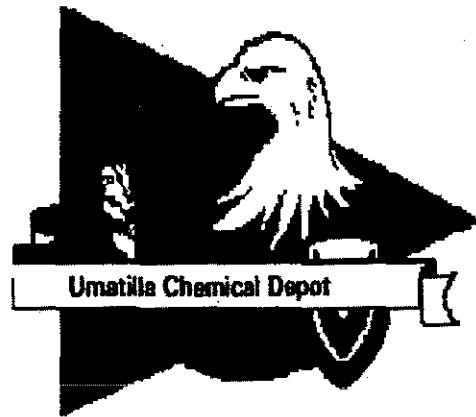
James R. Wilkinson, Environmental Consultant

Richard Condit, Attorney

Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting

Stuart Sugarman, Attorney

Paul Loney, Attorney, OWF



Umatilla Chemical Agent Disposal Facility

Comments on Proposed Permit Modification No. UMCDF-02-039-BRA(EQC), “Required Operation of the Brine Reduction Area”



Washington

**COMMENTS ON PROPOSED PERMIT MODIFICATION NO. UMCDF-02-039-BRA(EQC) "REQUIRED OPERATION OF THE BRINE REDUCTION AREA"
AT THE UMATILLA CHEMICAL AGENT DISPOSAL FACILITY**

I. Introduction

These comments on Proposed Permit Modification No. UMCDF-02-039-BRA(EQC)(the "Proposed Modification") are submitted by the U.S. Army Umatilla Chemical Depot, the U.S. Army Project Manager for Chemical Stockpile Disposal, and the Washington Demilitarization Company (collectively, the "Permittees"). The Permittees respectfully request that these comments be forwarded to the Environmental Quality Commission (EQC) and that the Permittees be allowed to comment on the Proposed Modification at the March 20-21, 2003 EQC meeting.

The Permittees respectfully request that the EQC not approve the Proposed Modification. As written, proposed Permit Condition II.B.4 would require that all Pollution Abatement System (PAS) brines be treated in the Brine Reduction Area (BRA) regardless of its impact on the Permittees ability to maintain focus on the issue of greatest risk to the public—the continued storage of chemical agent. The Permittees have constructed, and are committed to using the BRA at the Umatilla Chemical Agent Disposal Facility (UMCDF). However, the Permittees must retain viable hazardous waste management options to expedite the destruction of the chemical stockpile. It is imperative that the Permittees reserve the right to exercise all legal and environmentally sound options to manage the agent destruction mission.

The basis for the Permittees request is two fold. First, in accordance with the Resource Conservation and Recovery Act (RCRA) regulations, all legally acceptable methods must be allowed to be used by the Permittees to maintain focus on eliminating the risk posed by continued storage of the chemical agent stockpile. As was emphasized in a recent National Research Council (NRC) report (Attachment 7), continued storage of the chemical stockpile presents the greatest risk to the public. The Permittees feel strongly that public risk should not be extended to accomplish all treatment of agent-free wastewater on-site. It is only prudent that all management options remain available to the Permittees. While the BRA capacity is not currently forecasted to limit agent destruction activities, the proposed HW permit condition will stop agent destruction activities should a limiting problem arise. Secondly, the Permittees oppose the proposed modification because it would prohibit the Permittees from shipping agent-free PAS brines off-site for treatment and disposal in accordance with existing State and Federal regulations. The EQC and DEQ should not impose a permit condition that is not only inconsistent with these regulations, but also fundamental administrative law principles.

II. Background

II.A. BRA Technology

The BRA treatment units are based on technology from the food industry. Evaporation and drying systems are common for producing products such as powdered milk, cereal flakes, instant coffee, flour, sugars, juices, and dehydrated meat. BRA operations will follow the same process as used in the food industry:

- first a system of evaporation is used to concentrate solids by removing water—the flash evaporators of the BRA are typical of those seen in the food industry;
- second a final dryer (single drum dryer, double drum dryer, pulse combusters, etc.) is used to finish the drying process. The double drum dryer that will be used in the BRA is typical of those used in the food industry for products of moderate viscosity such as the preconcentrated brine salts.

The ability of these systems to reduce the weight and moisture of waste products is the reason the food industry was among the first to use this technology to reduce the bulk of the high moisture content of their food wastes and residues prior to disposal (please refer to Attachment 1 for a detailed discussion of the PAS, BRA, and how the brines are derived).

The waste stream that the BRA is designed to process are brines that are created when the PAS of the UMCDF neutralizes and removes other impurities from the incinerator flue gases (please refer to Attachment 1 for a detailed discussion of the PAS, BRA, and how the brines are generated). This high water content brine is transferred from the PAS to the BRA for reduction to a dry salt product. The salts will then be sent off-site to a permitted treatment facility for ultimate disposal. Although proposed Permit Condition II.B.4 proposes to prevent high moisture content salt from being shipped off-site, dry salt waste and brine sludges from the Brine Surge Tanks will continue to be shipped off-site for disposal as permitted.

II.B. Introduction to the PAS and Brines

All the furnace systems have a PAS and a PAS Filter System (PFS) that chemically and physically treat exhaust gases. The PAS/PFS systems for the Deactivation Furnace System (DFS), Metal Parts Furnace (MPF), and both Liquid Incinerators (LICs) are nearly identical and share a common exhaust stack. Each PAS has a quench tower, venturi scrubber, scrubber tower, mist eliminator vessel (sometimes referred to as the demister vessel), filter system, and a two-stage induced draft fan. The PASs produce brines that are transferred to the BRA for storage and processing. The volume of brines produced during agent operation will range from approximately 9,000 gallons per day to 53,000 gallons per day (equivalent to 2 to 12 tank trucks per day and is dependent on the chemical agent being processed).

II.C. Characterization of the Brines

- The UMCDF brines are water (70-80%) saturated with salts such as sodium salts of fluoride, chloride, sulfite, sulfate, phosphate, carbonate, and nitrate (dependent on which chemical agent is being destroyed).
- These brines will also contain trace amounts of heavy metals (in the parts per million range), e.g., silver, arsenic, barium, cadmium, chromium, mercury, lead, and selenium (most below the regulatory limits for characteristic hazardous waste under the hazardous waste regulations and again dependent on which chemical agent is being destroyed).
- The pH of the brines ranges between 5.5 and 11.
- Brines are sampled in accordance with the UMCDF's Waste Analysis Plan to verify they meet the criteria of agent free.

As indicated above, the brines produced by the PAS are typically a highly saline solution with trace amounts of heavy metals. Regardless of metal content, the brines are regulated as hazardous waste under the Resource Conservation and Recovery Act (RCRA) because they result from hazardous waste processing operations. Thus, they will be properly managed in accordance with the RCRA regulations.

II.D. Purpose of the Brine Reduction Area (BRA)

Spent brines can be treated in the permitted UMCDF BRA. The BRA consists of five miscellaneous treatment units: two evaporator packages (each consisting of a flash evaporator and heat exchanger) and three drum dryers. The Function of the BRA is to reduce the bulk of the brines by removing water and producing a dry salt for transportation and ultimate disposal off-site (Note: for the reasons the brine is considered hazardous waste [i.e., agent-derived waste and metals content] so is the salt). The treatment objectives of the BRA are:

1. reduce the volume of the brines and wastewater processed by at least 80 percent; and
2. produce a brine salt residue that has no free liquids.

Currently, the UMCDF is systemizing and preparing the BRA for operation. The BRA is fully constructed and was certified by an independent, qualified, professional engineer on February 6, 2002, this certification package was approved by the Oregon Department of Environmental Quality's (DEQ) Facility Construction Certification (FCC) package review contractor on April 3, 2002, and the certification package was accepted by the DEQ on April 19, 2002. Thus, the Permittees have built and will operate a fully functional BRA in accordance with the conditions of Module V of the UMCDF HW Permit.

III. Hazardous Waste Management

III.A. Rationale for Using the BRA

The Function of the BRA is simply to reduce the volume of the waste to decrease the amount of shipments required to dispose of secondary wastes (dry salts). Using the BRA to process the brines does not change the hazardous waste classification of the resultant salt it simply removes the water. The BRA is a form of waste minimization and as mentioned above originated in the food processing industry to reduce the volume of waste for disposal.

III.B. Potential Brine Processing Limitations

Potential brine processing limitations and the potential for offsite shipment of brines during limited capacity should be considered. The BRA will be operational and brine will be processed in the BRA. This proposed permit modification should not limit the Permittees from having a safe and effective alternative that is legally compliant, such as shipping brines off-site. Certain limiting factors, listed below, could possibly hinder and halt brine processing at the UMCDF:

- If and when the BRA is not available for processing, e.g.,
 - Catastrophic failure, i.e., an incident or accident that is unforeseen and reduces or eliminates the BRA processing capacity;
 - Mechanical failure, which reduces or halts the BRA processing capacity, such as a warped drum on the drum dryers; and
 - Routine maintenance such as changing out the bags in the BRA PAS baghouse, duct cleanout, or maintenance of the boilers, etc.
- Metal Feed Limitations, i.e., when metal content of the brine limits the amount of brine that can be fed to the BRA due to emissions limitations diminishing processing capacity.
- Processing Limitations, i.e., when more brine is being produced than the BRA can process and the Brine Surge Tanks are at or near capacity.

Processing experience for the BRA was mainly derived from experience at the Johnston Atoll Chemical Agent Disposal System (JACADS). At JACADS the BRA was available for processing approximately 70-80% of the time. Processing availability at JACADS was dependent on the following factors: high variability in the metal contents of munitions (e.g., impurities in chemical agent, variations of agent lots, chromium from the incinerators refractory brick, etc.), mechanically unavailable (warped drums in the drum dryers, clogged heat exchanger on the evaporator package, etc.), and brine generation exceeding the capacity of the BRA. The variability in processing ability led JACADS to seek extra storage capacity and to store excess brines in isotainers because shipping brine off-site for treatment at a permitted facility was not a viable option.

III.C. Management Discretion

This Proposed Permit Modification would limit management options available for brines at the UMCDF if the treatment units in the BRA were unavailable for processing. The proposed condition, as written, would mean that if the Brine Surge Tanks were at capacity and the BRA was not available (for example, outage for routine maintenance) or brines were being generated above BRA capacity, all the furnaces, incinerators, and PASSs would have to be shut down until the BRA was available for processing. This would prolong agent destruction and prolong the storage risk. If the proposed modification is not approved, delays for situations such as that mentioned above will not occur because the Permittees will have the ability to pursue other options.

III.D. Consistency with other Demilitarization Facilities

If the Proposed Condition were allowed in the HW Permit of UMCDF, it would be inconsistent with how other Demilitarization sites are managing or will manage their brines. For example, Tooele Chemical Agent Disposal Facility (TOCDF) has been shipping brines derived from the agent destruction process off-site since August of 1996 without incident. Anniston Chemical Agent Disposal Facility (ANCDF) and the UMCDF are currently shipping surrogate-derived brines off-site in accordance with the HW regulations. The surrogate brines that are currently being shipped off-site from the UMCDF are of similar chemical composition as agent derived brines (see brine characterization above) and are classified as hazardous waste because they contain trace amounts of metals.

III.E. The Risk from Delaying Agent Destruction Outweighs Brine Transportation Risks

The Permittees conducted a limited quantitative risk assessment (QRA), "Risk Evaluation of UMCDF Brine Reduction Area (BRA)," 10 December 2002, to analyze the public risk associated with the proposed permit modification requiring all brine to be treated on-site. Eliminating shipping brines off-site for treatment as a HW management option could have the unintended consequence of prolonging risk to human health and the environment, because the per-day risk of storage of the chemical agents is over 100 times greater than the per-day risk of transporting the brines off-site (Attachment 2).

Under the general requirements for shippers in the Department of Transportation regulations (DOT)(49 CFR §173), the brines are listed as a Class 9 miscellaneous hazardous material. This is a material that does not meet any of the recognized hazard classes listed by DOT. Brines meet the definition of a miscellaneous hazardous material because they are classified as hazardous waste under the RCRA regulations and Oregon Administrative Rules. Thus, they are not an explosive material, compressed gas, flammable liquid, flammable solid, oxidizer or organic peroxide, poisonous material, radioactive material, or corrosive material. The dry salts and sludges that are already allowed to be disposed of off-site will be transported under the same DOT classification as the liquid brines.

The QRA determined there are approximately 770,000 shipments of hazardous materials by roadway per day throughout the United States. In the event of a contingency requiring off-site treatment of brines, the UMCDF would contribute approximately 2 to 12 tanker trucks per day. This is compared with common hazardous materials being transported every day, e.g., gasoline, ammonia, natural gas, used oil, or sodium hydroxide (Please refer to Attachment 2 for the risks associated with transportation and continued storage). Thus, the risk of transporting brines following applicable DOT and RCRA regulations is minimal. Brine shipments would account for less than 0.00002 percentage to the overall hazardous materials shipment.

IV. Legal Basis

The following comments explain why proposed Permit Condition II.B.4 is inconsistent with current applicable laws.

IV.A. Permit Condition II.B.4 Would Prohibit the Off-Site Transport of Pollution Abatement System Brines.

Proposed Permit Condition II.B.4 says, "The Permittee shall process all brines generated by each UMCDF pollution abatement system from the treatment of chemical agent, or chemical agent-contaminated materials, in the Brine Reduction Area Subpart X miscellaneous treatment units in accordance with the requirements of Module V of this Permit." The effect of this condition would be to prohibit the off-site shipment of UMCDF PAS brines. The brines, which will be generated during the destruction of chemical agents and chemical agent-contaminated materials at UMCDF, are regulated as a hazardous waste under Oregon regulations. Or. Admin. R. 340-102-0011(2)(C)(B)(i) and (ii). A generator of a hazardous waste may ship those wastes off-site when the generator complies with packaging, labeling, manifesting and other regulatory requirements. 40 C.F.R. Part 262, incorporated by Or. Admin. R. 340-100-0002(1), and Or. Admin R. 340-102-0010 through -0070.

The proposed modification is inconsistent with fundamental administrative law principles. The EQC and DEQ's authority is that which is granted by statute. *Oregon Newspaper Publishers Ass'n v. Oregon Dep't of Corrections*, 988 P.2d 359, 363 (Or. 1999)(do not infer agency authority where power not granted by statute); *City of Klamath Falls v. Environmental Quality Cmm'n*, 870 P.2d 825, 833 (Or. 1994)(agencies derive their authority from statutes); *Morse v. Oregon Div. of State Lands*, 581 P.2d 520, 522, 528 (Or. App. 1978) (state agency lacked power to issue permit that was contrary to statute), *aff'd on other grounds*, 590 P.2d 709 (Or. 1979); *see also* Oregon Att'y General Opinion OP-6294, 1989 Ore. AG LEXIS 1 (January 6, 1989)(agency may do only what legislature authorizes). The Oregon Hazardous Waste Act does not give DEQ authority to prohibit off-site shipment of a hazardous waste by a generator. Rather, it authorizes the EQC to issue regulations requiring generators to properly package, label, store, and manifest their hazardous waste, and to send it to a permitted facility. Or. Rev. Stat. § 466.075.

An agency's statutory power also can be circumscribed by regulations. *City of Klamath Falls*, 870 P.2d at 833. The generator requirements in the DEQ hazardous waste regulations do not prohibit the off-site transport of a hazardous waste by a generator. 40 C.F.R. Part 262, incorporated by Or. Admin.R. 340-100-0002(1), and Or. Admin. R. §§ 340-102-0010 through -0070. Rather, a generator may ship hazardous waste offsite as long as the generator complies with the regulations. The DEQ has acknowledged that neither the Permit nor the hazardous waste regulations prohibit off-site shipment of PAS brines. See Testimony of Wayne C. Thomas, Transcript of Oregon EQC Meeting, July 26, 2002 (Attachment 3); Letter, Wayne C. Thomas to Lt. Col. Frederick Pellissier, et al., Feb. 1, 2002 (Attachment 4).

The EQC and DEQ should not impose a permit condition that is contrary to the Oregon hazardous waste statute or their own regulations. *Morse*, 581 P.2d at 522, 528 (permit that was inconsistent with statute was outside an agency's power and was not upheld); *In re Beazer East, Inc.*, 1993 EPA App. LEXIS 12, at *28 (Env. Appeals Bd. March 18, 1993)(permit condition that purported to limit appeals of permit modifications under 40 C.F.R. § 270.41 was inconsistent with regulations, and was ordered to be removed from permit); *In re GSX Services of S.C., Inc.*, 1992 EPA App. LEXIS 77, at *26-7 (Env. Appeals Bd. Dec. 29, 1992)(agency ordered to remove hazardous waste permit condition that was inconsistent with statute); *In re General Motors Corp., Delco Moraine Div.*, 1992 EPA App. LEXIS 34 at *32-3 (Env. Appeals Bd. Nov. 6, 1992)(remove permit condition inconsistent with regulation); cf. *Fisher Broadcasting, Inc. v. Dep't of Revenue*, 898 P.2d 1333, 1341 (Or. 1995)(state agency cannot overrule legislation through regulation contrary to statute). Proposed Permit Condition II.B.4 is contrary to the Oregon regulations that allow hazardous waste to be shipped off-site, and therefore, it should not be added to the Permit.

IV.B. The Unilateral Modification Adding Permit Condition II.B.4 Cannot Be Justified.

The EQC may unilaterally modify a hazardous waste permit for the reasons set forth in 40 C.F.R. § 270.41(a), incorporated by Or. Admin. R. 340-100-0002(1). In its fact sheet for this modification, DEQ explained that it was relying on paragraphs 270.41(a)(1) and (2) for its proposed unilateral modification. Fact Sheet at 3 – 4 (Attachment 5). Those provisions state:

- (1) *Alterations:* There are material and substantial alterations or additions to the permitted facility or activity which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit.
- (2) *Information:* The Director has received information. Permits may be modified during their terms for this cause only if the information was not available at the

time of permit issuance (other than revised regulations, guidance, or test methods) and would have justified the application of different permit conditions at the time of issuance.

There are two preconditions under each of these provisions. The first is the factual predicate: a material and substantial alteration or addition to the permitted facility in paragraph (1); and new information in paragraph (2). In addition to the factual predicate, the modification must be justified. *Id.* Permit conditions must either implement the hazardous waste regulations, or be necessary to protect human health and the environment. 40 C.F.R. § 270.32(b)(1) and (2), incorporated by Or. Admin. R. 340-100-0002(1). Proposed Permit Condition II.B.4 does neither.

The DEQ states that it is proposing the modification because, based upon the Permit Application and other documents prepared by the Permittees, it and the EQC had no reason to believe at the time the Permit was issued in 1997 that the Permittees would not use the BRA to treat all brines generated at UMCDF from the destruction of chemical agent and agent-contaminated materials. Fact Sheet at 4 (Attachment 5). Even if the factual predicate for a unilateral modification may exist, the proposed Permit Condition II.B.4 is not justified because it does not implement an existing regulation, and there has been no regulatory or technical justification presented by the DEQ that demonstrates it is necessary for the protection of human health and the environment.

As noted above, DEQ has acknowledged that no regulation prohibits the Permittees from shipping the PAS brines off-site. Nevertheless, EQC may add a permit condition that is not specifically identified in the regulations when necessary to protect human health or the environment. 40 C.F.R. § 270.32(b)(2), incorporated by Or. Admin. R. 340-100-0002(1). This power is referred to as the "omnibus authority." Regulatory agencies cannot rely on the omnibus authority to impose permit conditions that are inconsistent with the hazardous waste regulations. *General Motors*, 1992 EPA App. LEXIS 34 at *40-41. As noted above, the proposed permit condition to prohibit off-site shipment of brines is contrary to the hazardous waste generator regulations; therefore, the DEQ and the EQC should not rely on the omnibus authority to impose proposed Permit Condition II.B.4.

Even if the proposed Permit Condition II.B.4 were not inconsistent with the hazardous waste regulations, the DEQ has not demonstrated that the omnibus authority applies. A regulatory agency must justify why the condition is necessary for the protection of human health or the environment. The U.S. Environmental Protection Agency (EPA) Environmental Appeals Board has ordered EPA to remove a permit condition not authorized by the regulations where EPA failed to prove the condition was necessary to protect human health or the environment. *GSX Services*, 1992 EPA App. LEXIS 77, at *27. See also Memorandum from Sylvia K. Lowrance, EPA Director of Office of Solid Waste, to EPA Hazardous Waste Division Directors, Feb. 27, 1989 (regulatory agency must "thoroughly discuss why the additional permit conditions are needed to ensure protection of public health and the environment...[and] provide a sound technical basis

for inclusion of the permit conditions under the omnibus authority.”) (Attachment 6). The DEQ has not offered an analysis of the technical and regulatory issues that show why the proposed permit condition is necessary to protect human health or the environment. For these reasons, the addition of proposed Permit Condition II.B.4 is not justified, as required under § 270.41(a)(1) and (2), and it should not be added to the Permit.

IV.C. The United States Has Not Waived Its Sovereign Immunity.

A state may impose requirements on the United States, such as the Proposed Modification, only if the United States has waived its sovereign immunity. A waiver of sovereign immunity will be strictly construed in favor of the United States. *Dep't of the Army v. Blue Fox, Inc.*, 525 U.S. 255, 261 (1999); *United States v. Kentucky*, 252 F.3d 816, 825 (6th Cir. 2001).

There are two reasons why Proposed Modification Condition II.B.4 is not within the scope of the waiver of sovereign immunity in section 6001(a) of the Resource Conservation and Recovery Act (RCRA), as amended. First, the waiver is limited to “Federal, State, interstate and local requirements.” 42 U.S.C. 6961(a). “Requirements” is not defined in RCRA, but it has been interpreted in other cases involving environmental statutes to mean uniformly applied pre-established standards and the procedural requirements to implement them. *See, e.g., United States v. New Mexico*, 32 F.3d 494, 497-98 (10th Cir.1994); *Florida Dep't of Environmental Regulation v. Silver Corp.*, 606 F.Supp. 159, 162-63 (M.D. Fla. 1985) (extensive analysis of RCRA legislative history supports conclusion that “requirements” must be objective and ascertainable). Permit Condition II.B.4, if approved in its proposed form, is not a “requirement” for which the United States has waived its sovereign immunity. As is explained above, there is no regulatory authority for EQC and DEQ to prohibit a generator from shipping hazardous waste off-site, so long as the generator complies with the applicable regulations. A proposed permit condition that is contrary to law is not an objective or ascertainable requirement for which the United States has waived its sovereign immunity.

Second, in order for there to be a waiver of sovereign immunity under RCRA, the requirement must be one that applies “in the same manner, and to the same extent, as any person is subject to such requirements.” 42. U.S.C. § 6961(a). In other words, the United States has only waived its sovereign immunity for requirements that apply to all regulated persons. This relates to the rule that one element of a requirement is that it be uniformly applied. *See, e.g., New Mexico*, 32 F.3d at 497-98. By contrast, proposed Permit Condition II.B.4 is unique to UMCDF. To the knowledge of Permittees, similar conditions have not been applied to any other hazardous waste facility or generator in Oregon. For this reason, proposed Permit Condition II.B.4 is not a requirement for which the United States has waived its sovereign immunity.

IV.D. Proposed Permit Condition II.B.4 Could Be Pre-empted If It Interferes with Treaty Compliance.

The "Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction" (commonly referred to as the "Chemical Weapons Convention" or "CWC") requires the United States to complete its destruction of chemical weapons by April 29, 2007, which is ten years after the treaty entered into force. CWC at Art. IV, para. 6 (Note: the Permittees acknowledge that an automatic five-year extension may be granted. The same deadline is imposed by 50 U.S.C. § 1521(b)(2). As is explained elsewhere in these comments, there could be an impact on the schedule to destroy chemical agents stored at UMCDF if Permit Condition II.B.4 is imposed as proposed. If that condition jeopardizes CWC compliance, then it may be pre-empted by the Supremacy Clause of the Constitution. See *Silkwood v. Kerr-McGee Corp.*, 464 U.S. 238, 248 (1984) (state law is pre-empted where it is an obstacle to accomplishing purpose of federal law); *United States v. Pink*, 315 U.S. 203, 230-32 (1942)(state law must yield where it impairs treaty compliance); *U.S. v. Kentucky*, 252 F.3d at 822-25 (state regulations governing radioactive materials pre-empted where they conflicted with RCRA and the Atomic Energy Act).

IV.E. Proposed Permit Condition II.B.4 Restricts Interstate Commerce

Proposed Permit Condition II.B.4 prohibits brines from being shipped to out-of-state waste processors, requiring that they be processed exclusively at the UMCDF in Oregon. Waste "flow control" and local processing requirements of this type are subject to the highest level of scrutiny and have routinely been determined to violate the Commerce Clause of the United States Constitution. See, e.g., *C&A Carbone, Inc. v. Town of Clarkstown, N.Y.*, 511 U.S. 383 (1994).

The proposed permit requirement deprives the Permittees of the opportunity to utilize services in other states. It also deprives out-of-state businesses of the opportunity to continue processing this UMCDF waste stream. In this regard, Proposed Permit Condition II.B.4 is an example of local processing requirements that the courts routinely hold invalid.

Discrimination in favor of local investment is *per se* invalid unless local government can demonstrate, under rigorous scrutiny, that it has no other means to advance a legitimate local interest. DEQ has identified no such legitimate local interest in its proposal, much less held it up to Commerce Clause "alternatives" scrutiny. The proposed permit requirement will prevent patronage of out-of-state processing facilities and is prohibited under the Commerce Clause.

V. Clarification of Proposed Condition D.12

Proposed Permit Condition D.12 is vague and inconsistent with the UMCDF HW Permit Module V, Miscellaneous Units. While the focus of these comments is on proposed Permit Condition II.B.4, the Permittees also request that the second proposed permit condition, D.12, be clarified to explain the Department's definition of "fully tested." Proposed Permit Condition D.12 requires that the BRA be fully tested and operational prior to Shakedown Period II (agent operations) for the LIC1 incinerator. The Department should note that the BRA Performance Test mandated by Module V of the HW Permit does not have to be conducted until GB operations have already begun. Module V, Condition A.4.ii clearly states, "Within the first 720 hours of GB brine operation (the shakedown period) a performance test shall be conducted to verify that the treatment objectives are being met." This means that, as written, the UMCDF will be out of compliance with either the conditions of Module V or the proposed Permit Condition D.12. The Permittees respectfully request that the Department and the EQC evaluate the language of proposed Permit Condition D.12 prior to issuance of a final decision regarding the proposed permit modification.

VI. Conclusion

As stated, the UMCDF will operate the BRA as permitted. This should not preclude the Permittees from pursuing all legal alternative hazardous waste management techniques, such as shipping brine off-site, if the BRA becomes operationally unavailable or is a limiting factor in the destruction of the chemical agent stockpile. The UMCDF should have the option, and by regulation have the right, to ship brines off-site when a delay in brine processing would extend the storage risk of the stockpile for the public. Shipping brines to Subtitle C Permitted Treatment Facilities is an efficient and effective management alternative for the brines that will be conducted in an approved manner fully protective of human health and environment. In addition, the Permittees will fully coordinate shipment of brine with the Confederated Tribes of the Umatilla Indian Reservation and the Oregon DEQ. For the reasons stated above, as further explained in the attachments to these comments, the Permittees respectfully request that the EQC not approve the Proposed Modification.

Attachments

- Attachment 1. Pollution Abatement System Brine Fact Sheet
- Attachment 2. Risk Evaluation of UMCDF Brine Reduction Area (BRA)
- Attachment 3. Transcript of Oregon EQC Meeting, July 26, 2002
- Attachment 4. Letter, DEQ to Lt. Col. Frederick Pellissier, et al., DEQ Item No. 02 0165(27.05), February 1, 2002.
- Attachment 5. DEQ Fact Sheet, Permit Modification No. UMCDF-02-039-BRA (EQC), October 2002
- Attachment 6. Memorandum, Sylvia K. Lowrance, EPA Director of Office of Solid Waste, to EPA Hazardous Waste Division Directors, February 27, 1989.
- Attachment 7. *Evaluation of Chemical Events at Army Chemical Agent Disposal Facilities*, National Research Council, 2002



FACT SHEET

Pollution Abatement System Brine Fact Sheet

Brine solutions are generated during the flue gas scrubbing process in the Pollution Abatement System (PAS) (Figure 1) for the Deactivation Furnace System (DFS), Liquid Incinerators (LICs), and Metal Parts Furnace (MPF) at the Umatilla Chemical Agent Disposal Facility (UMCDF). Chemical agent will be destroyed in the furnace systems and the resulting hot flue gases from the furnaces and incinerators will be cooled and scrubbed with caustic solution of sodium hydroxide and process water for removal of acidic gases.

The PAS serves to cool flue gases to a saturation temperature, neutralize most of the acidic gases such as hydrogen chloride, hydrogen fluoride, nitrogen oxide, and sulfur dioxide, and remove most of the particulates that may be present in the flue gas.

Generalized Characterization of the Brine

- The UMCDF brines are water (70-80%) saturated with salts such as sodium salts of fluoride, chloride, sulfite, sulfate, phosphate, carbonate, and nitrate (dependent on which chemical agent is being destroyed).
- These brines will also contain trace amounts of heavy metals (in the parts per million range), e.g., silver, arsenic, barium, cadmium, chromium, mercury, lead, and selenium (most below the regulatory limits for characteristic hazardous waste under the hazardous waste regulations).
- The pH of the brines ranges between 5.5 and 11.
- Brines are sampled in accordance with the UMCDF's Waste Analysis Plan to verify they meet the criteria of agent free.

As indicated in schematic figure 1 (see page 3), the brines produced by the PAS are typically a highly saline solution with trace amounts of heavy metals. Regardless of content, the brines are regulated as hazardous waste under the Resource Conservation and Recovery Act (RCRA) because they result from hazardous waste processing operations. Thus, they will be properly managed in accordance with the RCRA regulations.

PAS Process and Flow

All the furnace systems have a PAS and a PAS Filter System (PFS) that chemically treats exhaust gases. The PAS/PFS systems for the DFS, MPF, and both LICs are nearly identical and share a common exhaust stack. Each PAS has a quench tower, venturi scrubber, scrubber tower, mist eliminator vessel (sometimes referred to as the demister vessel), filter system, and a two-stage induced draft fan (Figure 1).

The first process in the PAS is to reduce temperatures and neutralize acidic by-products in the flue gas. This is accomplished with the use of a counter flow quench tower. Flue gases exit from a furnaces secondary chamber at approximately 2000° Fahrenheit (F). These gases are sprayed with a brine solution and are cooled to approximately 185° F to begin the neutralization process.

The next unit in the process is the venturi scrubber. As the flue gas enters the top of the venturi scrubber, the flue gas is sprayed with additional brine solution and transferred through the venturi section. The primary purpose for the venturi scrubber is to remove particulate from the flue gas.

Further stripping of combustion products from the flue gas and lowering of the temperature of the flue gas is done in the scrubber tower. The temperature is lowered to 125° F to condense water vapor. Brine in the flue gas exiting the venturi scrubber is separated in the bottom section of the scrubber tower prior to the flue gas entering the packed bed and clean liquor section of the scrubber tower.

The primary purpose of the clean liquor section of the scrubber tower is to remove acid gases from

the flue gas. Clean liquor is distributed over a packed bed of metal saddle rings to assure adequate distribution of the clean liquor throughout the packed bed. Exiting flue gas from the packed section enters a demister pad where entrained clean liquor droplets are removed from the flue gas. The flue gas continues out of the scrubber tower into the mist eliminator vessel.

Flue gas enters the bottom of the mist eliminator vessel and travels upward, coming in contact with the vertical candle elements. These elements remove metal oxides and other solid and liquid particulates that were not removed by the previous processes.

Although the primary purpose of the quench tower is to quench the flue gas, the primary purpose of the venturi scrubber is particulate removal. The primary purpose of the scrubber tower is acid gas removal; all of these equipment items remove both particulate and acid gases, although at different removal efficiencies.

The flue gas is then reheated by the PFS reheater to approximately 160° F to decrease the relative humidity of the flue gas before it enters the PFS. The PFS is the final stage before the flue gas has completed the cleansing process. The flue gas will pass through a series of filter banks (Prefilter, High Efficiency Particulate Air (HEPA) filters, two banks of High Efficiency Carbon Adsorber (HECA) filters, followed by a final bank of HEPA filters. The flue gas is then emitted out a common stack. The common stack is constantly monitored for the presence of agent, carbon monoxide, oxygen, moisture and nitrogen oxides.

The specific gravity of the quench brine and clean liquor is maintained between 1.08 and 1.15 grams/milliliter during processing. This is accomplished by adding either process water or caustic solution to the quench brine or the clean liquor until the programmed specific gravity and pH is reached. When the specific gravity of the brine solution or the volume of brine solution exceed the set values, the brine solution is pumped to one of the four (4) 47,000 gallon (40,000 gallon working capacity) Brine Surge Tanks.

The Brine Surge Tanks are sized such that each tank provides the capacity for one day's production of brine at the maximum generation rate. The volume of brines produced during agent operation will range from approximately 9,000 gallons per day to 53,000 gallons per day (equivalent

to 2 to 12 tank trucks per day and is dependant on the chemical agent being processed).

Purpose of the Brine Reduction Area (BRA)

Spent brines can be treated in the permitted UMCDF Brine Reduction Area (BRA). Currently, the UMCDF is systemizing the BRA (Figure 2, page 3) and plans to operate the BRA to reduce the bulk of the incoming brines by removing the water and producing a dry salt (Note: for the reasons the brine is considered hazardous waste [i.e., agent-derived waste and metals content] so is the salt). The treatment objectives of the BRA are:

- to reduce the volume of the brines and wastewaters processed by at least 80 percent; and
- to produce a brine salt residue that has no free liquids.

The evaporator packages are used to the brine by reducing the moisture content. Brines are flash evaporated and sent to the heat exchanger. The heat exchanger raises the temperature of the brines using steam. The increase in temperature increases the evaporation when the brine is reintroduced to the evaporator. The brines can then be recirculated to the heat exchanger and sent back to the Brine Surge Tanks or sent to a drum dryer for final drying.

Each drum dryer consists of two rotating drums which rotate toward the center of the dryer. A small volume of liquid is held between the two drums and end boards. Steam flows through the interior of the drums and the heat transferred results in a film of dried salt on the drums. Knife blades on the outside of the drums scrape of the salt which drops to a screw type conveyor. At the end of each conveyor, the salt is dropped into a container that is removed periodically and taken to the residue handling area for further waste management before shipment to a permitted disposal facility.

The potential to ship brines off-site to a permitted hazardous waste treatment facility during contingency events would prevent delays in meeting the project mission to dispose of the Umatilla stockpile and allow for management of the brines from the pollution abatement system in an approved

manner that is fully protective of human health and environment.

Figure 1. Schematic of Typical UMCDF Pollution Abatement System

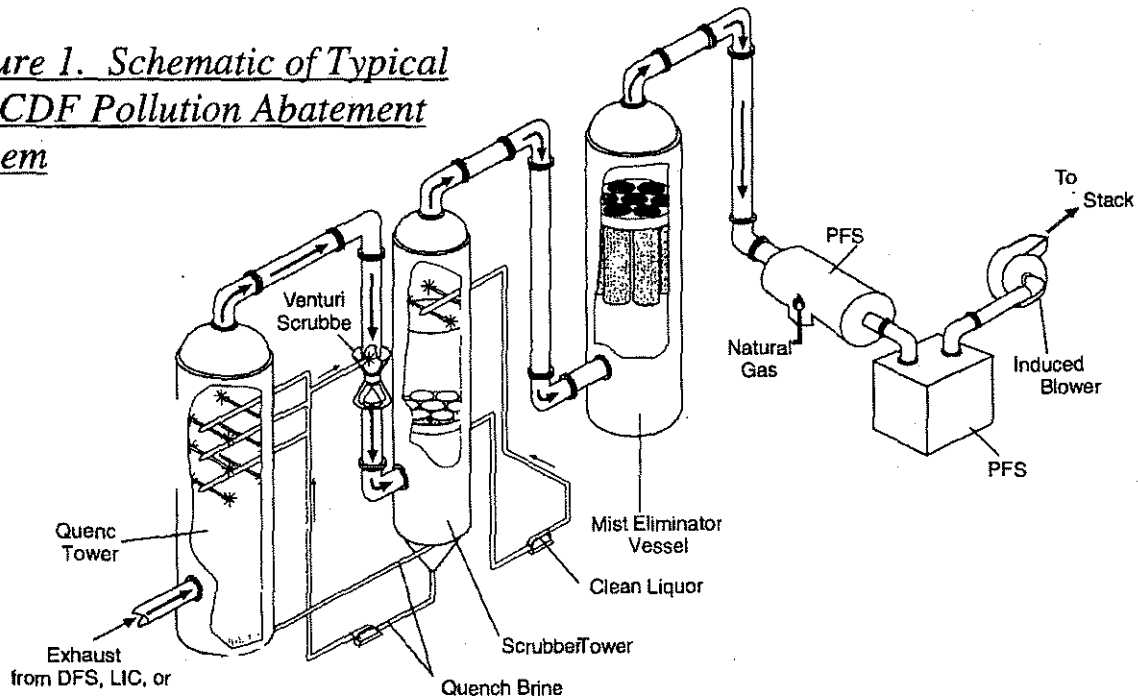
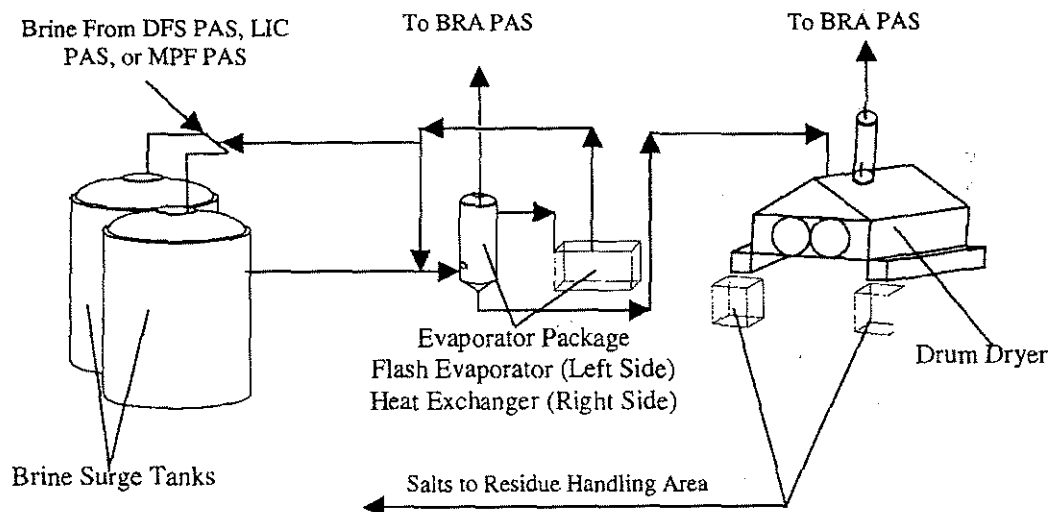


Figure 2. Schematic of Brine Reduction Area Process Flow



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Risk Management Analysis



RA
QUANTUS

Risk Evaluation of UMCDF Brine Reduction Area (BRA)

10 December 2002

Site	UMCDF	Study Number	RM-02-009	Rev.	1
Summary	This paper summarizes the limited quantitative risk assessment (QRA) performed for the UMCDF Brine Reduction Area (BRA). It includes the present risks associated with munitions storage; the present processing risk associated with incineration; an assessment of how delays in processing affect the storage risk with respect to each agent type; the risks associated with transporting brine within a 500 mile radius; and the risk associated with operating the BRA. The total public risk associated with transporting all brine offsite for processing is less than the increase in public storage risk incurred during processing delays as long as the average delay exceeds approximately 3% across all campaigns.				

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Prepared for
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At Umatilla Chemical Agent Disposal Facility

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Revision Log

Rev. #	Date	Summary
0	5 December 2002	Original
1	10 December 2002	Incorporate comments (permit request, hazardous wastes)



Introduction

The UMCDF is currently evaluating impacts associated with a State of Oregon proposed permit modification request that will require all brine generated from agent processing be treated on-site in the Brine Reduction Area (BRA). While it is the intent of UMCDF to operate the BRA, there are many contingencies which may result in the BRA limiting or restricting the ability to process agent through the life of the project, thus delaying the disposal of agent and munitions.

This paper summarizes the limited quantitative risk assessment (QRA) performed for the UMCDF Brine Reduction Area (BRA). The following topics are addressed in this paper:

- Present risks associated with storage.
- Present processing risk associated with incineration.
- How does a delay in processing affect the storage risk with respect to each agent type?
- Risks associated with transporting brine within a 500 mile radius.
- Risk associated with operating the Brine Reduction Area (BRA).

The results in this paper are based on the analysis that supports the UMCDF Phase 2 QRA (to be published 12/31/02) which is based on the DAB (3 agent changeover) processing schedule. In the DAB schedule, both GB and VX rockets are processed in the early campaigns, followed by the remaining VX, GB and HD munitions. The DAB schedule is summarized in table 1.

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Table 1. UMCDF DAB (3 Agent Changeovers) Schedule

UMCDF DAB Schedule (3 Agent Changeovers)		
(campaign)	(operation)	(days)
-	Operations Start	-
1	GB M55	126
2	GB M55 & GB MC-1	246
3	GB M55 & GB MK-94	1
4	GB M55	224
CO	Changeover	190
5	VX M55	59
6	VX M55 & VX ST	41
7	VX M55	37
<u>CO</u>	<u>Changeover</u>	<u>64</u>
8	VX 8-inch	33
<u>CO</u>	<u>Changeover</u>	<u>42</u>
9	VX 155mm	64
<u>CO</u>	<u>Changeover</u>	<u>49</u>
10	VX Mine	61
CO	Changeover	190
11	GB 155mm	87
<u>CO</u>	<u>Changeover</u>	<u>42</u>
12	GB 8-inch	55
CO	Changeover	190
13	HD TC	294
-	Operations End	-
Total Disposal Processing Duration		2095 days (5.7 years)
Note: Agent changeovers are shown in bold. Munitions changeovers are underlined.		



Storage Risk

The total public acute fatality risk associated with storage during disposal processing is 1.8×10^{-2} . This value represents the number of public fatalities expected from stockpile storage during the UMCDF disposal period. The stockpile storage risk is dominated by external events, primarily earthquakes. The risk contribution by campaign is summarized in table 2 (note that the storage risk values are based on the risk at the start of the campaign and include the risk of all remaining munitions in storage).

The risk contribution by agent can be conservatively estimated in the following manner. HD has only one campaign, so the HD agent risk per-day is 3.2×10^{-9} . However, the processing of GB is not continuous so it is appropriate to use two values for GB, 3.4×10^{-5} for the first series of GB campaigns, and 2.6×10^{-6} for the second series of GB campaigns. For VX it is also appropriate to utilize two values since the risk changes significantly once rockets have been processed. For VX campaigns that include rockets, the risk per-day is 8.8×10^{-6} . Once rockets have been processed, the risk per-day is 5.2×10^{-8} .

Table 2 displays both the per-day and integrated storage risk data. Figure 1 depicts the same data in graphical form, emphasizing the per-day risk rates (the individual campaign durations are not explicitly shown on figure 1 but are included in table 2). The per-day values can be used to evaluate the change in storage risk during disposal processing due to schedule changes (examples are presented below). The data is taken from recent studies conducted in support of the UMCDF Final Phase 2 QRA (to be published 12/31/02).

Table 2. Public Acute Fatality Risk of Storage
During Each Disposal Processing Campaign

Public Acute Fatality Risk of Storage During Each Disposal Processing Campaign *				
Campaign	Munitions	Days	Risk per Day**	Integrated Risk**
1	GB Rocket (1)	126	3.4E-05	4.3E-03
2	GB Rocket + MC-1	246	2.8E-05	6.8E-03
3	GB Rocket + MK-94	1	2.7E-05	2.8E-05
4	GB Rocket (2)	224	1.9E-05	4.2E-03
CO	CO	190	8.8E-06	1.7E-03
5	VX Rocket (1)	59	8.8E-06	5.2E-04
6	VX Rocket + ST	41	5.0E-06	2.1E-04
7	VX Rocket (2)	37	2.6E-06	9.5E-05
CO	CO	64	5.2E-08	3.3E-06
8	VX 8inch	33	5.2E-08	1.7E-06
CO	CO-VX8inch	42	4.9E-08	2.0E-06
9	VX 155mm	64	4.9E-08	3.1E-06
CO	CO	49	3.6E-08	1.8E-06
10	VX Mines	61	3.6E-08	2.2E-06
CO	CO	190	2.6E-08	5.0E-06
11	GB 155mm	87	2.6E-08	2.3E-06
CO	CO	42	1.1E-08	4.8E-07
12	GB 8inch	55	1.1E-08	6.3E-07
CO	CO	190	3.2E-09	6.1E-07
13	HD TC	294	3.2E-09	9.4E-07
Total Disposal Processing Duration		2095 days	-	-
Total Storage Risk During Disposal Processing (5.7 years)				1.8E-02

* Analysis based on DAB Schedule.

** The storage risk values are based on the risk at the start of the campaign and include the risk of all remaining munitions in storage.

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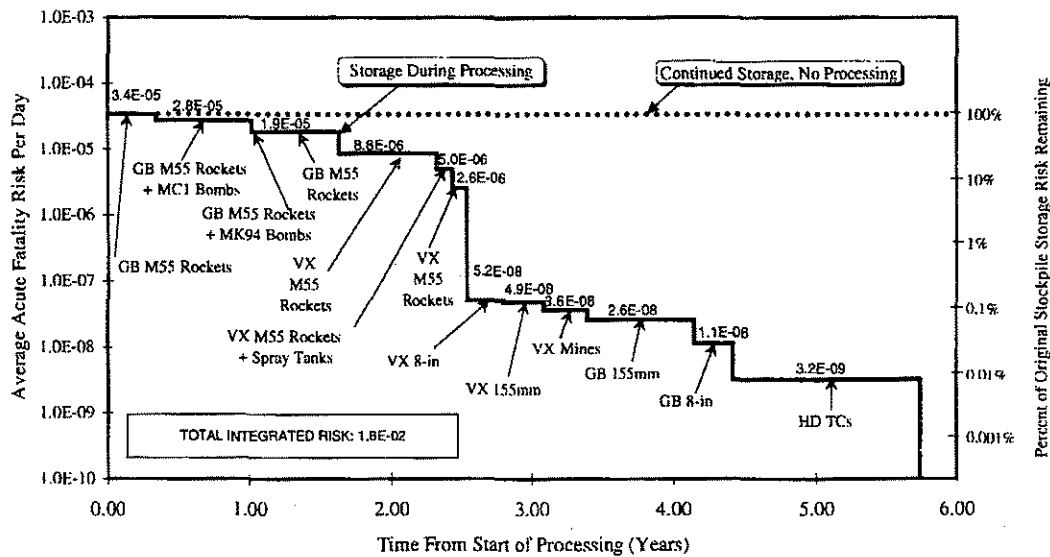


Figure 1. Public Acute Fatality Risk of Storage During Each Disposal Processing Campaign

Processing Risk

The total public acute fatality risk due to disposal processing is 9.0×10^{-3} . This value represents the number of public fatalities expected from disposal processing across all campaigns and changeovers at the UMCDP. Disposal processing risk is also dominated by external events, primarily fires. The risk contribution by campaign is summarized in table 3. Because external events, not internal processing events, dominate the processing risk, the per-day values can be used to make reasonable estimates of the change in processing risk during disposal processing due to schedule delays. Figure 2 depicts the average acute fatality risk of disposal processing for each campaign in graphical form. The data is taken from recent studies conducted in support of the UMCDP Final Phase 2 QRA (to be published 12/31/02).

**Table 3. Public Acute Fatality Risk of Processing
During Each Disposal Processing Campaign**

Public Acute Fatality Risk of Processing During Each Disposal Processing Campaign *				
Campaign	Munitions	Days	Risk per Day	Integrated Risk
1	GB Rocket (1)	126	4.1E-06	5.1E-04
2	GB Rocket + MC-1	246	1.2E-05	3.0E-03
3	GB Rocket + MK-94	1	6.9E-06	6.8E-06
4	GB Rocket (2)	224	5.1E-06	1.1E-03
CO	CO	190	1.5E-07	2.9E-05
5	VX Rocket (1)	59	3.6E-06	2.1E-04
6	VX Rocket + ST	41	5.4E-05	2.2E-03
7	VX Rocket (2)	37	3.6E-06	1.3E-04
CO	CO	64	5.5E-11	3.5E-09
8	VX 8inch	33	8.3E-06	2.8E-04
CO	CO-VX8inch	42	5.5E-11	2.3E-09
9	VX 155mm	64	5.8E-06	3.7E-04
CO	CO	49	5.5E-11	2.7E-09
10	VX Mines	61	1.9E-06	1.2E-04
CO	CO	190	5.5E-11	1.0E-08
11	GB 155mm	87	6.0E-06	5.2E-04
CO	CO	42	5.5E-11	2.3E-09
12	GB 8inch	55	8.2E-06	4.5E-04
CO	CO	190	5.6E-11	1.1E-08
13	HD TC	294	8.8E-08	2.6E-05
Total Disposal Processing Duration		2095 days	-	-
Total Processing Risk During Disposal Processing (5.7 years)				9.0E-03

* Analysis based on DAB Schedule.

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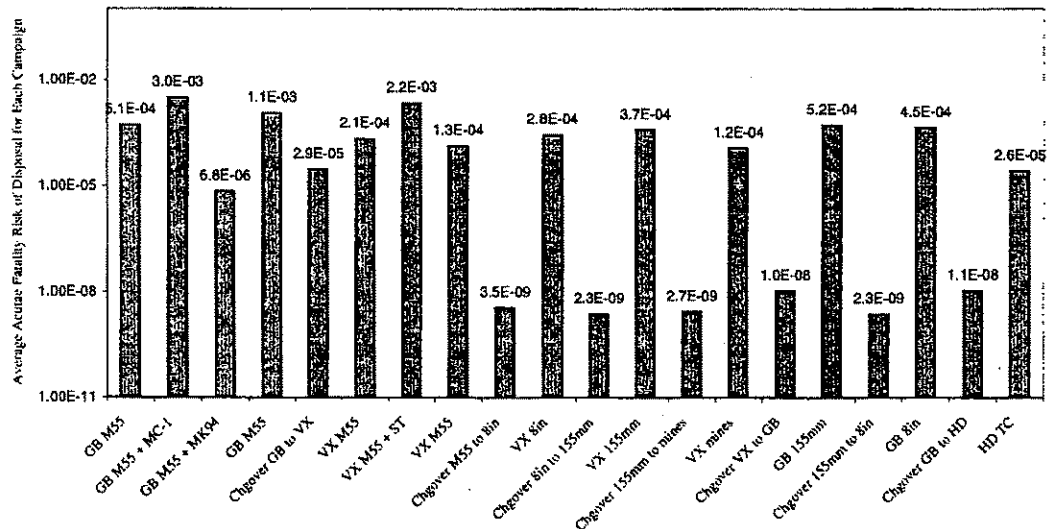


Figure 2. Public Acute Fatality Risk of Processing During Each Disposal Processing Campaign

Risk Associated with Transporting the Brine Offsite

This section describes the risk assessment associated with shipping brine to an offsite treatment facility. The methods and data used were based on those utilized in a recent transportation study conducted for the proposed Pueblo CDF [Williams, 2001]. The Pueblo study investigated the frequency and risk of offsite shipment of the various hazardous wastes (hazmats) associated with the demilitarization process, including brine. (Brines are regulated as hazardous waste under the Resource Conservation and Recovery Act (RCRA) because they result from waste processing operations [Carter, 2002].)

Detailed hazmat transport and incident data at the US national level was obtained from the US Department of Transportation (DOT). The data is robust and provides a wide base of information across many years of experience. It is expected to be representative of the local truck accident data along specific routes that would be expected to be used for brine transport from Umatilla to Kent (namely, US Highways 82 and 90 and State Highway SR167). It is also a reasonable estimate of transport to processing facilities in any of the states within the 500-mile radius.

Analysis Details

According to information from the DOT Office of Hazardous Materials Safety [DOT OHMS, 1998], there are at least 800,000 shipments per day nationwide of hazardous materials (see table 4); of these, approximately 770,000 are transported by truck.

Table 4. US National Hazardous Material Shipment Data

Product Group	Daily Shipments	Annual Tons Shipped
Chemicals & Allied	500,000	0.53 billion
Petroleum Products	300,000	2.60 billion
Other	10,000	0.01 billion
TOTALS	>800,000	>3.1 billion

The OHMS also issues fatality data from the Hazardous Materials Information System [DOT OHMS HMIS, 2002] on incidents by transportation mode and year, as shown in table 5.

Table 5. US National Hazardous Material Transport Fatalities by Mode and Incident Year

Mode	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Total
Air	0	0	0	0	110	0	0	0	0	0	110
Highway	16	15	11	7	8	12	13	10	15	7	114
Railway	0	0	0	0	2	0	0	0	0	0	2
Water	0	0	0	0	0	0	0	0	0	0	0
Freight	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
TOTAL	16	15	11	7	120	12	13	10	15	7	226

Using the data in the 'Highway' row of table 5 and taking an average across ten years yields an average of 11.4 fatalities per year due to highway hazmat transport.

This fatality and shipment data was combined to produce an initial estimate:

$$11.4 \text{ fatalities per year} / (770,000 \text{ truck shipments per day} * 365 \text{ days per year}) \\ = 4.1 \times 10^{-8} \text{ fatalities per hazmat shipment.}$$

This value was then multiplied by the estimated 8 offsite shipments of brine per day (provided by the PMCSDF at UMCDF) from UMCDF to produce a brine shipment risk estimate:

$$4.1 \times 10^{-8} \text{ fatalities per hazmat shipment} * 8 \text{ brine shipments per day} \\ = 3.2 \times 10^{-7} \text{ fatalities per day due to brine shipment from UMCDF}$$

$$3.2 \times 10^{-7} \text{ fatalities per day} * 1328 \text{ days of brine processing} \\ = 4.3 \times 10^{-4} \text{ fatalities (total for all brine shipments)}$$

While it is recognized that this method does not break out fatalities by case (for example, trucks carrying brine or similar material could cause fewer fatalities than those carrying flammable material, and driver vs. passenger car fatalities are not distinguished) it is believed that this estimate provides a reasonable, defensible and conservative bounding case for the brine offsite transport risk.

Comparison to State Hazmat Shipments

It is reasonable to ask how significant the addition of these 8 shipments of brine would be compared to the number of hazardous materials shipments by truck that occur at the state level on a daily basis. The Federal Highway Administration (FHWA) produces yearly tables of state and US total annual vehicle miles of travel, including the percentage of trucks [FHWA, 1996-2001]. This data, along with the 770,000 hazmat shipments per day and 8 brine shipments per day, was used to generate the data in table 6. [NOTE: Washington state was selected since it houses the candidate processing site in Kent; since Umatilla lies on the Oregon/Washington border, the bulk of the transport would occur in Washington state.] This analysis shows that the UMCDF brine shipments would constitute a less than one tenth of a percent increase per day in the total state-level hazmat shipments by truck.

Table 6. Estimated Percent UMCDF Brine out of Washington State Hazmat

Data Source	WA State Percent Truck Vehicle Miles out of US Total	WA State Est. Daily Hazmat Shipments	Percentage Brine out of WA State Shipments
1998 FHWA	1.8%	13,860	0.06%
2001 FHWA	1.9%	14,630	0.05%
1 out of 50 states*	2.0%	15,400	0.05%

* The results from this method are comparable to the percentage based on one out of fifty states used to estimate Colorado state hazmat shipments by truck in the PUCDF transportation study.

Comparison of Liquid Brine to Salt Transport

Another comparison was made between the number of truck shipments of liquid brine vs. brine salts that would result from the use of the Brine Reduction Area (BRA) at UMCDF. Based on the estimates of brine volume [Carter, 2002] and experience-based salt to brine weight fractions and agent volumes, approximately 2 trucks per day are estimated for brine salt shipments.

Risk Associated with Operating the Brine Reduction Area (BRA)

The brine that is processed in the Brine Reduction Area (BRA) contains trace elements of metals, but is not contaminated with agent. Therefore, the risk to the public from BRA operation was limited to an evaluation of the offsite transport of brine salts (discussed above) and not the brine processing operations. Worker risk associated with the operation of a brine reduction facility would be expected to be similar if located at UMCDF or at an offsite location. Therefore, total brine reduction worker risk would be about equal if the brine was processed on-site, or if it was processed at an offsite disposal facility (in other words, worker risk is not increased or decreased, but simply transferred).

Example Use of Risk Results

The following examples outline some uses for the data provided in this paper and are based on the study areas cited in the Scope of Work.

Present risks associated with storage

From table 2 above, it can be noted that the total public acute fatality risk associated with agent storage during disposal processing is 1.8×10^{-2} . This value represents the number of public fatalities expected from stockpile storage during the UMCDF disposal period of 5.7 years.

Present processing risk associated with incineration

From table 3 above, it can be noted that the total public acute fatality risk due to agent disposal processing is 9.0×10^{-3} . This value represents the number of public fatalities expected from disposal processing across all campaigns at the UMCDF.

How does a delay in processing affect the storage risk with respect to each agent type?

Consider a situation wherein a single campaign, for example campaign 2, is extended by 10% due to processing delays, and the impact of this delay on total storage risk during disposal processing must be quantified.

Campaign 2 co-processes GB M55 rockets and GB MC-1 bombs, and according to the DAB schedule (see table 1) this campaign is expected to take 246 days to complete. Increasing this campaign by 10% results in an increase of 25 days to complete the disposal processing. From table 2 above it is noted that campaign 2 has a per-day storage risk of 2.8×10^{-5} . Over a 25-day period, this results in an increase in storage risk of 6.9×10^{-4} , or a total storage risk of $1.8 \times 10^{-2} + 6.9 \times 10^{-4} = 1.9 \times 10^{-2}$. This represents an increase in total storage risk during disposal processing of about 4%. It should be noted that because external events (not internal processing events) dominate the processing risk, any delay also affects processing risk. From table 3 above



it is noted that campaign 2 has a per-day processing risk of 1.2×10^{-5} . Over a 25-day period, this results in an additional increase in risk of approximately 3.1×10^{-4} .

The same approach can be used to evaluate storage risk associated with delaying all campaigns for a given type of agent (for example all of the GB campaigns) by performing a similar calculation for each agent campaign and then summing the individual results. Delaying all GB campaigns by 10% results in an increase in storage risk of 1.8×10^{-3} , or a total storage risk of $1.8 \times 10^{-2} + 1.8 \times 10^{-3} = 2.0 \times 10^{-2}$. This represents an increase in total storage risk during disposal processing of about 10%.

However, it is unlikely that only one campaign, or even one agent, will be delayed if operating the BRA results in processing delays. Therefore, it is useful to consider what effect an average delay that impacts all disposal processing campaigns will have on storage risk, and to compare that to the total risk of brine transportation.

The total risk associated with the transportation of brine to an offsite processing facility is 4.3×10^{-4} . The per-day storage risk data from table 2 and the campaign durations from table 1 can be used to show that an average campaign duration increase (i.e., delay) of about 3% will result in an increased storage risk equivalent to the total risk of brine transportation. In other words, average processing delays of less than 3% result in an increase in storage risk that is less than the risk associated with transporting the brine offsite. However, an average processing duration delay that is 3% or more will result in an increased storage risk during processing that exceeds the total risk associated with transporting the brine offsite. As noted above, because external events (not internal processing events) dominate the processing risk, any delay will also affect processing risk.

Risks associated with transporting brine within a 500 mile radius

As noted above, the risk of transporting the brine offsite is approximately 3.2×10^{-7} per-day, and the current storage risk is 3.4×10^{-5} per-day. Therefore, the current per-day storage risk is over 100 times greater than the per-day risk associated with transporting the brine offsite. The risk of brine transportation is fixed but the per-day risk of munitions storage will decrease as munitions are removed.

Risk associated with operating the Brine Reduction Area (BRA)

As noted above, 8 shipments are required each day for transporting brine offsite for processing, and 2 trips would be required each day if the brine was reduced onsite but the remaining brine salts transported offsite for disposal. Therefore, the difference in risk due to transporting brine offsite compared to transporting brine salts offsite would be 8:2 (i.e., the risk of transporting brine offsite is about four times greater than transporting just the salts).

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Conclusion

The total public risk associated with transporting all brine offsite for processing is less than the increase in public storage risk incurred during processing delays as long as the average delay exceeds approximately 3% across all campaigns.

References

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Department of Transportation (DOT) Office of Hazardous Materials Safety (OHMS), *Detailed Study of Hazardous Materials Shipments Within the U.S.*, Table 1: Hazardous Materials Shipments, Movements and Tons, October 1998, downloaded from: <http://hazmat.dot.gov/ohmforms.htm#other>.

Federal Highway Administration (FHWA) Office of Highway Policy Information (OHPI), Highway Statistics Series, 1996 through 2001, Tables PS-1 and VM-2, downloaded from: <http://www.fhwa.dot.gov/ohim/ohimstat.htm>

Williams, C., Collins, E. and Boyd, G., *Final Draft - Pueblo Transportation Assessment*, SAIC-Abingdon, MD for US. Army Program Manager for Chemical Demilitarization, Risk Management & Quality Assurance Office, Study No. RM-00-010, Rev. 2, 31 December 2001.

Oregon DEQ EQC Meeting Minutes

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Approved _____
Approved with Corrections X



Minutes are not final until approved by the Commission.

Environmental Quality Commission Minutes of the Three Hundredth and Fourth Meeting

July 25-26, 2002

Regular Meeting^[1]

The following Environmental Quality Commission (EQC) members were present for the regular meeting, held at the Department of Environmental Quality (DEQ) headquarters building, Room 3A, located at 811 S.W. Sixth Avenue, in Portland.

Melinda Eden, Chair
Tony Van Vliet, Vice Chair
Mark Reeve, Member
Harvey Bennett, Member
Deirdre Malarkey, Member

Also present were Stephanie Hallock, DEQ Director; Larry Knudsen, Oregon Department of Justice; and other DEQ staff.

Thursday, July 25, 2002

Before the regular meeting, the Environmental Quality Commission toured a DEQ monitoring site on Balch Creek in Northwest Portland. Mary Abrams, DEQ Laboratory Administrator, and Rick Hafele and Mike Mulvey, DEQ Water Quality scientists, led a macroinvertebrate sampling demonstration and discussed DEQ's biomonitoring and ambient monitoring programs with Commissioners. Following the tour, Commissioners held a working lunch with Ms. Abrams and Fenix Grange, DEQ Facilities Coordinator, to discuss the Department's efforts to locate a new lab facility.

At approximately 2:00 p.m., Chair Eden called the regular Commission meeting to order and agenda items were taken in the following order.

A. Contested Case No. WQ/M-NWR-00-010 regarding City of Scappoose

Larry Knudsen, Assistant Attorney General, introduced a contested case between DEQ and the City of Scappoose involving a proposed \$9,600 civil penalty for an alleged violation of the City's wastewater discharge permit. Mr. Knudsen explained that the

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alleged violation was for intentional submittal of false data on a discharge monitoring report on two occasions in December 1998. Mr. Knudsen summarized the findings of fact made by the Hearing Officer and asked Commissioners to declare any ex parte contacts or conflicts of interest regarding the case. All Commissioners declared they had no ex parte contacts or conflicts of interest. Christopher Rieve presented arguments to the Commission on behalf of the City of Scappoose. Jeff Bachman, Environmental Law Specialist, and Lynne Perry, Department of Justice, summarized arguments on behalf of the Department.

Commissioners discussed key issues in the case with Mr. Knudsen and the representatives of both parties. After deliberation, Commissioner Malarkey moved the Commission uphold the proposed order and civil penalty. Commissioner Reeve seconded the motion and it passed with four "yes" votes. Commissioner Bennett voted "no." The Commission asked Mr. Knudsen to prepare an order for the Director's signature on the Commission's behalf.

B. Contested Case No. WQ/OI-ER-01-065 regarding Brian Littleton, dba/Brian's Sewer & Septic Service

Larry Knudsen, Assistant Attorney General, introduced a contested case between DEQ and Brian Littleton, doing business as Brian's Sewer & Septic Service in the Klamath Falls area. Mr. Knudsen explained that the case involved a \$1,000 civil penalty for allegedly performing sewage disposal services without first obtaining a sewage disposal service license from DEQ. Mr. Knudsen summarized the findings of fact made by the Hearing Officer and asked Commissioners to declare any ex parte contacts or conflicts of interest regarding the case. All Commissioners declared they had no ex parte contacts or conflicts of interest. Dorothy Littleton presented arguments to the Commission on behalf of Brian Littleton. Bryan Smith and Les Carlough, Environmental Law Specialists, summarized arguments on behalf of the Department.

Commissioners discussed the facts of the case and debated issues. After consideration, Commissioner Malarkey moved the Commission uphold the proposed order and civil penalty. Commissioner Reeve seconded the motion and it passed with four "yes" votes. Commissioner Van Vliet voted "no." The Commission directed Mr. Knudsen to prepare an order for the Director's signature on the Commission's behalf.

C. Rule Adoption: Permanent Rules to Add Methane, Under Certain Conditions, to the List of Environmental Cleanup Hazardous Substances

Director Hallock introduced permanent rules to add methane, under certain conditions, to Oregon's list of hazardous substances. Without these rules, DEQ lacked the authority to review and approve, order, or investigate and control methane at historic solid waste landfills. Alan Kiphut, DEQ Cleanup Program Manager, explained that under certain conditions at past landfill sites, methane gas has the potential to build up in confined spaces and create a threat of explosion. To give DEQ management authority in such cases, the Commission passed a temporary rule in January 2002. Commissioners discussed DEQ's work with a stakeholder advisory committee since January to develop permanent rules to address the issue. Commissioner Bennett moved the Commission adopt the permanent rules. Commissioner Malarkey seconded the motion and it passed with five "yes" votes. Commissioner Van Vliet moved the Commission repeal the temporary rule upon the effective date of the permanent rules. Commissioner Malarkey seconded the motion and it passed with five "yes" votes.

D. Director's Dialogue

Commissioners discussed current events and issues involving the Department and State with Stephanie Hallock, DEQ Director. In addition, Director Hallock introduced

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Dick Pedersen, new DEQ Land Quality Division Administrator, who took the place of Acting Administrator David Rozell, and previous Administrator Paul Slyman.

E. Discussion Item: Preparation for Director's Performance Evaluation

In accordance with the Commission's process for evaluating the Director's performance, Chair Eden asked Director Hallock to prepare and submit a self-evaluation of her performance since becoming Director in November 2000. The Commission appointed Commissioner Van Vliet and Commissioner Bennett to serve as a subcommittee to prepare for the evaluation and solicit external input on the Commission's behalf. The Commission planned to conclude the evaluation by the end of the year.

Chair Eden recessed the meeting at approximately 5:25 p.m.

Friday, July 26, 2002^[2]

The Commission held an executive session at 8:00 a.m., to consult with counsel concerning legal rights and duties with regard to current and potential litigation involving the Department. Executive session was held pursuant to ORS 192.660(1)(h).

At approximately 8:30 a.m., Chair Eden called the regular EQC meeting to order and agenda items were taken in the following order.

F. Approval of Minutes

Chair Eden corrected the spelling of Dick Pedersen's name on page 2 of draft minutes of the June 6-7, 2002, EQC meeting. Commissioner Reeve moved the Commission approve the minutes as corrected. Commissioner Malarkey seconded the motion and it passed with four "yes" votes.

G. Rule Adoption: Renewal of NPDES 1200-A, NPDES 1200-Z and WPCF 1000 General Permits

Mike Llewelyn, DEQ Water Quality Division Administrator, proposed renewal of three water quality general permits that together, apply to approximately 1,000 facilities for industrial storm water discharges or wastewater disposal at sand and gravel mining operations. DEQ issues general permits that apply to large groups of facilities with similar water discharge or pollution control systems. Kevin Masterson, DEQ Water Quality staff, described the three permits proposed for renewal in detail: (1) the National Pollutant Discharge Elimination System (NPDES) General Storm Water Discharge permit #1200-A, which covers industrial scale non-metallic mining, asphalt mix batch plants, and concrete batch plants with storm water runoff, (2) the NPDES General Storm Water Discharge permit #1200-Z, covering approximately 850 industrial facilities with storm water discharges, and (3) Water Pollution Control Facilities (WPCF) General Permit #1000, covering sand, gravel and other non-metallic mineral mining operations that dispose wastewater by recirculation, evaporation or controlled seepage, with no discharge to surface waters.

The Commission discussed the function of these permits, including associated monitoring requirements and key changes, with Mr. Llewelyn and Mr. Masterson. Commissioner Reeve moved the Commission renew the three permits in rule. Commissioner Malarkey seconded the motion and it passed with four "yes" votes.

**Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting**

H. Informational Item: Operation of Brine Reduction Area at the Umatilla Chemical Agent Disposal Facility

Chair Eden introduced a briefing for the Commission on issues surrounding the operation of the Brine Reduction Area (BRA) at the Umatilla Chemical Agent Disposal Facility (UMCDF) and the potential for off-site shipment of liquid brines and other wastewater. Mr. Gary I. Burke, Chairman of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), brought the issue to the Commission's attention in a May 8, 2002, letter. At this meeting, the Commission heard presentations from representatives of the Department, the CTUIR, the U.S. Army and Washington Demilitarization Company, and GASP (a Hermiston environmental group) on the issue, and discussed the status of the UMCDF with each party.

Wayne Thomas, DEQ Administrator of the Chemical Demilitarization Program, gave an update on the status of the UMCDF. Sue Oliver and Thomas Beam, DEQ Hazardous Waste policy and permit specialists, described the purpose and intended function of the BRA.

Armand Minthorn, CTUIR Board of Trustees Member, and Dr. Rod Skeen, CTUIR Chemical Engineer, expressed concerns over recent developments at the UMCDF and presented analysis of the effectiveness of the BRA.

Joseph Keating, on behalf of GASP, expressed concerns for operation of the BRA and the incineration facility.

Don Barclay, UMCDF Site Project Manager, Dave Nylander, Washington Demilitarization Company Environmental Manager, and Robert Nelson, Umatilla Chemical Depot Environmental Protection Specialist, discussed the incineration facility and plans for using the BRA on behalf of the UMCDF permittees.

The Commission discussed its response to issues raised by the speakers and asked Mr. Thomas to draft a response letter from the Commission to the CTUIR for their review. Chair Eden thanked the Tribe for bringing their concerns to the Commission's attention and thanked presenters for their comments.

Public Forum

At approximately 11:30 a.m., Chair Eden asked whether anyone wished to make general comments to the Commission. George Ward, a consulting engineer and interested citizen, presented his ideas and analysis of operation of the Brine Reduction Area at the Umatilla Chemical Agent Disposal Facility.

I. Informational Item: Preview of New Air Toxics Rules

Andy Ginsburg, DEQ Air Quality Division Administrator, described the Department's work to create a new state program to reduce air toxics emissions, designed to supplement the federal air toxics program that DEQ has implemented since 1990. Mr. Ginsburg summarized development of the program over the past two years, in cooperation with a diverse stakeholder advisory committee. Sarah Armitage, DEQ Air Toxics specialist, explained that the state program would target urban air toxic emissions from mobile and various small sources to complement the industrial focus of the federal program. Commissioners discussed the program with Mr. Ginsburg and Ms. Armitage, in preparation for considering adoption of program rules at the December 2002 EQC meeting.

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J. Action Item: Consideration of Oregon Environmental Council Petition for Air Quality Rulemaking

Director Hallock introduced this item, explaining that on July 10, 2002, the Oregon Environmental Council (OEC) petitioned the Commission for permanent rulemaking to increase the regulation of mercury emissions to the air. Specifically, OEC petitioned to direct DEQ to require monitoring for mercury emissions and begin rulemaking to establish air emission limits for mercury, including Plant Site Emission Limits for facilities that discharge over one pound of mercury per year. Director Hallock described DEQ's priority and work to date to reduce the release of toxic chemicals, particularly mercury, to the environment. Chair Eden invited representatives from OEC, interested stakeholders and members of the public to comment on the petition.

Jeff Allen, OEC Executive Director, Laura Weiss, OEC Program Director, and Chris Rich, representing OEC, presented the rationale for the petition. Andy Ginsburg, DEQ Air Quality Administrator, explained the Department's reasons for recommending the Commission deny the petition, and summarized current plans for addressing the issues OEC raised. John Ledger, Associated Oregon Industries, expressed support for DEQ's toxic reduction approach and concern for OEC's request for rulemaking. Michael McColly, M.D., a public health physician and professor at the Oregon Health and Sciences University, expressed support for OEC's petition and the need for reducing all sources of mercury emissions. Rhett Lawrence, Oregon State Public Interest Research Group, provided written testimony in support of OEC's petition.

The Commission discussed the importance of making progress on reducing toxics to protect human health and the environment, as well as the complexity of the issue and DEQ's resource limitations. Commissioners also considered the difficulty of using individual regulatory mechanisms outside of a comprehensive approach that included stakeholder support. After deliberation, Commissioner Bennett moved the Commission deny the petition. Commissioner Malarkey seconded the motion and it passed with five "yes" votes. Chair Eden asked Mr. Knudsen to prepare an order for the Director's signature on the Commission's behalf. In addition, the Commission asked DEQ to respond in writing to OEC's recommendations that accompanied the petition, with the exception of OEC's comments on DEQ's water quality general permit rules. Director Hallock suggested the Department respond with details about the feasibility of OEC's recommendations, including resource limitations and necessary changes to agency work, by the end of the year. The Commission agreed with the Director's suggestion, and thanked those who presented.

K. Informational Item: Revision of MOU between the Commission and Oregon Department of Agriculture for the Confined Animal Feeding Operations Permit Program

Mike Llewelyn, DEQ Water Quality Division Administrator, and Charles Craig, Oregon Department of Agriculture (ODA) Deputy Director, described the need to revise a Memorandum of Understanding (MOU) between the EQC and ODA for the Confined Animal Feeding Operation (CAFO) permit program. They explained that in 1993, the Oregon Legislature directed the Commission to enter a MOU with the ODA to transition the CAFO permit program from DEQ to ODA. The resulting 1995 MOU transferred the state Water Pollution Control Facilities permit program for CAFOs from DEQ to ODA. In 2001, the Legislature directed DEQ to transfer the National Pollutant Discharge Elimination System permit program for CAFOs to ODA as well, upon approval from the Environmental Protection Agency. Commissioners discussed plans for revising the existing MOU with Mr. Llewelyn, Mr. Craig and Director Hallock in preparation for making the changes at the October 2002 EQC meeting.

L. Commissioners' Reports

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Commissioners gave no reports.

Chair Eden adjourned the meeting at approximately 2:40 p.m.

[1] Staff reports and written material submitted at the meeting are made part of the record and available from DEQ, Office of the Director, 811 SW Sixth Avenue, Portland, Oregon 97204; phone: (503) 229-5990.

[2] On July 26, Commissioner Van Vliet participated in the meeting by phone for items H, I and J only.

For more information contact Mikell O'Mealy at 503-229-5301.

DEQ Online is DEQ's official Internet site.
If you have questions or comments contact DEQ's webmaster.



Oregon

John A. Kitzhaber, M.D., Governor

DEQ-02-0021

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February 1, 2002

Lieutenant Colonel Frederick D. Pellissier
Commander
Umatilla Chemical Depot
Attn.: SCBUL-CO
Hermiston, OR 97838

Mr. Loren D. Sharp
Project Manager
Washington Demilitarization Company
78068 Ordnance Road
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RECEIVED

FEB 4 2002

WDC

Mr. Don E. Barclay
UMCDF Site Project Manager
Project Manager for Chemical Stockpile Disposal
78072 Ordnance Road
Hermiston, OR 97838

Re: Off-site Shipment of PAS Liquids (Brines)
Prior to the Start of Chemical Agent
Operations
Umatilla Chemical Agent Disposal Facility
ORQ 000 009 431
DEQ Item No. 02-0165 (27.05)

Dear LTC Pellissier, Mr. Barclay, and Mr. Sharp:

The Department of Environmental Quality (Department) has reviewed the information discussed with Permittees at the January 30, 2002 meeting concerning Umatilla Chemical Agent Disposal Facility's (UMCDF's) decision to pursue off-site shipment, treatment and disposal of incinerator "pollution abatement system (PAS) liquids" until the start of chemical agent operations planned for February 2003.

The Department acknowledges that the current, existing UMCDF Hazardous Waste (HW) Treatment and Storage Permit (ID No. ORQ 000 009 431) does not specifically prohibit the Permittees from managing these wastes using the described approach. The Department is also unaware at this time of any specific federal Resource Conservation and Recovery Act (RCRA) hazardous waste regulations (40 CFR Parts 260-266, 268, 270-273, 279-282, 148, and 124), or Oregon hazardous waste rules (OAR 340-100 through 340-120) that prohibit this approach.

However, this waste management approach is not preferred, and directly contradicts the implied approach presented by the U.S. Army and its contractors to the Department and Oregon's citizens since the beginning of the UMCDF environmental permitting process. "PAS liquids" have always been consistently referred to as "brines," and slated for treatment in the Brine Reduction

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Area (BRA), regardless of whether they are generated during systemization activities, surrogate operations or chemical agent operations. The introduction to Module V of the HW Permit even identifies one of the primary treatment objectives of the BRA as that of reducing the brines and wastewaters (i.e. "liquids") from the PAS by at least 80% by weight. HW Permit Condition V.A.1.i. provides additional reference to planned processing of brines during both surrogate and chemical agent operations.

The inconsistency exhibited by this decision is further reinforced by the following examples:

- The U.S. Army's Revised Final Environmental Impact Statement "*Disposal of Chemical Agents and Munitions Stored at Umatilla Depot Activity, Oregon*" (November 1996) includes language (Section 2.2.3.3) indicating that 1) "The hazardous wastes would consist mainly of ash residue from the furnace systems and dried salts from process and PAS liquids"; 2) "No liquid hazardous process waste would be generated by or shipped from the proposed disposal facility"; and 3) "The only liquid discharge from the facility would be domestic sewage..."
- The March 1996 UMCDF RCRA Part B Hazardous Waste Permit Application (used by the Department to develop the initial UMCDF HW Permit issued in February 1997) contains language (Section D-9) which describes other wastewater streams (e.g. boiler blowdown, water softener regeneration, separator condensate) as "brines" that will be processed in the BRA.
- The current Permit Application includes language in Section D-9 that was proposed by the Permittees in the Class 2 Permit Modification Request UMCDF-99-018-BRA(2) [approved 10/19/99], and which states that both hazardous [waste] and non-hazardous [waste] brines will be generated in three distinct phases (prior to surrogate trial burns, during surrogate trial burns and during chemical agent operations), and that these brines will be processed through the BRA. This same information was presented during the required public information meeting held by the Permittees. These "brines" represent the same "PAS liquids" identified in the Permittees' current planned approach.
- On December 13, 2001 and January 8, 2002, the Department met with UMCDF staff to discuss alternate BRA operational approaches that maintained compliance with the HW Permit and applicable regulations, while accommodating UMCDF's need to process quantities of brine generated during systemization activities and surrogate operations. The Permittees' desire to hold these discussions indicates that within the last month, UMCDF still planned to process and treat all these "PAS liquids" in the BRA.

Finally, the Permittees are reminded that HW Permit Condition II.I.1.ii. requires submittal to the Department of annual waste minimization/pollution prevention certifications (in accordance with 40 CFR §264.73) that proposed treatment, storage or disposal methods are the most practicable ones available to minimize threats to human health and the environment.

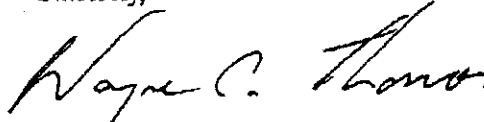
The Department is extremely concerned that this type of change represents a shift in priorities for the U. S. Army and its contractors. It appears that the Permittees place a larger emphasis on

LTC Pellissier, Mr. Barclay and Mr. Sharp
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attempting to maintain the current planned operational schedule than on fulfilling commitments made previously to the State of Oregon and its citizens.

If you have any questions concerning this matter, please contact me at (541) 567-8297, ext. 21.

Sincerely,



Wayne C. Thomas
Administrator
Chemical Demilitarization Program

Cf: Environmental Quality Commission
Thomas Beam, DEQ Hermiston
Mark Daugherty, UMCD
Stephanie Hallock, Director-DEQ Portland
Catherine Massimino, USEPA Region X
Dave Nylander, WDC
Sue Oliver, DEQ Hermiston
Wendell Wrzesinski, PMCSO



FACT SHEET

02-1844

**Proposed Modification of the
Hazardous Waste Storage and Treatment Permit
for the
Umatilla Chemical Agent Disposal Facility
(Permit No. ORQ 000 009 431)**

**Permit Modification No. UMCDF-02-039-BRA(EQC)
"Required Operation of the Brine Reduction Area"**

Introduction

In February 1997, the Environmental Quality Commission ("Commission" or EQC) and the Department of Environmental Quality ("Department" or DEQ) issued a Hazardous Waste Storage and Treatment Permit (HW Permit) to the United States Army¹ to build and operate the Umatilla Chemical Agent Disposal Facility (UMCDF). Construction of UMCDF started in June 1997 and is now essentially complete. A systemization² and surrogate "shakedown"³ (i.e. testing) phase is now underway to ensure that all UMCDF systems (e.g. incinerators and their associated pollution abatement systems) are working properly prior to the start of actual chemical agent destruction operations.

When the UMCDF HW Permit was issued in February 1997, the Commission and Department believed that all brines generated by each incinerator pollution abatement system (PAS) (during both surrogate testing and chemical agent destruction operations) would be treated in the Brine Reduction Area (BRA). The BRA was permitted as a miscellaneous treatment unit in the HW Permit for just such a reason. The existing UMCDF HW Permit does not explicitly require all PAS brines be treated in the Brine Reduction Area.

The proposed modification will add a HW Permit Condition requiring the UMCDF Permittees to utilize the Brine Reduction Area for treatment of all brines generated by the incinerator pollution abatement systems during chemical agent destruction operations. The DEQ is also proposing the addition of a HW Permit Condition requiring the UMCDF BRA be fully tested and operational prior to the start of chemical agent destruction operations. This Fact Sheet describes the proposed modification and provides background information concerning the basis for the proposed modification.

Attachment A is a copy of the public notice that was mailed to interested parties and contains detailed information concerning information repositories and public hearings related to the proposed modification. Attachment B contains copies of several letters documenting recent developments with respect to the strategy for managing the PAS brines in the Brine Reduction Area. Attachment C is a list of Permit Modification Requests that have previously been submitted by the UMCDF Permittees related to the design and operations of the BRA.

¹ There are three "Permittees" named on the UMCDF HW Permit. The U.S. Army Umatilla Chemical Depot and the U.S. Army Project Manager for Chemical Stockpile Disposal (PMCSO) are named as Owner and Operator of UMCDF. Washington Demilitarization Company (the Army's construction and operations contractor) is named as a co-operator of UMCDF.

² Systemization is a pre-operational testing phase that involves testing components, instruments, and associated equipment using non-hazardous materials and waste feeds (such as simulated munitions filled with ethylene glycol to test conveyors, controls, and feed mechanisms).

³ Hazardous waste regulations allow a facility to operate with permitted waste feeds for up to 720 hours (equivalent to 30 days at 24 hours/day operation) prior to conducting actual "trial burn" tests. This period is known as a "shakedown" period. Because of the extreme toxicity of chemical warfare agents, UMCDF is required to first test the incineration systems with surrogate waste feeds (chemicals not as toxic as the chemical warfare agents, but more difficult to burn) prior to beginning shakedown operations with actual chemical warfare agents.

Location and Purpose of UMCDF

The UMCDF is located in northeastern Oregon at the Umatilla Chemical Depot, about seven miles west of Hermiston, Oregon (about 175 miles east of Portland, Oregon). The address is 78072 Ordnance Road, Hermiston, OR 97838-9544. The UMCDF is a hazardous waste treatment facility that will use four incinerators to destroy a stockpile of chemical warfare agents that has been stored at the Umatilla Chemical Depot (UMCD) since 1962.

The chemical agents stored at UMCD include nerve agents and blister ("mustard") agents in liquid form. Nerve agents ("GB" and "VX") are contained in munitions, such as rockets, projectiles, and land mines, and in large containers, such as spray tanks, bombs, and "ton containers." Mustard agent is stored only in ton containers.

Description of the UMCDF

UMCDF includes two liquid injection incinerators to destroy liquid nerve and blister agents. In addition to the liquid incinerators there are two other high temperature furnaces that will be used for thermal treatment of metal parts ("Metal Parts Furnace") and destruction of explosives and propellants ("Deactivation Furnace System"). All container handling, munitions disassembly, and incinerator loading will be conducted within an enclosed building. Emissions from the building and the incinerators will be directed through pollution control systems before being released to the atmosphere. Computer controls will shut down waste feed to the incinerators if proper operating conditions are not maintained or if chemical agent is detected in the exhaust from any of the four incinerators. Liquid brines that are generated by the incinerator pollution abatement systems as they cool and clean the exhaust gases are pumped to a separate treatment facility ("Brine Reduction Area") located nearby, where all the liquid is evaporated off, leaving behind only a salt residue for off-site disposal.

Proposed Modification to the UMCDF HW Permit

Because the UMCDF HW Permit is considered an operating document, modifications are expected to occur over the duration of the project. For example, modifications are required if there are alterations to the originally permitted facility, if new information becomes available to the Permittees or to the Department, or if there are new regulations that apply to the facility. There have already been over 160 modifications made to the HW Permit at the request of the Permittees.

The proposed modification will add two new conditions to the UMCDF HW Permit. The new Permit Conditions will require the UMCDF Permittees to treat all incinerator PAS brines generated during chemical agent destruction operations in the Brine Reduction Area, and require the BRA be fully tested and operational prior to the start of chemical agent shakedown operations for the first UMCDF furnace to feed chemical agent.

The Department proposes to add one Permit Condition to Module II ("General Facility Conditions") of the HW Permit in a section titled "Receipt of Offsite Waste and Shipment of Onsite Waste" (Condition II.B.). The Department proposes to revise Condition II.B. by adding Permit Condition II.B.4. as indicated by the underlined text below:

- II.B. RECEIPT OF OFFSITE WASTE AND SHIPMENT OF ONSITE WASTE
- II.B.1. The Permittee is not authorized to accept and therefore shall not receive hazardous waste, chemical agent, or munitions containing chemical agents from offsite, except from the UMCD.
- II.B.2. Any chemical agent-related material and/or demilitarization waste being transferred to an off-site RCRA Subtitle C permitted hazardous waste disposal facility (or RCRA Subtitle C permitted smelting facility in the case of munition casings) must meet the agent-free criteria as defined in Attachment 2 of the Permit.

II.B.3 The Permittee shall process, in accordance with this Permit, all chemical agents, and chemical agent-contaminated materials currently stored or otherwise located at the Umatilla Chemical Depot.

Proposed Text
Addition ➡

II.B.4. The Permittee shall process all brines generated by each UMCDF pollution abatement system from the treatment of chemical agent, or chemical agent-contaminated materials, in the Brine Reduction Area Subpart X miscellaneous treatment units in accordance with the requirements of Module V of this Permit.

The Department also proposes to add one Permit Condition to Attachment 6 ("Requirements for Commencement of Unit and Facility Operations") of the HW Permit in a section titled "Requirements for Commencement of Shakedown Period II (Agent) on the First Incinerator" (Section D). The Department proposes to revise Section D by adding Permit Condition D.12 as indicated by the underlined text below (Permit Conditions D.1. through D.11. are current, existing requirements that are shown in abbreviated format to provide convenient context for the reader):

D. REQUIREMENTS FOR COMMENCEMENT OF SHAKEDOWN PERIOD II (AGENT) ON THE FIRST INCINERATOR

Prior to commencing a Shakedown Period II (Agent) for the first incinerator, or by the date specified, the Permittee must complete all of the following:

D.1. The Permittee must implement a waste/munitions tracking procedure and system approved by the Department.

D.2. The Permittee must...

D.11. The Permittee must have written notification from the Environmental Quality Commission authorizing the start of agent shakedown operations.

Proposed Text
Addition ➡

D.12. The Permittee must have a fully tested and operational Brine Reduction Area (40 CFR 264 Subpart X Miscellaneous Treatment Units) ready to treat all brines generated from operation of the incinerator pollution abatement systems.

Regulatory Basis to Modify UMCDF HW Permit

Regulations regarding the permitting and operation of hazardous waste treatment, storage, and disposal facilities are known as the "Resource, Conservation and Recovery Act" (RCRA) regulations. They are contained in Title 40 of the Code of Federal Regulations (CFR). In accordance with the RCRA regulations, the State of Oregon has been authorized by the U.S. Environmental Protection Agency to implement its own hazardous waste program. Oregon has adopted RCRA regulations as Oregon Administrative Rules.

In accordance with 40 CFR §270.41, the Department/Commission may not modify the UMCDF HW Permit unless sufficient cause [as defined in 40 CFR §270.41(a) and (b)] exists to warrant such action. If the Department/Commission determines that sufficient cause exists to modify the UMCDF HW Permit, a draft Permit must be prepared and processed in accordance with the applicable requirements of 40 CFR Part 124, Subpart A.

The Department believes that sufficient cause, based on two of the criteria listed in 40 CFR §270.41(a), does exist to warrant a modification of the UMCDF HW Permit to require that all PAS brines generated during chemical agent destruction operations be treated in the Brine Reduction Area, and that the UMCDF Permittees be required to have the BRA fully tested and operational prior to the start of chemical agent shakedown for the first incinerator. These two applicable causes for modification are:

- 40 CFR §270.41(a)(1) – *“There are material and substantial alterations or additions to the permitted facility or activity which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit.”*
- 40 CFR §270.41(a)(2) – *“The Director has received information. Permits may be modified during their terms for this cause only if the information was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and would have justified the application of different permit conditions at the time of issuance.”*

At the time the UMCDF HW Permit was issued in February 1997, the Commission and Department did not believe there was any question as to whether the Brine Reduction Area would be used to treat all PAS brines generated during UMCDF operations. All information provided by the U.S. Army during the permitting process indicated they planned to process all brines (including those generated during surrogate operations) through the BRA, and not pursue off-site shipment and disposal. As a result, the HW Permit was issued without any explicit requirements for UMCDF to treat its brine on-site in the Brine Reduction Area, although language in the Waste Analysis Plan (Attachment 3 of the HW Permit), Permit Condition V.A.7. and Section D-9 of the Permit Application indicates that the brines were to be treated in the BRA. One of the key issues surrounding the debate over the issuance of the HW Permit was the desire to treat everything possible on-site and minimize any off-site waste shipments. If the Commission and Department had foreseen the possibility that the UMCDF Permittees would pursue other brine management strategies, specific requirements very similar to those being proposed at this time would have been included in the UMCDF HW Permit.

During the original permitting process, the UMCDF project timeline was portrayed in a very sequential manner that proceeded from the construction phase to systemization activities to facility operations. Based on the information available to the Commission and Department at that time, it was expected that all treatment units, including the Brine Reduction Area, would be ready prior to the start of facility operations. As the UMCDF project experienced delays in the construction schedule, the systemization and testing schedule underwent significant compression to try and mitigate some of the delay. In addition, the Permittees have proposed numerous facility changes to improve the design and operational efficiency of various treatment units (including the BRA). As a result, the Department is concerned that the Brine Reduction Area may not be fully operational to support the planned start of chemical agent operations. Once again, if the Commission and Department had foreseen this possibility, they would have included HW Permit Conditions requiring a fully operational BRA prior to authorizing the start of facility operations.

Additional Background Information and Discussion

A summary overview of the recent developments regarding operation of the Brine Reduction Area to treat PAS brines can be found by a review of the correspondence provided in Attachment B of this information package. Information available when the original HW Permit was issued indicated that the BRA had sufficient capacity to treat all the brines generated by the pollution abatement systems. All subsequent permit modification requests submitted by the UMCDF Permittees that proposed operational or design changes to the Brine Reduction Area (see Attachment C) continued to indicate that both surrogate and agent brines would be treated in the BRA. Since the Brine Reduction Area was operated only for a limited time at the Tooele Chemical Agent Disposal Facility (TOCDF) in Utah, the Department made every effort to stay informed of operational plans for the BRA at UMCDF. It was not until February 2002, that the Department became aware of the Army's plans to revise their brine management strategy as a way to help mitigate additional delays that had been experienced in the project schedule. The proposed modifications to the HW Permit will allow the UMCDF Permittees to continue shipping brines generated during surrogate operations off-site for disposal at a permitted hazardous waste management facility, but still require the BRA be ready to process all brines from chemical agent operations. While this is a departure from the original intent, the Department believes this is a reasonable approach that continues to provide appropriate protection of human health and the environment.

Potential Impacts of Proposed Changes

At this time, the Department has insufficient information to fully quantify the potential impacts of these proposed changes on UMCDF operations. However, it is possible to qualitatively discuss the potential impacts.

If the Brine Reduction Area has sufficient operational capacity to handle the expected generation quantities of PAS brines, then the proposed changes should have little or no impact on UMCDF operations. The proposed changes would implement explicit requirements that are already consistent with the UMCDF Permittees' current plans to have the BRA ready for processing of PAS brines generated during chemical agent operations.

If, however, it is determined that the Brine Reduction Area has an operational capacity lower than the generated quantities of PAS brines, the proposed permit modification could potentially impact UMCDF operations depending on what additional brine waste management approaches are implemented. The Department believes that if the existing Brine Reduction Area has insufficient operational capacity, the UMCDF Permittees will have to examine the following alternative waste management approaches (either individually or in combination):

- Increase on-site brine storage capacity to compensate for the lower treatment capacity;
- Increase BRA operational capacity to handle expected brine generation quantities;
- Reduce chemical agent destruction rates so that brines are only generated in quantities that the BRA can accommodate; or
- Pursue off-site shipment of brines generated during chemical agent operations for disposal at a permitted hazardous waste management facility.

Other alternative brine waste management approaches may also exist that the Department has not considered. Regardless, the Department does not have sufficient information to fully evaluate the potential impacts on UMCDF operations of any of these options.

If the proposed changes are not implemented, the UMCDF HW Permit will not include any enforceable requirement(s) to treat PAS brines in the BRA. The UMCDF Permittees have maintained that they intend to process PAS brines in the BRA during chemical agent operations, but lacking a specific requirement to do so, would be able to change their mind if they so desire. The Department estimates (based on the latest information available in the UMCDF Permit Application) that off-site shipment of PAS brines during chemical agent operations would be approximately 40,000 gallons per day at the maximum brine generation rate.

Opportunity for Public Comment

The proposed modification will add two conditions to the HW Permit (described on Page 3) requiring the UMCDF Permittees to treat all PAS brines generated during chemical agent destruction operations in the Brine Reduction Area, and the Brine Reduction Area to be fully tested and operational prior to the start of chemical agent operations for the first incinerator. The Department, on behalf of the Commission, is seeking comment not only on the proposed language of the new Permit Conditions, but also on whether the public believes that there is a need to impose these additional requirements on the Permittees. In addition, the Department is seeking information that will allow a more complete assessment of the UMCDF operational impacts from these proposed changes. The Department is also seeking information that will allow a full evaluation of the alternative PAS brine waste management approaches outlined above (as well as any others that are identified), including a discussion of PAS brine management when the Brine Reduction Area is unavailable for treatment due to maintenance activities, repairs or unanticipated operational problems.

The Department will review and consider all oral and written comments received during the comment period. Department staff will then prepare a report with a recommendation to the Environmental Quality

Commission. The report will include the Department's response to all significant comments received during the open public comment period. The Commission is anticipated to make a final decision on the proposed modification to the UMCDF HW Permit in March 2003 at its regularly scheduled meeting (March 20-21, to be held in the Portland, Oregon area). The Commission may decide to modify the HW Permit as proposed or with changes, or may decide against modifying the HW Permit.

How to Submit Comments on the Proposed Permit Modification

The public comment period on this proposed Permit Modification will remain open from November 1 through 5:00 p.m. on December 23, 2002. Written comments may be submitted by e-mail, fax, or regular mail any time during the comment period, provided the comment is received by the Department no later than 5:00 p.m. on December 23. E-mail comments should be submitted to mayes.ann@deq.state.or.us and include the words "Public Comment" in the subject line. Comments submitted by facsimile transmission should be sent to (541) 567-4741. Comments sent by regular mail should be addressed to Mr. Wayne C. Thomas, Administrator, Chemical Demilitarization Program, 256 E. Hurlburt, Hermiston, Oregon 97838. There will be an opportunity for the public to provide oral comments to the Department on December 4, 2002 in Hermiston, Oregon (Good Shepherd Conference Center, 610 N.W. 11th, beginning at 7:00 p.m.).

For More Information

For more information about this Permit Modification, or for information on UMCDF, please contact Ann Mayes, Chemical Demilitarization Program, Hermiston office of the DEQ [Phone 541-567-8297, ext. 25 or toll free in Oregon (800) 452-4011, E-mail: mayes.ann@deq.state.or.us]. The Department's Chemical Demilitarization Program has prepared numerous fact sheets about the chemical weapons destruction process at the Umatilla Chemical Depot, available upon request:

- ❖ Storage and Management of Hazardous Waste (June 2000, also available in Spanish)
- ❖ Public Participation (June 2000, also available in Spanish)
- ❖ Hazardous Waste Storage Permit Application (June 2000, also available in Spanish)
- ❖ Modification of a Hazardous Waste Permit (June 2000, also available in Spanish)
- ❖ Metal Parts Furnace (September 2000, also available in Spanish)
- ❖ Liquid Incinerator (September 2000, also available in Spanish)
- ❖ Dunnage Incinerator (September 2000, also available in Spanish)
- ❖ Deactivation Furnace System (September 2000, also available in Spanish)
- ❖ Rocket Processing (January 2001)
- ❖ Projectile Processing (January 2001)
- ❖ Mine Processing (January 2001)
- ❖ Bulk Item Processing (January 2001)

Attachments

- A Public Notice: Request for Comments and Notice of Public Hearing
- B Copies of Recent Correspondence Regarding Operation of the Brine Reduction Area
- C List of UMCDF Permit Modification Requests (PMR) Modifying the Design and Operation of the Brine Reduction Area

ATTACHMENT A

Copy of Public Notice

"REQUEST FOR COMMENTS AND NOTICE OF PUBLIC HEARING"

[DEQ Item No. 02-1833]

Public Notice: Request for Comments and Notice of Public Hearing

Proposed Modification of the Hazardous Waste Storage and Treatment Permit for the Umatilla Chemical Agent Disposal Facility (UMCDF) (Permit NO. ORQ 000 009 431)

[Permit Modification No. UMCDF-02-039-BRA(EQC), "Required Operation of the Brine Reduction Area"]

Notice issued: November 1, 2002

Written comments due:
5:00 p.m., December 23, 2002

Hearing date: December 4, 2002

Hearing time: 7:00 p.m.
(DEQ staff will be available to answer
questions before the hearing from 6:30-7:00
p.m.)

Hearing location:
Good Shepherd Conference Center
610 N.W. 11th
Hermiston, OR

How can I send comments?
The Oregon Department of Environmental
Quality (DEQ) will accept both written and
oral comments at the hearing listed above, or
written comments by mail, fax or e-mail as
shown below.

Contact Name:
Ann Mayes, Public Information Specialist
Hermiston DEQ office

Phone: (541) 567-8297 ext. 25, or
Cellular (541) 561-6332, or
toll free in Oregon (800) 452-4011

Mailing address:
Oregon DEQ
Chemical Demilitarization Program
256 E. Hurlburt Avenue
Hermiston, OR 97838

Fax: (541) 567-4741

E-mail: mayes.ann@deq.state.or.us

*(Please include "Public Comment" in the
subject line. E-mail comments will be
acknowledged as soon as possible. The DEQ
is not responsible for delays between servers
that result in missed comment deadlines.)*

What are DEQ's responsibilities?

DEQ is the regulatory agency that helps protect
and preserve Oregon's environment. DEQ is
responsible for protecting and enhancing
Oregon's water and air quality, for cleaning up
spills and releases of hazardous materials, and
for managing the proper disposal of hazardous
and solid waste. One way DEQ does this is by
requiring permits for certain activities.

A Hazardous Waste Storage and Treatment
Permit (HW Permit) for UMCDF was issued by
the DEQ and the Environmental Quality
Commission [EQC] (DEQ's policy and rule-
making board) in February 1997. It is DEQ's
responsibility, under the direction of the EQC, to
process permit modification requests and to
ensure that UMCDF complies with requirements
of the HW Permit.

Who are the UMCDF Permittees?

There are three Permittees named on the
UMCDF HW Permit. The U.S. Army Umatilla
Chemical Depot and the U.S. Army Project
Manager for Chemical Stockpile Disposal
(PMCSO) are named as Owner and Operator of
UMCDF. Washington Demilitarization
Company (the Army's construction and
operations contractor) is named as a co-operator.

What kind of facility is this?

The UMCDF is a hazardous waste storage and
treatment facility that will use four incinerators
to destroy a stockpile of chemical warfare agents
that has been stored at the Umatilla Chemical
Depot (UMCD) since 1962. The chemical agent
stockpile at UMCD includes about 3,717 tons of
nerve agents ("VX" and "GB") and blister
("mustard") agents in liquid form.

Nerve agents are contained in munitions, such as
rockets, projectiles and land mines, and in large
containers, such as spray tanks, bombs and "ton
containers." Mustard agent is stored only in ton
containers. All of the chemical warfare agents
are highly toxic.



State of Oregon
Department of
Environmental
Quality

Office of the
Director
Chemical
Demilitarization
Program
256 E. Hurlburt Ave.
Hermiston, OR 97838
Phone: (541) 567-8297
(800) 452-4011
Fax: (541) 567-4741

Contact: Ann Mayes

DEQ Item No. 02-1833

www.deq.state.or.us

Where is the facility located?

The UMCDF is located in northeastern Oregon at the Umatilla Chemical Depot, about seven miles west of Hermiston, Oregon (about 175 miles east of Portland, Oregon). The address is 78072 Ordnance Road, Hermiston, OR 97838-9544.

What changes are proposed?

The DEQ is proposing to modify the UMCDF HW Permit to add a Permit Condition that will require all incinerator pollution abatement system brines generated during chemical agent destruction operations be treated onsite in the Brine Reduction Area (BRA). The DEQ is also proposing to add a Permit Condition that will require UMCDF to have a fully tested and operational BRA prior to the start of chemical agent operations for the first incinerator.

How do I get more information and review pertinent documents?

You can review documents related to the proposed permit modification and the UMCDF at the Hermiston DEQ office (please call ahead for an appointment) or at one of the following information repositories:

Hermiston Public Library
235 E. Gladys Avenue
Hermiston, OR 97838
(541) 567-2882

Mid Columbia Library (Kennewick Branch)
1620 S. Union St.
Kennewick, WA 99336
(509) 586-3156

Pendleton Public Library
502 S.W. Dorion Avenue
Pendleton, OR 97801
(541) 966-0210

Portland State University Library
951 S.W. Hall, Fifth Floor
Portland, OR 97204
(503) 725-4617

You can also call, write or e-mail the Hermiston DEQ office to have an information package sent to you by mail or electronic transmission.

The information package includes a Fact Sheet that describes the proposed changes, provides appropriate background information, and explains the impact and need for the proposed changes.

Interested parties are invited to provide comments on any or all of the proposed changes to the UMCDF HW Permit.

What happens next?

After completion of the public comment period the DEQ will review and consider all oral and written comments received during the comment period. DEQ staff will prepare a report with a recommendation to the EQC on whether to approve the proposed modification. The report will include the DEQ's response to all significant comments received during the public comment period.

The EQC is anticipated to make a final decision on the proposed modification at its regularly scheduled meeting on March 21, 2003 to be held in the Portland, Oregon area. The EQC may decide to modify the HW Permit as proposed or with changes, or may decide against modifying the HW Permit.

Accessibility Information

DEQ is committed to accommodating people with disabilities at our hearings. Please notify DEQ of any special physical or language accommodations or if you need information in large print, Braille or another format. To make these arrangements, contact Ann Mayes at (541) 567-8297 ext. 25, cellular (541) 561-6332, or toll free in Oregon at (800) 452-4011.

People with hearing impairments may call DEQ's TTY number, (503) 229-6993.

ATTACHMENT B

Copies of Recent Correspondence Regarding Operation of the Brine Reduction Area

- Letter, dated February 1, 2002, Wayne C. Thomas, DEQ, to UMCDF Permittees "Off-site Shipment of PAS Liquids (Brines) Prior to the Start of Chemical Agent Operations" [DEQ Item No. 02-0165]
- Letter, dated February 8, 2002, Stephanie Hallock, DEQ, to James L. Bacon, PMCD [DEQ Item No. 02-0226]
- Letter, dated March 5, 2002, UMCDF Permittees to Mr. Wayne C. Thomas, DEQ "Off-Site Shipment of Pollution Abatement System (PAS) Wastewater" [DEQ Item No. 02-0324]
- Letter, dated May 7, 2002, Gary I. Burke, CTUIR, to Ms. Melinda Eden, EQC [DEQ Item No. 02-0704]
- Letter, dated August 21, 2002, Melinda S. Eden, EQC, to Gary I. Burke, CTUIR "Response to May 7, 2002 CTUIR Letter Regarding Operation of the UMCDF Brine Reduction Area and Off-Site Shipment of Pollution Abatement System Brines" [DEQ Item No. 02-1380]



Oregon

John A. Kitzhaber, M.D., Governor

Department of Environmental Quality

Eastern Region

Hermiston Office

256 E Hurlburt

Hermiston, OR 97838

Phone: (541) 567-8297

FAX: (541) 567-4741

TTY: (503) 229-6993

February 1, 2002

Lieutenant Colonel Frederick D. Pellissier
Commander
Umatilla Chemical Depot
Attn.: SCBUL-CO
Hermiston, OR 97838

Mr. Loren D. Sharp
Project Manager
Washington Demilitarization Company
78068 Ordnance Road
Hermiston, OR 97838

Mr. Don E. Barclay
UMCDF Site Project Manager
Project Manager for Chemical Stockpile Disposal
78072 Ordnance Road
Hermiston, OR 97838

Re: Off-site Shipment of PAS Liquids (Brines)
Prior to the Start of Chemical Agent
Operations
Umatilla Chemical Agent Disposal Facility
ORQ 000 009 431
DEQ Item No. 02-0165 (27.05)

Dear LTC Pellissier, Mr. Barclay, and Mr. Sharp:

The Department of Environmental Quality (Department) has reviewed the information discussed with Permittees at the January 30, 2002 meeting concerning Umatilla Chemical Agent Disposal Facility's (UMCDF's) decision to pursue off-site shipment, treatment and disposal of incinerator "pollution abatement system (PAS) liquids" until the start of chemical agent operations planned for February 2003.

The Department acknowledges that the current, existing UMCDF Hazardous Waste (HW) Treatment and Storage Permit (ID No. ORQ 000 009 431) does not specifically prohibit the Permittees from managing these wastes using the described approach. The Department is also unaware at this time of any specific federal Resource Conservation and Recovery Act (RCRA) hazardous waste regulations (40 CFR Parts 260-266, 268, 270-273, 279-282, 148, and 124), or Oregon hazardous waste rules (OAR 340-100 through 340-120) that prohibit this approach.

However, this waste management approach is not preferred, and directly contradicts the implied approach presented by the U.S. Army and its contractors to the Department and Oregon's citizens since the beginning of the UMCDF environmental permitting process. "PAS liquids" have always been consistently referred to as "brines," and slated for treatment in the Brine Reduction

Area (BRA), regardless of whether they are generated during systemization activities, surrogate operations or chemical agent operations. The introduction to Module V of the HW Permit even identifies one of the primary treatment objectives of the BRA as that of reducing the brines and wastewaters (i.e. "liquids") from the PAS by at least 80% by weight. HW Permit Condition V.A.1.i. provides additional reference to planned processing of brines during both surrogate and chemical agent operations.

The inconsistency exhibited by this decision is further reinforced by the following examples:

- The U.S. Army's Revised Final Environmental Impact Statement "*Disposal of Chemical Agents and Munitions Stored at Umatilla Depot Activity, Oregon*" (November 1996) includes language (Section 2.2.3.3) indicating that 1) "The hazardous wastes would consist mainly of ash residue from the furnace systems and dried salts from process and PAS liquids"; 2) "No liquid hazardous process waste would be generated by or shipped from the proposed disposal facility"; and 3) "The only liquid discharge from the facility would be domestic sewage....".
- The March 1996 UMCDF RCRA Part B Hazardous Waste Permit Application (used by the Department to develop the initial UMCDF HW Permit issued in February 1997) contains language (Section D-9) which describes other wastewater streams (e.g. boiler blowdown, water softener regeneration, separator condensate) as "brines" that will be processed in the BRA.
- The current Permit Application includes language in Section D-9 that was proposed by the Permittees in the Class 2 Permit Modification Request UMCDF-99-018-BRA(2) [approved 10/19/99], and which states that both hazardous [waste] and non-hazardous [waste] brines will be generated in three distinct phases (prior to surrogate trial burns, during surrogate trial burns and during chemical agent operations), and that these brines will be processed through the BRA. This same information was presented during the required public information meeting held by the Permittees. These "brines" represent the same "PAS liquids" identified in the Permittees' current planned approach.
- On December 13, 2001 and January 8, 2002, the Department met with UMCDF staff to discuss alternate BRA operational approaches that maintained compliance with the HW Permit and applicable regulations, while accommodating UMCDF's need to process quantities of brine generated during systemization activities and surrogate operations. The Permittees' desire to hold these discussions indicates that within the last month, UMCDF still planned to process and treat all these "PAS liquids" in the BRA.

Finally, the Permittees are reminded that HW Permit Condition II.I.1.ii. requires submittal to the Department of annual waste minimization/pollution prevention certifications (in accordance with 40 CFR §264.73) that proposed treatment, storage or disposal methods are the most practicable ones available to minimize threats to human health and the environment.

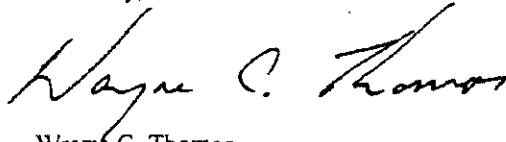
The Department is extremely concerned that this type of change represents a shift in priorities for the U. S. Army and its contractors. It appears that the Permittees place a larger emphasis on

LTC Pellissier, Mr. Barclay and Mr. Sharp
February 1, 2002
DEQ Item No. 02-0165 (27.05)
Page 3

attempting to maintain the current planned operational schedule than on fulfilling commitments made previously to the State of Oregon and its citizens.

If you have any questions concerning this matter, please contact me at (541) 567-8297, ext. 21.

Sincerely,



Wayne C. Thomas
Administrator
Chemical Demilitarization Program

Cf: Environmental Quality Commission
Thomas Beam, DEQ Hermiston
Mark Daugherty, UMCD
Stephanie Hallock, Director-DEQ Portland
Catherine Massimino, USEPA Region X
Dave Nylander, WDC
Sue Oliver, DEQ Hermiston
Wendell Wrzesinski, PMCSO



Oregon

John A. Kitzhaber, M.D., Governor

Department of Environmental Quality

811 SW Sixth Avenue

Portland, OR 97204-1390

(503) 229-5696

TTY (503) 229-6993

February 8, 2002

02-0226

Mr. James L. Bacon

Program Manager for Chemical Demilitarization (PMCD)

ATTN: SFAE-CD-Z, Building E4585

Corner of Hoadley and Parrish Roads, Edgewood Area

Aberdeen Proving Ground, Maryland 21010-5401

STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY

RECEIVED

FEB 11 2002

Dear Mr. Bacon:

HERMISTON OFFICE

During my twelve years of involvement with the Chemical Demilitarization Program, Army and Department of Defense representatives repeatedly have stated that "safety and environment" are the number one priority for the Umatilla Chemical Agent Disposal Facility (UMCDF). I am, however, concerned that schedule pressures to begin surrogate operations may compromise safety and compliance with the hazardous waste permit.

Recently, Army site representatives requested that DEQ modify the Independent Engineer Facility Construction Certification (FCC) process in order to achieve the planned facility startup date. The independent FCC process was a critical aspect in granting approval of the hazardous waste permit in 1997. An independent certification of the final as-built configuration of UMCDF provides the state with assurance that the thousands of engineering changes made to the UMCDF design have been approved, implemented and documented. Although the Department does not want to unnecessarily delay the start of UMCDF, we cannot modify this permit requirement simply to accommodate the Army's concerns about schedule.

At public and private meetings in the past seven years, the Army has reiterated a commitment to: process liquid brines on-site using the Brine Reduction Area; identify secondary waste treatment technologies; and, to leave no legacy wastes behind. This commitment has provided assurance that the Army is prepared to meet its obligation to protect citizens and the environment, and to comply with permit conditions.

The Brine Reduction Area is not used at the Tooele facility, and the Army apparently does not intend to use it at the facilities in Alabama or Arkansas. Not using the Brine Reduction Area means shipping millions of gallons of liquid wastes off-site for further treatment or disposal. The Army has always assured the citizens of Oregon that all liquid wastes will be treated on-site, and yet just recently UMCDF informed the Department that liquids generated during surrogate testing will, in fact, be shipped to an off-site facility. Despite the Army's past commitments to resolve the issues of treatment and disposal of secondary wastes, both the Department and the Environmental Quality Commission are disappointed that the Army is not meeting the schedule developed in 1999 to resolve the secondary waste issues.

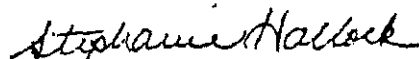
We are very concerned about the potential for "legacy wastes" remaining at the Umatilla Chemical Depot after the chemical weapons have been destroyed. Disposal of secondary waste has not yet been resolved and does not appear to be a priority for the Army. It is difficult to understand how the Army can expect the state to support facility startup with this issue unresolved. Our concern about legacy wastes was clearly communicated to you in a letter dated September 24, 1999 from Carol Whipple, then-Chair of the Environmental Quality Commission.

Mr. James Bacon
February 7, 2002
Page 2 of 2

The primary mission given to the Department and the Environmental Quality Commission by the Governor of the State of Oregon is the maximum protection of human health and the environment. In our public outreach activities DEQ has consistently communicated the message that the Army is also committed to ensuring public safety. It is my hope that we can continue to voice this message to the surrounding communities.

The beginning of surrogate operations at UMCDF will be a significant milestone for the project and an integral step toward the planned start of chemical agent operations in February 2003. Critical issues will continue to emerge that will challenge the Army and the State of Oregon to work together to seek acceptable solutions. I must emphasize that the success of moving the Umatilla project forward has been due in large part to our unwavering commitment to the public and permit processes expected by the citizens of Oregon. We will continue to fulfill that commitment, and we expect to do that in partnership with the Army, not in conflict.

Sincerely,



Stephanie Hallock
Director

cc: Governor John Kitzhaber
Environmental Quality Commission members
Wayne Thomas, Administrator, Chemical Demilitarization Program, DEQ
Don Barclay, UMCDF Site Manager, Program Manager for Chemical Demilitarization
LTC Pellissier, Commander, Umatilla Chemical Depot
Loren Sharp, Site Project Manager, Washington Demilitarization Company



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
PROGRAM MANAGER FOR CHEMICAL DEMILITARIZATION
UMATILLA CHEMICAL AGENT DISPOSAL FACILITY
78072 ORDNANCE ROAD
HERMISTON, OREGON 97838

02-0324

MAR - 5 2002

Project Manager
for Chemical Stockpile Disposal

ENV-02-0034

SUBJECT: Umatilla Chemical Agent Disposal Facility (UMCDF) Hazardous Waste Permit
(ORQ 000 009 431) - Off-Site Shipment of Pollution Abatement System (PAS) Wastewater

Wayne C. Thomas, Program Administrator
Chemical Demilitarization Program
Oregon Department of Environmental Quality
256 East Hurlburt Avenue, Suite 105
Hermiston, Oregon 97838

STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY

MAR 05 2002

Dear Mr. Thomas:

HERMISTON OFFICE

References:

Letter, Department of Environmental Quality (DEQ), DEQ Item No. 02-0165(27.05), dated February 1, 2002, subject: Off-site Shipment of PAS Liquids (Brines) Prior to the Start of Chemical Agent Operations.

The Permittees sincerely appreciate the opportunity to discuss this important matter with you on January 30, 2002. We feel the open discussion led to a mutually agreed upon management approach in regards to the Brine Reduction Area (BRA). In addition, we appreciate the regulatory analysis recognizing our management approach is supported by regulation and the Permit. We are writing this letter in response to the issues identified in the letter referenced above.

We are systemizing and preparing the Brine Reduction Area (BRA) to support brine treatment during agent operations. Processing PAS liquids on site that are generated prior to agent operations would delay agent operations startup and increase the risk associated with continued agent storage. We recognize the option of shipping PAS liquids off-site is not your preferred approach, but for wastes generated prior to the commencement of agent destruction it is a prudent course of action that will avoid what is now projected to be a four-month delay of agent operations startup.

In reference to your concern that we are changing our priorities. Our priority was and remains maximum protection to the public. In this context, we provide maximum protection to the public by ensuring agent destruction operations are our focus and are not delayed by issues presenting little to no public risk.

Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting

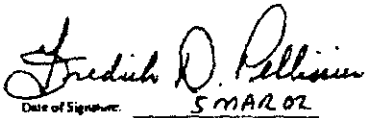
Page E-78

We will safely and expeditiously destroy the chemical warfare munitions stored at the Umatilla Chemical Depot in an environmentally sound manner. Our top priority is to eliminate the risk of chemical weapons storage to the citizens of Oregon. Our concern regarding the maintenance of an aggressive schedule is evidence we are committed to fulfilling our commitment to the community that wants the chemical weapons stockpile expeditiously destroyed. Our efforts to date reflect our commitment to maintaining schedule along with maintaining excellence in safety and environmental compliance. We share your commitment to move the Umatilla project forward in partnership and look forward to the Department's continued cooperation and commitment to work through the regulatory process.

A copy of this letter is being provided to the members of the Environmental Quality Commission, 811 SW Sixth Avenue, Portland Oregon, 97204; and Ms. Stephanie Hallock, Director, Oregon Department of Environmental Quality, 811 SW Sixth Avenue, Portland Oregon, 97204.

If you have any questions, please call our technical point of contact, Mr. Wendell Wrzesinski, (541) 564-7053.

Sincerely,


Date of Signature: 5 MAR 02

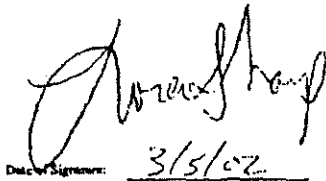
Frederick D. Pellissier
Lieutenant Colonel, USA
Commander

*CERTIFICATION STATEMENT


Date of Signature: 5 MAR 02

Don E. Barclay
UMCDF Site
Project Manager

*CERTIFICATION STATEMENT


Date of Signature: 3/5/02

Loren D. Sharp
Washington Demilitarization Company
Project Manager

*CERTIFICATION STATEMENT

Enclosures

*I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION ACCORDING TO A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.



GENERAL COUNCIL
and
BOARD OF TRUSTEES

CONFEDERATED TRIBES 02-0704

of the

Umatilla Indian Reservation

P.O. Box 638

PENDLETON, OREGON 97801

Area Code 541 Phone 276-3165 FAX 276-3095

7 May 2002

STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY
RECEIVED
MAY 08 2002

Ms. Melinda Eden
Chair, Environmental Quality Commission
c/o Department of Environmental Quality
811 SW 6th Ave.
Portland, OR 97204

HERMISTON OFFICE

Dear Madam Chair,

I am writing to express my grave concern over a recent development at the Umatilla Chemical Agent Disposal Facility (UMCDF). It has come to my attention that the United States Army is now contemplating not operating the brine reduction area (BRA) at the UMCDF. This fact was confirmed by Mr. Wayne Thomas, director of the Department of Environmental Quality (DEQ) Hermiston office, at a 1 May 2002 public meeting in Hermiston, Oregon. It appears that the Army is now pursuing off-site shipment of brine liquids for treatment and disposal. In fact, a representative of the Washington Demilitarization Company stated candidly to one of our staff members after the May 1st public meeting that no operating the BRA was an option since off-site shipment of liquid waste was not explicitly prohibited in the facility's Hazardous Waste Treatment and Storage Permit (HW Permit). Mr. Wayne Thomas has confirmed the fact that the HW Permit does not explicitly prohibit off-site shipment of liquid brine in a letter to the UMCDF Permittees dated 1 February 2002.

Sadly, a policy of no off-site shipment of liquid waste has been verbally stated numerous times to our Board of Trustees (BOT) by both the Army and by the DEQ. In fact, the DEQ has been so strong on this issue that it was our understanding that the permit had enforceable language to ensure this policy was followed. It should be noted that no off-site shipment of liquid waste, along with the Army's commitment to not leaving legacy waste at the site, were two important policies that have allowed the BOT to support the incineration project. The former issue is important to our people since there is a high probability that waste will travel through our

(Continued)

TREATY JUNE 9, 1855 + CAYUSE, UMATILLA AND WALLA WALLA TRIBES

Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting

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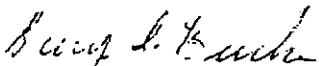
Melinda Eden, EQC Chair
7 May 2002
Page 2

reservation and so represents a risk to our homeland. Clearly the risk of environmental contamination is increased if liquid waste, rather than solid waste, is accidentally spilled. The importance of the later issue arises from our desire to make use of the lands for traditional purposes once the base is closed.

I would remind you that the Confederated Tribes represent a culture where the spoken word is as important as the written word. Our history, our heritage, our way of life is preserved and taught in the spoken word. Hence, it is very disturbing to us when we are misled by the words of others. It raises serious doubts in our minds of the Army's ability to accurately represent their intentions. Does this move by the Army indicate that they will also renege on their agreement to not leave legacy waste at the site? Will the Army not pursue full closure and restoration of the UMCDF site at the end of the demilitarization campaign? These are questions that the BOT and the EQC must now consider as policy makers for our peoples.

In closing, I am requesting a response from your office on what actions the EQC is taking, or intends to take, to ensure the Army holds to their word on not shipping liquid wastes off-site, particularly the liquids from the pollution abatement system.

Sincerely,



Gary I. Burke
Chairman, CTUIR Board of Trustees

Cc:

Armand Minthorn, Member, CTUIR-BOT
Richard Gay, Acting Manager, CTUIR-ESTP
Rod Skeen, Chemical Engineer, CTUIR-ESTP
Wayne Thomas, Oregon DEQ
File

02-1380 Oregon

ENVIRONMENTAL

QUALITY

STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY COMMISSION

RECEIVED

AUG 28 2002

August 21, 2002

Gary I. Burke, Chairman
Board of Trustees
Confederated Tribes of the Umatilla Indian Reservation
P.O. Box 638
Pendleton, OR 97801

HERMISTON OFFICE

Re: Response to May 7, 2002 CTUIR Letter Regarding Operation of the UMCDF Brine Reduction Area and Off-Site Shipment of Pollution Abatement System Brines

Dear Chairman Burke:

I would like to thank Armand Minthorn and Dr. Rod Skeen for speaking on behalf of the Board of Trustees during the Environmental Quality Commission meeting on July 26, 2002. We were prompted to schedule the briefing session when we received your letter of May 7, 2002, expressing the concerns of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) related to the operation of the Brine Reduction Area at the Umatilla Chemical Agent Disposal Facility (UMCDF) and off-site shipment of liquid waste for disposal. Your letter requested a response from the Commission "on what actions the EQC is taking, or intends to take, to ensure the Army holds to their word on not shipping liquid waste off-site, particularly the liquids from the pollution abatement system."

First, let me assure you that the Commission understands your frustration and disappointment with the apparent lack of desire by the U.S. Army and its contractors to fulfill previous commitments made to the State of Oregon regarding the operation of the Brine Reduction Area. Throughout the entire life (15+ years) of the UMCDF project, the U.S. Army has consistently conveyed the message that all pollution abatement system (PAS) liquids (i.e. brines) would be processed in the Brine Reduction Area, and that no significant quantities of liquid waste would be shipped to off-site hazardous waste disposal facilities.

At the July 26 briefing session, the Commission heard from representatives of CTUIR, GASP, and the UMCDF Permittees (U.S. Army and its contractor, Washington Demilitarization Company). In addition, Department of Environmental Quality (DEQ) staff briefed the Commission on the existing requirements of the UMCDF Hazardous Waste Permit, and on the history of commitments by, and discussions with, the UMCDF Permittees regarding operation of the Brine Reduction Area and off-site shipments of PAS brines.

The U.S. Army clearly stated that it has no plans to operate the Brine Reduction Area during systemization and testing activities, including the surrogate shakedown and trial burn periods. They claimed that the use of available resources to prepare the Brine Reduction Area for operations during surrogate testing would adversely affect scheduled activities and preparations to begin chemical agent operations. This approach by UMCDF is a significant departure from plans discussed with DEQ staff as recently as



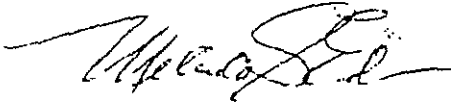
811 SW Sixth Avenue
Portland, OR 97204-1390
(503) 229-5696

early 2002. The Army did indicate that UMCDF intends to operate the Brine Reduction Area during chemical agent operations.

The Environmental Quality Commission believes that a fully functional Brine Reduction Area is vital to the over-all success of the UMCDF in completing its mission of destroying all chemical warfare agent, munitions and secondary waste stored at the Umatilla Chemical Depot. The UMCDF Brine Reduction Area must be fully tested and operational to support the start of chemical agent operations. The Commission expects to take the operational status of the Brine Reduction Area into account when deciding whether or not to authorize the start of UMCDF chemical agent operations, currently scheduled for Summer 2003. As an immediate measure, DEQ is preparing a proposed modification to the UMCDF Hazardous Waste Permit specifically addressing operation of the Brine Reduction Area and off-site shipment of PAS brines. DEQ expects to have this proposed modification available for public comment in September 2002, and present it to the Commission for final decision in December 2002.

The Commission appreciates and shares the substantive environmental and safety concerns raised by CTUIR on this issue, and we welcome a continued dialogue with you and your staff to address any future concerns that you may have regarding the Umatilla Chemical Agent Disposal Facility.

Sincerely,



Melinda S. Eden, Chair
Environmental Quality Commission

Ct: Environmental Quality Commissioners
Stephanie Hallock, DEQ Director
Chris Dearth, Office of the Governor
Wayne C. Thomas, DEQ Hermiston
LTC Frederick D. Pellissier, Commander, Umatilla Chemical Depot
Don E. Barclay, UMCDF Site Project Manager, Project Manager for Chemical
Stockpile Disposal
Ronald W. Garner, Project General Manager, WA Demilitarization Company
Karyn Jones, GASP

ATTACHMENT C

List of UMCDF Permit Modification Requests (PMR) Modifying the Design and Operation of the Brine Reduction Area

- Class 1 PMR UMCDF-98-007-BRA(1R) "Subpart X Engineering Drawings", submitted 6/22/98. Approved 8/4/98.
- Class 1 PMR UMCDF-98-015-BRA(1R) "Secondary Containment for the Subpart X Units in Section D-9, Miscellaneous Units", submitted 9/24/98. Approved 4/5/99.
- Class 2 PMR UMCDF-99-002-BRA(2R) "Brine Surge Tank System (BRA)", submitted 1/27/99. Approved 8/17/99.
- Class 2 PMR UMCDF-99-018-BRA(2) "Brine Reduction Area Subpart X Treatment Unit Performance Test", submitted 5/11/99. Approved 10/19/99.
- Class 2 PMR UMCDF-99-028-BRA(2) "Design of the Brine Reduction Area System", submitted 8/31/99. Approved 12/18/00.
- Class 1 PMR UMCDF-99-035-BRA(1R) "Clarification of the Brine Reduction Area Installation Certification Permit Condition", submitted 9/16/99. Approved 10/29/99.
- Class 2 PMR UMCDF-01-005-BRA(2) "Brine Reduction Area Operating Conditions and Certified Design Changes", submitted 2/27/01. Approved 10/15/01.
- Class 1 PMR UMCDF-01-032-CONS(1R) "Update of RCRA-Only Specification Sections 11510, BRA Drum Dryers, 11522, Brine Reduction Area Pollution Abatement System (BRA PAS), and 11524, BRA Evaporator Package", submitted 1/2/02. Approved 1/25/02.
- Class 1 PMR UMCDF-02-018-BRA(1R) "Brine Reduction Area (BRA), and BRA Pollution Abatement System (BRA PAS) Design Changes", submitted 8/20/02. No DEQ decision yet.
- Temporary Authorization Request (TAR) UMCDF-02-034-BRAT(TA) "Waste Transfer Modification to the Brine Surge Tank", submitted 10/1/02. Approved 10/10/02. Expires 4/9/03.

Faxback 11399

9488.1989(01)

United States Environmental Protection Agency
Washington, D.C. 20460
Office of Solid Waste and Emergency Response

February 27, 1989

MEMORANDUM

SUBJECT: Use of Omnibus Authority to Control Emissions
of Metals, HCl, and PICs from Hazardous Waste
Incinerators

FROM: Sylvia K. Lowrance, Director Office of Solid
Waste

TO: Hazardous Waste Division Directors, Regions
I-X

Questions have recurred regarding the implementation under omnibus authority of the forthcoming proposed amendments to the hazardous waste incinerator standards, and the relationship between implementing the controls and meeting the November 8, 1989, permitting deadline. This memorandum provides OSW's policy on these issues.

We are concerned that the existing standards for hazardous waste incinerators under 40 CFR 264.340 may not be fully protective for all facilities with respect to emissions of toxic metals, hydrogen chloride (HCl) and products of incomplete combustion (PICs). We have developed proposed amendments to the standards to better address the hazards posed by these emissions. The proposed rules have completed the internal Agency review process and are under review by the Office of Management and Budget. We anticipate that the proposed rules will be published for public comment in the spring of 1989.

In the interim, until the rules are promulgated, EPA permit writers should use the authority provided under Section 3005(c)(3) of the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA), to apply additional permit conditions as necessary to adequately control these emissions. This provision, often called the "omnibus" authority, gives permit writers the authority to apply additional permit conditions as necessary to adequately protect human health

Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting
Page E-84

and the environment. Thus, EPA permit writers have the authority and the responsibility to consider, on a case-by-case basis during the permit process, whether controls based on the current regulations are fully protective, and, if not, to establish additional permit conditions as necessary to protect human health and the environment.

The use of the omnibus authority is clearly within the initial intent of Congress in including the omnibus provision in the statute, as evidenced by the legislative history at S. Rep No. 284, 98th Cong., 1st Sess. 31 (1983), which states:

"[the omnibus authority] can also be used to incorporate new or better technologies or other new requirements in permits, where EPA intends to add such technologies or requirements to the regulations but has not yet issued a final regulatory amendment."

Guidance Documents

To assist permit writers, we have developed two guidance documents: Guidance on Metals and Hydrogen Chloride Controls for Hazardous Waste Incinerators, December 29, 1988 (Draft final report); and Guidance on PIC Controls for Hazardous Waste Incinerators, December 30, 1988 (Draft final report). These guidance documents recommend a step-by-step approach to develop permit conditions consistent with the regulatory requirements the Agency plans to propose. We recommend that permit writers use the guidance documents to develop appropriate permit conditions. However, in using the guidance documents or other information to establish permit conditions under the omnibus authority, the permit writer must provide the applicant and other interested parties due process. The permit writer must explain and document what the concern is, and thoroughly discuss why the additional permit conditions are needed to ensure protection of the public health and the environment. Through the permit process, he must provide the time and opportunity for comment, he must fully respond to those comments, and he must include the responses in the administrative report of the permit. In short, the permit writer must provide a sound technical basis for inclusion of the permit conditions under the omnibus authority.

Permit writers need not wait to use OSW's guidance documents and the documents have been issued in final form. Like the proposed rules, the guidance documents have completed the internal Agency review process. We anticipate that the documents will be published in the spring of 1989, and made available through the National Technical Information Service. Permit writers should use the guidance notwithstanding its draft status because, as indicated above, the permit writer must justify thoroughly and, in writing, any requirements applied under the omnibus authority.

Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting

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The permit writer cannot simply refer to the guidance document to support the conditions included in the permit. Moreover, we anticipate that the guidance may change over time as permit writers and applicants gain experience dealing with the issues and as additional information becomes available (e.g., health effects data; improvements in dispersion models). We plan to revise the documents as needed after publication and to provide notice in the Federal Register of the availability of subsequent editions.

By considering the need for additional controls under the omnibus authority on a case-by-case basis, permit writers can avoid petitions from interested parties asserting that the permit is not adequately protective. The Administrator has already ruled in favor of a petition for review of a RCRA incineration permit that argued, in part, that adequate controls on metals and PIC emissions were not provided in the permit. The Administrator subsequently directed the Region to consider adding permit conditions addressing PICs and metals.

State Permit Writers

We encourage State permit writers to implement the guidance if the State has an omnibus authority in its statute. EPA permit writers should review the draft State permit to determine if it adequately protects human health and the environment, particularly with respect to emissions of metals, hydrogen chloride, and PICs. If the State permit does not provide adequate controls, the EPA permit writer should provide these controls in the HSWA portion of the permit, given that the omnibus authority is a HSWA provision. HSWA provisions must be implemented by EPA in authorized States until the State obtains authorization for HSWA provisions as well. To date, only one State, Georgia, has been authorized under HSWA.

Impact on Permitting Deadline

We do not believe that considering the need for additional controls for metals, HCl, and PIC emissions during the permit process will cause the Regions or States to miss the November 8, 1989, permitting deadline established by HSWA. We developed the guidance documents to enable the permit writer to apply appropriate controls on a site-specific basis and to explain to interested parties the need for those controls. In addition, we have conducted four training workshops for Regional and State permit writers on how to use the guidance documents. Finally, Headquarters staff in the Combustion Section, WMD, and the Alternate Technology and Support Section, PSPD, are available to assist permit writers as necessary. Limited contractor funds are also available to handle special problems that may arise.

Some permits, however, may have already progressed to a stage

Required Operation of the UMCDF BRA
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where issuance of the permit would be substantially delayed if a trial burn was required to demonstrate conformance with the metals and PIC controls recommended by the guidance documents. Examples are when the trial burn has already been conducted or where the trial burn plan has been approved. In these cases, the guidance documents recommend that permit writers establish conservative, but reasonable, interim controls until the owner or operator conducts a trial burn to demonstrate that the interim requirements (or less stringent requirements) will not result in an exceedance of the limits recommended by the guidance documents. Methods for determining these interim limits are presented in the guidance documents. In applying these interim controls, however, the permit writer must still thoroughly explain in writing the basis for imposing such conditions and provide interested parties due process through the RCRA permit procedures.

Nonetheless, if a State believes that it may not be able to meet the November 8, 1989, permitting deadline because of the policy on implementing controls on metals, HCl, and PIC emissions, the State should discuss the situation with the Regional Office. If site specific guidance is needed, the Regional Office may discuss the situation further with Joseph Carra, Director, Permits and State Programs Division.

cc: State Hazardous Waste Division Directors; Incinerator Permit Writers' Workshop; Jeffery H. Denit; David Bussard; Robert Tonetti; Joseph Carra; Steven Silverman; James Berlow; Bob Holloway

□

EVALUATION OF CHEMICAL EVENTS at Army Chemical Agent Disposal Facilities

Committee on Evaluation of Chemical Events at Army Chemical
Agent Disposal Facilities

Board on Army Science and Technology

Division on Engineering and Physical Sciences

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Cover: Decontaminated chemical munitions and containers at Johnston Atoll Chemical Agent Disposal System. Photographs for composite image courtesy of Colin Drury.

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Preface

For over half a century the United States has maintained a stockpile of chemical weapons at Army depots distributed around the country. These weapons are now obsolete, and some have deteriorated to an alarming extent. Since 1990, in response to P.L. 99-145 and, later, P.L. 102-484, the Army's Program Manager for Chemical Demilitarization (PMCD) has been engaged in active destruction of the chemical weapons stockpile. Operation of the two initial chemical agent demilitarization facilities utilizing incinerator technology—Johnston Atoll Chemical Agent Disposal System (JACADS) and Tooele Chemical Agent Disposal Facility (TOCDF) (see Appendix A)—has achieved destruction of more than 23 percent of the original chemical agent tonnage (U.S. Army, 2001a) but has not been without incident. A number of chemical events have resulted in various levels of chemical agent migrating at higher than anticipated levels into areas within the plants themselves, and in a few incidents small amounts of chemical agent have been released into the ambient atmosphere (see Appendix B). Although none of these incidents resulted in agent releases large enough to be measured at the chemical demilitarization plant perimeters (U.S. Army, 2001c) and thus posed no threat to nearby communities, they did raise concern among affected public officials and citizens about the fundamental safety of incineration-based chemical demilitarization facilities, particularly the three third-generation incineration facilities scheduled to begin operation at depots near Anniston, Alabama; Umatilla, Oregon; and Pine Bluff, Arkansas.

STATEMENT OF TASK

This report was motivated by congressional concern that incidents at JACADS and TOCDF might indicate systemic safety issues with either the technology or the management and operational systems employed at those two initial chemical demilitarization facilities.

The Committee on Evaluation of Chemical Events at

Army Chemical Agent Disposal Facilities, convened in April 2001 by the National Research Council (NRC), was charged with the following statement of task negotiated between the Army and the NRC:

The National Research Council will assemble a committee to evaluate chemical events that have occurred at the Johnston Atoll Chemical Agent Disposal System (JACADS) and the Tooele Chemical Agent Disposal Facility (TOCDF). The committee will:

- review process technology, operational activities (including training, operations and maintenance), and management by both the Army and its contractors to identify the causes of chemical events
- review applicable risk management and safety programs
- review emergency response activities that have occurred as a result of each chemical event, including information dissemination
- review actions and changes that have occurred in response to each chemical event and evaluate the impact and adequacy of these actions and changes
- visit JACADS and TOCDF to review facility configurations and to meet with personnel involved with operational activities, facility management, and emergency response
- make recommendations regarding improvements in operational activities, facility management, and emergency response
- review and recommend the needs to enable credible and more rapid investigation and corrective actions in response to future chemical events at chemical demilitarization sites, including consideration of needs of external stakeholders (e.g., regulators and concerned public).

To ensure that new facilities for the destruction of chemical agent are operated as safely as possible, the NRC was further asked to recommend how lessons learned from the

events at JACADS and TOCDF should influence future operations, particularly at the new facilities in Alabama, Oregon, and Arkansas scheduled for completion and initial operations in the near future.

COMMITTEE COMPOSITION AND PROCESS

Committee members brought to their task extensive experience in chemical process engineering, chemical plant operations, human factors and ergonomics, industrial engineering, risk assessment and management, atmospheric sciences, environmental chemistry, toxicology, environmental regulations and law, emergency management, and public involvement and community relations (see Appendix H). In conducting this study, committee members drew on insights gained from their experiences in academia, chemical and related industries, federal and state agencies, private sector laboratories and consulting firms, and a law firm.

The committee first met as a whole in Washington, D.C., in May 2001 to hear Army briefings on JACADS and TOCDF general operations and chemical events. (Appendix I lists the committee's several meetings.) In early June many committee members attended an informational meeting on Capitol Hill hosted by Congressman Bob Riley (R-Ala.), who represents the region around the Anniston Chemical Demilitarization Facility, which is currently undergoing systemization and preoperational testing. Local government officials, emergency management professionals, and concerned citizens from the area near Anniston, Alabama, shared their perspectives with the committee. Committee members and staff also visited PMCD and its supporting contractors located at the Aberdeen Proving Ground, Maryland.

The committee made site visits to JACADS in late June 2001 and to TOCDF in late July 2001 where it investigated the operational history, management procedures, and evaluations of and responses to chemical events at these facilities and discussed these issues with contractors and PMCD personnel at many levels. At a meeting at Woods Hole, Massachusetts, in October 2001 the committee completed the bulk of the data-gathering process as well as much of the initial draft of its report. The November 2001 meeting, in Washington, D.C., was dedicated to completing the initial report draft. A portion of the committee also visited Anniston, Alabama, in early December 2001 to inspect a completed third-generation incineration facility and a storage depot with an extensive nearby population base. As a part of the visit the committee visited the County Emergency Response Facility, met with County Commissioners, and participated in a public meeting. A draft report suitable for NRC prereview editing was produced subsequent to the Anniston visit. A final committee meeting in January 2002 focused on review-

ing this draft, including refining the report's findings and recommendations.

The committee consulted with and received input from many stakeholders, both principals and agents, including personnel assigned to the office of the PMCD and its support contractors; contractor and subcontractor personnel responsible for operating chemical demilitarization facilities; former employees of chemical demilitarization facilities; congressional, state, and local officials; members of state citizen advisory committees; members of citizen activist groups; and local citizens. (See Appendixes C, D, and I.)

The committee has also benefited from previous NRC reports on the chemical demilitarization program. Many of these reports were prepared by a standing NRC committee, the Committee on Review and Evaluation of the Army Chemical Stockpile Disposal Program (the Stockpile Committee), which evaluates aspects of the disposal program at the request of the Army. Several of the Stockpile Committee reports provided background for this committee's study.

In preparing, reviewing, printing, and distributing this report, the National Research Council (NRC) and this committee are acting as an expert *agent* for several principals, including the U.S. Congress; the Army, which contracted with the NRC to perform the study; and the U.S. public.

The committee's goals for this report were to respond, as thoroughly as feasible in the short time allotted, to the concerns stakeholders have expressed about past chemical events at JACADS and TOCDF, to determine the impact of these events on ongoing operations at TOCDF, and to assess the implications of these events for the safe and efficient operation of incineration-based chemical demilitarization facilities scheduled to begin operation at Anniston, Umatilla, and Pine Bluff.

The committee greatly appreciates the support and assistance of National Research Council staff members Bruce A. Braun, Margaret Novack, Nancy Schulte, Bill Campbell, Jim Myska, Sonnett Hossanah, Pamela Lewis, and Carter Ford in the production of this report.

NOTE: Following preparation of this report two chemical events, one at TOCDF on July 15, 2002, and one at JACADS on August 12, 2002, have taken place. Although these incidents occurred after the committee completed its analysis, they are similar in nature to events analyzed by the committee and reinforce the validity of the findings and the utility of the recommendations presented in this report.

Charles E. Kolb, *Chair*
Committee on Evaluation of
Chemical Events at Army Chemical
Agent Disposal Facilities

Acknowledgment of Reviewers

This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the National Research Council's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following individuals for their review of this report:

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Although the reviewers listed above have provided many constructive comments and suggestions, they were not asked to endorse the conclusions or recommendations, nor did they see the final draft of the report before its release. The review of this report was overseen by Royce W. Murray, University of North Carolina, Chapel Hill. Appointed by the National Research Council, he was responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring committee and the institution.

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Acronyms and Abbreviations

ACAMS	automatic continuous air monitoring system
AEGL	Acute Exposure Guideline Level
AMC	Army Materiel Command
ASC	allowable stack concentration
CAC	Citizens Advisory Commission
CAMDS	Chemical Agent Munitions Disposal System
CDC	Centers for Disease Control and Prevention
Chem demil	chemical demilitarization
CSDP	U.S. Chemical Stockpile Disposal Program
CSEPP	Chemical Stockpile Emergency Preparedness Program
CWC	Chemical Weapons Convention
CWWG	Chemical Weapons Working Group
DAAMS	depot area air monitoring system
DCD	Deseret Chemical Depot
DEQ	(Utah) Department of Environment Quality
DFS	deactivation furnace system
DoD	Department of Defense
DSHW	(Utah) Division of Solid and Hazardous Waste
DWL	drinking water level
ECP	engineering change proposal
ECR	explosive containment room
EG&G	Edgerton, Germerhausen and Grier (a contracting company)
EMIS	Emergency Management Information System
EOC	emergency operations center
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FPD	flame photometric detector
GAO	General Accounting Office
GB	sarin (a nerve agent)
GC	gas chromatograph, gas chromatography
GPL	general population limit

H	sulfur mustard
HAZMAT	hazardous material
HAZOP	hazardous operation
HD	sulfur mustard (distilled)
HDC	heated discharge conveyor
HRA	health risk assessment
HT	vesicant mixture: 60 percent agent H and 40 percent bis[2(2-chloro-ethylthio)ethyl] ether
HVAC	heating, ventilation, and air conditioning
JACADS	Johnston Atoll Chemical Agent Disposal System
LIC	liquid incinerator
MDB	munitions demilitarization building
MOU	memorandum of understanding
MPF	metal parts furnace
MSD	mass spectrometric detector
NARAC	National Atmospheric Release Advisory Center
NRC	National Research Council
OSHA	Occupational Safety and Health Administration
PARDOS	partial dosage
PAS	pollution abatement system
P.L.	public law
PLL	programmatic lessons learned (program and database)
PMACWA	Program Manager for Assembled Chemical Weapons Assessment
PMATA	Product Manager for Alternative Technologies and Approaches
PMCD	Program Manager for Chemical Demilitarization
PMCS	Project Manager for Chemical Stockpile Disposal
QA	quality assurance
QC	quality control
QRA	quantitative risk assessment
RCRA	Resource Conservation and Recovery Act
RIR	recordable injury rate
SAIC	Science Applications International Corporation
SBCCOM	U.S. Army Soldier and Biological Chemical Command
SHA	systems hazard analysis
SOP	standard operating procedure
TOCDF	Tooele Chemical Agent Disposal Facility
TWA	time-weighted average
UPA	unpack area
USACAP	U.S. Army Chemical Activity Pacific
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
U.S.C.	United States Code
VX	a nerve agent
WCL	waste control limit
WPL	worker population limit
5X	level of decontamination (suitable for commercial release)

Executive Summary

The National Research Council was asked by the Army to form a special, ad hoc committee to investigate whether incidents involving chemical warfare materiel stored, processed, and destroyed at the two operational Army chemical demilitarization sites provide useful information for the safe operation of future sites.¹ To discharge its responsibility, the Committee on Evaluation of Chemical Events at Army Chemical Agent Disposal Facilities examined information on all forms of chemical events and incidents that occurred through the summer of 2001 at the Johnston Atoll Chemical Agent Disposal System (JACADS)² site in the Pacific Ocean and at the Tooele Chemical Agent Disposal Facility (TOCDF) in Utah. Information on these events was obtained from sources within the government and from a full range of public sources.

The committee concluded that safe chemical weapons disposal operations are feasible at the new facilities scheduled to begin operating at Anniston, Alabama; Umatilla, Oregon; and Pine Bluff, Arkansas, if their management is diligent in setting and enforcing rigorous operational procedures, in providing comprehensive training, in establishing a strong safety culture encompassing all plant personnel, and in absorbing programmatic lessons learned from the first two operational facilities, JACADS and TOCDF. The committee believes that many of the observations and recommendations made in this report are applicable to all demilitarization facilities, including those that may not use incineration. No evidence derived from previous chemical events causes the committee to doubt that the new incinerator technology

plants or the disposal processes they will employ can be operated safely and effectively. The committee joins predecessor committees (NRC, 1994, 1997) of the National Research Council that have found that the risk to the public and to the environment of continued storage overwhelms the potential risk of processing and destruction of stockpiled chemical agent.

Recommendation 1. The destruction of aging chemical munitions should proceed as quickly as possible, consistent with operational activities designed to protect the health and safety of the workforce, the public, and the environment.

THE CHEMICAL DEMILITARIZATION CHALLENGE

How can we safely destroy the current U.S. stockpile of chemical weapons within the time constraints imposed by a dangerous and deteriorating stockpile (U.S. Army, 2001d) and mandated by law? Under congressional mandate (Public Law 99-145), the Army instituted a sustained program to destroy elements of the chemical weapons stockpile in 1985 and extended this program to destroy the entire stockpile when Congress enacted Public Law 102-484 in 1992. The stockpile then included more than 31,000 tons of nerve and blister agents deployed in several million individual munitions and containers. In 1997, the Congress reiterated this commitment by ratifying the Chemical Weapons Convention.³

The U.S. Army, through its Program Manager for Chemical Demilitarization (PMCD), began active destruc-

¹The statement of task is included in the preface.

²Johnston Island, southwest of Hawaii, was the site at which the U.S. Army gathered chemical weapons withdrawn from overseas locations. JACADS, the initial stockpile facility, began destruction activities in 1990 and completed processing in November 2000. Planning for closure operations is currently under way.

³Formally known as the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction (P.L. 105-277), the CWC requires the destruction of chemical weapons in the stockpile by 2007 and any non-stockpile weapons in storage at the time of the treaty ratification (1997) within 2, 5, or 10 years of the ratification date, depending on the type of chemical weapon or on the type of chemical with which an item is filled.

tion of overseas chemical weapons stockpiles at JACADS in 1990. In 1996, PMCD commenced destruction of the continental U.S. chemical weapons stockpile at TOCDF, located at the Deseret Chemical Depot (DCD) in Tooele County, Utah. The disposal of the stockpile on Johnston Island was completed in November 2000, and by September 2001 nearly 40 percent of the chemical agent at Tooele, the site of the largest stockpile, had been destroyed. Between these two facilities, approximately 23 percent of the original chemical weapons stockpile had been disposed of by the end of the summer of 2001.

During the 10 years of JACADS operation and the first 5 plus operational years at TOCDF, a number of operational upsets or incidents occurred (U.S. Army, 2001c). Some resulted in chemical agent penetrating into normally agent-free areas where workers could be exposed. In others, improper operating procedures in agent-contaminated areas led to actual or potential worker exposure. Further, in a few of these events, very small amounts of agent were actually released outside the building into the ambient atmosphere.

JACADS and TOCDF are first- and second-generation chemical demilitarization facilities based on the disassembly of chemical munitions and destruction of both the chemical agent and the associated energetic munitions, as well as the decontamination of metal containers in a suite of specialized incinerators. In 2002 and 2003, third-generation facilities based on the same disassembly and incineration technologies are scheduled to commence operation at three of the largest remaining stockpiles at Army depots in Anniston, Alabama; Umatilla, Oregon; and Pine Bluff, Arkansas.

This report responds to congressional, Army, and public concerns by:

- Providing a context for evaluating the significance of chemical events,
- Illustrating methods for the analysis of chemical events,
- Analyzing chemical events at the two initial chemical demilitarization sites as of September 2001, and
- Providing recommendations for minimizing and managing potential future chemical events.

Dismantling and destroying chemical weapons is inherently hazardous, but the Program Manager for Chemical Demilitarization has incorporated extraordinary safety precautions into both plant design and personnel training (NRC, 1996, 1997, 1999a). The chemical demilitarization incineration plants are virtual fortresses built to withstand the consequences of accidents, and, to date, releases of chemical agent from these facilities have been rare, isolated events involving only small amounts of agent, even under upset conditions (NRC, 1996, 1997, 1999a). State-of-the-art quantitative risk assessments have determined that the major hazard to the surrounding communities arises from potential releases of agent from stockpile storage areas, not the de-

militarization facilities (U.S. Army, 1996a; NRC, 1997; see also Chapter 1 and Appendix E). However, given the inherent complexity of the chemical demilitarization task at the assembled weapons stockpile sites, it is almost certain that new problems will continue to arise, particularly from aging and deteriorating weapons and the challenges of demilitarization plant closure and decommissioning. There will be future "chemical events," and serious consequences to both plant personnel and surrounding communities cannot be ruled out.

WHAT ARE CHEMICAL EVENTS?

Data and Definition

To determine the frequency and nature of chemical events at JACADS and TOCDF, the committee requested that PMCD provide information on all incidents at the two sites that the Army considered to be chemical events. PMCD provided data on 81 separate incidents (39 from June 1990 through December 2000 at JACADS and 42 from August 1996 through May 2001 at TOCDF; see Appendix B) and included independent investigation reports for the most serious events. The committee also solicited and received information on actual or suspected incidents from concerned citizens, local and state officials, an organization opposed to incineration as a disposal means, and current and former facility employees (see, for example, Appendix C). Much of this information was gathered during visits to PMCD, JACADS, TOCDF, and the recently constructed Anniston Chemical Agent Disposal Facility.

To gain a perspective on the release of chemical agent to the environment during chemical demilitarization activities, the committee obtained data from the U.S. Army Soldier and Biological Chemical Command on the rate and severity of leaks from 1990 through 2000 from the chemical weapons stockpiles stored at Johnston Island and Deseret, Utah (U.S. Army, 2001d).

The committee determined that current Army criteria for classifying events at storage and demilitarization facilities are ambiguous and allow the local depot commander latitude to define as a chemical event accidents or incidents that do not involve release of chemical agent.⁴ Other incidents that clearly involved chemical agent were not defined

⁴For example, Army Regulation 50-6, on chemical surety, provides specific examples of chemical events which the committee judges to be so broad as to invite widely divergent interpretations by local Army depot commanders, such as example number 7: "Any malfunction or other significant activity at a chemical demilitarization plant that could reasonably be expected to cause concern within the local community or the press, or that in the judgment of the local facility or installation management or leadership could cause embarrassment to the U.S. Army" (U.S. Army, 1995).

as chemical events, because the escaped agent remained within the plant's engineering controls.

For the purposes of this report, the committee determined that a *chemical event* is any incident associated with chemical demilitarization operations that results in an actual or potential release of chemical agent.

Recommendation 2. The Army should establish a consistent set of criteria to be used by all chemical-agent-processing facilities to ensure uniformity in the classification of events, and to facilitate event analysis and comparison.

Risk Assessment

The demilitarization facilities contain relatively little chemical agent at any one time, and that agent is under stringent engineering controls in the demilitarization facility. The published quantitative risk assessment for TOCDF (U.S. Army, 1996a) makes clear that by far the greatest risk to the public arises from accidental or deliberate detonation of stored chemical munitions and the accompanying release of large amounts of chemical agent to the environment. Although after the events of September 11, 2001, the Army delayed publication of its quantitative risk assessments for the third-generation chemical demilitarization facilities, the committee has ascertained that the new risk assessments confirm the dominance of the risk of continued chemical munitions storage. The committee concluded that, in the post-September 11, 2001, world, the threat of terrorism and sabotage would likely be focused in the storage facilities, rather than the demilitarization facilities.

The committee further finds that quantitative risk assessments (QRAs) and health risk assessments (HRAs) are critical inputs to the dialogue necessary to ensure adequate public involvement in and understanding of chemical demilitarization activities. Maintaining a prudent balance between the public's right to know the risks they face and the need to protect sensitive information will be an ongoing challenge for the chemical demilitarization program. Without adequate risk information available to the public, it will be difficult to develop or maintain the level of public trust necessary for PMCD to accomplish its mission.

Recommendation 3. The Army should continue its practice of making available to the public the results of its quantitative risk assessments and health risk assessments for each chemical demilitarization site.

The committee also found that the QRAs provide a valuable framework for managing the risk from chemical events, including events arising from sabotage, terrorism, and war, by placing events in the context of their impact on safety.

Recommendation 4. The quantitative risk assessment (QRA) for each chemical demilitarization site should be it-

erative. Actual chemical events should be used routinely to test the completeness of the QRA, which should be routinely utilized to hypothesize the frequency and consequences of chemical events. The Program Manager for Chemical Demilitarization and the U.S. Army Soldier and Biological Chemical Command should use the QRAs to evaluate measures to control future chemical events. The Army should also consider using QRAs to examine scenarios associated with sabotage, terrorism, and war.

MONITORING CHEMICAL AGENT

The committee also reviewed the chemical agent monitoring procedures at incinerator-based demilitarization facilities. It determined that because the monitoring levels used by PMCD are very conservative and highly protective of worker and public health and safety, there are frequent false positive alarms, as well as alarms for actual events that pose no measurable threat to workers or the public. These conservative stack-monitoring thresholds ensure that no significant amounts of agent can be exhausted into the ambient air without the facility alarming and the agent incineration feed automatically terminating. In-plant air breathed by unmasked workers and the output of the scrubbing system for air exiting the chemical demilitarization plant are monitored at similarly conservative thresholds.

Recommendation 5. The Army should maintain conservative chemical demilitarization exhaust stack and in-plant airborne agent exposure thresholds. If current limits for exposure to stockpiled chemical agents are further reduced, the Army should not further reduce existing monitoring thresholds unless chemical agent monitors can be made both more sensitive and more specific so that lower thresholds can be instituted without significant increases in false positive alarm rates or unless health risk assessments demonstrate that lower thresholds are necessary to protect workers or the public.

However, the high rate of false positive alarms seems to be causing a "crying wolf" mentality whereby some operational personnel tend to discount alarms until they have been confirmed by laboratory analyses. PMCD must make it clear that properly responding to alarms is more important than production and, at the same time, show that it is trying to solve the underlying problem by actively developing better instruments. The committee notes that PMCD's operating procedures require that all alarms be treated as real until it has been demonstrated by laboratory analyses that they were not triggered by real chemical events.

Recommendation 6. To reduce the rate of false positive alarms for both airborne and condensed-materials agent contamination, the Program Manager for Chemical Demilitarization and the relevant Department of Defense research and development agencies, such as the Army Research Office,

the Army Research Laboratory, the Defense Advanced Research Projects Agency, and the Defense Threat Reduction Agency, should invigorate and coordinate efforts to develop chemical agent monitors with improved sensitivity, specificity, and time response. These efforts should be coordinated with, and take advantage of, the increased level of interest in and increased resources available for developing chemical weapons detectors for homeland defense.

CHEMICAL EVENTS ANALYSES

In analyzing past chemical events, the committee found that the basic design of the incineration-based demilitarization facilities and the processes used to disassemble and destroy chemical weapons and to dispose of residue and waste streams (see Appendix A) are fundamentally sound. The committee further found that the investigation of chemical events and incidents at demilitarization facilities has been straightforward and honest. However, the committee observed that future investigations could benefit from the use of methodologies such as causal tree analysis (where events are related to the final outcome) and human factors engineering (where data on human performance are related to the causal tree). Such methodologies would result in uncovering and understanding the complete set of those factors found to have contributed to each incident.

Recommendation 7. Incident investigation teams should use modern methodologies of incident investigation routinely at all chemical demilitarization sites to help uncover a broader set of causal and contributing factors, and to enable greater understanding of the interrelationships between and among these factors. Experts in human performance modeling should be included on any incident investigation team. A standing incident review board at each site should be established to identify chemical events requiring in-depth investigation and to ensure that the lessons learned appropriately influence ongoing operations. These boards would meet regularly to review accidents and incidents, including chemical events, and would be fully informed of any findings and recommendations made by chemical event investigation teams.

In its analysis of JACADS and TOCDF chemical incidents and events, the committee observed that repeating patterns of causal factors occurred across the range of incidents, from minor to severe. In particular, deficiencies in standard operating procedures (SOPs), design failures, and understandable, although inappropriate, assumptions (mind-set) of operations personnel contributed to almost all of the incidents investigated in depth. Repeating patterns of causal factors in most incidents did not appear to have been used by management to generalize incident findings beyond the immediate context of each incident.

Recommendation 8a. The Program Manager for Chemical

Demilitarization should analyze all chemical-agent-related incidents at chemical demilitarization plants for patterns of causal factors and should institute program-wide actions to address the causes found.

The programmatic lessons learned (PLL) database compiled by PMCD is a large undertaking and should help capture lessons from past chemical events and help prevent the recurrence of similar events. PMCD is to be commended for creating and maintaining the PLL database. However, information in the PLL database is relatively hard to use and is not prioritized. The data would be more useful if it were organized in a manner that included a system for prioritizing the data. The data may contain patterns that underlie several events and that could be found by "mining" the data for these connections. This information would improve the capability for broad generalization of specific information from an individual incident.

Recommendation 8b. Any improvements made in investigation procedures should become part of a systematically organized programmatic lessons learned (PLL) database that makes information easier for the non-expert to find and/or use. This can include prioritization and developing a drop-down "tree" list. Lastly, the Program Manager for Chemical Demilitarization should ensure that, at the plant level, the data are available to, known by, and useful to operations personnel. The proposed contractor for the PLL program should address these issues. For the program to be useful all stakeholders need to buy into its use and structure.

CHEMICAL EVENT IMPACTS

The committee observed that the computer models used to model accidental chemical releases in Army and local government emergency operation centers (EOCs) are representative of the state of the art as of the late 1970s. The Gaussian plume dispersion modeling techniques embedded in the D2PC computer model used to predict agent emission plume extent have more current and accurate implementations. Adoption of more modern and more accurate emission plume models seems to have been delayed by the failure to integrate better plume models into standard Chemical Stockpile Emergency Preparedness Program (CSEPP) emergency response models.

Recommendation 9a. Stockpile sites that still use the D2PC computer model should, at a minimum, upgrade their emergency response models to take advantage of the improved capabilities available in the D2-Puff model. Consideration should be given to testing and possibly optimizing the D2-Puff model at each site by performing tracer release experiments under a variety of meteorological conditions.

Recommendation 9b. The Chemical Stockpile Emergency

Preparedness Program should undertake a continuing evaluation of alternative approaches to modeling the release and impact of chemical agents.

Recommendation 9c. Accurate agent plume dispersion modeling capability should be coupled with timely communication of results and appropriate responses to the stockpile site and surrounding communities.

The committee also determined that communications during and after incidents and events have not always occurred as intended between and among the various stakeholders. The lack of an override function or a hot line dedicated to notification that an event has occurred has led to inadequate communication during chemical events. For example, the lack of notification and warning between DCD, Tooele County, and other Utah responsible agencies was caused in part by a lack of coordination between the Federal Emergency Management Agency's (FEMA's) CSEPP and the Army's Emergency Operations Center, and in part because of DCD's prevailing attitude that its emergency management responsibilities "end at the fence." This perspective, if carried to other communities where chemical demilitarization facilities are to be operated, can endanger the ability to provide an effective, coordinated emergency response to incidents. The memorandum of understanding for information exchange recently agreed to by the DCD and Tooele County (see Appendix G) could serve as a model for every community with a chemical weapons stockpile, to ensure very close oversight of the disposal plant's operations.

Recommendation 10a. Chemical demilitarization facilities should develop site-specific chemical event reporting procedures and an accompanying training program that tests and improves the implemented procedures and communication system.

Recommendation 10b. The standing incident review board recommended by the committee for each site should include a qualified member of the public who can effectively represent and communicate public interests.

Recommendation 10c. Each chemical demilitarization site should consider the establishment of a reporting and communication memorandum of understanding (MOU), of the sort developed between the Desert Chemical Depot and Tooele County, which specifies reliable and trusted means of alerting and informing local officials about chemical events. These MOUs should be designed to permit ready evaluation and updating of the terms of the MOU to take full advantage of learning across the array of chemical demilitarization sites.

Recommendation 10d. The Army Emergency Operations Centers and the Chemical Stockpile Emergency Prepared-

ness Program should establish a stronger capability and capacity for the coordination of training, equipment, and plans necessary to respond effectively to an emergency incident, and the commitment to do so in a coordinated and cooperative fashion. Additionally, the Army should continue its program of outreach—including listening to public concerns and responding to them, as well as engaging in more conventional public information efforts—to both the public and the relevant government oversight agencies to enhance general understanding of the chemical demilitarization program.

A major chemical event can result in several months of lost chemical munitions processing time. Multiple incident investigations and responses have led to additional delays in restarting operations when incidents have led to plant shutdown. All aspects of such investigations and resumption of operations should be accelerated consistent with safe operations.

Recommendation 11. All stakeholders and involved regulatory agencies should agree that a single team will investigate chemical events requiring outside review. This investigation team should comprise already-appointed representatives from all stakeholder groups and agencies, including members of the public who can effectively represent and communicate with local officials and the affected public. Incident findings should be documented in a single comprehensive report that incorporates the findings, proposed corrective actions, and concerns of the various oversight agencies.

ESTABLISHING A SAFETY CULTURE

The committee believes that the JACADS and TOCDF safety programs and performance have been and continue to be adequate to ensure that chemical demilitarization operations are being conducted safely. Even so, there is considerable opportunity for improvement. Many of the incidents that have occurred at JACADS and TOCDF could have been significantly mitigated—if not prevented—had a true "safety culture" been in place and functional at the time.

Recommendation 12a. Much of the needed improvement in safety at chemical weapons facilities can come from increased attention to factors that contribute to and/or cause chemical events. For example, the Program Manager for Chemical Demilitarization and chemical demilitarization facility managers should ensure that standard operating procedures are in place, up to date, and effective, performing hazard operations analyses on new process steps and design changes even when such changes are viewed as trivial and recognizing that chemical hazards are posed by things other than agent (e.g., waste).

Recommendation 12b. Management at the Tooele Chemical Agent Disposal Facility (TOCDF) and the new third-gen-

eration facilities should develop or identify and implement programs that will result in the establishment of a pervasive, functioning safety culture as well as improved safety performance. In doing so, TOCDF and the new chemical demilitarization sites should draw on experience in the chemical industry, obtained through industry associations or other appropriate venues. The Army should revise the award fee criteria to encourage each new chemical demilitarization site operator to demonstrate better safety performance than that at the older sites.

NEW FACILITY START-UP

The near-term start of operations at the three third-generation chemical demilitarization facilities presents an opportunity to get these facilities off on the right foot. Plant start-up can be a difficult learning experience for new operating crews. It is probable that conditions will arise in plant operation for which no SOP has been written. In these situations operators need an in-depth knowledge of their equipment and its limitations to handle these unusual conditions and maintain plant security. It is common practice in other industries to include "design" people in the start-up crew for new plants.

Recommendation 13. A generous allotment of time should be given to training and retraining chemical demilitarization plant operating personnel to ensure their total familiarity with the system and its engineering limitations. All plant personnel should receive some education on the total plant operation, not just the area of their own special responsibility. The extent of this overall training will be a matter of judgment for plant management, but the training should focus on how an individual's activities affect the integrated plant and its operational risk. Each facility should develop training programs using the newly designed in-plant simulators to present challenges that require knowledge-based thinking. The training programs should include a process for judging the effectiveness of the training. Including "design" experts in the start-up crew for new plants could be helpful in identifying latent failures in process and facility design.

The committee's specific findings are paired with the recommendations noted above and presented together in Chapter 6 of this report.

The Chemical Demilitarization Challenge

For more than 50 years the United States has maintained an extensive weapons stockpile containing chemical agents, stored primarily in military depots distributed in the continental United States. Largely manufactured 40 or more years ago, the chemical agents and associated weapons in this stockpile are now obsolete. Under a congressional mandate (Public Law 99-145), in 1985 the Army instituted a sustained program to destroy elements of the chemical weapons stockpile and extended this program to destroy the entire stockpile when Congress enacted Public Law 102-484 in 1992.

Chemical weapons stored overseas were collected at Johnston Island, southwest of Hawaii, and destroyed by the Johnston Atoll Chemical Agent Disposal System (JACADS), the first operational chemical demilitarization facility. JACADS began destruction activities in 1990 and completed processing of the 2,031 tons of chemical agent and the associated 412,732 munitions and containers in the overseas stockpile in November 2000 (U.S. Army, 2001a).

The largest continental U.S. stockpile component, which initially contained 13,616 tons of agent, is stored at the Desert Chemical Depot (DCD) near Tooele, Utah. This component of the stockpile is being processed by the Tooele Chemical Agent Disposal Facility (TOCDF), which started operation in August 1996 and destroyed 5,320 tons of agent and processed more than 880,000 munitions and containers in its first 5 years of activity. As of September 2002, the first two chemical demilitarization facilities had destroyed over 25 percent of the original chemical agent tonnage (U.S. Army, 2002a).

The Army, through its Office of the Program Manager for Chemical Demilitarization (PMCD), now has more than 15 years of cumulative operating experience in chemical weapons demilitarization. PMCD plans to open three additional facilities in the near future to meet Chemical Weapons

Convention¹ requirements for destruction of the U.S. stockpile. Despite the progress made to date, however, operations at JACADS and TOCDF have not been without incident. Several "chemical events" at the two plants have resulted in either unplanned discharge of significant amounts of agent within the facilities and/or the release of very small amounts of agent to the atmosphere above these plants.

The following sections in this chapter discuss the chemical demilitarization challenge: how to safely destroy the stockpile of chemical weapons within the available time constraints imposed by a dangerous and deteriorating stockpile. To put this challenge in context the Committee on Evaluation of Chemical Events at Army Chemical Agent Disposal Facilities describes technology for the chemical stockpile's disposal, defines and describes chemical events, discusses the significance of risk assessment to the chemical weapons disposal process, and categorizes institutional issues associated with chemical demilitarization.

STOCKPILE CONTENT, DISPOSAL DEADLINE, AND DISPOSAL TECHNOLOGY

The chemical weapons stockpile contains two types of chemical agents: the cholinesterase-inhibiting nerve agents (GB and VX), and blister agents, primarily mustard (H, HD, and HT) but also a small amount of Lewisite. Both types of chemical agents, which are liquids at room temperature and normal pressures, are frequently, but erroneously, referred

¹Formally known as the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction (P.L. 105-277), the CWC requires the destruction of chemical weapons in the stockpile by 2007 and any non-stockpile weapons in storage at the time of the treaty ratification (1997) within 2, 5, or 10 years of the ratification date, depending on the type of chemical weapon or on the type of chemical with which an item is filled.

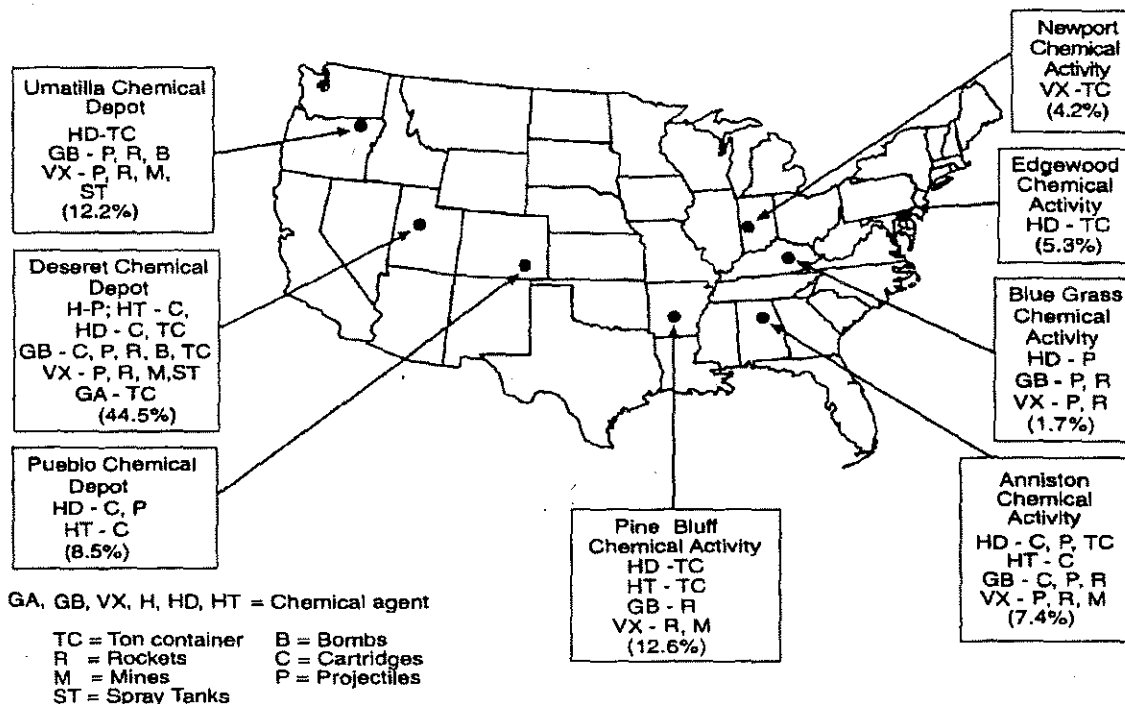


FIGURE 1-1 Location and size (percentage of original stockpile) of eight continental U.S. storage sites. SOURCE: NRC (1997).

to as gases. The stockpile contains both bulk ("ton") containers of nerve and blister agent and munitions, including rockets, mines, bombs, projectiles, and spray tanks loaded with either nerve or blister agents. Many munitions contain both chemical agent and energetic materials (propellants and/or explosives), a combination that poses particular challenges for safe and efficient destruction.

The disposal of stockpiled chemical weapons is a major undertaking. In 1990, the stockpile included 31,496 tons of chemical agents. The current stockpile is stored at eight chemical weapons depots operated by the Army in the continental United States. The location, size, and composition of the original continental U.S. stockpile is presented in Figure 1-1.

The U.S. Chemical Stockpile Disposal Program (CSDP) has evolved in parallel with international initiatives to eliminate chemical weapons. After many years of negotiation, the terms of the CWC were agreed upon in 1993 to deal with this issue. As of June 2002, the CWC had been signed by 174 countries and ratified by 145. The convention went into effect on April 29, 1997, after ratification by 65 countries. The CWC requires that signatories, which include the United States, destroy their chemical weapons stockpiles within 10 years of its initiation, making April 29, 2007, the deadline for destruction of the U.S. stockpile. A provision in the treaty allows a 5-year extension of the deadline under some circumstances. As of early October 2001, PMCD released new

schedule estimates indicating that chemical demilitarization activities at the three disposal facilities scheduled to commence operation in the near future may not be completed until 2008 at Pine Bluff, Arkansas, and until 2009 at Anniston, Alabama, and Umatilla, Oregon (U.S. Army, 2001b).

The disposal technology selected by the Army for storage sites that contain a full range of chemical agents and munitions types is a multifurnace incineration process (NRC, 1999a). In this "baseline" technology approach munitions and containers are drained of agent, which is burned in dual liquid incinerators (LICs). Robotic machinery disassembles munitions containing energetic charges and the separated energetic materials are burned in a rotary kiln-based deactivation furnace system (DFS). Sheared bulk containers and metal munitions parts are fed through a large heated metal parts furnace (MPF) designed to burn off any residual agent or energetic material, decontaminating metal components to the point that they can be recycled as normal scrap metal. The LIC, DFS, and MPF furnaces are all equipped with extensive pollution abatement systems (PASS) designed to substantially eliminate gaseous and particulate exhaust material of potential concern and exhaust remaining gases through a common stack.

The first-generation incineration system was deployed at JACADS. The second-generation system, deployed at

TOCDF, is described in detail in the National Research Council report *Tovele Chemical Agent Disposal Facility—Update on National Research Council Recommendations* (NRC, 1999a)²; this detailed description is reprinted in Appendix A. Third-generation incineration systems are currently close to operational status at the Pine Bluff, Anniston, and Umatilla sites. The new facilities will use basically the same process as that used at TOCDF and JACADS. Weapons will be taken apart in the same way, and there will be the same three lines of incineration: a rotary furnace for destroying propellant and explosive materials (see Appendix A, Figure A-6), a furnace with a moving conveyor primarily for decontaminating metal parts (see Figure A-7), and a furnace for burning liquid agent (see Figure A-8). Improvements to the new facilities have been made compared with TOCDF and JACADS, however; these are noted in Chapter 5.

In addition, the Army has selected liquid-phase hydrolysis processes, supplemented by various secondary hydrolysate treatment and/or disposal processes, to destroy the chemical agents contained only in bulk "ton" containers at Newport Chemical Depot in Indiana and at the Edgewood Chemical Activity site on Aberdeen Proving Ground in Maryland. Significant problems in introducing these new technologies to dispose of even the simplest case of "bulk only" chemical agent have been recognized (NRC, 2000a). A disposal technology has not yet been selected for the relatively small stockpile of nerve and mustard munitions at the Blue Grass Chemical Depot in Kentucky. At the Pueblo Chemical Depot in Colorado the Department of Defense has decided to use neutralization, followed by bio-treatment of the secondary waste to dispose of the mustard munitions stored there.

CHEMICAL EVENTS

During the 10 years of JACADS operation to destroy the chemical weapons stockpile at Johnston Island and the first 5 years of operation of TOCDF, a range of operating incidents occurred that were designated as chemical events by the local Army depot commanders. Army Regulation 50-6 on Chemical Surety (U.S. Army, 1995) defines chemical events very broadly: "The term chemical event encompasses all chemical accidents, incidents and politically/public sensitive occurrences." The regulation goes on to give specific examples, such as:

1. Confirmed releases of agent from munitions outside a closed containment system, such as a filtered bunker, storage igloo, or overpack container.

2. Discovery of an actual or suspected chemical agent container or munition in a place where it is not supposed to be that may require emergency transportation or disposal.
3. Confirmed detection of agent above the threshold concentration for any period outside the primary engineering control.
4. Actual exposure of personnel to agent above the allowed limits specified in various Army regulations.
5. Loss of chemical agent.
6. Any terrorist or criminal act directed toward a chemical agent storage, laboratory, or chemical demilitarization facility or any deliberate release of chemical agent.
7. Any malfunction or other significant activity at a chemical demilitarization plant that could reasonably be expected to cause concern within the local community or the press, or that in the judgment of the local facility or installation management or leadership could cause embarrassment to the U.S. Army.

At the eight continental U.S. storage sites, the Army's local depot commander has the responsibility to decide whether an upset or incident within the storage yard or at the associated chemical demilitarization facility is a chemical event. Examples 1 through 6 above seem to imply that, in most cases, chemical events are those in which chemical agent ends up where it should not be, i.e., in the ambient atmosphere or under the control of an unauthorized individual. However, no such requirement is inherent in example 7. The wide latitude in judgment about what might "cause concern within the local community or the press, or . . . could cause embarrassment to the Army" that is delegated to the depot commander suggests that some incidents defined as chemical events by one commander may not be considered chemical events by another.

Whatever the local Army commander deems to be a chemical event is subject to strict reporting procedures detailed in Army Regulation 50-6 (U.S. Army, 1995). Both telephone reports (within 3 hours) and initial written reports following specified formats (within 24 hours) must be made to both the Army Operations Center and Headquarters—Department of the Army. These reports are usually shared with local authorities and serve as the basis for press releases issued by the local depot and/or PMCD, but there appear to be no general guidelines for the form and the timing of such notification. A tabulation of chemical events is also provided in the Army's annual reports to Congress summarizing chemical agent storage and chemical demilitarization activities (see, for example, U.S. Army, 2000a).

Chemical Events Associated with Disposal

The Program Manager for Chemical Demilitarization (PMCD) is required to prepare and provide reports of chemi-

²This update report also details TOCDF technology and management issues identified by an NRC oversight committee during that facility's first 3 years of operation.

cal events for incidents so designated that occur within its facilities, as specified in Army Regulation 50-6.³

PMCD provided to the committee a chronicle of 81 incidents that occurred over the 10 years of JACADS operation and the initial 5 years of TOCDF operation (U.S. Army, 2001c). As shown in the Army's document (see Appendix B), a significant number reported under example 7 listed above did not involve chemical agent. Of those events involving chemical agent, only a few resulted in release of agent outside of engineering control and into the atmosphere. The total mass of chemical agent released to the environment in these incidents was almost certainly less than a gram (U.S. Army, 2001d), which is equivalent to no more than a few drops. The committee's analysis of PMCD-reported chemical events at the two chemical demilitarization facilities is presented in Chapter 2.

In addition to a list of PMCD-reported chemical events, the committee also received lists of possible chemical-agent-related incidents from local officials and concerned citizens groups (see Appendixes C and D). These are also addressed in Chapter 2.

Chemical Events Occurring During Storage

A listing and analysis of the chemical incidents involving leaking containers and munitions at the Johnston Island storage site from 1990 until the end of disposal operations in 2000 and at the Tooele site (now the DCD) from 1990 through 2000 were provided to the committee by the Army's Soldier Biological and Chemical Command's (SBCCOM's) Stockpile Management Team (U.S. Army, 2001e). As a result of its continuous stockpile inspection program SBCCOM has records of the frequency of chemical agent leaks occurring in stockpiled munitions and containers. Most of the incidents listed by SBCCOM involved a single leaking munition or container, although incidents involving more than one leaking munition discovered in a storage igloo were not uncommon. One incident involved 20 leaking munitions treated over the course of a month. The most serious incidents, including all those known to have discharged a significant amount of agent outside of engineering control, were designated as chemical events and reported as required by Army Regulation 50-6.

According to the SBCCOM statistics on stockpile leakage at Johnston Island, 13 incidents involving leaking munitions were reported from 1990 through 2000. Ten of these occurred from 1990 through 1992, with only 3 occurring in 1993 or later. Some of the later falloff is likely due to reduction of the stockpile as chemical demilitarization proceeded, with the most problematic munitions scheduled for the earli-

est destruction, according to the overall risk mitigation strategy outlined below in this chapter. Inspection and remediation of corroded or leaking munitions prior to their shipment to Johnston Island probably also contributed to the fact that so few munitions and containers leaked in the Johnston Island storage site.

The statistics for stockpile leakage at the Tooele site (DCD) for the same period from 1990 to 2000 differ considerably from those for JACADS. SBCCOM tabulated 31 incidents for 1990, 34 for 1991, 40 for 1992, 37 for 1993, 38 for 1994, 33 for 1995, 26 for 1996, 14 for 1997, 14 for 1998, 10 for 1999, and 11 for 2000, for an 11-year total of 288 (U.S. Army, 2001e). Again the record of events suggests that as stockpile destruction proceeds, with the most problematic weapons and containers scheduled for early destruction, the stockpile leakage statistics improve. From 1990 through 1995, 72 percent (159) of the 213 tabulated stockpile leakage incidents involved GB, which was the agent type destroyed at TOCDF through March 2002.

Some of the 288 storage chemical agent incidents at DCD from 1990 through 2000 involved only relatively low storage igloo vapor readings with most, possibly all, of the released agent captured in the carbon air filters present in igloos storing the highest-risk munitions (generally those containing GB) (U.S. Army, 2001e). In more than 100 different incidents, however, storage personnel who entered an igloo reported observing liquid agent leaks with volumes estimated to range between 1 teaspoon and 2 quarts, with one leak from a GB ton container totaling 10 gallons. In dozens of additional incidents smaller amounts of leaked liquid were observed. Since most of these incidents involved high-vapor-pressure GB, many resulted in release of small amounts of agent to the atmosphere, if only when the igloo door was opened to allow entry. Many of these leaks were initially detected by monitoring igloo air drawn through sampling ports. Mobile powered air filtration units were often used to minimize agent migration out of the igloo.

In addition, in 11 incidents at DCD from 1990 through 2000, ton containers of mustard, stored outside, were found to be leaking agent directly into the environment (U.S. Army, 2001e). When these incidents occurred, storage site personnel attempted to quantify the amount of agent lost by estimating the volume of contaminated gravel or soil underneath the leaking container, or, in the case of large leaks, measuring the agent remaining in the container. For most of the outdoor incidents documented at DCD, relatively small amounts of agent (a few drops to a few cups) were estimated by depot workers to have been lost. However, in the most serious event, a leak of distilled mustard estimated at 78 gallons (~375 kg) was discovered on September 9, 1993. The volume of agent released in this incident alone swamped the total mass of known emission of agent from chemical demilitarization facilities by at least a factor of several hundred thousand.

Large outdoor releases from storage facilities are an ongoing concern. In fact, while the committee was gather-

³Detailed guidance on the preparation and distribution of these reports and on associated record keeping is presented in a periodically updated document designated PMCD Regulation 385-3, "Accident and Chemical Event Notification, Investigation, Reporting and Record Keeping" (U.S. Army, 1999a).

ing data for this report during a visit to TOCDF on July 26, 2001, a leaking plug in a ton container of HD in the DCD storage site produced a vapor plume large enough to force workers at adjacent TOCDF to don respirators. That leak, according to chemical event reports and related memoranda supplied by SBCCOM, was determined to be about 9 pounds (~4 kg). This incident delayed the committee's access to TOCDF for several hours.

While chemical demilitarization operations at JACADS and TOCDF have released small amounts of chemical agent into the environment, these releases are negligible compared with releases to the environment from associated chemical weapons storage sites. The rate of agent leaks and releases does decrease significantly as the stockpile is processed.

TOOLS FOR ASSESSING HAZARDS IN THE OPERATION OF CHEMICAL STOCKPILE DISPOSAL FACILITIES

The Army has developed a suite of risk assessment and risk management tools to permit analysis of potential risks in terms of the scenarios that can contribute to risk, the likelihood of those scenarios, and the consequences associated with them. Those consequences are as follows (NRC, 1997, p. 16):

For humans (both workers and the public) there are three potential measures of risk either from the stockpile or from stockpile destruction: acute lethality; acute and latent non-cancerous health effects; and latent cancer. The potential adverse consequences for the environment are the contamination of land and/or water and adverse effects on native or endangered species.

These tools can be used to evaluate the risk associated with specific chemical events. Real-world events can also then be used as a check on the analyses, enabling revision of risk analyses to include new classes of events when surprises occur.

The variety of analysis tools is useful because of the differing needs of various program elements. To understand how they are related, the committee first groups these tools into two large classes: prospective (or predictive) tools and retrospective (or documentation) tools.⁴

Prospective Risk Analysis Tools

Health Risk Assessment

A health risk assessment (HRA) is a compliance-oriented analysis that examines the risk to a set of stylized receptors (e.g., the subsistence fisherman) associated with routine releases (intended to be conservative upper bounds

based on tests and performance of other units) and mild upset conditions (assumed to lead to release of a multiple of the conservative routine release for a specific fraction of the year). Accidents, specific systems failures, and specific human actions are not considered. The HRA is an upper-limit risk estimate for routine operations. Because it does not provide a realistic estimate (accounting for uncertainty), does not consider accidents, and does not address worker risk, it is not helpful in evaluating chemical events, other than providing a baseline, of sorts, against which the consequences of chemical events can be evaluated. For an example HRA see the analysis of TOCDF sponsored by the Utah Division of Solid and Hazardous Waste (Utah DEQ, 1996).

Systems Hazards Analysis

A systems hazards analysis (SHA) is a systematic and comprehensive search for and evaluation of all significant failure modes of facility systems components that can be identified by an experienced team. The hazards assessment often includes failure modes and effects analysis, fault tree analysis, event tree analysis, and hazards and operability studies. Generally, the SHA does not include external factors (e.g., natural disasters) or an integrated assessment of systems interactions. However, the tools of SHA are valuable for examining the causes and the effects of chemical events. They provide the basis for the integrated analysis known as quantitative risk assessment. For an example SHA see the TOCDF Functional Analysis Workbook (U.S. Army, 1993-1995).

Quantitative Risk Assessment

A quantitative risk assessment (QRA) is an integrated, quantitative analysis (including uncertainty) of accident scenarios, their likelihood, and possible consequences. Current QRAs examine human actions as well as systems failures, external events as well as internal failures, and worker risk as well as public risk. A salient feature of a QRA is that it is integrated, in that it:

- considers the interactions of systems and their effects on each component, considers common causes of failures, and considers all forms of system dependencies
- considers the integrated impact of multiple system and human failures on the potential for releases
- considers the impacts of weather and emergency protection on public consequences

Thus, the QRA provides an effective tool for evaluating the significance of chemical events. In fact, scenarios leading to chemical events and the frequency and consequences of these events are exactly what a QRA describes and calculates. Real-world events provide a check on the analysis. If

⁴The committee uses the Army's names and acronyms for these methods. Use of these names is not consistent with language in other environments.

potentially risk-significant events occur that were not previously modeled, the QRA can and should be updated to account for that event and any similar events that could occur. For an example QRA see the Army's TOCDF QRA (U.S. Army, 1996a). The committee notes that the TOCDF QRA was the first PMCD QRA and does not include all the features in the current analyses being finalized for the facilities at Anniston, Umatilla, and Pine Bluff. At the time of this writing the TOCDF QRA is the only one that has been published. Similar QRAs are being completed at the remaining sites. It is possible that portions of these may be unavailable publicly because of security concerns.

Key elements of the Army's approach to quantitative risk assessment are summarized in Appendix E for the interested reader. More details are available in the NRC Stockpile Committee's risk report (NRC, 1997).

Retrospective Analysis Tools

Monitoring Systems

Monitoring systems detect releases of hazardous chemicals, providing warning of hazardous conditions and a record of their occurrence and extent. They can also measure the burden of chemicals on the human body. They are not predictive, but instead provide real-time observations. For a description of monitoring schemes, see Box 1-1 and the NRC Stockpile Committee's report *Occupational Health and Workplace Monitoring at Chemical Agent Disposal Facilities* (NRC, 2001a).

Chemical Event Investigations

When chemical events occur, investigations identify what actually happened and when, the reasons, and the consequences; they usually suggest corrective actions for the future. An investigation (separate from possible corrective action) is most effective when it focuses on what actually happened from the viewpoint of those involved (i.e., why the actions of people involved made sense to them at the time, what they could see and what they knew, how they viewed their alternatives) (Weick and Sutcliffe, 2001). Too often these investigations are biased by hindsight and focus on what the operators might have done rather than why they did what they did. An effective investigation identifies the organizational and management issues that made the actions seem reasonable to those involved, and it can provide a basis for real improvement. Chemical event investigation and analysis are the subjects of Chapter 2 of this report.

Putting It All Together

From this brief introduction, it is clear that the QRA, chemical agent monitoring, and event investigation are the key tools for addressing the safety issues associated with

chemical events. In its published QRA the Army performed a detailed assessment of the risk of public fatalities and cancers associated both with the stockpile storage sites and chemical weapons processing activities at Tooele (U.S. Army, 1996a), and it has performed ongoing risk assessments for the planned third-generation incineration system chemical demilitarization facilities and associated stockpile storage areas at Pine Bluff, Anniston, and Umatilla. In its QRA for TOCDF, the Army's analyses indicated that, over the facility's projected operating schedule, the risk associated with accidental releases of agent due to disruption of the stockpile, most likely due to earthquake or leaks from ton containers of GB, greatly outweighed the risk of release of agent due to chemical demilitarization activities (U.S. Army, 1996a). This risk assessment does not examine potential terrorist activities, threats that are addressed by other federal agencies in addition to the Army.

The Army's risk assessment for TOCDF and its associated storage facility was reviewed by the NRC and found to be sound (NRC, 1997). Even in the event of an earthquake or plane crash that damages the disposal plant, the risk of public fatalities due to release of agent from the disposal facility is calculated to be about 5 percent of the expected risk of fatality due to releases of agent from the storage yard (U.S. Army, 1996a; NRC, 1997). A more detailed discussion of the TOCDF QRA and of advances incorporated in subsequent QRAs is presented in Appendix E.

Until the last few days of the disposal schedule, the amount of agent in the storage yard greatly exceeds the amount in the chemical demilitarization plant; as the stockpile is depleted, the risk posed by the storage facility drops proportionally. A key risk management strategy adopted by the Army is to order the stockpile destruction so that the most volatile, highly toxic agent and associated munitions are processed first (those containing the nerve agent GB), while less volatile and/or deadly agents are processed later.

Finally, it is important to note that the original TOCDF QRA focused on public risk, and little effort was devoted to examining worker risk. One consequence of this limitation in scope was that very little modeling of human performance was done in the TOCDF QRA. As attention in the program shifted to include worker risk, more significant modeling of human action has been performed. None of these improved analyses have yet been published. A variety of human reliability analysis methods have been used (Gertman and Blackman, 1994). For ongoing work, new approaches that account for details of context and human cognitive function are being adapted (Hollnagel, 1998; USNRC, 2000). With more careful and complete analysis, new scenarios especially important to worker risk are being developed. These methods, integrated into the risk assessments, can be used to quantify the impact of human actions on situations posing risk. Human performance not only is a significant component in risk assessment, but also, as the committee learned in its study, is directly involved in most chemical events. In

BOX 1-1 Details on Airborne Chemical Agent Monitoring Methods and Standards at Chemical Demilitarization Facilities

Two systems are currently used to monitor concentrations of airborne chemical agents at chemical demilitarization facilities. One system, the automatic continuous air monitoring system (ACAMS), is designed for "near-real-time" monitoring (currently ~3- to 8-minute cycle time, dependent on agent, for a single instrument). The ACAMS consists of an air sampling system connected to a gas chromatograph (GC) equipped with a flame photometric detector (FPD).

Specific columns and detector filters are used for each agent. The nerve agents, GB and VX, are detected by phosphorus oxide chemiluminescence, due to their P content, excited in the FPD detector, while mustard is detected by sulfur dimer chemiluminescence, from its sulfur content. Since VX has high molecular weight (298 amu), it is catalytically cleaved at the entrance to the GC column to shorten its detection time. This detection scheme relies on the characteristic GC column transit time of the agent or agent fragment (in the case of VX) plus the P or S spectrally specific flame chemiluminescence detection signal to identify the agents. The method is quite sensitive; ACAMS are often run at threshold detection volume-mixing ratios of a part per trillion (pptv) or lower. However, at these low threshold levels false positive alarms often occur because other chemical species can "interfere" by producing chemiluminescent signals that overlap the time gate and spectral band pass associated with the agents. For time-critical applications, like exhaust stack monitoring, the GC cycle time can be mitigated by time phasing two or more ACAMS sampling the same gas stream.

ACAMS alarms must be verified to ensure that they are not a false positive due to an "interferent" species or instrument malfunction. This verification is done using a depot area air monitoring system (DAAMS) deployed near an ACAMS. DAAMS is a passive system that draws an air stream through a sorbent tube. The tubes are collected and replaced periodically if there are no ACAMS alarms or shortly after an alarm occurs. They are transported to a laboratory and thermally desorbed onto a sample tube and analyzed on a laboratory scale GC/FPD system. Without confirmation by the more sensitive

and specific laboratory GC/FPD system, the ACAMS alarm is not confirmed. If the laboratory GC/FPD system does not show a chromatogram consistent with agent, a second DAAMS sample may be run on a laboratory GC equipped with a mass spectrometric detector (MSD). The GC/MSD analysis is designed to identify interferent compounds that may have caused a false positive ACAMS alarm.

The Army currently mandates very conservative alarm thresholds for its chemical demilitarization facilities (U.S. Army, 1997a; NRC, 2001a). Current exhaust stack alarms are set at 0.2 of the allowable stack concentration (ASC), for GB the ASC is just three times the time weighted average (TWA), which serves as the worker population limit (WPL) for the demilitarization workforce. The TWA is the level of agent an unmasked person can breathe for an 8-hour shift without harm. Thus, GB, the most volatile agent and therefore the greatest airborne threat to surrounding communities, is monitored at stack concentrations equivalent to 0.6 of the level currently deemed safe for a worker to breathe for a full shift without protection.

Stack exhaust monitoring levels for the less volatile and less threatening HD and VX are monitored at levels a factor of 2 and 6 above their TWA (WPL) levels, respectively. The 0.2 ASC stack level for GB is a factor of 10,000 below the "immediately dangerous to life and health" (IDLH) level for this agent. In-plant air levels breathed by unmasked workers and the output of the scrubbing system for air exiting the demilitarization plant are monitored at similarly conservative levels (generally 0.2 TWA). Since any agent in either the stack exhaust gas or scrubbed plant air will be greatly diluted before reaching the facility's fence line, air flowing into the surrounding communities will be well below the "general population limit" (GPL) defined as the level believed to pose no threat to the public. The GPL for the three stockpile agents is set at 30 to 33 times lower than their TWA (U.S. Army, 1997a; NRC, 2001a). The current ASC, TWA, and GPL levels for GB are 3×10^{-4} , 1×10^{-4} , and 3×10^{-6} mg/m³. For VX these values are 3×10^{-4} , 1×10^{-5} , and 3×10^{-6} mg/m³, while for HD they are 3×10^{-2} , 3×10^{-3} , and 1×10^{-4} mg/m³ (NRC, 2001a; U.S. Army, 1997a).

Chapter 2, the committee examines the more significant of the chemical events at JACADS and TOCDF to determine their characteristics with respect to facility performance and human performance. How these events are related to safety performance is not a simple question. In his widely referenced book (Reason, 1997), in a chapter devoted to the relationship between frequent, low-consequence events and the risk of high-consequence events, James Reason concludes that:

If both individual and organizational accidents have their roots in common systemic processes, then it could be argued

that . . . personal injury statistics are indicative of a system's vulnerability (or resistance) to organizational accidents. The number of personal injuries sustained in a given time period must surely be diagnostic of the "health" of the system as a whole. Unfortunately, this is not so. The relationship is an asymmetrical one. An unusually high [personal injury rate] is almost certainly the consequence of a "sick" system that could indeed be imminently liable to an organizational accident. But the reverse is not necessarily true. A low . . . rate (of the order of 2-5 per million man hours)—which is the case in many well-run hazardous technologies—reveals very little about the likelihood of an organizational accident.

The problem of human-caused events, how to control them, and how to discern the difference between high- and low-risk events continues to be studied in many industries (Reason, 1997; Hollnagel, 1998; IOM, 2000).

Monitoring Methods

The occurrence and the extent of a release of chemical agent are tracked through PMCD's workplace chemical agent monitoring system as described in NRC (2001a). Monitoring for airborne agent is a major activity at each chemical agent disposal facility. Box 1-1 provides details on monitoring.

Sensitivity requirements for the near-real-time automatic continuous air monitoring system (ACAMS) for airborne agent are demanding. This is because the allowable stack concentration and time-weighted-average levels used for exhaust stack and in-plant action levels are quite low and because the ACAMS alarms are currently set at 0.2 of the relevant action level.

This demand for sensitivity results in relatively frequent false positive alarms, particularly for the ACAMS monitoring the individual incinerator exhaust flows and the common exhaust stack (NRC, 1999b). Previous NRC reports have noted that the frequency of false positive ACAMS alarms disrupts plant operations, particularly when stack alarms trigger an automatic shutdown of agent feed to the liquid incinerator, and can lead to an unsafe "crying wolf" mind-set that tends to discount ACAMS alarms (NRC, 1999b, NRC, 2001a). In fact, one of these studies found evidence that the May 8-9, 2000, agent stack release at TOCDF was exacerbated by an expectation that what proved to be real exhaust system ACAMS alarms were instead just false positives (NRC, 2001a). While previous NRC reports have urged PMCD to improve both the reliability and time response of its airborne agent monitoring systems (see NRC, 1999b for a summary), progress in this area has been modest.

Another weakness of the airborne monitoring system is the lack of real-time (<10 seconds) agent detection. The NRC has previously recommended that the Army develop a real-time system that uses a measurement technology independent of the gas chromatography with flame photometric detector methods used by the ACAMS and the depot area air monitoring system (DAAMS) (NRC, 1994). To date, the Army's attempts to develop and demonstrate such a real-time system have not been successful (NRC, 1999b, 2001a). New interest in chemical agent detection as a key component of antiterrorism activities has spurred government and commercial activities focused on developing better sensors for airborne agent (IOM, 1999). The NRC has also urged the Army to continue to monitor technological advances in trace gas detection and to consider implementing any that are appropriate for monitoring agent in chemical munitions disposal facilities (NRC, 1999b). Renewed interest in

chemical agent detection and monitoring methods spurred by homeland defense concerns may lead to better and more robust technology. The committee urges PMCD to vigorously seek out and exploit any suitable developments arising from these activities.

Previous NRC reports have also noted the lack of robust techniques for rapidly measuring agent and agent breakdown products present in liquid waste streams and associated with solid materials (NRC, 2000a; NRC, 2000b; NRC 2001a). These reports recommend vigorous efforts to develop better methods to measure agent contamination in these media.

Event Analysis and Significance

The committee notes the importance of chemical event analysis that focuses on the viewpoint of the operators during the sequence of events. Understanding why their actions seemed appropriate to them, *at the time*, is the key to effecting real improvement in performance. Gaining an understanding of the factors within their work environment—training, equipment, and operational indications, as well as goals and rewards—which led them to conclude that their actions were appropriate is an essential element of developing a real safety culture at the facility.

An associated effort is to ensure that the QRA includes the class of events that actually have occurred. Mapping real event scenarios onto scenarios modeled in the QRA allows one to see a particular action integrated into the larger system for each chemical event and thus determine its effect on safety.

CHEMICAL DEMILITARIZATION INSTITUTIONAL ISSUES

Trust and Institutional Arrangements

The chemical demilitarization program necessarily depends on a combination of trust and institutional arrangements to accomplish the destruction of the chemical stockpile. Because extremely hazardous materials and complex technologies are involved, those seeking destruction of chemical agent and munitions must rely on agencies and firms expert in these processes to carry out the chemical demilitarization program. In essence, legislation and regulatory agency rule making establish institutional and contractual arrangements for the chemical demilitarization program, stipulating what is to be accomplished and (in some cases) how it is to be done. As in any contract, the "principal" relies on an "agent"⁵ to accomplish a task or service, and provides

⁵It is unfortunate that use of the term "agents" to indicate those that carry out tasks for "principals" might in this report be a source of confusion in the context of the chemical demilitarization program (where "agent" usually refers to chemical agent). Where *agent* is used in this report in the institutional sense, it is italicized to reduce the potential for confusion.

the means to ensure that the task is accomplished according to the principal's needs (Wood, 1992; Scholz and Wei, 1986). The U.S. Congress and the public it represents rely on agencies of the U.S. Army, state and federal regulators, private contractors, and a host of other entities to carry out the chemical demilitarization program. At specific chemical demilitarization sites, the local public and the officials who represent them similarly depend on these *agents* to carry out the task safely and effectively.

When principals delegate complex tasks, they create a relationship in which the *agents* on whom they rely are more knowledgeable about the task than are the principals. *Agents* design, test, construct, operate, and modify the chemical demilitarization facilities and have intimate knowledge of these steps, while principals often rely on *agents* for such knowledge. This kind of information asymmetry may place the principal at a disadvantage in overseeing the safety and effectiveness of the program, and necessitates monitoring and control mechanisms that are specified in the relevant laws and contracts. Monitoring mechanisms include permitting and reporting requirements, inspections, investigations, and rules governing whistle-blowers, while control mechanisms include arrays of incentives (such as contract fee structures) and sanctions (civil and criminal punishments, fee deductions, and so on). A trade-off implicit in this relationship is that of the principal's control over *agents* versus the scope of the *agent's* discretion, some of which is typically necessary for complex and demanding tasks that require the *agent* to push the boundaries of known processes and technologies. Greater trust reduces the need to rely on formal monitoring and control, and conversely loss of trust increases the need for monitoring and controls.

The Institutional Setting of Chemical Demilitarization

The U.S. government's approach to chemical demilitarization involves a complex amalgam of institutional stakeholders. The Army's SBCCOM is the operator of the eight remaining stockpile storage facilities. PMCD is responsible for the construction, operation, and subsequent closure of JACADS, TOCDF, the three new incinerator system facilities at Anniston, Umatilla, and Pine Bluff, and the two-bulk only, hydrolysis-based facilities under construction at Newport and Edgewood (Aberdeen). By law, evaluation of alternative (non-incineration) technologies that may be used to dispose of the stockpiles located at Pueblo, Colorado, and Blue Grass, Kentucky, has been delegated to an independent Program Manager for Assembled Chemical Weapons Assessment (PMACWA) within the Army.

Protection of the public from harm due to accidental releases of agent near storage depots and associated chemical demilitarization facilities is the responsibility of the Chemical Stockpile Emergency Preparedness Program (CSEPP), which is funded by the Army but administered by the Federal Emergency Management Agency (FEMA).

Thus, at any of the six continental sites where a chemical demilitarization facility is either operating or under construction, a concerned citizen needs to receive a consistent and accurate message from a range of state and federal entities including PMCD, SBCCOM, FEMA, and CSEPP. In the past a consistent message from these Army or Army-related entities has been hard to achieve (NRC, 1999a).

In addition, chemical demilitarization facilities must obtain environmental permits from state environmental agencies in order to commence operations and must seek permit amendments and renewals from these same agencies in order to sustain operations. Permit conditions may vary widely from state to state even though the state environmental agencies operate largely under authority delegated from and overseen by the federal Environmental Protection Agency. State-to-state discrepancies in chemical demilitarization facility operating permits or amendments to existing operating permits may raise public concerns. Hearings related to environmental permit applications and amendments give citizens an important opportunity for input into the operation of chemical demilitarization plants.

The PMCD receives guidance from the Army Medical Services (U.S. Army Center for Health Promotion and Preventive Medicine), working in conjunction with the Department of Health and Human Services' Centers for Disease Control and Prevention, about the levels of exposure to chemical agent that are considered safe for both workers and the public (U.S. Army, 1990, 1991). Recent reevaluations have led to proposals for significantly lower recommended standards related to exposure to chemical agents. This possibility has raised citizen concern about the safety of Army stockpile storage and chemical demilitarization operations designed to meet the current exposure limits.

Chemical events have raised questions about the safety of the stockpile storage and the demilitarization process. Understanding whether an event results from flaws in design, fundamental problems with technologies, organizational failures, or personnel lapses is essential for determination of appropriate responses. Because the answers to these questions materially affect the circumstances of the *agent*, concerns about whether *agents* are sufficiently forthcoming and responsive are inevitable. The U.S. Congress has responded to such concerns with diligent oversight (including the request for this report), requirements that whistle-blowers be protected from retaliation, and requests for formal annual reports from the Army on the progress of chemical demilitarization and the occurrence of any chemical events associated with either chemical demilitarization or storage facilities.

REPORT ROADMAP

The chemical events that have occurred at JACADS and TOCDF are characterized and a selected subset analyzed in Chapter 2. Chapter 3 discusses protocols and pro-

cesses for reporting chemical events, outlines how selected events were reported at both facilities, and discusses how these events affected plant operator interactions with other stakeholders, including environmental regulators, elected state and local officials, and the public. Chapter 4 discusses the implications of lessons learned from past chemical events and their impact on continuing operations at

TOCDF and future operations at Anniston, Umatilla, and Pine Bluff. Prudent preparations to minimize the occurrence and impact of future chemical events at incineration system chemical demilitarization facilities are discussed in Chapter 5. Chapter 6 contains focused findings and recommendations drawn from material presented in the first five chapters.

Causal Factors in Events at Chemical Demilitarization Facilities

Early in its deliberations, the committee recognized that different stakeholders have different perceptions of what constitutes a chemical event. It further became apparent that the sheer number of incidents recorded for JACADS and TOCDF made a detailed review of each event beyond the committee's resources and time. To focus its efforts, the committee identified from the full list of incidents compiled by a variety of groups (see Appendixes B, C, and D) a comparatively small number of serious events that could be evaluated in some detail. The committee's goal was to select representative occurrences so that this report's findings and recommendations would be generally applicable.

This chapter describes the committee's process for defining a chemical event, its rationale for selecting which of the large number of chemical events it would analyze in depth, and what its analysis of operational events inside each facility determined.

DEFINITIONS

One of the first issues addressed by the committee was what constitutes a chemical event. The Army's definition of chemical events encompasses all chemical accidents, incidents, and politically and publicly sensitive occurrences (U.S. Army, 1995), whether or not chemical agent was actually present. The committee determined that the seven examples provided in Army Regulation 50-6 (U.S. Army, 1995; see Chapter 1) were too broad for the tasks assigned to it. Consequently, it elected to establish its own criteria to determine which of the reported incidents qualified as chemical events.¹ The following definition was developed by the committee and used for the selection process:

¹The committee's purpose in reclassifying chemical events was solely to assist in selecting the events that it would review, and not to "second-guess" the Army's classification system.

Chemical event: Any incident associated with chemical demilitarization operations that resulted in an actual or potential release of chemical agent.

As used in this report, the term "release" refers to agent detected and confirmed in an area where agent is not normally present or expected to be present. Further, as described in this report, an "environmental release" refers to agent detected and confirmed in the environment outside the chemical demilitarization facility. Additionally, the committee had an interest in whether there was "worker exposure" involved in the chemical event.

SOURCES OF INPUT AND SELECTION OF EVENTS FOR IN-DEPTH ANALYSIS

Any analysis of events must recognize a continuum of potential events, ranging from expected and safe variations of processes to serious events that harm people or damage equipment. If too narrow a set of events is chosen for analysis (for example, only those with severe consequences), patterns of contributing factors may be difficult to identify. Conversely, too broad a set of incidents includes much "normal" variation that merely confirms that process controls are functioning as planned. The amount of effort devoted to the investigation of events tends to be a function of the severity of the outcomes, with the result that much more detailed data are available on the (rare) major events.

The committee received written or verbal communication from stakeholders and/or their representatives describing a large number of potential chemical events.

- The Army Program Manager for Chemical Demilitarization (PMCD) provided a written list of 81 events (Appendix B) that occurred after operations began at Johnston Atoll Chemical Agent Disposal System (JACADS) and at Tooele Chemical Agent

Disposal Facility (TOCDF), as well as detailed investigation reports on several of the incidents.

- The Calhoun County (Alabama) Commissioners provided a letter detailing concerns and questions for the committee and including a list of six chemical events and a number of areas of concern (Appendix D).
- The committee met with Congressman Bob Riley (R-Ala.) at his request, and with representatives from Calhoun and Talladega counties, plus concerned citizens and governmental officials from Alabama, at a Capitol Hill meeting arranged by Congressman Riley to provide the committee with a local perspective.
- The Chemical Weapons Working Group (CWWG) provided the committee with a list of 118 items (Appendix C). Several committee members discussed some CWWG concerns with Craig Williams, the executive director of the CWWG, at the Capitol Hill meeting.
- A verbal presentation was made and submitted in writing by Gary Harris, a former employee and whistle-blower at the Chemical Agent Munitions Disposal System (CAMDS) facility and at TOCDF, at the committee's meeting of October 18, 2001.
- A verbal presentation was made by Suzanne Winters, chair, Utah Citizens Advisory Commission (formerly science advisor to the governor of Utah), at the committee's meeting of October 18, 2001.
- A set of 69 Notices of Violation at TOCDF issued by the State of Utah's Department of Environmental Quality, Division of Solid and Hazardous Waste, on February 13, 2001, was reviewed.
- A subgroup of the committee visited Anniston, Alabama, and received comments from local officials and citizens.

Of these submissions, the three formal lists of events supplied to the committee (by PMCD, the Calhoun County Commissioners, and the CWWG) had some events in common that are discussed further below. The written submission by Gary Harris focused principally on his experiences at the CAMDS facility, which was not part of this study.

The PMCD Incident List

The PMCD provided to the committee a list of 81 incidents, 42 at TOCDF and 39 at JACADS (U.S. Army, 2001c; see Appendix B). The Army had classified 24 (17 at TOCDF and 7 at JACADS) of these as "chemical events." Of the 81 incidents, some were significant enough to warrant investigation by agencies external to the incineration facility. The committee obtained investigation reports for 14 of the incidents and supplemented the information in them by interviewing managerial, operating, and laboratory personnel during site visits to JACADS and TOCDF. The committee also obtained data from process logs and other operational

documents to assist with detailed analysis of specific incidents. Using its agreed-to definition of a chemical event and drawing on the extensive reports, the committee reevaluated this extensive material and designated 40 events (19 at TOCDF and 21 at JACADS) as chemical events.

To focus its analysis, the committee decided to examine events with the following characteristics: (1) sufficient investigation had already been done to provide a basis for analysis and (2) the event could have had potentially serious outcomes, was complex in nature, was well documented, and provided a rich source of potential causal factors. With this as a rationale, the committee examined five dissimilar incidents in significant detail (Table 2-1).

The committee then analyzed two relatively recent events, both of which resulted in the release of agent into the environment and triggered detailed investigations (Table 2-2; see Boxes 2-1 and 2-2 for details on the two events).

The Calhoun County Commissioners' List

The Calhoun County (Alabama) Commissioners submitted a letter (see Appendix D) that listed six areas of concern about operations at TOCDF. Those concerns included six chemical events the commissioners wished the committee to evaluate. They also requested that the committee evaluate events described or concerns raised by groups of concerned citizens. The only citizen group that provided such a listing was the CWWG.

Five of the incidents identified by the commissioners were included in the PMCD incident list (Appendix B) and were reviewed either in the committee's overall examination or in its detailed analyses; the remaining incident could not be confirmed as having happened. Many of the other concerns expressed by the commissioners were deemed to be outside the scope of the committee's statement of task, although some, such as the operation of the chemical agent monitoring systems and the potential impact of changes in demilitarization technology and/or operational procedures, are examined in this report. To ensure that a full range of possible incidents was considered, members of the committee met in person with the Calhoun County Commissioners at their offices on December 3, 2001, to discuss their concerns within the constraints imposed by NRC committee guidelines.

The Chemical Weapons Working Group Incident List

The Chemical Weapons Working Group provided a list of 118 items to the committee (see Appendix C), 55 of which were notations of operational shutdowns and unconfirmed automatic continuous air monitoring system (ACAMS) alarms, for example: "Site masking alarm and/or stack alarm. Potential case of chemical warfare agent release or release of other related toxic chemicals (unidentified to date)." It is probable that most, if not all, of the "site masking" alarms

TABLE 2-1 Events on the PMCD List That Were Examined by the Committee

Date	Demilitarization Site and Army Classification	Process Component	Incident / Event Description by PMCD
21-Jan-92	JACADS (Unusual Occurrence)*	Deactivation furnace system (DFS)	Processing VX-filled M55 rockets when a detonation occurred within the DFS, causing the kiln to stop rotating.
2-Jan-93	JACADS (Unusual Occurrence)	Explosive containment room (ECR)-A	During M60 105-mm projectile processing within the ECR a fire occurred along the miscellaneous parts conveyor. Fire was contained within the ECR. Changes made to the equipment and increased frequency of ECR cleanup of residual explosives.
17-Mar-93	JACADS (Chemical Event)	Munitions demilitarization building (MDB)	Ratheon Engineering and Constructors worker potentially exposed to mustard agent (HD). Worker developed blister(s) on leg after handling HD-contaminated waste materials.
23-Mar-94	JACADS (Chemical Event)	Common stack	Liquid incinerator (LIC) was being ramped down (controlled cooling operation) for slag removal. Minute amount of GB released via common stack. Technical investigation completed and operation procedures changed.
19-Nov-94	JACADS (Unusual Occurrence)	ECR	Detonation of rocket on fuze shear caused agent migration to observation corridor. All agent vapor contained under engineering controls and exhausted through the MDB charcoal filter units.

*The committee's definition of a chemical event requires that the event result in actual or potential release of agent in an area where agent is not normally present or expected to be present. The committee categorized the January 1992, January 1993, and November 1994 incidents as unusual occurrences because no agent was released or migrated to areas where it was not supposed to be, and further, the potential of this happening was considered slight. Conversely, the March 1993 and March 1994 incidents were categorized as chemical events because both resulted in the release of agent into the environment.

SOURCE: Excerpted from U.S. Army (2001c); see Appendix B.

TABLE 2-2 Events on the PMCD List That Were Chosen by the Committee for Detailed Analysis

Date	Demilitarization Site and Army Classification	Process Component	Incident / Event Description by PMCD
8-May-00	UMCDF (Chemical Event)	Deactivation furnace system (DFS)	During processing of GB rockets the DFS interlock shut off all burners due to pollution abatement system air flow meter failure. ACAMS alarmed in the furnace stack during re-light of the furnace. No agent or munitions were being processed at time of the alarms. The perimeter monitors' readings were all negative for agent. Investigation teams from CDC (Centers for Disease Control and Prevention), Department of Army Safety, and Utah DSHW (Division of Solid and Hazardous Waste) conducted the investigation of stack release. Technical investigation completed with recommended procedural and design changes.
3-Dec-00	JACADS (Chemical Event)	DFS waste bin	Chemical agent (VX) was detected and confirmed in the ash from the heated discharge bin at the DFS. The agent was detected during routine monthly sampling for metals as required by the RCRA (Resource Conservation and Recovery Act) permit. The bin was isolated and placed under engineering control, and subsequently the bin was fully enclosed under engineering control.

SOURCE: Excerpted from U.S. Army (2001c); see Appendix B.

BOX 2-1 December 3-5, 2000, Johnston Atoll Chemical Agent Disposal System (JACADS) Event

The destruction of the last agent-containing munitions on Johnston Island, M23 VX land mines, was completed on November 29, 2000. This marked the end of the operational phase of JACADS and the beginning of the closure phase. One of the first steps of closure was to process bulk solid waste (items such as spill pillows, rags contaminated with explosive or agent, metal hardware, rubber hoses, etc.) from the explosive containment room (ECR) through the deactivation furnace system (DFS). The material was processed using the standard 5X procedure (1000°F for 15 minutes) and the ash and unburned material produced placed in disposal bins. A bin was sampled monthly for agent analysis.

Between 7:47 PM on Dec 2, 2000 and 12:56 AM on Dec 3, 2000, three spill-pillows (each containing approximately 20 pounds of liquid waste) were processed. How much of that was chemical agent VX is unknown. The spill-pillows contained talcum powder and an amorphous silicate absorbent. The 5X treated remains of the pillows, cardboard mines, fuses, and kicker chutes passed through the DFS and the non-combustible ash exited the heated discharge conveyor (HDC) to bin 135. At 8:06 AM on Dec 3, 2000 bin 135 was placed in the staging area (outside primary engineering control) with the lid open to cool.

At 10:30 AM on Dec 3, 2000, a routine sample of the solid waste from bin 135 was taken for waste control limit (WCL) analysis and the bin lid closed. The analysis (12:30 AM Dec 4, 2000) indicated a suspected interference. An extraction analysis on the same sample confirmed the presence of VX at 3000 WCL at 1:56 AM Dec 5, 2000. A second sample was taken at 3:00 AM Dec 5, 2000 and analysis indicated 5045 WCL. At 4:30 AM Dec 5, 2000, bin 135 and two others were moved to the unpacking area for further monitoring.

At 10:10 AM Dec 5, 2000, an automatic continuous air monitoring system (ACAMS) reading of 1476 time weighted average (TWA) was measured in air drawn from the bottom of bin 135. After another positive ACAMS reading, the site alarm sounded at 10:20 AM and all personnel were masked and sent to checkpoint "Charlie" for possible

evacuation. Depot area air monitoring system (DAAMS) confirmation of VX in bin 135 was obtained at 3:00 PM Dec 5, 2000. The hazardous materials (HAZMAT) team began a series of checks of all other bins at 12:13 PM Dec 5, 2000 and found all readings less than TWA. The DFS kiln was restarted at 9:19 PM Dec 5, 2000 to maintain a negative pressure in the HDC waste bin enclosure. An all-clear was sounded at 9:39 PM. No agent was measured at the perimeter DAAMS tubes throughout the incident.

The Chemical Event Report was submitted within 3 hours of the event and the JACADS field office and U.S. Army Chemical Activity Pacific made notifications to their respective field offices. The Program Manager for Chemical Demilitarization (PMCD) made telephone notifications to the Assistant Secretary of the Army for Installations, Logistics, and the Environment, the Department of the Army Safety Office and the Department of Health and Human Services, however no notification was given to Region IX, Environmental Protection Agency. PMCD initiated an investigation to protect evidence and gather information and assembled an investigation team on Johnston Island on Dec 13, 2000.

The conclusions of the investigation team as summarized in the report were: "The process of sending VX contaminated liquid and saturated spill pillows to the DFS in excess of the decontamination capability of the furnace system appears to be the major cause of the chemical event. There are no other scenarios consistent with the physical evidence observed in bin 135 that could have resulted in the agent levels that were recorded during this chemical event. A faster response from the lab and a procedure that includes an action level for the exceedance of waste control limits would have reduced the amount of time bin 135 was outside of engineering controls. A detailed review of standard operating procedures for bulk solid waste fed to the DFS should be conducted. In addition, a narrower definition of what constitutes bulk solid waste should be developed."

SOURCE: Reprinted from U.S. Army (2001f).

noted were false positive ACAMS alarms, which are discussed in some detail in Chapter 1. Thirty items were simple statements of fact that bore no relationship to the committee's task, for example: "August 1, 1997—Former Chief Safety Officer, Steve Jones is ruled for in his Dept. of Labor Wrongful Termination Action. Judge awards Jones his job back and \$500,000 or no rehiring and \$1 million. Judge calls EG&G managers liars." Four items appeared to be related to stockpile storage, and not to chemical demilitarization operations. Seventeen of the items on the CWWG list were identifiable as being related to inci-

dents or events included on the PMCD list and were considered by the committee.

For most of the items on the CWWG list, no specific documentation or details were included beyond one to a few sentences. The committee concluded that the majority of the items were not germane to its statement of task. Those that were relevant were typical of the ones from the PMCD list that the committee studied intensively. In conclusion, the committee determined that evaluation of additional items on the CWWG list would not materially influence the findings and recommendations of this report.

BOX 2-2 May 8-9, 2000, Tooele Chemical Agent Disposal Facility (TOCDF) Event

During processing of rockets containing the chemical agent GB, at approximately 4:20 PM on May 8, 2000, a jam occurred in the lower feed gate of the deactivation furnace system (DFS) feed chute from the explosives containment room (ECR). Operators sprayed water into the chute in an attempt to clear the feed gate jam. The last of the material in the furnace had cleared the DFS and the heated discharge conveyor (HDC) by 5:30 PM. At approximately 6:10 PM the pressure was lowered in accordance with non-normal operating plans. An alarm indicating high air flow rates through the DFS and pollution abatement system went off at 8:20 PM and by 8:42 PM pressure fluctuations were affecting the operation of the DFS induced draft fans.

Meanwhile, at approximately 8:30 PM, personnel entered the area to inspect the feed chute and found enough debris to fill a coffee can. The decision was made to wash down the chute. With several openings and closing of the feed gates and spraying with water, the pressure controlling equipment was unable to stabilize the pressure in the kiln. The DFS operator took manual control in attempting to stabilize the pressure. The wash down of the chutes was completed by about 9:30 PM. The maintenance personnel then changed the strainers in ECR - B and placed approximately one pound of agent contaminated waste on the upper feed gate (this was the source of the agent that eventually was monitored in the stack, but the operators were unaware of its presence). The DFS operators continued to have difficulty stabilizing the furnace system. About 10:00 PM the DFS burners were automatically shut down and operators locked out by a malfunction signal sent by the DFS exhaust flow meter.

While seeking approval to by-pass the lock out of the burners and restart the afterburner, the common stack automatic continuous air monitoring system (ACAMS) alarmed at 11:26 PM. The site was immediately masked. A depot area air monitoring system (DAAMS) tube was taken for analysis at 11:38 PM and another put in its place. ACAMS readings as high as 3.63 allowable stack concentration (ASC) were obtained. The furnace was "bottled up" (dampers closed to slow airflow) at 11:44 PM. By 12:18 AM on May 9, 2000 the ACAMS had cleared and the order to unmask given.

Restarting of the DFS afterburner was attempted again at

12:23 AM, but the furnace went to a negative pressure and fluctuated once again. Another burner lockout occurred this time because the clean liquor pump was not running. At 12:28 AM, the DFS duct ACAMS alarmed and the site was masked again and the furnace was "bottled up" at 12:32 AM. The alarm cleared and the site was unmasked at 1:07 AM. DAAMS tubes from the perimeter were collected around 6:55 AM and subsequent analysis showed no detectable agent. The analysis of the stack DAAMS tubes indicated a stack release of 18-36 mg.

The TOCDF control room notified Deseret Chemical Depot (DCD) emergency operations center (EOC) at 11:30 PM on May 8, 2000 following the stack ACAMS alarm and updated the report at 11:42 PM with the highest readings and the fact that the duct ACAMS had also alarmed. They further notified the DCD EOC at 12:25 AM on May 9, 2000 that all ACAMS had cleared and that DAAMS analysis was pending. At 12:32 AM the DCD EOC was informed that the stack ACAMS were back in alarm and at 1:17 AM that DAAMS tubes from the first set of alarms confirmed the presence of agent GB.

At approximately 3:00 AM on May 9, 2000 notification was made by the DCD EOC to the Utah Department of Environmental Quality (DEQ) and at approximately 3:34 AM to the Tooele County dispatcher. The event was classified as a Limited Area Event (not likely to leave the site). No action was taken by the state or county until normal business hours on May 9.

Investigations were conducted by the TOCDF contractor EG&G, the Army Safety Office, the Centers for Disease Control and Prevention (CDC), and the Utah DEQ. Suspension of agent burning was initiated and stayed in effect until corrective actions recommended by the reports were made and approved by the Utah DEQ. The CDC report concluded that there was neither an impact to the health of TOCDF workers nor the general public. Subsequent computer modeling indicated that no harm to humans would occur beyond 8 ft. past the top of the 200-ft. common stack.

Resumption of operations in the two liquid incinerators and the metal parts furnaces (none of which were involved in the event) followed approval on July 28, 2000. Approval to resume operations in the DFS was given September 29, 2000.

SOURCE: Compiled from Utah DEQ (2000a), U.S. Army (2000a,b), and CDC (2000).

Notice of Violation Reports

The Notice of Violation reports issued by the Utah Department of Environment Quality (DEQ) for TOCDF contained a total of 69 items. These often differ in nature from the events listed by PMCD and others, in that they were

mainly failures to observe and follow prescribed procedures, and, in general, did not lead to chemical events. Table 2-3 shows the frequency of occurrence of each type of violation reported by DEQ.

Although many of these violations were classified by the committee as minor, they are important as indicators of

TABLE 2-3 Committee's Classification of 69 Items Cited in Notice of Violation Reports

Violation Type	Number
Operational error (wrong feed, missed analysis, use of faulty equipment)	20
Failure to test/inspect on schedule	13
Failure to follow plans/procedures/specifications	11
Failure to keep correct records	7
Improper storage	5
Storage time limits exceeded	5
Incorrect labeling of waste	2
Failure to notify of changes	2
Other	4

systemic operating problems. Record-keeping errors or instances of exceeding time limits for testing or inspection, which tend to occur in all complex processes, may be indicative of insufficient resources devoted to the tasks to be performed, or lack of priority setting to prevent such "minor" infractions. The committee considered each of these as it developed its findings and recommendations.

ANALYSIS OF SELECTED CHEMICAL EVENTS

The committee's analysis was conducted on several levels. First, members investigated the causal factors for each of the seven events listed in Tables 2-1 and 2-2. They then developed a notional causal tree for each of the two events in Table 2-2 that were analyzed in depth. For illustrative purposes, a causal tree developed by the committee for the December 3-5, 2000, incident at JACADS appears at Appendix F. The tree is a standard tool in reliability analysis and is particularly useful in human reliability analysis where operator actions contribute either positively or negatively to an incident. Lastly, the committee provides a series of general and specific observations about the events.

Causal Factors

The committee's analysis of the seven chemical events listed in Tables 2-1 and 2-2 showed that there were multiple causal factors for all of the selected events. (Note: the committee could determine causal factors only for incidents for which sufficient investigation data were available.) Rather than being specified for each incident, the causal factors identified by the committee are grouped into the following generic categories:

- *Standard operating procedure (SOP) deficiencies*, including nonexistent SOP(s), inadequate SOP(s), and SOP(s) being circumvented or ignored as a routine operating practice. Such deficiencies contributed to 6 of the 7 incidents subjected to in-depth re-

view (Table 2-4) and were noted as being involved in at least 14 of the incidents that received less thorough review by the committee. Note also that 11 of the 69 items in the Notice of Violation reports (see Table 2-3) involved similar failures to follow procedures. Several incidents involved multiple SOP deficiencies, and in one, the March 17, 1993, incident in which a worker was exposed to HD, at least six SOP deficiencies were noted, including:

- No procedures for loading/handling bags.
- Placing HD sludge in plastic bags.
- Tagging bags improperly.
- No pre-entry hazards briefing.
- Improper carrying of bags.
- Failure to wear proper personal protective equipment.

Following existing SOPs could have prevented several of the incidents that occurred at both TOCDF and JACADS. However, the non-compliance with SOPs was not a question of operators being contrary. Most operators were in fact trying to smooth or simplify the process by using non-approved methods, and had presumably been reinforced in this approach by past experiences. SOPs are not always perfect, for example, in that they apply to conditions not quite met at the particular time they are required. If the safe alternative is to stop work whenever an SOP is not exactly appropriate, that may not always be apparent to the operator.

- *Failures of communication*, including failure to communicate essential information, failure to heed communicated information, and inadequate communication systems, contributed to four of the incidents reviewed in-depth by the committee, and to at least five others. The March 17, 1993, and May 8, 2000, incidents could have been prevented had communications failures not occurred. In the March 17, 1993, incident, the supervisor of the work group noted that a bag containing HD waste was leaking and communicated this information to the individual handling the bag. The warning was not heeded, and subsequently the contents leaked onto the individual who was carrying the bag. In the May 8, 2000, incident, the control room supervisor was not informed that the agent strainer was to be changed during a demilitarization protective ensemble entry to clear the lower feed gate, or that the agent-contaminated strainer was being placed on the gate. During the course of this event, at many points the operator performed actions that were later seen to have been unfortunate. This suggests that the design of the system displays was not adequate to obtain an integrated overview of what was happening. This fact was recognized after the incident and a new single-screen display was developed to assist operators. However,

TABLE 2-4 Frequency of Causal Factors in the Seven Incidents Analyzed by the Committee

Date	Causal Factors						
	SOP Deficiencies	Communication Failure	Unexplained Human Error	Equipment Malfunction	Design Deficiency	Improper Technique	Mind-set
21-Jan-92					1		1
2-Jan-93	1					1	1
17-Mar-93	6	1	1	1	1	2	1
23-Mar-94	1				4		2
19-Nov-94	1	1	1	1	3		1
8-May-00	2	2		1	1	1	1
3-Dec-00	3	1			1		2
TOTAL	14	5	2	3	11	4	9

during the committee's visit, the operator and supervisor took about 10 minutes to find this screen, suggesting that it is not often used. Also, when the screen was located, it was found to be an all-text display, rather than an analog or pictorial representation. All-text displays are good for obtaining detailed information but poor for obtaining an integrated view of changing situations or conditions. The implication is that the fix was not a great improvement over the existing system.

- *Unexplained human error* is a category that describes human actions that were wrong for no reason recorded in the investigation reports or for which there is no apparent explanation. One example is the operator who assembled a piece of equipment incorrectly. The committee suspected that a more complete investigation would reveal causes for such errors.
- *Equipment malfunction* refers to the failure of equipment to function as designed but does not include design deficiencies. Contributing to three of the seven incidents subjected to in-depth review, and to at least nine other incidents, these failures ranged from simple tearing of waste bags to breakdowns of critical instrumentation such as flow meters and sensors. The committee noted that in virtually every incident involving equipment malfunction, there was a precursor, for example, installation of a flow sensor on the wrong side of a water flow control solenoid (design deficiency).
- *Design deficiency* applies to equipment or facilities found to perform operating functions inadequately as a result of their poor design. In several incidents examined by the committee, entrainment of agent into nonagent areas by personnel leaving a demilitarization protective ensemble entry could have been avoided if a timed interlock had been designed into transitional airlocks to ensure sufficient purging of airlock. Design deficiencies were found to have contributed to six of the seven incidents reviewed by the

committee and to at least five others. Although a higher frequency of design deficiencies might be expected in the early phases of an operation, this does not appear to have been the case for either TOCDF or JACADS—at least based on the information that was available to the committee. The committee notes, however, that one of the chemical events it examined was directly attributable to failure to capture and implement at TOCDF design changes made at JACADS.

- *Improper technique* refers to a manner of performing tasks that causes either a hazard or a malfunction. An example is using equipment for purposes other than those dictated by design, as occurred in the May 8, 2000, incident at TOCDF in which the water spray nozzles designed for cooling the deactivation furnace system (DFS) lower feed gate were used to clean the gate when jams occurred. Since the nozzles were operated at low pressure, operators used significant quantities of water in attempts to clean or clear the feed gate and the water vaporized, causing fluctuations in pressure and in the flow rate in the DFS. While these factors were not frequent, they contributed to several incidents.
- *Mind-set* refers to the mental attitude people have about the process of disposal and the state of the system during processing. In the incidents studied, people behaved at times as if they assumed that an ACAMS alarm was false, that contaminated waste was less hazardous than raw agent, or that parts coming through a furnace were automatically 5X material.² During its review of incidents, the committee

²5X refers to a level of decontamination at which solids may be released for general use or sold (e.g., as scrap metal) to the general public in accordance with applicable federal, state, and local regulations. There is a misconception that 5X means simply that the solid has been placed in a temperature zone of 1000°F or higher for 15 minutes. To achieve a 5X level of decontamination a solid must be heated to 1000°F and maintained at that temperature for 15 minutes.

invariably found itself engaged in discussions of the mind-set(s) prevalent at the time of the incident(s). Mind-set was involved in every incident the committee reviewed in depth, and it contributed significantly to several others. Perhaps the most troubling was what the committee referred to during its deliberations as the "false positive mind-set." False positive ACAMS alarms have been frequent at both JACADS and TOCDF and have caused people at both sites to assume that any alarm without a readily apparent cause is false—an assumption that has, in turn, fostered other failures and delays in addressing and responding to events.

Table 2-4 summarizes the results of the committee's analyses, indicating the frequency with which the causal factors outlined above contributed to the severe incidents closely examined by the committee.

Causal Tree Analysis of Two Events

For the two events it examined that were sufficiently documented to allow a detailed analysis, the committee charted activities in the sequence of events leading to each incident, either as a time line or as a causal tree (see Appendix F). A standard tool in reliability analysis, the causal tree or event tree is particularly useful in analyzing incidents to which operator actions contribute either positively or negatively. Figure F-1 in Appendix F shows the causal tree for the December 3-5, 2000, event at JACADS. The committee recognizes that such trees are designed at the discretion of the analyst and should not be construed as reflecting scientific certainty. Figure F-1, as well as a similar analysis by the committee of the May 8-9, 2000, event at TOCDF, suggests that the incidents examined by the committee grew from normal activities into potentially dangerous events.

The activities charted can be categorized as ranging from normal operations through system response. In addition, some can extend back in time before the occurrence of the incident, e.g., latent failures.

- *Normal tasks*—that the system was attempting to accomplish before the adverse event occurred. Examples are maintenance and operations.
- *Latent failures*—conditions present in the system for some time before the incident, but evident only when triggered by unusual states or events. Examples include equipment design deficiencies, unexpected configurations of munitions, or routine ignoring of standard operating procedures.
- *Active failures*—events *before* which there were no adverse consequences and *after* which there were. Active failures are usually the result of personnel decisions or actions. These same actions may have resulted in safe outcomes on previous occasions, but

in the incidents examined by the committee, such actions combined with latent failures to cause some adverse consequences. Examples of active failures include use of the wrong procedure, incorrect performance of an appropriate procedure, or failure to correctly and rapidly diagnose a problem.

- *Immediate outcome*—the adverse state the system reached immediately after the active failure. Examples are release of agent, plant damage, or personal injury. Reporting and investigation flow charts supplied by the Army indicate that the severity of outcome often determines the incident's prominence for managers, the workforce, or the community, which in turn drives subsequent responses. Incidents with more salient outcomes naturally receive more scrutiny, which may bias the data set used for analysis.
- *System responses*—actions taken to correct the effects and anticipate the aftereffects of an adverse outcome. Following each event, there is a system response that also needs to be analyzed. How did the system for incident response function? How did the management act to improve safety? Was an exposed worker properly treated? Were communities notified appropriately? How did the plant return to a normal state? How rapidly did it return? Finally, how was the system changed in light of the incident? This stage of analysis is considered in Chapter 4.

General Observations

Based on its review, the committee believes that the chemical events and other serious incidents examined at JACADS and TOCDF have been honestly investigated and reported. Even so, the investigation reports that were available to the committee did not always reflect the complete set of factors that caused or contributed to the cause of events. Likewise, the investigation team(s) may not have used the most appropriate methodologies for collecting, analyzing, and reporting the events. In particular, the committee saw little evidence of the use of formal methods, such as event tree analysis, and little involvement of human factors engineering even though most of the incidents reviewed by the committee had a component of human behavior as a causal factor (see Table 2-4). The committee found inconsistencies in the form and format of investigation reports within and between chemical demilitarization sites.

Finally, the committee noted that complete documentation supporting incident investigations was not always retained with the reports or in a report file. For example, a videotape relevant to the December 3, 2000, incident at JACADS could not be located for the committee to view.

During its in-depth review, the committee observed differences in the types and completeness of entries made in JACADS and TOCDF operating logs (deactivation furnace system, demilitarization protective ensemble, control room,

and so on). The variations were largely attributable to individuals who made the entries, which suggests that some training relative to the nature, content, and detail of entries into operating logs would be appropriate. Error-correction deficiencies were also noted in the operating logs.

Specific Observations

In conducting its detailed examination, the committee observed patterns of causal factors or categories of activities, such as latent and active failures, that appeared to recur over significant time periods. Deficiencies in standard operating procedures, which can be readily identified and corrected and should decline with time and operating experience, were the most notable. Based on the information available to the committee, it appears, however, that the frequency of SOP deficiencies in the incidents examined did not decline with time. This might suggest that any lessons learned from past experience are being interpreted too narrowly (Chapter 4) or that the need for improvement in this area is not being recognized. As noted earlier, following an SOP may not appear to be the correct choice to an operator. This is particularly true when the operator has a limited perspective on the task and so does not understand the reasons why a procedure that looks unnecessarily complex is indeed appropriate. This circumstance argues again for operator knowledge in addition to rule following.

As in any complex system, there are likely still undetected design deficiencies at TOCDF, and, most certainly, systemization at new chemical demilitarization facilities will uncover other design deficiencies. Active communication between and among chemical demilitarization facilities via the programmatic lessons learned (PLL) program (Chapter 4) is key to ensuring that design deficiencies are detected and corrected.

Equipment failure may be random, but it is certainly preventable. Excellent maintenance, equipment monitoring, and preventive maintenance practices can dramatically reduce equipment malfunctions at a lower overall cost than that incurred in an unanticipated shutdown. Many industries have found that investment in these practices can provide reductions in overall costs.

Equally, human errors are preventable, even if they appear to be random. Better knowledge of human functioning in complex situations (human factors engineering) shows how equipment design, workforce knowledge, and management environment can contribute to human error, or to its reduction (Reason, 1997). Industry experience has shown that a well-trained and vigilant workforce, and vigorous and effective management and supervision, committed to creating an environment in which safety is always first, will help to minimize human errors and any ensuing events that might be caused or initiated by them. Similarly, the human component of failures in communication and improper tech-

BOX 2-3 An Example of Negative Effects of Mind-set

The committee highlights a sentence in an investigation report that begins the section titled "Air Monitoring of 5X Material": "The waste located in BIN 135 was designated 5X by the process. Therefore, there was no requirement to monitor for an airborne agent hazard" (U.S. Army, 2001f).

Although it agrees that the process had been demonstrated to be capable of producing 5X (decontaminated) material, the committee asserts that the waste bin enclosure should have been actively monitored to ensure that 5X destruction was being achieved on a continuous basis. To the committee, this case is not different from that of the liquid incinerator, where "6 nines" destruction efficiency has been demonstrated but does not obviate the need for monitoring to ensure that the operating requirements are achieved. It was known that certain materials could pass through the deactivation furnace system without complete combustion (e.g., rolled-up coveralls), and thus, the operating assumption regarding 5X decontamination was known to be erroneous in some cases. This assumption also led to employees being sent on two occasions to deal with the waste bin with an inappropriate level of personal protective equipment, and the "false positive" mind-set led to delays in reporting the results of monitoring.

niques can be greatly reduced, if not eliminated, through the development of a strong safety culture in the chemical demilitarization work environment.

The "crying wolf" phenomenon of a decreased willingness to respond after repeated false alarms is an expected, and sensible, human behavior, but one that must be discouraged in chemical demilitarization operations by appropriate training and a recognized reward structure.

The committee also discussed "waste mind-set"—the attitude or belief among employees and management at both JACADS and TOCDF that waste processing and/or handling is less hazardous than agent processing. This mind-set has led to notable deficiencies in SOPs for waste handling and contributed significantly to several incidents. Even though mind-set cannot be considered to be the root cause of any of the incidents reviewed by the committee, it is a prevalent factor (see Table 2-4) and a significant issue, as the December 3, 2000, deactivation furnace system waste bin incident at JACADS illustrates (U.S. Army, 2001f) (see Box 2-3).

The most difficult challenge facing those operating future demilitarization facilities will be overcoming, or preventing the development of, mind-sets that lead to an adverse chemical event or contribute to the severity, magnitude, and consequences of such an event. This challenge is also important to bear in mind as sites transition from agent disposal operations to decommissioning and closure.

Responses to Chemical Events at Baseline Chemical Demilitarization Facilities

Concentrating on the procedures for reporting and disclosing events and the legal processes involved, in this chapter the committee reviews onsite investigations and reports triggered by the chemical events discussed in Chapter 2 to determine if general conclusions can be drawn about whether those responses can assist in the tasks of determining the causes of events and preventing their recurrence. The committee concentrates on the two events involving release of chemical agent to the environment analyzed in detail in Chapter 2—the December 3-5, 2000, incident at Johnston Atoll Chemical Agent Disposal System (JACADS) and the May 8-9, 2000, incident at Tooele Chemical Disposal Facility (TOCDF) (see Boxes 2-1 and 2-2)—both of which triggered detailed investigations.

The committee also examines how emergency response professionals estimate the potential population exposure from a chemical event, reviews emergency response activities and public responses, and discusses how the events are communicated to local news media and interested citizens groups. These communications have important implications, since they affect how political leaders, regulators, and the general public view the chemical demilitarization program.

FORMAL EVENT REPORTING PROTOCOLS

Formal protocols for reporting a chemical event establish a communication network designed to alert the chemical demilitarization facility staff and plant workforce and the surrounding community to any imminent danger and to mobilize emergency assistance in case of a major event. Additionally, there are a variety of reporting requirements to the Army, the Environmental Protection Agency (EPA), and state and local emergency operations centers, as well as reporting protocols within the facility operating contractor's organization and the Program Manager for Chemical Demilitarization (PMCD) organization.

Generally, the first indication of a problem is an automatic continuous air monitoring system (ACAMS) alarm, but because many interfering chemicals also cause an alarm, declaration as a chemical event requires laboratory confirmation by the more accurate depot area air monitoring system (DAAMS) analysis (which can take from 20 minutes to more than an hour).¹ If an ACAMS alarm is confirmed within the chemical demilitarization facility, the installation commander must be notified. Army Regulation 50-6 requires installation commanders to notify the Army Operations Center by telephone within 3 hours of the time a chemical event is confirmed and in writing within 24 hours. A confirmed event must further be reported to EPA within 24 hours (U.S. Army, 1996b). PMCD has tailored the Army's regulations to support its mission and requires notification within 1 hour of confirmed events.

The Army Materiel Command (AMC) has set additional guidelines for reporting incidents, including those that (1) have a potential for negative reactions from local officials or the media, (2) involve workers reporting possible exposure to agent, and (3) involve detection of agent outside primary engineering controls but within secondary engineering controls. The state and local protocols for any given plant are determined on a case-by-case basis in accordance with state and local regulations and laws.

Located on an isolated island, JACADS had only EPA Region IX to report to at the local level. Contingency procedures for dealing with agent outside engineering controls were approved in the early days of the project and included a flow chart and call-down lists. The contingency plans involved notification of on-site U.S. Army Chemical Activity

¹Incidents triggering ACAMS alarms that are not verified by DAAMS analyses are considered to be Resource Conservation and Recovery Act (RCRA) events that require reporting within 15 days.

Pacific (USACAP) soldiers, the Johnston Island Fire Department, the Johnston Island airport, and resident personnel. Priority was placed on basic notification of fires, explosions, agent releases, and serious bodily injury. There was a call-down list, and a written log was kept. Military officials in Washington, D.C., were notified within 24 hours.

Two Army reporting chains run in parallel. The *green suit* chain culminates at the Chief of Staff of the Army and the civilian chain with the Secretary of the Army. For chemical incident reports, both the Assistant Secretary of the Army for Installations, Logistics, and the Environment and the Chief of Staff are notified. The desire is to get the report right, take the time necessary to be credible, and avoid putting out information or sounding alarms that later prove to be unfounded. The task is difficult because frequent ACAMS stack alarms are a common problem; most prove to be false positives rather than chemical events (NRC, 1999a, page 29).

ACTUAL ON-SITE RESPONSES

December 3-5, 2000, Event at JACADS

After the event at JACADS on December 5, 2000, a six-person investigation team was convened, with members from PMCD, the USACAP, and the U.S. Army Pacific, as well as two consultants. The team assembled on Johnston Island on December 13. This team reported its findings on March 15, 2001 (U.S. Army, 2001f). In addition, EPA conducted an investigation on December 7-8, 2000, and issued a report on May 9, 2001 (EPA, 2001). The Army investigation team's agenda was to determine the cause of the event, while the EPA team's aim was to determine whether or not Resource Conservation and Recovery Act (RCRA) violations had occurred. The description below relies heavily on the investigations' written reports (U.S. Army, 2001f; EPA, 2001).

The chemical event report submitted within 3 hours of the event (Appendix A of U.S. Army, 2001f) is necessarily a truncated version of what happened and, as a result, relates a sequence of events that is easily misinterpreted. It states, "At 0156 (local) 05DEC00, a routine sample of ash from the Decontamination Furnace (DFS) was analyzed in the site laboratory that produced levels of VX nerve agent at approximately 2000 [7000]² times greater than Drinking Water Levels (DWL)³ 40,000 ppb vs. 20 ppb." The report also states, "Upon agent detection, the HDC (heated discharge conveyor) bin was moved to the Unpack Area (UPA) and placed under engineering controls." It is important to note, however, that this analysis was for a sample taken from the bin 1½ days earlier (the site's operating procedures allow up to 4 days for samples to be analyzed). A second sample, taken at 0300 local time, was

analyzed and reported at 0430 local time, and only then was action contemplated, though not yet taken. Indeed, although the chemical event report states that the bin was placed under engineering controls as soon as the analysis was reported (at 0220 local time), it also notes that the bin was outside engineering controls until 0800 local time.

The Army investigation report (U.S. Army, 2001f) also seems to minimize the importance of the time the event began. It begins: "*In troduction*. On 5 December 2000 at 0156 hours (local time), chemical agent VX was detected and confirmed in the ash from the HDC bin (BIN 135) at the Deactivation Furnace System (DFS)."

There is no mention in that report, either in the introduction or in the Executive Summary, of the sample having been taken on December 3. The first mention of the earlier sample occurs on Page 6, under "V. *Event Description*." The report then describes several attempts to analyze the sample on December 4, the suspicion of a false positive, and a request for a second sample.

Had the first sample been analyzed promptly and the results believed, the release of agent to the environment and any potential for harm could have been minimized. This incident illustrates a flaw in the reporting system, which is focused on formal declaration of an incident as a chemical event. The first indication of a problem was an analysis showing VX at approximately 3000 times WCL at 0156 on December 5, but this is not when the "event" was defined as having begun. The question of when a chemical event begins is important because it is the moment beyond which workers, the public, and/or the environment are potentially in harm's way. It also determines the timing for fulfilling the various reporting requirements. It is debatable at what point the evidence was sufficient to declare this JACADS incident an "event," but the *potential* for harm certainly began at 0806 on December 3, 2000, when Bin 135 was removed from the bin enclosure. The most generous interpretation is that event onset began when the site alarm sounded at 1020 on December 5, 2000. Even given this time of onset, the external reporting was tardy. In fact, the event was not reported to EPA Region IX until the compliance officer serendipitously called at 0930 on December 6, 2000, about another matter and was informed of ongoing events. A notice of violation was subsequently issued by EPA on May 9, 2001 (EPA, 2001). Internally, there were indications of notification problems as well; the notification list indicates "1039 completed call-down list." However, several lines were "busy" or resulted in "no answer" or, in one case, "machine."

The subtitle of the Army investigative report (U.S. Army, 2001f), *Report of the 3 December 2000 Chemical Agent Reading [emphasis added] in the Heated Discharge Conveyor (HDC) Bin rather than Report of the 3 December 2000 Chemical Agent Event [emphasis added] in the Heated Discharge Conveyor (HDC) Bin* appears to suggest a continued state of denial.

²The bracketed number is in the original document, perhaps indicating confusion about what the actual handwritten entry said.

³DWL is the agent waste protection limit used to assess contamination.

From the December 2000 event at JACADS, it appears that an "event" is assumed to begin when personnel confirm agent release, as opposed to when a release may have actually occurred. The time of onset of an event needs to be clarified.

The problem in defining an event (both whether one has occurred and the date/time of onset) also lies partially in the tendency of the chemical demilitarization personnel to disregard initial indications due to frequent "false positive" readings, as discussed in Chapter 2. The required detection sensitivities test the limits of the technology and lead to many readings that are not verified by subsequent analysis. Modifications, such as ACAMS employing at least two different chromatographic columns, could reduce the number of unverified alarms (false positives). Alternative methods, potentially capable of greater specificity and/or sensitivity, have been suggested in other reports (NRC, 1994).

At the sites where the committee visited there does not seem to be a call-forwarding mechanism for getting information directly to people or a hot line dedicated to notification that an event has occurred. This problem would be amplified at sites where officers to be notified are not in the immediate vicinity.

May 8-9, 2000, Event at TOCDF

After the detection of GB in the common stack at TOCDF on the night of May 8-9, 2000, an investigation was undertaken by a 10-person team, which included representatives from the U.S. Army Nuclear and Chemical Agency, the U.S. Army Center for Explosives Safety, PMCD, the Desert Chemical Depot, and General Physics Corporation, with partnering from two Centers for Disease Control and Prevention (CDC) scientists. The team completed its information gathering on May 18, 2000, and its report on June 6, 2000 (U.S. Army, 2000b). Separate reports were issued by the CDC's National Center for Environmental Health (May 18, 2000; CDC, 2000), the Utah Department of Environmental Quality (DEQ) (Utah DEQ, 2000a), and the contractor, EG&G (June 16, 2000; EG&G, 2000).

These reports are extensive in their detail, with multiple findings and recommendations, and many addenda. The Army report lists 25 separate findings, 29 recommendations, and four "observations." The CDC report lists 11 conclusions and 15 recommendations. The Utah DEQ report lists eight "concerns," while the EG&G report lists several "direct causes," "root causes," "contributing causes," 11 "findings," and 22 "corrective actions."

Observations

A number of observations can be made from a review of the reports relating to both the December 2000 event at JACADS and the May 2000 event at TOCDF:

1. The various agencies responsible for reviewing incidents took their task very seriously. They made a determined effort to understand the causes of the incident and to recommend changes that would prevent its recurrence.
2. The multiplicity of reports is an example of overlapping investigations that create the potential for lost time for the mission of the program. It is also an indication of communication problems within the chemical demilitarization program. (This observation is elaborated below in this chapter.)
3. Incidents such as the May 8-9, 2000, stack release at TOCDF need to be rare occurrences for such in-depth investigations to be feasible. More frequent investigations of this type would quickly demand more resources than could be made available.
4. The extensive investigation of the May 8-9, 2000, TOCDF incident as opposed to the comparatively cursory examination of the December 3-5, 2000, JACADS incident may be partially attributable to the fact that JACADS was in a shutdown mode while TOCDF will continue operations for several more years. Yet dismantling a plant is not inherently less hazardous than operating a plant. The "waste" mentality (discounting the potential for "mere waste" to result in release of agent) that may have contributed to the JACADS incident needs to be changed, just as does the "crying-wolf too often" mind-set that results from the frequent occurrence of and the use of the term "false positives."
5. It remains to be seen if all of the recommendations in the various investigation reports are actually implemented. Incorporation of such recommendations into the programmatic lessons learned (PLL) program (see Chapter 4) and their subsequent utilization at TOCDF and other sites are necessary responses, if the reports are to be effective.

Following the May 8-9, 2000, event, the TOCDF facility was shut down pending the completion of the various investigations. According to Occurrence Report No. 00-05-08-A1 *Confirmed GB Agent Readings in the Common Stack* (EG&G, 2000), 22 corrective actions were assigned to various individuals on June 19, 2000, at the conclusion of the investigative reports. According to the *Annual Status Report on the Disposal of Chemical Weapons and Materiel for Fiscal Year 2000* (U.S. Army, 2000a), authorizations for operation of the liquid incinerator and metal parts furnace were issued on July 28, 2000, and for the deactivation furnace system on September 21, 2000. Thus, the event led to an approximately 4½-month shutdown. It is difficult to assign the exact amount of time for the investigative, corrective, and approval phases needed to commence facility restart because of considerable overlap in phases; i.e., corrective measures

and equipment ordering were already occurring as the investigations proceeded.

EXTERNAL AND REGULATORY RESPONSES TO CHEMICAL EVENTS

Applicable Statutes, Regulations, and Guidelines

The activities of the facilities located at the Johnston Island and Tooele sites were governed by multiple statutes and regulatory rules and procedures, as well as permitting requirements. The controlling federal statute, the Resource Conservation and Recovery Act (RCRA; 42 U.S.C. §6901 et seq.), was enacted in 1976. RCRA contains stringent statutory requirements that control the handling and disposal of hazardous waste. The legislation is commonly referred to as the "cradle-to-grave" regulatory procedure and gives EPA's administrator the responsibility to oversee the generation, transportation, treatment, storage, and disposal of hazardous waste. The program can be delegated to the various states for primary enforcement of the statute, although EPA continues to have a federal role of oversight of any such facilities.

Additional statutes that must be considered include the Toxic Substance Control Act (TSCA; 15 U.S.C. §2601 et seq.), the Emergency Planning and Community Right to Know Act (EPCRTKA; 42 U.S.C. §11001 et seq.), the Clean Air Act (CAA; 42 U.S.C. §7401 et seq.), the Chemical Safety Information, Site Security and Fuels Regulatory Relief Act (P.L. 106-40), the Occupational Health and Safety Act (OSHA; 29 U.S.C. 1920.120 et seq.), and the Clean Water Act (CWA; 33 U.S.C. §1251 et seq.), in addition to any state statutes, regulations, and local ordinances. Additionally, as mentioned above and in Chapter 2, the chemical demilitarization program is subject to U.S. Army regulations and specific-site regulations, or standing orders, implemented by the post commander and/or the civilian plant manager. Finally, site activities may also be subject to requirements set forth in memoranda of understanding (MOUs) entered into by government entities and the facility. The MOUs are unique to the site and can address issues specific to the surrounding area and nearby communities.

In addition to national, state, and local regulatory review, there is also oversight required pursuant to the Chemical Weapons Convention (CWC). International CWC observers, commonly referred to as the Inspectorate, maintain offices on site at JACADS and TOCDF. The Inspectorate is responsible for general oversight and for ensuring that the destruction of chemicals is carried out pursuant to CWC guidelines.

These statutes, regulations, and guidelines require notification of outside agencies when incidents affect public health, when permits require such notification, or for the marshalling of assistance in the event of a catastrophe. A

review of these international treaties, statutes, rules, and regulations makes it clear that the facilities for chemical demilitarization are highly regulated and can be subject to microscopic oversight. This panoply of regulations befits the extremely hazardous materials that are destroyed by on-site incinerators. Failure to follow the protocols called for by the statutory framework can result in facility shutdowns by the agencies that possess the authority to do so, by court orders, and by the U.S. Army. These failures can also erode public trust. Enforcement of the statutes and regulations can result in notices of violation for failing to operate within a given permit or any number of multiple permits, or for failing to follow reporting procedures. Ultimately there is authority to impose remedial activity sanctions, civil fines, and in the worst case, criminal fines and imprisonment.

Following a serious chemical event, it is typical that there is an investigation that can originate from multiple state and federal regulatory agencies. For instance, the state environmental agency may assume the lead investigative position, although the EPA always retains the authority to initiate its own independent investigation.

Time requirements for verbal reporting and follow-up written reports are not unique to chemical demilitarization facilities. Furthermore, the regulatory process is not static—it evolves. The same is true for the permitting process. Renewals are a part of the process, with a period of time built in prior to the expiration of permits. This provides the regulated community with an opportunity to revisit and implement technological advances by the operating unit. The trend to tighten the regulation to a higher standard of compliance affects all regulated facilities.

Each facility develops a regulatory history with the enforcement agencies with which it works. Candor and trust are essential for these relationships to succeed. Failure to follow incident reporting procedures, as agreed upon in advance of an incident, erodes trust that is critical to chemical demilitarization operations, wherever they are located. The facilities begin operations under a cloud of suspicion, often due to public misunderstanding, lack of public education and information, media hyperbole, and general "NIMBY" (not in my back yard) sentiments. Poor communication with the regulatory agencies and the public will further erode the program's public involvement and regulatory agency trust (NRC, 2000b).

Memorandum of Understanding Between Deseret Chemical Depot and Tooele County

In the case of TOCDF, because of and subsequent to the May 8-9, 2000, incident, Tooele County entered into an MOU (Utah DEQ, 2000b) in September 2000 (updated in November 2001) with the facility that (1) defines specific event classifications; (2) identifies and displays hazard predictions for chemical operations with a potential for producing agent effects beyond the installation boundary; (3) provides recom-

mendations for protective actions to be taken in advance of potential events; and (4) conducts daily activities that will mimic and reinforce emergency activities, thereby enhancing the notification and response abilities of Deseret Chemical Depot (DCD) and Tooele County. Thus, the facility and Tooele County have an agreed-to daily protocol concerning the tasks that will be undertaken on a particular day, the times and type of agent munitions that will be processed, and the meteorological data that will be obtained during each operation. Under the MOU, Tooele County is required to inform the DCD of any special events, projects, or other activities occurring in the community that could affect a quick and safe evacuation of DCD. Examples given were special events drawing unusually large crowds, road construction, bridge work, and so on. In the event of a chemical incident, Tooele County must inform DCD and Utah Comprehensive Emergency Management of the protective action decisions they have made (see Appendix G).

The parties agreed to the following terms for classifying emergency events:

- Routine leaker or agent detection within containment
- Non-surety event
- Limited-area event
- Post-only event
- Community event.

Definitions for each of these classifications, as well as the body of the MOU, are reprinted in Appendix G.

For the last three of the five event categories listed above, DCD has agreed that notification shall be made to Tooele County within 10 minutes of when chemical agent is detected in the atmosphere, i.e., outside engineering controls, and when other unusual circumstances occur, even if a chemical event is only suspected. DCD also agrees to use the dedicated "Chemical Notification Hotline"⁴ telephone as the primary means of notification for routine leakers and other occurrences of chemical agent detection outlined above, as well as for events falling into the defined chemical event classifications (Utah DEQ, 2000b).

Had the above terms of notification and procedures now specified in the MOU been in place at the time of the May 8-9, 2000, incident at TOCDF, the impermissible delays between the time of detection and the time of reporting could have been avoided. The MOU between DCD and Tooele County and the new reporting procedures address a number of the recurring reporting deficiencies that have been experienced at the site. Missing from the MOU, however, are specific training requirements that should be implemented to ensure that

the proposed reporting system can be implemented effectively.

Levels of Investigation

The multiple investigations of the May 8-9, 2000, Tooele chemical event probably prolonged operational shutdown unnecessarily. Arguably, multiple levels of review by independent agencies increase the ability to thoroughly characterize an incident. There is a point, however, where the scale tips and accuracy and completeness give way to redundancy and inefficiency with no added benefits.

The loss of operating time is expensive. During the committee's visit to TOCDF, operating staff estimated that the cost to operate the Tooele chemical demilitarization facility is approximately \$10,000 per hour or \$240,000 per day (U.S. Army, 2001g). Long facility shutdowns also lead to a deterioration of operating skills. Facility down-time following chemical events can be minimized by implementing policies that permit a coordinated review effort between multiple oversight entities, in addition to the development and submittal of a single comprehensive incident report. Preagreement among responsible oversight agencies to establish a single review team with a predetermined distribution of representatives from various agencies and their areas of expertise would allow the rapid deployment of a single, comprehensive event investigation.

Consolidating the investigation process can still ensure that the facilities are operating with the highest margin of safety, while at the same time ensuring that procedures are in place that will minimize plant shutdown time following chemical events or other safety infractions.

MODELING POTENTIAL POPULATION EXPOSURE

When chemical agents are released into the atmosphere, a key challenge is to predict the affected population's exposure. This information is needed for developing effective evacuation plans and implementing any needed mitigation measures. Figure 3-1 illustrates the four elements that must be integrated, the linkage between these components, and some of the information needed to perform the calculations.

As used by the Community Stockpile Emergency Preparedness Program (CSEPP), the current implementation of the system shown in Figure 3-1 is called D2PC, which is used to calculate dosages and concentrations from accidental releases of chemical warfare agents. The model is based on a Gaussian plume/puff formulation for transport and dispersion in the atmosphere (Seinfeld and Pandis, 1998). D2PC is a revision of an older dispersion model, D2, which was documented in 1982. The D2PC model runs on a personal computer and is based on the technical paper "Methodology for Chemical Hazard Prediction" (DoD, 1980). The June 1992 revision of D2PC was the version originally approved by the Army for use by the CSEPP. Subsequently, D2PC has under-

⁴The Chemical Notification Hotline is a dedicated phone line between DCD and Tooele County. The Chemical Notification Form (see Attachment A of Utah DEQ, 2000b) provides the format for any information communicated via the Hotline.

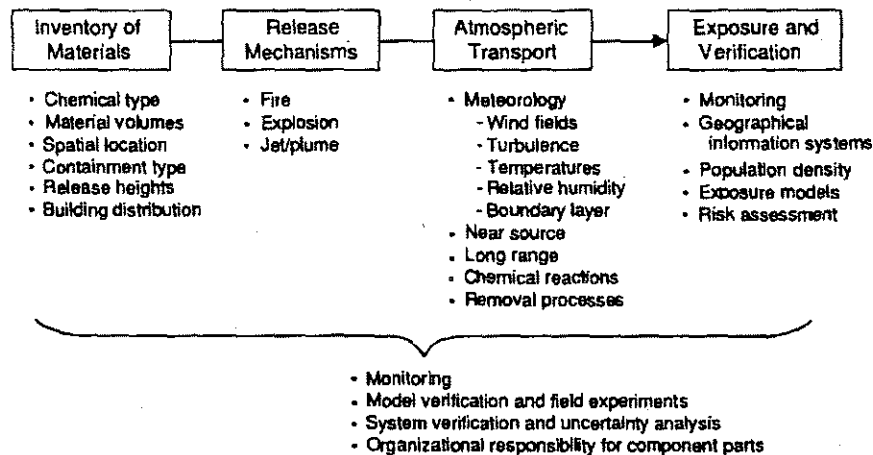


FIGURE 3-1 Component parts of an integrated system for modeling the impact of release of chemical agents.

gone at least two revisions. In June 1994, the U.S. Army Nuclear and Chemical Agency approved an October 1993 version of D2PC for all CSEPP and chemical stockpile emergency planning and response actions. In March 1997, it approved the Emergency Management Information System (EMIS), version 3.0 (with the exception of the automated calculation of atmospheric stability), for CSEPP as well. D2PC was most recently upgraded in March 1998, and it is this version that is embedded in EMIS 3.1.

The D2PC model is currently supplemented with the Partial Dosage (PARDOS) model, which uses the D2PC methodology to predict cloud arrival and departure times and dosage accumulation times. The D2PC/PARDOS models assume flat terrain and steady-state meteorological conditions. Many demilitarization sites, however, are in regions of complex terrain, and the steady-state assumption is realistic only for small, short-term releases.

Gaussian puff/plume dispersion modeling techniques embedded in D2PC are representative of the state of the art in the late 1970s. Since then, there have been many technical advances in understanding atmospheric turbulence, boundary layer structure, and the effects of complex terrain that could benefit the CSEPP program.

In 1996, in response to some of the limitations of D2PC, the Army tasked Innovative Emergency Management, Inc., to develop a new model called D2-Puff. D2-Puff predicts dosages and concentrations in changing meteorological conditions, including wind shifts. D2-Puff uses the same methodology for release of agents and the same atmospheric dispersion coefficients as D2PC. The technical basis for the model and its verification are described in three comprehensive documents (IEM, 2001a,b; U.S. Army, 1999b). At present, the modeling system is used in two modes. In the first, a planning mode, the model is used to determine potential population exposure to agent at a particular level in acci-

dent scenarios that might occur during routine operations. In the second mode, when emergencies occur the system is used to predict the dispersion of the agents and the likely population exposure. D2-Puff includes the following new features and capabilities:

- A Lagrangian puff model that allows concentrations and dosages to be calculated when meteorological conditions change in time or vary over a region
- The calculation of concentrations and dosages within enclosed structures, such as buildings used as shelters
- The ability to handle multiple release locations
- The ability to simulate dosages received by individuals who are exposed to only a portion of a plume
- The ability to include meteorological observations from multiple locations
- The ability to include data from weather forecasting models (assuming that a suitable meteorological data assimilation capability is attached to D2-Puff)
- The ability to model the effects of complex terrain on plume motion
- The ability to compute dispersion based on measurements of the variance of wind direction
- The ability to compute for acute exposure guideline levels (AEGLs) (NRC, 2001b)⁵
- A graphical user interface.

⁵Acute Exposure Guideline Levels (AEGLs) are a hazard communication measure developed by the National Advisory Committee on Acute Exposure Guideline Levels for Hazardous Substances. The committee developed detailed guidelines for devising uniform, meaningful emergency response standards for the general public. The guidelines define three tiers of AEGLs as follows:

Another important change in approach concerns the way that the hazard is represented in D2-Puff. D2PC produces cigar-shaped footprints for 1 percent lethality, no-deaths, and no-effects dosages. With D2-Puff the analyst can no longer think of dosages solely in terms of distances or relatively simple cigar-shaped footprints. With varying meteorological conditions, D2-Puff produces irregularly shaped footprints for 1 percent lethality, no-deaths, and no-effects dosages. The no-effects footprint for D2-Puff will generally not be as long as the no-effects footprint (no-effects distance) for D2PC, although the D2-Puff footprint will generally be wider. This difference will have an impact on protective action decisions. As with D2PC, D2-Puff indicates that persons living in the downwind direction near a release will be the first exposed to the hazard. However, the wind direction may shift before populations farther away are exposed to the hazard. This wind shift may result in exposure of a broader area in the immediate vicinity of the release location—an area larger than the initial downwind path of the plume. In this situation, emergency managers may find that they have to change their priorities for protective actions.

The D2-Puff model, and other plume dispersion models, can be calibrated for the effects of complex terrain at specific sites by experimental releases and downwind measurements of an inert gaseous tracer under a variety of representative meteorological conditions. These calibrations can significantly enhance the accuracy of dispersion calculations from specific fixed sites like chemical agent storage yards and demilitarization facilities.

While D2-Puff represents an advance in capabilities over D2PC, it is still based on Gaussian dispersion modeling with its attendant limitations. Perhaps the most serious limitation of the D2-Puff/D2PC methodology for chemical hazard prediction arises from the neglect of the variation in wind speed with height. Because both the D2-Puff and D2PC models assume that the wind speed measured at 10 m above ground level is representative of the transport wind speed at all downwind distances, they tend to overestimate transport speeds for low-level releases at short range and underesti-

mate transport wind speeds for all release heights at longer downwind distances. Thus, the toxic cloud produced by a large accident will arrive in areas more than 1 to 2 km from the release sooner than predicted by the models. This is especially relevant to sites close to population centers. A further limitation of the Gaussian dispersion formulation is its low predictive accuracy for long-range transport (>50 km). If a substantial release were to occur, the current D2PC/D2-Puff models are not suited for predicting the impacts on populations that might be 100 km or more downwind from the release site. As with any model, the results produced are limited by the accuracy of the inputs. These limitations include uncertainties about the amounts of chemical agents released and about meteorological conditions. D2-Puff, like other models, can produce hazard estimates that are helpful for emergency planning and response.

In light of the limitations of Gaussian dispersion models, a key part of the CSEPP should be an ongoing evaluation of alternative approaches to modeling the release and impact of chemical agents. A considerable wealth of relevant modeling experience has been developed for coping with such events as fires and explosions at chemical plants, transportation spills, nuclear accidents, tunnel fires, uncontrolled forest burns, volcanic eruptions, and oil well fires. Many different models and methodologies are available. For example, one option would be to supplement each stockpile site with the capabilities of the National Atmospheric Release Advisory Center (NARAC)⁶ that is located at the University of California's Lawrence Livermore National Laboratory.

A more accurate modeling capability is valuable only if it is coupled with timely communication of results and appropriate responses by the stockpile site and surrounding communities. In the case of sites located close to large communities it is particularly important to have fast communication and alert procedures. The committee found, based on several site visits and interviews, that these procedures should be reviewed to identify bottlenecks that could be removed through better communications technologies.

EMERGENCY RESPONSE: PREPAREDNESS, PLANS, NOTIFICATION, AND COORDINATION AT TOCDF

This section focuses on the May 8-9, 2000, TOCDF incident but also draws on the December 3-5, 2000, JACADS event in discussing the importance of reporting requirements. The TOCDF incident is the primary focus because of that

AEGL-1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL-2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL-3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

Guidelines for each of the three levels of AEGL—AEGL-1, AEGL-2, and AEGL-3—have been developed for each of five exposure periods: 10 minutes, 30 minutes, 1 hour, 4 hours, and 8 hours. See NRC (2001b).

⁶NARAC is a national emergency response service for real-time assessment of incidents involving nuclear, chemical, biological, or natural hazardous material. NARAC's primary function is to support the Department of Energy and the Department of Defense for radiological releases. Under the auspices of the Federal Radiological Emergency Response Plan and the Federal Response Plan, the state-of-the-art NARAC modeling system has the capability to perform assessments of impacts from local to global scales. More information is available online at <<http://narac.llnl.gov>>.

event's potential implications for the safety not only of the workers at the plant, but also for residents in the nearby community. This National Research Council (NRC) committee is not the first to express concern about the emergency response and management capabilities at TOCDF. Previous findings and concerns regarding the response system noted by other NRC committees and the General Accounting Office (GAO) (see Box 3-1) provide some necessary context for the committee's examination.

This committee's evaluation of the emergency response to the two JACADS and TOCDF incidents that it examined in detail focuses on how effectively the division of responsibilities between the Army and the Federal Emergency Management Agency (FEMA) (see Box 3-1) actually functioned, and analyzes how it is likely to continue to function in the future. Although it is critical to have well-exercised plans, a communication system that enables adequate warning, effective communication among responders, and personnel who are appropriately attired for the nature of the hazard, it is equally critical that the organizational structure functions as designed, enabling an effective response. Indeed, how effectively the emergency response system is organized and how capable it is of functioning in a coordinated fashion have important implications for the three additional incinerator-based chemical demilitarization sites that are close to beginning operations. One of the important components of this committee's examination of the emergency response to the two JACADS and TOCDF incidents has been a review of the preparedness of the emergency management system when required to function during stressing events.

Relevant to the examination of emergency preparedness are a recent GAO report that examined FEMA's and the Army's efforts to prepare states for chemical weapons emergencies (GAO, 2001) and a CSEPP report describing CSEPP and Army benchmarking of the system (CSEPP, 2000). As pointed out in the GAO report, FEMA has adopted a series of national quantitative performance indicators that use benchmarks to evaluate the preparedness of different states in the program (GAO, 2001). These benchmarks are supposed to focus on outcomes rather than outputs as measures of performance in ensuring the essentials of public safety, including warning system effectiveness, readiness of coordination systems, reliability of critical communication systems, and public awareness of protective actions. FEMA is responsible for benchmarking emergency management compliance off-post; the Army uses a similar system at its installations (GAO, 2001). The 2001 GAO report also mentions that Utah is one of three states considered to be fully prepared for a chemical emergency and that an active cooperative effort by the community is essential to the state's current state of preparedness. Interestingly, these three states are considered by FEMA and the Army to be fully prepared, even though both the Army and FEMA have failed to issue any site-specific planning guidance for local communities or states covering reentry into a contaminated area of a com-

BOX 3-1 Previous Concerns About and Recommendations for Achieving Efficient CSEPP Operations

In its first systemization report produced when the plant was about to begin operations in 1996 (NRC, 1996), and as summarized in the National Research Council (NRC) report Tooele Chemical Agent Disposal Facility—Update on National Research Council Recommendations (NRC, 1999a), the NRC's Stockpile Committee called on the Army and the Federal Emergency Management Agency (FEMA) where appropriate to:

1. ensure that local and state Chemical Stockpile Emergency Preparedness Program (CSEPP) plans for responding to chemical events were complete and well exercised
2. increase its efforts to work with the Utah Division of Comprehensive Emergency Management to ensure that first responders were adequately trained to use personnel protective equipment
3. make certain that the Army/FEMA provided the necessary resources for completing the planned Tooele County emergency communications system.

In 1999, the NRC added another recommendation: that the Army ensure that CSEPP and FEMA officials understand how the quantitative risk assessment (QRA) and other activities might affect risk and reflect this understanding in emergency planning and preparedness activities (NRC, 1999a). The 1999 NRC report reviewed and updated recommendations on operations at the Tooele Chemical Agent Disposal Facility (TOCDF). It noted that in accordance with the formal reorganization of responsibilities that had just been carried out between the Army and FEMA, all on-site responsibilities for emergency management were retained by the Army and all off-site responsibilities for emergency management and planning were given to FEMA. The 1999 Stockpile Committee report, noting previous General Accounting Office (GAO) reports that had cited existing problems with the CSEPP, stated, "The Committee is also concerned about CSEPP and about the horizontal fragmentation of responsibility at the federal level." The report further commented (NRC, 1999a):

Previous briefings by directors (both Army and FEMA) of the CSEPP, as well as discussions with directors of state emergency management agencies, have all stressed the importance of a well-coordinated response-management capability.... The recent reorganization will require excellent coordination and communication to overcome the barriers of separate organizational responsibilities.

Finally, the 1999 NRC report expressed skepticism about the reorganization's impact on improving the capacity for responding to an emergency.

munity, or guidance on when it is appropriate to notify citizens to leave shelters following an event.

The committee judges that the benchmarks demonstrate a significant effort by FEMA and the Army to coordinate their efforts to measure a program's status and to guide funding. For example, these measures have been developed over time and include the initial guidance document issued in 1993 (FEMA, 1993), and revised in 1996 (FEMA, 1996) to include nine benchmarks. These benchmarks were later revised again in 1997, and then again in a joint policy paper (FEMA, 1997) that added three additional benchmarks. The GAO used these 12 agreed-upon benchmarks in 19 "critical items" for its review of the program.

The development of jointly used benchmarks does not reveal the full extent of the efforts by the Army and FEMA to jointly coordinate the emergency response/management system for chemical incidents. On October 8, 1997, coinciding with the formal division of the program, an MOU between the Army and FEMA formally identified their respective roles and responsibilities and joint efforts for "... emergency response, preparedness involving the storage and ultimate disposal of the U.S. stockpile of chemical warfare material" (FEMA, 1997). Despite these efforts, the GAO has continued to find uneven performance measures being used and a lack of effectiveness in providing technical assistance and guidance to the states and communities (GAO, 2001).

The performance of the emergency management system during the TOCDF May 8-9, 2000, event is not reassuring. It raises questions about how to interpret the system's performance and what is meant by the term "fully prepared." The lack of timely notification that an event had occurred has several important implications. First, benchmarking performance evaluations aside, the real test of an emergency management and response system is how it functions during an incident rather than performance during training exercises. What is particularly troubling is that something as simple as notification of an alarm (even after it was confirmed) was not reported to the Tooele County Emergency Operating Center (EOC). No one disputes the fact that the Tooele County EOC and Utah officials should have been notified of the events. This notification is part of the standard operating procedures (SOPs) and is probably the most exercised component of the system during operations testing and exercises. The fact that SOPs were clearly disregarded, and the off-site community potentially put at risk because of the lack of notification and knowledge of the event, demonstrates a clear breakdown of the system at the most elementary level. While some action aimed at preventing the repeating of this sequence of events has been taken through a new MOU for Information Exchange (Utah DEQ, 2000b), as discussed previously, the events surrounding this incident raise questions in critics of the program concerning the trustworthiness of those in charge of the emergency response and notification system. This trust is crucial to surrounding communities' participation and cooperation in these programs, and ques-

tions concerning the credibility and functioning of the emergency notification and response systems have serious implications not only for communities where operating systems are currently located, but also for communities where they are planned, like Anniston. As pointed out above, this cooperation was cited in the GAO 2001 report as being a fundamental condition for the three programs gaining fully prepared status from FEMA and the Army.

During their tours of TOCDF and DCD, members of the committee raised questions concerning the responsibilities of personnel as they related to the Tooele County EOC and Utah DEQ. In several instances personnel reported that their responsibilities "ended at the fence" and that they were not responsible for emergency management operations in the community. Similar attitudes were expressed at the JACADS facility, although the lack of a community near the facility mitigates the impact of such views. Technically, this view is correct concerning the division of responsibilities. However, for an effective response the program requires a strong degree of coordination between the DCD EOC and the Tooele County Office of Emergency Management.

It should be remembered that at both JACADS and TOCDF the emergency response system functioned with only a few problems (such as those at JACADS when important personnel could not be notified because of communication problems). That is, the failures of notification occurred in alerting the civilian authorities that are a part of CSEPP. Within the Army structure at JACADS, for example, the personnel were assembled at checkpoint "Charlie" for possible evacuation once the alarm was sounded. The plant control room at Tooele informed the DCD's EOC in a timely fashion of the alarms and provided it with updates on the situation. However, the DCD EOC then failed to pass on the notice to the Tooele County EOC and relevant State of Utah agencies. It is impossible to determine how the CSEPP portion of the emergency management system functioned as it was not provided timely notification of the events. Other communities soon to host chemical demilitarization facilities can learn a good deal from these two events and the nature of the "fix" that has been made by the Army and Tooele officials. Given this failure of communication and adequate notification, it is reasonable to assume that efforts to correct the problems associated with the response would focus on information exchange, such as through the MOU entered into by Tooele County and the DCD (Appendix G).

The lack of notification and warning between the DCD and Tooele County and appropriate local and state agencies was caused in part by a lack of coordination between components of the two programs (CSEPP/FEMA and the Army), and in part because of DCD's emergency management responsibilities that "end at the fence" (although timely communication cannot). The recent GAO report (GAO, 2001) on FEMA and Army efforts to prepare communities for a chemical emergency is vague on how to improve what is

being done other than suggesting that the two entities become proactive in doing so.

Even if the various components of the emergency response system are designed to be fully coordinated, the system will not function well unless there is a high level of trust among the personnel involved. In particular, there needs to be trust between those "inside the fence" (professional personnel) and those "outside the fence" (local officials and the public).

PUBLIC RESPONSES TO CHEMICAL EVENTS

A significant aspect of the responses to chemical events concerns when and how the event is communicated to local officials and the local public.⁷ While much of the focus of post-event response is necessarily on the requirements of the formal regulatory process, interactions with the affected local officials and public have important implications as well. From the perspectives of the public and their officials, "chemical events" are largely involuntary risks that are potentially catastrophic and of technological origin. These characteristics render chemical events and incidents subject to substantial "social amplification" in which the characteristics of the events interact with individuals' perceptions of the risk associated with them and the pattern of communication with the public and their response to both the event and the communication (Kasperson, 1992; Kasperson et al., 1988).

According to this formulation, news reporters, interest groups, and concerned citizens monitor events and select and retransmit risk signals pertinent to those events via the news media and informal networks, which in turn results in a ripple effect of secondary impacts. These secondary impacts could include changes in perceived levels of risk, altered trust for the organizations and officials involved, pressure for legal and institutional change, changes in property values, and a myriad of other effects. Thus, the pattern of communication with and responsiveness to the public and their officials can have substantial "real" effects beyond the immediate health and environmental impacts posed by the chemical event. From a programmatic perspective, most importantly, these secondary effects can delay and further debilitate a program by undercutting the credibility of the agency(ies) entrusted with implementing the program, reinforcing negative messages about the technology being utilized and leading the public to question reports and official statements about progress in meeting program objectives.

Understanding how chemical events might initiate the "social amplification" process is facilitated by elucidating critical aspects of the trust relationship engendered by activities such as the chemical weapons demilitarization pro-

gram. Officials and citizens of the affected local communities, along with national officials, share the objective of destroying the chemical stockpile but must rely on others to carry out that destruction in a safe and timely manner. To undertake the program, these "principals" must establish a relationship with agencies (PMCD) and contractors—or "agents"⁸—to carry out the mission.⁹ The technological requirements of the process, and the magnitude of the potential hazards, lead to barriers of complexity and security that—for practical purposes—make the program difficult for the principals to directly evaluate and monitor. The theory of principals and agents is discussed further in Chapter 1.

Effective management of the principal-agent relationship in the chemical demilitarization program in order to achieve the required level of trust appears to require (1) monitoring processes that assure principals of their role in effective oversight, (2) complete and timely disclosure of events by the agents, and (3) demonstrable and timely assessments of the problems leading to chemical events and their correction.

The JACADS December 3-5, 2000, incident raises several important issues concerning interactions with external principals. First, failure to believe the first sample analysis and act immediately to isolate the contaminated material is troubling. Absent very careful monitoring (in the form of investigations) by regulators, the event would have been misunderstood, potentially inhibiting appropriate responses. Second, tardy compliance with reporting requirements (as discussed above in this chapter), even when very permissive assumptions are made about the timing of the event onset, may well raise significant concerns among public officials, media, and affected citizens. Though JACADS is itself a geographically isolated facility, if the lapses associated with the December 2000 incident are repeated at other sites, residents living near similar facilities might lose confidence in the monitoring process. Moreover, these incidents could be seen as indicators of larger, unobserved problems in plant operations, such as insufficient willingness to forthrightly identify and correct conditions that could lead to chemical events.

The committee's investigation did not indicate that JACADS personnel intended to distort the December 3-5, 2000, event or delay reporting. However, the context (the "mere waste" mind-set versus the "agent" mind-set) and outcome could erode the confidence of external principals at a continental U.S. site in the monitoring and control processes.

⁸It is unfortunate that use of the term "agents" to indicate those who carry out tasks for "principals" might in this report be a source of confusion in the context of the chemical demilitarization program (where "agent" usually refers to chemical agent). Where *agent* is used in the institutional sense, it is italicized to reduce the potential for confusion.

⁹There is a large and growing literature on what is referred to as the principal-agent relationship. For some of the more important work, see Wood (1992) and Scholz and Wei (1986).

⁷Almost by definition, the communication process includes the local news media and interested citizens' groups.

The substantial costs in terms of resources and time required for multiple investigations of chemical events involving environmental releases, such as those that occurred in the TOCDF May 8-9, 2000, event, might contribute to a defensive mentality on the part of the operating personnel. At the same time, it is essential that local officials and local citizens have trusted representatives involved in these inves-

tigations both to ensure that they are competently undertaken and to facilitate effective communication of the results. The need for such local representation is underlined by the findings of delayed reporting or failure to report, indicating the significant flaws in the reporting process that stimulated the new notification and communication MOU between the DCD and Tooele County.

Implications of Past Chemical Events for Ongoing and Future Chemical Demilitarization Activities

Chapters 1 through 3 of this report are based on an examination of activities at Johnston Atoll Chemical Agent Disposal System (JACADS) and Tooele Chemical Disposal Facility (TOCDF), both of which employ baseline incineration systems to destroy chemical agents. Third-generation incineration facilities are scheduled to begin operation in 2002 or 2003 at Anniston, Alabama, Umatilla, Oregon, and Pine Bluff, Arkansas. The committee believes that many of the observations and recommendations made in this report are applicable to all demilitarization facilities, including those that may not use incineration.

Evidence indicates that chemical demilitarization incineration facilities are safe as designed if they are operated properly and if the appropriate operating procedures and protocols are in place (NRC, 1996). The avoidance of risk during any type of process upset depends on having the necessary engineering controls in place and on the operator's skill and training in using them to advantage. This level of preparedness requires in turn that a thorough hazard risk analysis be performed and that all personnel be thoroughly trained and given refresher courses at appropriate intervals. At both JACADS and TOCDF, extensive written procedures are in place for normal operations as well as for startup and shutdown, and operators receive systematic refresher training in these procedures. It can be expected that future chemical demilitarization facilities will also operate this way. Key factors for minimizing—if not eliminating—chemical events in the future include:

- Sound risk and change management programs and procedures;
- Effective safety programs that are focused on continuous improvement, and have the full visible support of all levels of management; and
- Systems for efficient and timely program-wide dissemination of information and communication.

RISK AND MANAGEMENT OF CHANGE PROGRAMS ALREADY IN PLACE

This section describes the procedures that are in place for evaluation of change, including the risk associated with a change. The current Chemical Stockpile Disposal Program (CSDP) risk management program is fully described in *Risk Assessment and Management at Desert Chemical Depot and the Tooele Chemical Agent Disposal Facility* (NRC, 1997). It is a multilevel program that defines policy, sets requirements, provides guidance on implementation, and, at the facility level, defines specific requirements the facility must meet and specific management processes that must be implemented. The CSDP risk management program is based on a long history of safety and hazard analysis and regulation by the Army. An informal risk management process was developed at the TOCDF in parallel with the site-specific quantitative risk analysis (QRA). This process was described in the NRC report *Review of Systemization of the Tooele Chemical Agent Disposal Facility* (NRC, 1996), which summarized a number of plant and operational changes that had been implemented as a result of accident scenarios identified in preliminary work on the QRA. As part of the risk management process, the following risk-monitoring activities have been introduced:

- Performance evaluation (based on feedback from activities and incidents);
- Emergency response exercises (periodic exercises on site, with Chemical Stockpile Emergency Preparedness Program (CSEPP) personnel);
- Risk tracking (as new data become available, as risk models are improved, and when changes occur in the facility, the related changes in risk related to safety, environmental protection, and emergency preparedness will be calculated and tracked); and

- As required by the Program Manager for Chemical Demilitarization (PMCD) now for essentially all facilities, participation in meetings and/or teleconferences about design lessons learned and programmatic lessons learned.

The Army's formal risk management process is described in a program-wide document, *Chemical Agent Disposal Facility Risk Management Program Requirements* (U.S. Army, 1996c), which provides a basis for the CSDP risk management program. The risk management program is a framework for understanding and controlling all elements of risk within the disposal facility and the stockpile storage area. It links risk management needs to other specific requirements of the Army and other parties at top levels of management and identifies specific documents and references that apply to all CSDP facilities.

In January 1997, the Army issued its draft, *A Guide to Risk Management Policy and Activities (the Guide)* (U.S. Army, 1997b). This draft provides an overview of the processes for managing risks associated with Program Manager for Chemical Demilitarization (PMCD) activities and describes a process for managing changes that may affect the risk associated with PMCD activities. It defines issues that are matters of risk assessment and issues that are matters involving policy (value judgments) and attempts to establish an approach to integrating them and to involving the public in that integration.

The PMCD policy indicates that risk management is integrated into the normal functioning of the organization:

- Operations are now based on the risk management program requirements document (U.S. Army, 1996c).
- The Risk Management and Quality Assurance Office has been assigned the task of integrating risk management for operations, design, and construction.
- The Environmental and Monitoring Office has been assigned the task of assessing hazards to the environment, the populace, and biota in terms of regulatory requirements.
- The CSEPP has the task of planning for potential emergencies and providing liaisons with other emergency preparedness organizations. Note that this program is not a part of PMCD.
- The Public Affairs Office is charged with providing liaisons among the public, the Citizens Advisory Commission (CAC), state authorities, and the Army to facilitate public involvement.

Another significant element in risk management is the management of change. Although changes are presumably made for good reasons, the overall safety of the facility could be compromised if the effects of change on risk estimates are not evaluated or understood. Changes need to be documented and analyzed to determine if they affect procedures,

training, or other aspects of the program. This established configuration is based on the initial design of the facility and incorporates changes that have been approved and implemented. The established configuration is the basis for the plant's up-to-date health risk assessment (HRA) and QRA.

If a proposed change is significant, assessing its value is acknowledged to be both a policy question and a factual question. Structured discussions focus attention on all factors that affect the decision, and information on the impact of the proposed change in significant cases should be made available to the public, to the CAC, and to state regulators, and public comments should be solicited when appropriate to the change contemplated. For the most significant changes (Resource Conservation and Recovery Act (RCRA) Class 3) the Army, with the assistance of the controlling regulatory body, must schedule a public hearing. The definition of a RCRA Class 3 change is embodied in the existing federal regulations. The Army's decision will take into account community desires (where appropriate to the complexity of the change) and needs as well as important facts and intangible factors, which are summarized in Table 4-1. Note that factor 6 in Table 4-1, "comparison to previous decisions," ensures either that decisions are consistent or that the reasons for inconsistencies are clearly stated. A thorough consideration of uncertainties is also required. The Army is tasked to prepare

TABLE 4-1 Issues and Factors in Assessing the Value of Change Options

1	Public Input
2	QRA Risk <ul style="list-style-type: none"> a. All available QRA risk measures, including expected fatalities, cancer incidence, fatalities at a one-in-a-billion probability, and probability of one or more fatalities b. Risk trade-offs: public versus worker, individual versus societal, processing versus storage c. Uncertainties in the technical assessment of risk d. Insights from sensitivity studies
3	Hazard Evaluations
4	HRA Risk <ul style="list-style-type: none"> a. Insight from sensitivity studies
5	Programmatic <ul style="list-style-type: none"> a. Cost of the change relative to other proposals and program objectives b. Schedule for implementation c. Uncertainties in estimates d. Impact of implementation on overall objectives and schedule for disposal of the weapons and chemical agent e. Consideration of the improvement anticipated by this change with other proposed improvements
6	Comparison to previous decisions

SOURCE: Reprinted from U.S. Army (1997b), p. 53.

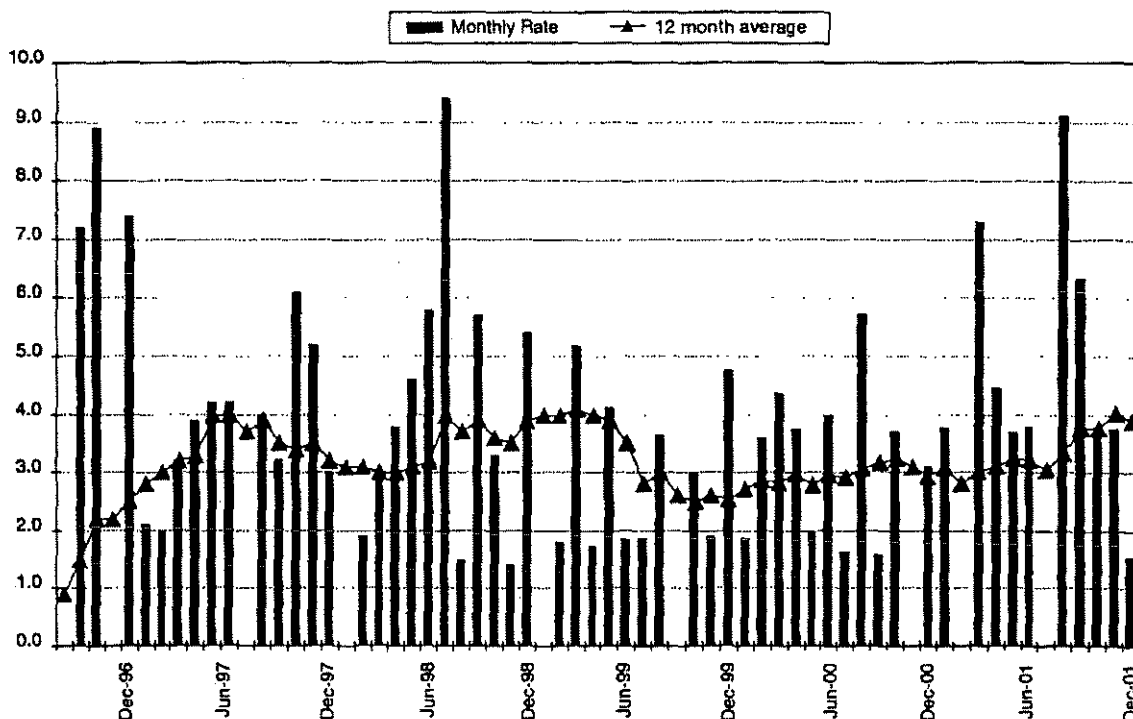


FIGURE 4-1 TOCDF recordable injury rate 12-month rolling average, August 1996 (the start of agent operations) through December 2001. SOURCE: Data up to 1998 from NRC (1999a); data for 1999 to 2001 from U.S. Army (2002b).

responses to all public comments and inform regulators and the CAC of decisions and their rationale.

If all issues are considered in an appropriate and timely manner, general consensus may be possible. But even if consensus is not reached, the Army, as decision maker, will provide a "synopsis of the considerations and a summary of the overall decision basis, listing the rationale for each factor" (U.S. Army, 1997b). In this way, interested parties can see if their concerns were considered and what effect they had on the decision.

SAFETY PROGRAMS

The safety of the public, the environment, and workers is a very significant part of a congressional mandate for the conduct of the chemical demilitarization program. The NRC's Stockpile Committee previously expressed concern over production (agent destruction) having a higher priority than safety—at least from the standpoint of the contractors' award fee criteria (NRC, 1999a and 2002). Responding to this observation, the Army revised the criteria to emphasize safety and production equally. An additional concern expressed repeatedly by the Stockpile Committee is a preoccupation with agent safety, to the detriment of traditional

occupational health and safety programs and performance, and it has urged plant management to lead the operating sites toward a "safety culture" (NRC, 1999a).

At JACADS, significant progress was made in developing a safety culture, and during the latter phases of demilitarization operations the plant was consistently achieving excellent safety performance. This does not appear to have been the case at TOCDF (NRC, 1999a).

Although traditional performance indicators such as recordable injury rates (RIRs) at TOCDF are comparable to all-industry averages, there has been very little improvement in these metrics since operations began (Figure 4-1). Nor is there an indication that TOCDF has moved toward a safety culture at any appreciable rate, even though management has developed a TOCDF safety culture plan and has implemented several programs aimed at achieving the safety plan's goals (NRC, 1999a). No additional findings or observations resulted from this study. The Committee on Evaluation of Chemical Events at Army Chemical Agent Disposal Facilities concurs with the Stockpile Committee in observing that the TOCDF is being operated in a safe manner, but that it can and should be continuously improving its safety programs and performance.

The Committee on Evaluation of Chemical Events also concurs with the Stockpile Committee in its belief that future

demilitarization facilities should be safer at start-up, as evidenced by performance metrics, than their predecessors. Such performance should not be difficult to achieve, given an effective programmatic lessons learned (PLL) program and the fact that several managers with chemical demilitarization experience will be working at the newer sites. Management and employees at new sites must begin the process of establishing a safety culture before operations commence.

PROGRAMMATIC LESSONS LEARNED PROGRAM

The PLL program—the principal means of communicating lessons learned both within and among the various chemical demilitarization facilities—is the PMCD's only significant vehicle for communicating and coordinating risk, design, and operational issues among sites. The PLL program until recently was administered by PMCD with support from Science Applications International Corporation (SAIC). The program manager at SAIC was hired specifically because of his background in and extensive familiarity with detailed operating procedures, training, and quality control in a hazardous and demanding environment.

Dr. Mario Fiori, Assistant Secretary of the Army for Installations and Environment, presented his vision of some changes in the management and operating philosophy for the chemical demilitarization program to the Stockpile Committee on June 29, 2002. A major thrust of his presentation was that the contractors need to take "ownership" of the various aspects of the program for which they are responsible. Included in this change is the concept that PMCD would no longer be directly responsible for the PLL program, but that a contractor (yet to be selected from the two operating contractors) would instead be responsible for it.

The philosophy and purpose of the PLL program are:

- to capture lessons learned during construction, equipment installation, systemization, operations, and closure, i.e., all phases of the operation
- to provide assistance to the sites and PMCD in assessing and utilizing these lessons and experiences
- to support PMCD's emphasis on safety and environmental compliance
- to reduce cost and schedule
- to provide information to decision makers.

The PLL program is a comprehensive, multicomponent activity that is distributed across all PMCD demilitarization sites and includes workshops, assessments, technical bulletins, directed actions and updates, programmatic planning documents, site document comparisons, critical document reviews, and a "quick react" feature (Box 4-1).

PLL PROGRAM DATABASE

The PLL program is a mechanism for developing and maintaining information associated with lessons related to preconstruction and construction activities, systemization, operations, and closure of the chemical demilitarization facilities. The majority of lessons learned are captured in the PLL database, which contains considerable information and is potentially an excellent resource for helping to maintain a high level of operational safety and security. However, so much information is present that plant personnel believe it is hard to identify what will be helpful in any given situation.

The information in the PLL computerized database is available to all participants in the PLL program. The database is searchable using both Boolean logic (and key word(s)) and a decision tree. Although other means of communication exist for discussing the operational and safety issues arising at the demilitarization facilities (described below), essentially all the information is contained in the database. The data are continuously updated and include information from workshops since 1994 and document reviews before that date. Not all PLL program components that lead to data included in the database were in place in 1994, and some have been improved since their inception. For example, workshops, critical document reviews, quick reacts, and the PLL oversight board were initiated in 1994; the technical bulletin, in 1995; and operational assessments, in 1996.

The issues database was first provided to the chemical demilitarization sites in 1997, the programmatic planning documents became available in 1997, the site documents comparison began in 1998, the directed action philosophy was revised in 1999, the engineering change proposal (ECP) review process (which began in 1987) was integrated with PLL in 1999, and the lessons learned database (a different way of sorting and accessing the information) was started in 2000-2001. The PLL team has also developed a help line to facilitate easier use of the information.

Data in the PLL database are accessible to the following staff:

1. PMCD home office, which includes stockpile disposal, alternative technologies, non-stockpile material, cooperative threat reduction, support offices, and contractors.
2. Project Manager Chemical Stockpile Disposal (PMCS) and Project Manager for Alternative Technologies and Approaches (PMATA) sites, which include field offices and site systems contractors.
3. Other stakeholders, including operations support command, U.S. Army Corps of Engineers, U.S. Department of Health and Human Services, U.S. Army Center for Health Promotion and Preventive Medi-

BOX 4-1 Additional PLL Program Components

In addition to the computerized PLL database, the PLL program has several other significant components, including workshops, assessments, technical bulletins, directed actions and updates, programmatic planning documents, site document comparisons, critical document reviews, and a "quick react" feature. A brief description of these components follows.

- *Workshops* enable communication between and among PMCD personnel (including sites) and are the basis for information that ultimately is included in the PLL program database. Facilitated by a person knowledgeable about the issues (but not a decision maker) and usually from either PMCD or SAIC, the workshops are essentially focused technical meetings held in person or via teleconference or videoconference. Sample workshop topics include incinerators and secondary treatment support systems; general operations maintenance and training; personal protective systems; environmental, laboratory, and monitoring procedures; safety, surety and security; quality assurance/quality control (QA/QC); construction; systemization; public outreach; trial burns; and information management systems.
- *Assessments*, relatively detailed studies of an issue such as management or very technical topics, are intended as a means of rapidly starting an effort. A topic is developed by the government, and SAIC follows up in planning and execution with appropriate learning partners (approved by the government).
- *Technical bulletins* are published quarterly and about 1000 copies are sent to various stakeholders. Each site makes additional copies as needed. The bulletins contain information that is not in the "quick react" category (discussed below) but requires attention before the next workshop, information that is of general interest but is not likely to be a workshop topic, or in some cases information that supplements the workshop discussions.
- *Directed actions and updates* transfer information or request that it be sent from or to the chemical demilitarization sites. Originating primarily in the workshops and/or quick reacts, directed actions and updates can also come from the PLL oversight board, critical document reviews, and other similar activities. The directed actions are assigned by PMCD managers and tracked by the PLL team until they are acted on. The responses are reviewed by the PLL team and incorporated into the PLL database.
- *Programmatic planning documents* that are maintained by the PLL team include a chemical demilitarization operations manual, PMCD management plan, PMCD information management plan, guide to systemization planning, guide to emergency response planning, and guide to closure planning (the last in draft form as of October 2001). The PLL team incorporates into these documents the results of lessons learned, adds new requirements (including applicable regulatory requirements), and comments on the cost/benefit considerations of producing a new version of any document.
- *Site documents comparison* involves PLL team review of new documents prepared at a site and comparison to previously approved documents from an earlier site and to programmatic guidance. The PLL team provides comments and recommendations, but implementing them is not mandatory at the site level.
- *Critical document review* is done by the PLL team for documents provided by the government, including reports of unusual occurrences or events, safety reviews (including near-miss advisories), reports of nonconformance or non-compliance, reports of test results, audit surveillance inspection reports, daily and weekly operating reports, and campaign reports. The purpose of these reviews is to identify lessons that will be added to the PLL database, update the database as needed, introduce appropriate topics for discussion at workshops and, if needed, recommend direct actions to secure further information.
- *Quick react* involves passing critical information—"changes to processes or equipment that affect operational safety, (or) environmental protection, or have the possibility to cause substantial equipment damage" quickly to the other affected parties. The site project manager or the chief of the operations division is responsible for and empowered to designate a lesson as critical. The time frame for a quick react is 24 hours. The quick react process consists of the following:
 1. The site project manager (or the chief of the operations division) designates an issue as quick react.
 2. The site faxes the information to PMCD and the PLL team (using a specific, designated form).
 3. The site calls the chief of the operations division and the PLL contractor staff (who have 24-hour pagers).
 4. The PLL team then conducts a data search and obtains any needed backup data, provides recommendations(s), faxes the government decision, confirms receipt, puts the data into the database, and tracks the directed actions.

The actual course of action is determined by PMCD operations management.

cine, U.S. Army Materiel Systems Analysis Activity, Edgewood Chemical and Biological Center, and regulators.

As of August 2001 the database was organized as an "issues" database and included about 3200 items from which users can choose to determine lessons applicable to their particular problem. Currently the PLL team (SAIC) is developing a new way to present the data and estimates that 5000 lessons will ultimately be available from the issues represented to date.

Although not specifically categorized as such, a significant number of laboratory issues are included in the database. Until recently JACADS provided most of the cases, but TOCDF is now providing most of the issues. The database also includes lessons from Anniston, Pine Bluff, Aberdeen, Newport, and Umatilla, all of which are currently under construction or undergoing systemization. The PLL team categorized these lessons as design, 341; systemization, 687; operations, 843; and closure, 241. Of these, 196 are categorized as maintenance and 202 as training lessons. Prior to 1999, the ECPs were handled in a separate manner, but all ECPs have now been captured in the database. Permitting issues are also included in the database.

When the PLL program began in 1994-1995, the major source of issues was the review of documents (event reports, end-of-campaign reports, inspection reports, and so on.). Now most of the information comes from the facilitated workshops run by the PLL program, which allow input and peer review by multiple program personnel with expertise in the subjects under discussion. The initiators of the information (subjects) are primarily the chemical demilitarization sites, but some issues come from other program participants. As currently operating, the decision process used to determine the ultimate content of the PLL database is as follows:

1. PMCD approves the list of topics (subjects) used at a facilitated workshop.
2. Twice a year the PLL team holds workshops for environmental and environmental oversight topics.
3. The minutes from the workshop are prepared, reviewed, and tentatively approved by SAIC. These minutes are sent to PMCD for its review and approval.
4. PMCD then makes the final decision before the minutes and lessons learned are entered into the database.
5. The database is distributed as a CD-ROM to each chemical demilitarization site to be loaded onto its local area network. It is not available on the Internet or on a wide-area network.

There is no mechanism to track the use of the data, but SAIC stated to the committee that use of the data is extensive at the engineering change proposal (ECP) level, as well as at the chemical demilitarization sites during start-up and

operation. The committee found no accurate means for assessing this assertion other than the use of anecdotal information. When queried, some operators were unaware of the database and its uses.

SAIC is in the process of prioritizing the data so that the highest-priority issues will require a response from the site. At present, a site does not have to respond, since there are too many issues in the database relative to staffing levels at the site. Additionally each ECP approved by any site is discussed at a biweekly ECP review teleconference. At a subsequent teleconference the sites inform the PLL team of what action will be taken regarding the ECP. These appear to be among the few issues that are handled in this more structured manner. The ECP review process consists of the following steps:

1. The sites approve the ECPs and forward approved ECPs to the PLL team.
2. The PLL team researches related issues and ECPs (using the database) and sends the ECPs and accompanying information to the other sites.
3. The ECP review team, which includes representatives of the PMCD office, demilitarization sites, Army Corps of Engineers, and the PLL team, conducts biweekly teleconferences and puts the decision documentation into the database.

The PLL database and PLL concept reflect a systematic effort to take advantage of lessons learned in one chemical demilitarization facility and use the information at another facility. At present only one facility is operating (TOCDF), and one is undergoing closure (JACADS). As more facilities come on line it will be more difficult to track the data and ensure that the most important issues are addressed at all sites. PMCD will need to strengthen the communication and implementing mechanisms in the near future. PMCD (SAIC) is currently developing a set of criteria for prioritizing the information in the PLL database. The intent is to create a few categories of issues (lessons), sorted according to relative importance. For instance, those with the highest priority (for example an important, operational safety directive) should probably be available and implemented at all facilities.

RESULTANT CHANGES

At JACADS and TOCDF, operations personnel did not appear to generalize lessons learned beyond the immediate equipment and task in the original incidents. There is room for making much wider use of these valuable lessons, such as by "mining" the information in the PLL database to detect patterns that may underlie several incidents. The effort to prioritize the data is a good start toward increasing the information's usefulness. PMCD could also make better use of information available from industries such as the chemical and petroleum manufacturing sectors. Both have

very active trade associations and routinely share information regarding safety procedures and good operating and maintenance practices among different companies.

The destruction of chemical weapons was first begun at JACADS and its design was based on equipment and procedures developed at the Chemical Agent Munitions Disposal System (CAMDS) at Deseret Chemical Depot, Utah. Many design changes were made after operations had begun, some in response to chemical events, but most to correct recognized problems with the original design. (Both types are included in the PLL database.) For all operating chemical facilities, design changes are part of a continuing process aimed at taking advantage of lessons learned from ongoing operations, new technology as it is developed, or better procedures developed at a plant or transferred from another facility.

Many design changes have also been made to improve productivity (e.g., inclusion of the hot slag withdrawal system on the liquid incinerator (LIC) secondary burner, and the process, currently under review, for freezing the M2A1 projectiles at Anniston before disassembly to minimize spilling, and subsequent cleanup, of mustard agent). Design changes to improve operating safety, however, are not as readily identified except in direct response to a chemical event. For instance, the airflow systems handling ventilation throughout a plant as well as combustion air will have variable-speed motors driving the fans, allowing improved control of airflow, particularly at low rates (combustion airflow control was a problem for the operator during the May 8-9, 2000, incident at TOCDF).

A large number of changes have been made to operating procedures and equipment in response to the PLL program and based on incident reports from JACADS and TOCDF. Of the 24 recommendations for change resulting from the May 8, 2000, event at TOCDF, for example, all have been examined, although not all have required action at the newer plants because of differences in the feed mix and in the plant designs. In the committee's view, some of the more significant changes made in response to the PLL are as follows:

- Staggered automatic continuous air monitoring system (ACAMS) monitors are now being installed in exhaust ducts, to shorten the time for detection of any release of agent.

- The deactivation furnace system (DFS) cyclone is contained in an enclosure that is monitored by an ACAMS.
- There is a carbon filter on the incinerators' exhaust.
- As a result of the JACADS waste-bin event (discussed in detail in Chapters 2 and 3), drip trays have been added to rocket and mine lines, a search is on for combustible spill pillows, and spill pillows will generally be treated in the metal parts furnace, not the DFS.
- The large isolation valves on the individual heating, ventilation, and air conditioning (HVAC) carbon filter banks now have a small "bleed" valve, connecting to the exhaust flow, to maintain the filter bank at negative pressure even if it is temporarily out of service and to prevent migration of agent from the filter bank to the connecting vestibule. (Such migration of agent has been a problem in the past.)

Chapter 1 discusses the systems hazards analysis (SHA) performed for TOCDF. A primary purpose of a standard hazardous operation (HAZOP) analysis is to learn to anticipate where safety may be compromised. There have been many changes to the original design (see footnote 1, Chapter 5), some identified above and all included in the PLL database. It is not apparent that each of these design changes has been subjected to the appropriate level of HAZOP analysis. In view of the challenging nature of the chemical weapons disposal program and its perceived potential for harm, this aspect of the design process needs particular and ongoing attention.

It is common practice in industry for people who do the design and initial HAZOP analysis to be included on the plant start-up team. The people who did the actual detailed design work and participated in the HAZOP studies done as a part of the design process should also play a strong role in operator training in the use(s) of the HAZOP procedures and information. It is also common industry practice for companies to share nonproprietary information about safety issues, operating procedures, HAZOP findings, and so on. PMCD could make better use of the experiences of other industries, such as the chemical and petroleum refining industries, in the benchmarking of its procedures and processes.

Preparing for Potential Future Chemical Events at Baseline Chemical Demilitarization Facilities

SUMMARY OF CHEMICAL EVENTS ANALYSES

The committee's analyses of past chemical events at Johnston Atoll Chemical Agent Disposal System (JACADS) and Tooele Chemical Disposal Facility (TOCDF) indicate that the causal factors are similar to those associated with breakdowns of other safety-critical systems. Release of chemical agent may be triggered by equipment design flaws and failures, by procedural deficiencies, and by human actions—i.e., by both latent and active failures (see Chapter 2).

The task of dismantling and destroying chemical weapons is inherently hazardous, but the Program Manager for Chemical Demilitarization (PMCD) has incorporated extraordinary safety precautions into both plant design and personnel training. The chemical demilitarization incineration plants are virtual fortresses built to withstand the consequences of accidents, and, to date, releases of chemical agent from these facilities have been rare, isolated events involving only small amounts of agent, even under upset conditions (NRC, 1996, 1997, 1999a). State-of-the-art quantitative risk assessments have determined that the major hazard to the surrounding communities arises from potential releases of agent from stockpile storage areas, not the demilitarization facilities (U.S. Army, 1996a; NRC, 1997; see also Chapter 1 and Appendix E). Further, to date by far the largest releases of agent have occurred in the storage areas, as described in Chapter 1.

The Army has sought to build in the process of learning by experience to avoid accidents where possible, and to avoid repeating them in any case. The centerpiece of this effort, the programmatic lessons learned (PLL) database, is admirable as a personnel-training tool but requires further modification to improve its accessibility (see Chapter 4). Despite considerable effort in plant design and personnel training, mistakes have been made and problems have occurred in the chemical demilitarization process.

The Army has established extraordinarily low agent

threshold concentrations to trigger site alarms and a subsequent shutdown of the plant (see Chapter 1). While laudable as an effort to protect worker and public health, these overly sensitive alarms introduce their own kinds of operating problems. Difficulty in reliably detecting agent at such low concentrations leads to recurring false positive alarms. It also means that alarms triggered by chemical events in which agent levels stay near threshold will actually pose no risk to the worker or the public.

Given the inherent complexity of the chemical demilitarization task at the assembled weapons stockpile sites, it is almost certain that new problems will continue to arise, particularly from aging and deteriorating weapons and the challenges of demilitarization plant closure and decommissioning. There will be future chemical events, and serious consequences to both plant personnel and surrounding communities cannot be ruled out. This chapter focuses on prudent ways to reduce their number and to minimize their consequences.

CHEMICAL EVENT RESPONSE AND REVIEW BY MANAGEMENT

Army Regulation 50-6 presents in detail the response to a chemical event and its reporting expected from the depot commander (U.S. Army, 1995). The objective is to:

... encompass those actions to save life, preserve health and safety, secure chemical agent, protect property, prevent further damage to and remediate the environment, and help maintain public confidence in the ability of the Army to respond to a military chemical accident or incident. . . . The major army commands (MACOM) commanders will establish procedures to review each chemical event and to initiate safety investigations when warranted

The extent of the review process generally varies with the seriousness of the incident. The review process for a

serious incident can be quite lengthy. Every chemical event should be investigated promptly, particularly those considered potentially or actually serious. Memories of the event will change with time. Having people identified in advance as potential candidates for a review team would appear worthwhile.

One of the objectives of Army Regulation 50-6, stated above, is to "help maintain public confidence." The committee believes that building trust requires regular and reliable communication between the Army and the communities around the demilitarization plants. It does not appear that these communities feel that such communication has been achieved. Public trust is not easily established and is very difficult to rebuild once lost. The recent report of the U.S. Commission on National Security (a commission headed by former senators Gary Hart and Warren Rudman) comments on the general lack of confidence in federal employees (USCNS, 2001). This general lack of confidence, exacerbated by the unfortunate pattern of interactions between PMCD and external stakeholder groups (NRC, 1996), has created a serious deficit of trust in the Army's chemical demilitarization program on the part of important segments of the public. In addition to addressing the public's lack of confidence in federal officials, at some sites PMCD must also deal with public distrust of state and local officials. A recent NRC letter report (NRC, 2000c) points out that:

... open, two way communications between PMCD and stakeholders are necessary, but insufficient. PMCD needs to encourage public trust in official representatives of the public (i.e., Citizens Advisory Commissions and local regulatory bodies) as much or more than it needs to build trust in the Army.

The memorandum of understanding between TOCDF and Tooele County (see Appendix G) should help build confidence that public officials are fully informed and responsive to chemical events, thereby contributing to building trust. This approach might serve as a model for other communities with similar concerns (Utah DEQ, 2000b).

BUILDING ON THE RESULTS OF RISK ASSESSMENT

Risks associated with the chemical demilitarization facilities have been studied in depth, through quantitative and health risk assessments and systems hazards analyses (see Chapter 1). The quantitative risk assessment, in particular, is a living document, subject to change as new information arises or facilities or operations are altered. It provides excellent guidance on where risk is the highest, and thus where the greatest care is needed. The Army's "Guide to Risk Management Policy and Activities" provides a process for managing risks, particularly when changes are made, and for communicating information on change to the public (U.S. Army, 1997b).

Understanding and building on the results of risk as-

essment implies more than knowing the summary numerical results of quantitative and health risk assessments. It also requires knowing the details, including the assumptions, simplifications, and omissions, of the analyses. The results must be viewed in the full context of the risk assessment, as well as in the context of the actual safety performance of the plant. This perspective must be accompanied by a better understanding of explicit and implicit uncertainties.

Understanding the results of risk assessment also means knowing the significant contributors to risk, i.e., knowing how improved performance can reduce risk and how degraded performance could increase risk. With this knowledge:

- Managers and workers can develop options for reducing risk or for ensuring that risk does not increase. They can also consider how proposals for change affect risk.
- Workers, emergency response personnel, and others can better understand their personal risks and how best to protect themselves and each other.
- Emergency preparedness managers can focus their planning and training programs on the most important scenarios or sources of risk to the surrounding communities.
- State and local officials can provide more informed oversight in their decision making.
- Everyone can participate knowledgeably in the risk management process.

Quantitative and health risk assessments are complex and, of necessity, include simplifications. The plant safety professionals should review the assessments thoroughly to be aware of their basic assumptions and/or limitations. Plant operating requirements may change, and changes need to be viewed in the light of the risk assessments.

Several lessons can be learned about risk management from thinking about possible responses to certain kinds of chemical events.

- *False positive alarms.* The history of false positives has contributed to a number of chemical events as described in Chapter 2. These result from a mindset that develops in operators. Faced with a series of false positive alarms, they tend to disbelieve future alarms, at least to the extent that they seek confirmation before taking action. A question that has been raised is whether a similar complacency could develop among emergency response managers and even the general public? If they too are subjected to false alarms, they may delay ordering or responding to orders for evacuation or sheltering. Generally, these people have not been subjected to the false alarms, but if it should happen, similar problems could arise.

- *Evacuation versus sheltering.* At some sites, there has been controversy over the question of evacuation versus sheltering. Countering the belief that evacuation is always the safe path are at least two circumstances. First, evacuation itself can create hazards. It disrupts the economy and daily life and can create high stress. It has led to injuries due to traffic accidents and improper use of safety equipment. Second, analyses by Chemical Stockpile Emergency Preparedness Program (CSEPP) planners have shown that for some release scenarios, evacuation can place the evacuees directly in the path of the hazardous plume (Blewett et al., 1996). For some scenarios, sheltering in place (remaining indoors with the doors and windows sealed) as the plume passes, followed by evacuation, can greatly reduce exposure. Continued sheltering after the cloud has passed may lead to exposure as severe as being caught in the plume. In these cases, sheltering as the cloud passes, followed by evacuation through contaminated areas, can be the most effective protective action.

BUILDING A SAFETY CULTURE

TOCDF has clearly made an effort to promote plant safety. Two examples are (1) the use of the Safety Training Observation Program (purchased from the DuPont Company) and (2) the use of the Voluntary Protection Program developed by the Occupational Safety and Health Administration (OSHA). A good safety organization on paper, however, does not ensure a high-quality safety culture. Some of the past events at both JACADS and TOCDF arose from obviously poor safety practices. The recordable injury rate (RIR) at TOCDF, for example, has been unimpressive (Chapter 4). The NRC has emphasized the need to focus on safety with constant attention to detail, starting with a complete and persistent commitment from management (NRC, 1999a).

OPERATIONAL CHANGES

It is clear that (1) serious mistakes have been made in chemical demilitarization plant operations in the past and (2) strict standards of operating practice have not been uniformly enforced (see Chapters 2 and 3). These are failures of management to fulfill their responsibilities. Improvement will come only with serious management effort, significantly greater than in the past. Strong safety cultures and an adherence to defined operating procedures have been established in other industries. The goal for chemical demilitarization plants should be to match the best achieved in industry.

A criticism that is easily voiced but difficult to respond to is the general acceptance of the status quo by chemical demilitarization operating people and management. Changes are made in response to chemical events or obvious operating

difficulties, but based on the committee's site reviews, a culture of questioning processes and constantly improving operations does not seem to exist. To be fair, it is clear that plant management is aware of the importance of being proactive on safety, rather than being reactive only. Certainly there has been real improvement in plant layout, equipment, and so on (see Chapter 4). Based on the committee's observations and discussions with operating personnel, TOCDF is clearly a better designed and engineered plant than JACADS, and the third-generation incineration plants, as exemplified by the Anniston Chemical Agent Disposal Facility, appear to be a significant improvement¹ on TOCDF. Many of these improvements were made by seeking better ways of doing things, and anticipating possible future problems rather than reacting after a problem has occurred. The committee encourages a continued vigorous questioning of plant operation and equipment by management and operating personnel. This open-minded, questioning approach should apply to operating practices and even equipment design.

¹Although the basic processes for weapon destruction will remain the same three lines of incineration as at TOCDF and JACADS (a furnace for injecting and burning liquid agent, a rotary furnace for propellant and explosive materials, and a furnace with a moving conveyor primarily for metal parts), improvements have been made compared with TOCDF and JACADS. For example:

- The pollution control systems of the new plants will include activated carbon filters for the incinerator exhaust gas. This is fairly new technology, not in common use when JACADS and TOCDF were designed. Trial burn data on those two early plants showed that carbon filters were not needed to meet environmental standards. More recently, however, some samples of mustard have shown unexpectedly high levels of mercury that could be a problem in exhaust emissions. Carbon filters represent the technology of choice for handling this problem. Other changes in the pollution abatement system are required to accommodate the carbon filters. The exhaust gas must be cooled and its humidity reduced to maintain the carbon filter's function.
- The ventilation air through the plant as well as the combustion air will have variable-speed motors driving the fans. This should be a great improvement in controlling airflow rates, particularly at low rates (a problem in the May 8, 2000, TOCDF incident). The technology for doing this with very large motors was just being introduced when TOCDF was designed and was not included.
- Isolation valves are included in the duct between the DFS burner and after burner. (The same valve was added in TOCDF after the May 8, 2000, event.) They should permit improved control during start-up.
- The DFS tipping gate has been redesigned to prevent jamming (part of the problem in the May 8, 2000, event).
- The large isolation valves on the individual HVAC carbon filter banks have a small "bleed" valve connecting to the exhaust flow in the new plants. The purpose is to maintain the filter bank at negative pressure even when the filter is temporarily out of service. This should prevent migration of agent from the filter bank into the connecting vestibule when the filter is out of service, a problem in the past.
- The DFS cyclone is in an enclosure that is to be monitored with an ACAMS and that has a carbon filter on an exhaust. (This modification was made in response to a JACADS event where VX was detected on the cyclone ash.)

The 2000 letter report of the NRC Stockpile Committee recommended a similar open-minded approach for a public involvement program (NRC, 2000b), naming as one requirement for a successful program "the capability to identify (even anticipate) serious problems and the flexibility and creativity to address them." The current study suggests that this approach is also needed in plant operations and technology.

A better understanding of the limitations of plant equipment might also be helpful. In the May 8-9, 2000, incident at Tooele, for example, there were some serious operating errors. But they were compounded by the operator's struggle to bring the system back under control. It is the judgment of the committee that some technical education and more hands-on testing on the system simulator would have helped (see Chapter 2).

There are usually surprises when new processes are first tried. In view of the particular sensitivity of the chemical agent disposal program, the committee emphasizes the need for a hazardous operations (HAZOP) analysis for any new process (see Chapter 4). A HAZOP analysis by suitably trained people, and with input from operating people, could be particularly useful: it might identify problems and at the same time warn the operating people about what to expect.

New plant start-up represents a special problem with inexperienced people. Trial burns with surrogate feeds and with the pollution abatement system in full operation, as well as disassembly trials with blank munitions, should provide substantial operating experience before any chemical agent is fed to the process. It is fairly common experience in industry to include design people on start-up teams for new facilities. As suggested earlier, their detailed knowledge of the process equipment and its limitations could be helpful to the operating people.

WORKER EDUCATION, TRAINING, AND INVOLVEMENT

Safe plant operation depends on an educated, well-trained staff. The risk to workers in an incineration plant is greater than the risk to the public (NRC, 2000c). Training should emphasize that processing agent demands a mind-set that always accepts a positive analysis as "real" until proven otherwise.

One approach to safe operation is through the use of standard operating procedures (SOPs). These have been used extensively at JACADS and TOCDF. The most serious chemical events of the past have occurred, however, when there was no SOP. There will always be combinations of circumstances for which no SOP has been written and the operating people must rely on knowledge-based decision making. Even with SOPs, there is no guarantee that mistakes will not occur. It is vital that decisions be made on the basis of accurate operational knowledge. Operating people should know their equipment and its limitations. They need to know the why of their job as well as the what. Bringing

the systems engineers with design knowledge into the training program could help convey that knowledge to the operators. These engineers are probably in the best position to know the equipment and its characteristics and limitations, information that plant operators need when unusual or unexpected conditions occur. Many plant operators seemed to the committee to have only a superficial knowledge of the operating principles and data processing algorithms of important process instrumentation and controls. But such knowledge is crucial to determine how to interpret reported instrument console readings during upset conditions which may exceed the normal ranges over which key instruments are calibrated or can be expected to operate reliably. A careful walk-through of any new procedure should precede its start-up.

The Army's more recent quantitative risk assessments (QRAs) include detailed human reliability analyses that identify potential human performance problems. Bringing this information into the training program will provide operators with a view of what activities are especially vulnerable and why that is so. In addition, training simulators, which mimic the operation of the various components of the instrument and control systems and demonstrate the effects of various operator actions or inactions, are now being provided in the chemical demilitarization plants. Targeted training with simulators and knowledge-based thinking exercises on plant operation need to be developed.

Training on overall plant operations should cover everyone in the plant and analytical laboratory, not just the operating and control people. However, this training has to be tailored to the specific jobs and knowledge levels of each group of workers. Workers need to understand how what they do fits into the overall operation and how things going wrong in their operations affect the whole plant and the likelihood of accidents and releases. The QRA and HAZOP analysis are a good potential source of this information.

Some of the reports of operational mistakes coming from within the plant and circulated widely within the affected communities have come from people who are simply uninformed and do not know normal procedures. Box 5-1 provides examples of such uninformed observations. Chemical demilitarization plants are complex. A better knowledge of the complexity of the plant and the care and design that have been incorporated may instill pride in being part of the important national effort of weapons disposal. The potential costs (e.g., lost trust) of having the local public alarmed by reported misperceptions of uninformed workers can be substantial.

DESIRED PRINCIPAL-AGENT INTERACTIONS

It is imperative that officials at the chemical demilitarization facilities communicate openly, frequently, and in a timely fashion with nearby residents and officials. The pattern of communication with and responsiveness to the local

BOX 5-1 Examples of Observations That the Committee Concluded Were Uninformed

"December 9, 2000—Agent break through in HVAC filter bank. ACAMS readings of 3.01 [TWA]."

"October/November 1997: Sources inside TOCDF (who wish to remain anonymous) communicated to CWWG [Chemical Weapons Working Group] several shutdowns/incidents at TOCDF due to computer malfunctions, slag build-up in the PAS, numerous agent migrations within the facility, and alarm ring-offs in the common stack, MDB [munitions demilitarization building] and HVAC stack (averaging 2-3 per week)."

These entries suggest that agent may have been released through the heating, ventilation, and air conditioning (HVAC) filter to the environment. In fact, the HVAC was operating as designed. The carbon filter bank consists of six carbon beds, with exhaust gas flowing through all six in series. The gas spaces between beds 1 and 2, 2 and 3, and 3 and 4 are monitored by an automatic continuous air monitoring system (ACAMS) (on a timer). Eventually agent will break through bed 1 as that bed approaches saturation, and this is undoubtedly the "agent break through" referred to by the whistle-blower. Agent break-through of bed 1 usually follows many weeks of operation, and with the gas having to traverse 5 more beds the agent breakthrough of the first bed does not call for immediate shutdown. However, it does indicate that the carbon should be replaced soon.

A video given to the committee and referred to in Appendix C showed rockets being sheared and the pieces dropping to the deactivation furnace system (DFS) below.

Approximately every 1½ minutes a large cloud of condensing vapor, referred to by the citizen group as "agent volatilization," rose into the picture, undoubtedly coinciding with opening of the gate to the DFS. In fact it was a cloud of condensing steam, as cooling water from the shear blade and the sliding gate dropped into the hot furnace to be instantly vaporized.

"Site-masking alarm and/or stack alarm. Potential case of chemical warfare agent release or release of other related toxic chemicals (unidentified to date)." [the most common incident listed by the CWWG (Appendix C)]

It is almost certain that the ACAMS alarm was not due to agent, because there was no depot area air monitoring system (DAAMS) confirmation. The committee concluded that the event reports as written are misleading but considers them to be from a source unfamiliar with the stringent laboratory procedures used to analyze DAAMS samples taken coincident with each ACAMS alarm to confirm or deny the presence of agent and to attempt to identify the cause of the alarm in the absence of agent.

NOTE: Observations quoted are drawn from the Chemical Weapons Working Group list of events provided to the committee (Appendix C).

public and local officials can have substantial effects. Beyond addressing the immediate health and environmental concerns posed by a chemical event, frequent and open dialogue can alter perceptions of risk and trust, influence demands for policy change, and mitigate undesirable effects on local economic growth and property values. As discussed in Chapter 3, the *agents* in the demilitarization process (regulatory agency officials, the Army, and contractors at the chemical demilitarization facilities) must gain and retain the trust of the principals (local public and the officials who represent them) in order to effectively destroy the chemical weapons stockpile in a safe and timely manner.

Absent complete trust, the mechanisms by which principals gain confidence in adequate performance by *agents* include effective monitoring of *agent* behavior and appropriate inducements and sanctions to obtain desired performance. The lower the level of trust, the greater the need for monitoring and incentives. At the same time, more stringent monitoring and incentives can limit the discretion necessary for *agents* to effectively and efficiently accomplish their complex task. The trade-off between effective monitoring and controls by principals over *agents* and optimal condi-

tions under which *agents* can carry out the demilitarization task (where some discretion may be essential) requires engendering and maintaining a degree of trust by principals for *agents*.

Effective handling of the principal-*agent* relationship in the chemical demilitarization program setting appears to the committee to require (1) demonstrable and timely assessments of the problems leading to chemical events and means for their correction, (2) complete and timely disclosure of events by the *agents*, and (3) overview processes that assure principals of effective oversight.

In its assessment of chemical events (Chapter 2), the committee found specific instances (e.g., the TOCDF May 8-9, 2000, incident) that resulted in a damaging erosion of the confidence of principals in the monitoring and control processes. It is essential that plant operators remain cognizant of the needs of principals for high degrees of confidence in the monitoring and control protocols (incentives and sanctions) and mechanisms over the entire chemical demilitarization program. Apparent weaknesses or failures at one facility or in one phase of operations will be seen to carry over to others. Protocols for reporting and responding

to events should stress meeting the needs of the array of external principals for assurance of timely, accurate reports of events and rapid, thorough assessment and corrections.

One important step to increase confidence in the monitoring process will be to ensure that representatives of principals (e.g., local stakeholder groups) are included in the teams assembled to investigate any serious chemical events. In addition, each site should develop clear and specific protocols that reflect the need to quickly, openly, and thoroughly inform all relevant principals of chemical events.

More broadly, program officials should consider ways in which principals and their representatives can participate in ongoing oversight efforts. The NRC has suggested elsewhere (NRC, 1999b) that representatives of the local public serve on monitoring teams whose purpose is to ensure that chemical weapons destruction processes (and the associated organizations) are operating as they should. Such an effort—ranging from temporary appointment of community observers on investigation teams to more permanent participation of community representatives in incident review boards—may increase the confidence of local principals that effective oversight is in place.

RAPID AND SAFE RESTART REQUIREMENTS

Restarts After Changeovers and Maintenance

The chemical weapons plants have very frequent shutdowns and restarts—"frequent" compared with industrial plants of comparable size. These shutdowns are required by the variable nature of the plant feed: a variety of weapon types with differing disassembly requirements, containing three different chemical agents. The times required for changeover have been estimated to be surprisingly long (U.S. Army, 2000c). For example:

- A change in agent:
 - 17 weeks—the time required for decontamination, monitor conversion and baselining, and some equipment changeovers.
- A change in munitions type:
 - 5 weeks without complete equipment removal (e.g., projectile to projectile types).
 - 8 weeks with equipment removal (e.g., mines or rockets to projectiles).

There are other normal maintenance items that require extended shutdown periods but can probably be scheduled during other changeovers. For example:

- Slag removal from the liquid incinerator (LIC) secondary burner. [The slag removal system at TOCDF failed before the refractory failed, so that slag had to be removed manually.] Time required: 10 days. The experience at JACADS and TOCDF permits an esti-

mate of the required frequency of slag removal, e.g., for TOCDF, after 250,000 lb of agent destroyed.

- Mist eliminator candle replacement (plugged during deactivation furnace system (DFS) rocket runs, probably due to fiberglass). Time minimized by having a spare eliminator on hand.
- LIC rebricking, maintenance that can also probably be planned ahead and done during "contingency time" (i.e., when the plant will be shut down for other activities such as agent changeover). Rebricking is needed after approximately 2,000,000 lb of agent (with decontamination fluid) have been processed.

A further complication arises from the age of the weapons as well as their varied history—"leakers" and "gelled agents" require changes in "standard" operations, for example. The shutdowns and restarts resulting from these feed stock variations can be planned for and shutdown times can be minimized.

The Operations Schedule Task Force 2000 recommended study teams to suggest how to minimize downtime (U.S. Army, 2000c); these teams should be very helpful. The committee suggests that industrial experience with carefully planned shutdowns for maintenance at regular intervals might be applicable. It is not clear that "project management," which has developed into a distinct engineering subdiscipline, is being fully integrated into the chemical demilitarization program. The suggested study teams noted above would represent a step in that direction.

Restarts After a Chemical Event

Major chemical events can impose further shutdowns with unpredictable shutdown times. Some of these have led to major structural changes and changes in some operating procedures. These changes stem from the incident reviews, and they all require regulatory approval. Shutdown times may be long, e.g., 4 1/2 months for the May 8-9, 2000, incident at TOCDF. The Operations Schedule Task Force 2000 suggested that a 2-week outage every 6 months be included in advance planning, to accommodate unplanned major maintenance (U.S. Army, 2000c). The committee believes that this unplanned shutdown allowance is less than past experience would indicate is necessary, but these unplanned shutdowns should decrease with time, as operating experience is gained. There also may be opportunities for reducing the required shutdown times after such incidents. Maintaining a larger inventory of critical spare parts has been suggested as one strategy to reduce lost operational time.

Obtaining regulatory approval to restart after a chemical incident may cause delays, although the committee heard no specific complaints of this. The Army Audit Agency, however, has been critical of the chemical demilitarization program for its handling of funds, based in part on regulatory

delays. Funds obtained for current planned programs could not be spent because of delays in regulatory approvals (U.S. Army, 2001g). It is not clear, however, that regulatory delay has been a serious problem in connection with unpredicted shutdowns, where there was no opportunity for advance planning.

Finally, as noted in Chapter 3, effort spent on the multiple investigations of the May 8-9, 2001, Tooele chemical

event probably extended the post-event shutdown associated with that event unnecessarily. Preagreement at each demilitarization site on the composition of a joint event investigation team, representing all regulatory and operational stakeholders and chartered to produce a single, comprehensive investigation report, could save significant shutdown time and clearly focus all parties on the steps necessary to achieve safe restart of operations after future chemical events.

Findings and Recommendations

Based on its review and analysis in Chapters 1 through 5 of incidents at two operating chemical demilitarization sites, JACADS and TOCDF, the Committee on the Evaluation of Chemical Events at Army Chemical Agent Disposal Facilities developed the following findings and recommendations.

Finding 1. Despite considerable Army security and stewardship activities, the remaining chemical weapons stockpiles are significant hazards to the communities surrounding them. The potential for significant release of agent to the atmosphere, triggered by either accidental or deliberate detonation of agent-loaded munitions within storage igloos, constitutes the greatest risk to the public. Accidental or deliberate release from a chemical demilitarization facility, while potentially serious, is a lesser threat because the agent inside the facility is maintained under stringent and effective engineering controls and because there is substantially less agent present in the demilitarization facility at any given time than there is in the storage facility. While chemical demilitarization operations at both Johnston Atoll Chemical Agent Disposal System and Tooele Chemical Disposal Facility have released small amounts of chemical agent into the environment, these releases were negligible compared with environmental releases from chemical weapons stockpiles (U.S. Army, 2001c). The rate of agent leaks and releases from storage facilities does decrease significantly as the stockpile is processed.

Recommendation 1. The destruction of aging chemical munitions should proceed as quickly as possible, consistent with operational activities designed to protect the health and safety of the workforce, the public, and the environment.

Finding 2. The criteria used by the Army to identify and determine the severity of the impact of an event are site and time specific, and the event classification decision is made at

the discretion of the Depot Commander. The recognition of a chemical event is often subjective, and the tendency of personnel to discount initial indicators because of frequent false positive automatic continuous air monitoring system alarms is a persistent problem in declaring a chemical event. The lack of uniform criteria can result in inconsistencies between and among sites that make it difficult to compare and analyze events and that constrain and discourage the application of lessons learned to other locations and situations.

Recommendation 2. The Army should establish a consistent set of criteria to be used by all chemical-agent-processing facilities to ensure uniformity in the classification of events, and to facilitate event analysis and comparison.

Finding 3. Risk assessments, including the quantitative risk assessment and the health risk assessment, are critical inputs to the dialogue necessary to ensure adequate public involvement in, and understanding of, chemical demilitarization activities. A prudent balance between the public's right to know the risks they face and the need to protect sensitive information will be an ongoing challenge for the chemical demilitarization program. Without adequate risk information available to the public, it will be difficult to develop or maintain the level of public trust necessary for the Program Manager for Chemical Demilitarization to accomplish its mission.

Recommendation 3. The Army should continue its practice of making available to the public the results of its quantitative risk assessments and health risk assessments for each chemical demilitarization site.

Finding 4. Of the wide range of Program Manager for Chemical Demilitarization risk analyses, the quantitative risk assessments (QRAs) are most closely linked with chemical events. They calculate the frequency and consequences of modeled events, and their analysts study real operational

events to help ensure the completeness of the models. The QRAs, and an understanding of their results, provide a framework for managing the risk from chemical events. As concern has focused on worker risk as well as risk to the public, recent QRAs have added extensive human reliability analysis—analysis of the human actions that can lead to a chemical event. While hazard analysis is a qualitative analysis primarily of single-failure events, it provides a catalog of possible failures that QRA analysts can use to improve the completeness of their models. Hypothesized chemical events, including those that might arise from sabotage, terrorism, and war, can also be incorporated into the QRA scenarios to determine their range of consequences. Actual events can be used to test and improve the completeness of the QRA and continue the effort to improve the human reliability analysis and focus on causal factors.

Recommendation 4. The quantitative risk assessment (QRA) for each chemical demilitarization site should be iterative. Actual chemical events should be used routinely to test the completeness of the QRA, which should be routinely utilized to hypothesize the frequency and consequences of chemical events. The Program Manager for Chemical Demilitarization and the U.S. Army Soldier and Biological Chemical Command should use the QRAs to evaluate measures to control future chemical events. The Army should also consider using QRAs to examine scenarios associated with sabotage, terrorism, and war.

Finding 5. Alarm thresholds for airborne agent monitoring used in the Army's chemical demilitarization program are very conservative (i.e., 20 percent of the applicable control limit, resulting in alarm thresholds that, depending on the agent, are either below or only moderately above the level of agent deemed safe for continuous exposure of an unmasked worker over an 8-hour shift.) These alarm thresholds are near the detection limits for the automatic continuous air monitoring system (ACAMS). As a result, there are frequent false positive alarms as well as actual alarms for events that pose no threat to workers or the public (NRC, 2001a). These conservative stack-monitoring thresholds ensure that no significant amounts of agent can be released into the ambient air without the facility alarming and the agent incineration feed automatically terminating. In-plant air breathed by unmasked workers and the output of the scrubbing system for air exiting the chemical demilitarization plant are monitored at similarly conservative thresholds.

Recommendation 5. The Army should maintain conservative chemical demilitarization exhaust stack and in-plant airborne agent exposure thresholds. If current limits for exposure to stockpiled chemical agents are further reduced, the Army should not further reduce existing monitoring thresholds unless chemical agent monitors can be made both more sensitive and more specific so that lower thresholds can be

instituted without significant increases in false positive alarm rates or unless health risk assessments demonstrate that lower thresholds are necessary to protect workers or the public.

Finding 6. Relatively frequent false positive ACAMS alarms for airborne agent and the lack of true real-time (<10 s) monitoring for airborne agent have long been a concern of National Research Council (NRC) committees assessing and examining the chemical demilitarization program (NRC, 1994, 1999a, 2001a). Improvements in the sensitivity, specificity, and time response of the ACAMS system and the development of an additional airborne-agent-monitoring technology robust at the parts-per-trillion level have previously been recommended. (Recent NRC reports have also noted the poor state of agent-monitoring technology for liquid waste streams and solid materials suspected of possible agent contamination (NRC, 2000a, 2001a).) Although the Program Manager for Chemical Demilitarization has made some efforts to develop better agent-monitoring technology, results to date have been disappointing. Development and deployment of airborne-agent monitors with shorter response times and lower false alarm rates would enhance safety and reduce the tendency to discount agent alarms.

Recommendation 6. To reduce the rate of false positive alarms for both airborne and condensed-materials agent contamination, the Program Manager for Chemical Demilitarization and the relevant Department of Defense research and development agencies, such as the Army Research Office, the Army Research Laboratory, the Defense Advanced Research Projects Agency, and the Defense Threat Reduction Agency, should invigorate and coordinate efforts to develop chemical agent monitors with improved sensitivity, specificity, and time response. These efforts should be coordinated with, and take advantage of, the increased level of interest in and increased resources available for developing chemical weapons detectors for homeland defense.

Finding 7. Chemical demilitarization facility and process design has contributed to the mitigation of incident severity in that, for most of the incidents examined by the committee, engineering controls functioned as designed. These incidents have been investigated honestly and thoroughly using straightforward techniques, but investigation could benefit from the use of other methodologies such as event tree analysis and human factors engineering to aid in understanding the complete set of causal factors associated with each incident.

Recommendation 7. Incident investigation teams should use modern methodologies of incident investigation routinely at all chemical demilitarization sites to help uncover a broader set of causal and contributing factors, and to enable greater understanding of the interrelationships between and among these factors. Experts in human performance modeling should be included on any incident investigation team. A

standing incident review board at each site should be established to identify chemical events requiring in-depth investigation and to ensure that the lessons learned appropriately influence ongoing operations. These boards would meet regularly to review accidents and incidents, including chemical events, and would be fully informed of any findings and recommendations made by chemical event investigation teams.

Finding 8a. Repeating patterns of causal factors evident in the incidents at Johnston Atoll Chemical Agent Disposal System and Tooele Chemical Disposal Facility reviewed by the committee included, in particular, deficiencies in standard operating procedures, design failures, and understandable, although inappropriate, assumptions made by operations personnel. In part, these inappropriate assumptions grew from development of dangerous mind-sets associated with frequent false-positive alarms. Repeating patterns of causal factors in most incidents do not appear to have been used by management to generalize incident findings beyond the immediate context of each incident.

Finding 8b. The programmatic lessons learned (PLL) database is a large undertaking, and the Program Manager for Chemical Demilitarization is to be commended for creating it. However, if the data were organized in a different manner that included a priority system and the operators were aware of its uses, the database would be more useful. "Mining" of data might yield patterns in events and information that would allow broader generalization and understanding of causes derived from specific information on individual incidents. To this end, experts in each area of use have to specify exactly what they need to find in the data, before programmers develop software to search and set priorities.

Recommendation 8a. The Program Manager for Chemical Demilitarization should analyze all chemical-agent-related incidents at chemical demilitarization plants for patterns of causal factors and should institute program-wide actions to address the causes found.

Recommendation 8b. Any improvements made in investigation procedures should become part of a systematically organized programmatic lessons learned (PLL) database that makes information easier for the non-expert to find and/or use. This can include prioritization and developing a drop-down "tree" list. Lastly, the Program Manager for Chemical Demilitarization should ensure that, at the plant level, the data are available to, known by, and useful to operations personnel. The proposed contractor for the PLL program should address these issues. For the program to be useful all stakeholders need to buy into its use and structure.

Finding 9. Gaussian puff/plume dispersion modeling techniques embedded in the D2PC computer model used to pre-

dict the extent of an agent emission plume are representative of the state of the art as of the late 1970s. Adoption of more modern and accurate emission plume models seems to have been delayed by the failure to integrate better plume models into standard Chemical Stockpile Emergency Preparedness Program emergency response models.

Recommendation 9a. Stockpile sites that still use the D2PC computer model should, at a minimum, upgrade their emergency response models to take advantage of the improved capabilities available in the D2-Puff model. Consideration should be given to testing and possibly optimizing the D2-Puff model at each site by performing tracer release experiments under a variety of meteorological conditions.

Recommendation 9b. The Chemical Stockpile Emergency Preparedness Program should undertake a continuing evaluation of alternative approaches to modeling the release and impact of chemical agents.

Recommendation 9c. Accurate agent plume dispersion modeling capability should be coupled with timely communication of results and appropriate responses to the stockpile site and surrounding communities.

Finding 10a. Communications during and after chemical events have not always occurred as intended between and among the various stakeholders. The lack of a call-forwarding mechanism for getting information directly to people or a hot line dedicated to notification that an event has occurred has contributed to an inadequate communication process during chemical events. The lack of notification and warning between the Deseret Chemical Depot (DCD), Tooele County, and other Utah responsible agencies reflects in part a lack of coordination between components of the two programs (Federal Emergency Management Agency / Chemical Stockpile Emergency Preparedness Program and the Army's Emergency Operations Centers) and in part the DCD's perspective that its emergency management responsibilities "end at the fence." This perspective, if carried to other communities where chemical demilitarization facilities are to be operated, can endanger an effective coordinated emergency response to incidents. The memorandum of understanding recently agreed to by the DCD and Tooele County (Appendix G) for information exchange could serve as a model for every community with a chemical weapons stockpile, to ensure very close oversight of the disposal plant operations.

Finding 10b. The Army's recent and sincere effort to build public trust in its actions has not been sufficiently successful, although the degree of trust or mistrust has not been effectively measured. Of equal or greater importance is public trust in the governmental agencies that monitor the Army's activities. It is essential that these agencies be seen by the public as being fully cognizant of the Army's actions and of

being, in effect, in command—a result that will require an extraordinary level of communication between the Army and relevant government oversight agencies and can lead to contradictory advice and requirements that will have to be resolved.

Recommendation 10a. Chemical demilitarization facilities should develop site-specific chemical event reporting procedures and an accompanying training program that tests and improves the implemented procedures and communication system.

Recommendation 10b. The standing incident review board recommended by the committee for each site should include a qualified member of the public who can effectively represent and communicate public interests.

Recommendation 10c. Each chemical demilitarization site should consider the establishment of a reporting and communication memorandum of understanding (MOU), of the sort developed between the Desert Chemical Depot and Tooele County, which specifies reliable and trusted means of alerting and informing local officials about chemical events. These MOUs should be designed to permit ready evaluation and updating of the terms of the MOU to take full advantage of learning across the array of chemical demilitarization sites.

Recommendation 10d. The Army Emergency Operations Centers and the Chemical Stockpile Emergency Preparedness Program should establish a stronger capability and capacity for the coordination of training, equipment, and plans necessary to respond effectively to an emergency incident, and the commitment to do so in a coordinated and cooperative fashion. Additionally, the Army should continue its program of outreach—including listening to public concerns and responding to them, as well as engaging in more conventional public information efforts—to both the public and the relevant government oversight agencies to enhance general understanding of the chemical demilitarization program.

Finding 11. A major chemical event can result in several months of lost processing time at chemical demilitarization plants. This delays the destruction of the chemical agents, requiring that they remain in the stockpiles where they could create a hazard. When incidents have led to plant shutdown, multiple investigations and responses have contributed to additional delays in restarting operations. All aspects of chemical incident investigations and resumption of operations should be accelerated, consistent with safe operations.

Recommendation 11. All stakeholders and involved regulatory agencies should agree that a single team will investigate chemical events requiring outside review. This investigation team should comprise already-appointed representa-

tives from all stakeholder groups and agencies, including members of the public who can effectively represent and communicate with local officials and the affected public. Incident findings should be documented in a single comprehensive report that incorporates the findings, proposed corrective actions, and concerns of the various oversight agencies.

Finding 12. Safety programs and performance appear to be adequate to ensure that chemical demilitarization operations are being conducted safely. Even so, there is considerable opportunity for improvement. Many of the incidents at Johnston Atoll Chemical Agent Disposal System (JACADS) and Tooele Chemical Disposal Facility (TOCDF) could have been significantly mitigated—if not prevented—had a true “safety culture” been in place and functioning.

Recommendation 12a. Much of the needed improvement in safety at chemical weapons facilities can come from increased attention to factors that contribute to and/or cause chemical events. For example, the Program Manager for Chemical Demilitarization and chemical demilitarization facility managers should ensure that standard operating procedures are in place, up to date, and effective, performing hazard operations analyses on new process steps and design changes even when such changes are viewed as trivial and recognizing that chemical hazards are posed by things other than agent (e.g., waste).

Recommendation 12b. Management at the Tooele Chemical Agent Disposal Facility (TOCDF) and the new third-generation facilities should develop or identify and implement programs that will result in the establishment of a pervasive, functioning safety culture as well as improved safety performance. In doing so, TOCDF and the new chemical demilitarization sites should draw on experience in the chemical industry, obtained through industry associations or other appropriate venues. The Army should revise the award fee criteria to encourage each new chemical demilitarization site operator to demonstrate better safety performance than that at the older sites.

Finding 13. It is probable that conditions will arise in plant operation for which no standard operating procedure has been written. Operators need an in-depth knowledge of their equipment and its limitations to handle these unusual conditions and maintain plant security. New plant start-up can be a difficult learning experience for new operating crews. They need to know how and why procedures are to be performed. It is common practice in other industries to include engineers with “design” knowledge and experience in the start-up crew for new plants.

Recommendation 13. A generous allotment of time should be given to training and retraining chemical demilitarization

plant operating personnel to ensure their total familiarity with the system and its engineering limitations. All plant personnel should receive some education on the total plant operation, not just the area of their own special responsibility. The extent of this overall training will be a matter of judgment for plant management, but the training should focus on how an individual's activities affect the integrated plant and its

operational risk. Each facility should develop training programs using the newly designed in-plant simulators to present challenges that require knowledge-based thinking. The training programs should include a process for judging the effectiveness of the training. Including "design" experts in the start-up crew for new plants could be helpful in identifying latent failures in process and facility design.

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LAWS GOVERNING CHEMICAL DEMILITARIZATION

Treaty

Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction (P.L. 103-277)

Statutes

Chemical Safety Information, Site Security and Fuels Regulatory Relief Act (P.L. 106-40)

Clean Air Act (CAA; 42 U.S.C. §7401 et seq.)

Clean Water Act (CWA; 33 U.S.C. §1251 et seq.)

Emergency Planning and Community Right to Know Act (EPCRTKA; 42 U.S.C. §11001 et seq.)

Occupational Safety and Health Act (OSHA; 29 U.S.C. 1920.120 et seq.)

Resource Conservation and Recovery Act (RCRA; 42 U.S.C. §6901 et seq.)

Toxic Substance Control Act (TSCA; 15 U.S.C. §2601 et seq.)

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ATTACHMENT F

**Copy of April 2003 CTUIR Letter to UMCDF Regarding the Off-
Site Shipment of PAS Brines
(DEQ Item No. 03-0743)**



GENERAL COUNCIL
and
BOARD OF TRUSTEES

03-0743

CONFEDERATED TRIBES
of the

Umatilla Indian Reservation

P.O. Box 638
PENDLETON, OREGON 97801
Area Code 541 Phone 276-3165 FAX 276-3095
STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY
RECEIVED

20 April 2003

Mr. Don Barclay
Site Project Manager
Umatilla Chemical Agent Disposal Facility
78072 Ordnance Road
Hermiston, OR 97838

APR 21 2003

HERMISTON OFFICE

Dear Mr. Barclay;

As you are aware, on 7 May 2002 the Chairman of the Board of Trustees of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) submitted a letter to the Oregon Environmental Quality Commission (EQC) indicating our opposition to the off-site shipment of brines from the Umatilla Chemical Agent Disposal Facility (UMCDF). This letter resulted in a hearing before the EQC in July 2002 where this position was restated. As was indicated in both instances, it was our understanding from past interactions with the Army and their contractors that off-site shipment of liquid brines was not an option that would be considered for UMCDF. Any change in this policy represented to us a breach in a verbal commitment to the CTUIR.

It is still our position that the Army needs to keep the commitments they make to the public, the surrounding governments, and nations for the incineration program to be successfully completed at Umatilla. However, after extensive consultation with your office and the Oregon Department of Environmental Quality (ODEQ), we have come to a better understanding of why occasional off-site brine shipments from the UMCDF may be required to keep chemical agent destruction activities operating at full capacity. In addition, we recognize that the brine represents a relatively low shipping hazard and that comparatively few shipments will likely be required.

In light of these facts, the CTUIR concurs that the UMCDF needs to maintain the flexibility of exercising the option to ship brines off-site if brine treatment becomes process limiting. We would, however, like to see the following conditions applied to the off-site shipment of brines:

1. The UMCDF make every good faith effort to continuously operate the Brine Reduction Area (BRA) at its full capacity.


Required Operation of the UMCDF BRA
July 17-18, 2003 EQC Meeting

Page F-1

2. The UMCDF addresses the metals feed limitations outlined in the report titled "*Assessment of UMCDF Brine Generation and Treatment/Disposal Options*" during compliance testing of the BRA. Specifically, test plans should propose higher metals emission rates for metals that are limiting the BRA feed rate, but are not drivers of the human health risk. Compliance tests should then incorporate the proposed higher rates.
3. The UMCDF make every good faith effort to minimize the amount of brines produced through waste segregation, process optimization, and process alteration.
4. The UMCDF has made maximal use of the Brine Reduction Area brine storage capacity.
5. The UMCDF demonstrates to the DEQ and the CTUIR that available Brine Reduction Area processing and storage capacity will adversely affect the munitions destruction schedule.
6. The UMCDF develop a notification plan for off-site shipments of brine that includes alerting the CTUIR when shipping is planned.
7. All brines are certified as agent free before they are shipped off-site.
8. The UMCDF limit the off-site shipment of brine to the minimum quantity necessary to alleviate adverse schedule impacts.

Thank you for considering this matter. I look forward to continuing to work with you to strengthen the government-to-government relationship that has been fostered between our organizations over the past several years. If you have any questions on this matter please feel free to contact me by phone at 541-966-2020.

Sincerely;


Armand Minthorn
Member, CTUIR Board of Trustees

Cc:

Mark Reeve, Chair, Environmental Quality Commission
Dennis Murphey, Director, Chemical Demilitarization Program, ODEQ
Rodney S. Skeen, Chemical Engineer, CTUIR-ESTP
Richard Gay, Interim Executive Director, CTUIR
File

EVALUATION REPORT AND FINDINGS

on the

Application for Certification
Pursuant to Section 401 of the
Federal Clean Water Act

Submitted by:

Department of the Army
U.S. Army Corps of Engineers

for the

DEEPENING OF THE COLUMBIA RIVER NAVIGATION CHANNEL

Pursuant to Oregon Administrative Rules
Chapter 340, Division 48



Prepared by:

Oregon Department of Environmental Quality
811 S. W. 6th Ave.
Portland, Oregon 97204

June 23, 2003

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functions prescribed by Section 401 of the Clean Water Act. DEQ may issue an unconditional certification where a project will not impact water quality. A conditioned certification may be issued in those cases where a project may have an impact on water quality, but implementation of the conditions contained in the certification will assure compliance with standards. Certification may be denied in cases where a project cannot be undertaken in accordance with water quality standards.

Administrative rules (OAR Chapter 340 Division 48) prescribe the procedure DEQ is required to follow for §401 certifications. The rules identify the information that must be included in an application for §401 certification [OAR 340-48-020(2)]. Aside from general information about the project, the substantive information is that "required by the federal permitting or licensing agency or such other environmental background information as may be necessary to demonstrate that the proposed project or activity will comply with water quality requirements." DEQ may also request any additional information necessary to adequately evaluate the project impacts on water quality [OAR 340-48-020(3)].

Further administrative rules identify the type of information which is to be evaluated by DEQ in making §401 findings [OAR 340-48-020(8)]. The information may include, but need not be limited to:

- (a) Existing and potential beneficial uses of surface and groundwater which could be affected by the proposed facility.
- (b) Potential impact from the generation and disposal of waste chemicals or sludges at the proposed facility.
- (c) Potential modification of surface water quality or water quantity as it affects water quality.
- (d) Potential modification of groundwater quality.
- (e) Potential impacts from the construction of intake or outfall structures.
- (f) Potential impacts from waste water discharges.
- (g) Potential impacts from construction activities.
- (h) The project's compliance with plans applicable to Section 208 of the federal Clean Water Act (area wide waste treatment plans).

The application, together with information provided during the public input process is essential to support the following determinations to be made by DEQ pursuant to Section 401 of the Clean Water Act and state law:

- a. Consistency with Sections 301, 302, 303, 306, and 307 of the Clean Water Act.
- b. Consistency with rules adopted by the EQC for water quality, OAR Chapter 340 Division 41.
- c. Identification of specific water quality-related requirements of state law which are appropriate to include as conditions in any granted certificate pursuant to Section 401(d) of the Clean Water Act, including ORS 468B.150 to 468B.185, the state Groundwater Protection Act.

SUMMARY OF APPLICATION

Documents Filed by the Applicant

The following documents are considered to be the application as filed by the applicant and have become part of the DEQ record:

1. US Army Corps of Engineers (1998) *Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October
2. US Army Corps of Engineers (1998) *Appendices A-F: Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October

Appendix A	Engineering Appendix
Appendix B	Columbia and Willamette River Sediment Quality
Appendix C	Economics
Appendix D	Real Estate Plan
Appendix E	HTRW Preliminary Assessment Screening
Appendix F	Salinity Intrusion Studies
3. US Army Corps of Engineers (1998) *Appendix G: Wildlife Mitigation: Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October
4. US Army Corps of Engineers (1998) *Appendix H, Volume I: Columbia River Ocean Dredged Material Disposal Sites: Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October
5. US Army Corps of Engineers (1998) *Appendix H, Volume II: Ocean Dredged Material Disposal Sites Coordination and Meeting Minutes: Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October
6. US Army Corps of Engineers (1998) *Appendix H, Volume III: April, May 1999 Ocean Dredged Material Disposal Sites Coordination and Meeting Minutes: Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October
4. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River*

Federal Navigation Channel, Volume I: Main Report and Exhibits, Portland District, August

5. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Volume II: Draft EIS Comments and Responses, Portland District, August*
6. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Volume III: Attachments to Paul King Comment Letter, Portland District, August*
7. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Appendices A-F: Technical Reports, Portland District, August*

Appendix A	Engineering Appendix
Appendix B	Columbia and Willamette River Sediment Quality
Appendix C	Economics
Appendix D	Real Estate Plan
Appendix E	HTRW Preliminary Assessment Screening
Appendix F	Salinity Intrusion Studies
8. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Appendix G: Wildlife Mitigation, Portland District, August*
9. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Appendix H, Volume I: Ocean Dredged Material Disposal Sites Main Report and Technical Exhibits, Portland District, August*
10. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Appendix H, Volume II: Ocean Dredged Material Disposal Sites Coordination and Meeting Minutes, Portland District, August*
11. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Appendix H, Volume III: Ocean Dredged Material Disposal Sites Coordination and Meeting Minutes, Portland District, August*
12. US Army Corps of Engineers (1999) *Letter from Robert E. Willis, Chief, Environmental Resources Branch, USACOE to Russell Harding, Oregon DEQ, October 14*

13. US Army Corps of Engineers (1999) *Fax from Laura Hicks, USACOE to Russell Harding, Oregon DEQ*, December 10
14. US Army Corps of Engineers (2001) *Biological Assessment: Columbia River Channel Improvements Project*, December 28
15. US Army Corps of Engineers (2002) *National Marine Fisheries Service Formal Endangered Species Act Consultation on the Columbia River Channel Improvements Project*, with Technical Appendices, May 20
16. US Army Corps of Engineers (2002) *Columbia River Channel Improvement Project: Draft Supplemental Integrated Feasibility Report and Environmental Impact Statement*, July
17. US Army Corps of Engineers (2002) *Errata Sheet for Columbia River Channel Improvement Project: Draft Supplemental Integrated Feasibility Report and Environmental Impact Statement*, August 26
18. US Army Corps of Engineers (2002) *Letter from Davis Moriuchi to Russell Harding and Water Quality Certification Application*, September 4
19. US Army Corps of Engineers (2002) *Letter from Richard W. Hobernicht to Russell Harding and Water Quality Certification Application*, November 26
20. US Army Corps of Engineers (2002) *E-Mail and Attachments from Laura Hicks to Russell Harding*, November 26
21. US Army Corps of Engineers (2002) *Attachment A to Oregon 401 Certification for CRCD: CRCD Database (Compact Disk)*
22. US Army Corps of Engineers (2003) *Columbia River Channel Improvement Project: Final Supplemental Integrated Feasibility Report and Environmental Impact Statement*, Portland District, January
23. US Army Corps of Engineers (2003) *Columbia River Channel Improvement Project: Final Supplemental Integrated Feasibility Report and Environmental Impact Statement, Volume 2, Exhibits 1 of 2*, Portland District, January
24. US Army Corps of Engineers (2003) *Columbia River Channel Improvement Project: Final Supplemental Integrated Feasibility Report and Environmental Impact Statement, Volume 3, Exhibits 2 of 2*, Portland District, January
25. US Army Corps of Engineers (2003) *Columbia River Channel Improvement Project: Final Supplemental Integrated Feasibility Report and Environmental Impact Statement, Volume 4, Comment Letters on the Draft SEIS and Corps Responses*, Portland District, January

26. US Army Corps of Engineers (2003) *Columbia River Channel Improvement Project: Final Supplemental Integrated Feasibility Report and Environmental Impact Statement, Volume 5, Public Testimony*, Portland District, January
27. US Army Corps of Engineers (2003) *Errata Sheet for Columbia River Channel Improvement Project: Final Supplemental Integrated Feasibility Report and Environmental Impact Statement*, February 11
28. US Army Corps of Engineers (2003) *Letter from Davis G. Moriuchi to Michael T. Llewelyn*, April 28
29. US Army Corps of Engineers (2003) *Letter from Davis G. Moriuchi to Russell Harding*, March 28

Notification of Complete Application

DEQ reviewed the application and deemed that it was deficient in that specific land use findings, as required by OAR 340-048-0020(2)(i)(A)-(D). DEQ forwarded the application to affected land use jurisdictions (Clatsop, Columbia and Multnomah Counties) on September 27, 2002 and solicited from them formal findings relative to the project. A letter was received from Clatsop County dated November 20, 2002 in which the County chose not to make formal findings, but to draw the attention of DEQ to applicable provisions of the applicable Comprehensive Plan policies and Land and Water Development and Use ordinances. The County reserved the right to make more comprehensive comments in the public comment period, but did not do so.

DEQ advised the applicant of the deficiency by letter on September 27, 2002.

On December 2, 2002 the application was deemed complete.

Legal Name and Address of Project Owner (Applicant)

Department of the Army
Portland District
Corps of Engineers
P.O. Box 2946
Portland, OR 97208-2946

Legal Name and Address of Owner's Official Representatives

As above.

Description of Project Location**Proposed Action**

The proposed action is to deepen the Columbia River portion of the Columbia and lower Willamette Rivers federal navigation channel from its current authorized 40- foot depth with advanced maintenance to 45-feet, to an authorized depth of 43-feet with advanced maintenance to 48- feet based on the recommendations in the Final *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement*, dated August 1999, beginning at river mile three at the mouth of the Columbia River and proceeding generally eastwards to river mile 106.5 at the Interstate 5 bridge at Vancouver, WA. Actions to deepen the Willamette River portion of the federal navigation channel have been deferred until completion of Superfund cleanup efforts and will be subject to a separate 404(b)(1) evaluation and 401 certification.

Disposal

A number of dredged spoil disposal sites are proposed, as follows:

1. Potential wetland fills at two sites totaling 16.1 acres. Both sites are located in Washington: 10.7 acres at Mt. Solo (W-62.0) and 5.4 acres at Puget Island (W-44.0).
2. In-water (flowlane) disposal for the 43-foot channel alternative includes 3 million cubic yards (mcy) for construction and 24 mcy of maintenance material during the first 20 years. Flowlane disposal sites are in or adjacent to the Columbia River federal navigation channel in both Oregon and Washington at depths generally ranging from 50 to 65 feet. New flowlane disposal areas will be used at depths below 65 feet and above 35 feet at locations described in Section II(c) below.
3. Placement of material at 3 beach nourishment sites: Sand Island, Oregon, Skamokawa Beach, Washington, and Miller Sands Spit, Oregon. Sump locations at Columbia River Mile (CRM) 21 (Harrington Sump) and at CRM 18-20 (Tongue Point, Oregon) would also be used for placement of dredged material.
4. In-water placement of dredged material for restoration of intertidal emergent marsh habitat at Martin Island embayment, Washington.
5. In-water placement of dredged material for restoration of tidal marsh-intertidal flat habitat at Lois Island embayment, Oregon, and at Miller/Pillar between Pillar Rock and Miller Sands Islands, Oregon.
6. Two restoration measures (interim and long-term) are being considered at Tenasillahe Island, Oregon. The interim actions would be directed at improving connectivity and water exchange between sloughs/backwater channels interior to the levees at the Julia Butler Hansen National Wildlife Refuge and the Columbia River. The interim measure includes construction of two temporary cofferdams at existing tidegates to allow installation of improved outlet structures in a "dry" environment. These improved outlet structures would improve fisheries access and egress. Inlet improvements, channels, and water control structures would be constructed at three locations to direct Columbia River waters into the interior sloughs to improve fisheries access and improve water quality and circulation in the interior sloughs.
7. The long-term measure at Tenasillahe Island involves breaching the flood control levee surrounding Tenasillahe Island at five locations. These breach locations include the two existing tidegates and the three proposed inlet sites for the interim restoration measures. This action will improve conductivity of interior channels and restore tidal circulation to approximately 1,778 acres of estuarine habitat; a substantial gain in salmonid habitat is envisioned.
8. Tidegate retrofits for salmonid passage at Burris Creek in Woodland Bottoms, Washington.
9. The Shillapoo Lake, Washington, ecosystem restoration feature creates waterfowl and wildlife habitats on 470 to 839 acres. The concept for the restoration feature would be to create cells hydraulically separated by levees, but interconnected by water control channels and structures. This will require modifications to the outlet structure involving

excavation and/or fill and emplacement of a porous rock levee to block carp access to the wetland management cells comprising the project feature.

10. Development of managed wetland habitat at the Webb and Woodland Bottoms mitigation sites.

Waters of the State Impacted by Project

Direct impacts are as specified in the Description of Project Location section above. Impacts to surface waters can also be expected from disposal sites identified in the disposal section above.

Adjacent Landowners

The list of adjacent landowners known to DEQ in 1999 is as follows. In order to ensure that the following land owners and any new land owners of which DEQ was unaware were notified of the project, DEQ used the address list supplied on a compact disk by the US Army Corps of Engineers (see #23 above).

<u>Owner Name</u>	<u>Owner Address</u>
River Ranch,	Route 2, Box 2341, Clatskanie, OR 97016
Homeowners Association	
Dianne Kim,	65640 Island Road, Deer Island, OR 97054
Dave Christensen	
James W. Ericksen	12304 River Front Road, Clatskanie, OR 97016
Webb Drainage District	P.O. Box 866, Clatskanie, OR 97016
Scappoose Dairy,	P.O. Box 1147, Scappoose, OR 97056
Loren Ellis Jr. & Sons	
Fay K. Fraser	P.O. Box 611, Clatskanie, OR 97016
Paul Godsil	P.O. Box 82249, Portland, OR 97282-049
St. Helens Yacht Club	P.O. Box 714, St. Helens, OR 97051
Mark Griffin	
Charles and Marie Haglund	Route 6, Box 598, Astoria, OR 97103
Lone Star Northwest, Doug Hale	1050 North River Street, Portland, OR 97227
Drams Inc., David J. Felgert	12454 Riverfront Road, Clatskanie, OR 97016
Scott R. Fraser	P.O. Box 611, Clatskanie, OR 97016
Vance R. Fraser	P.O. Box 1426, Beaverton, OR 97075
Morse Bros. Inc., Brian Gray	65060 Col. Riv. Highway, Deer Island, OR 97054
Charles Haglund Jr.	Route 6, Box 596, Astoria, OR 97103
International Paper,	P.O. Box 854, Gardiner, OR 97441-0047
Gene Harbeson	
Etsel & Bernice Honeycutt	79944 Bodine Road, Clatskanie, OR 97016
Ben J. Hudson, Jr.	12632 River Front Road, Clatskanie, OR 97016
Howard Kern	65640 Island Road, Deer Island, OR 97054
K.C. Klosterman	32260 Old Highway 34, Tangent, OR 97389

Lillian Hudson Columbia County Courthouse Board of County Commissioners, Tony Hyde	12632 River Front Road, Clatskanie, OR 97016 St. Helens, OR 97051
Donna Jensen City of St. Helens, Mayor, Don Kalberg	30803 SW Grahams Frry Rd., Wlsnvl, OR 97070 P.O. Box 278, St. Helens, OR 97051
Zilpha & Mr. Pederson George and Diane Lammi City of St. Helens City Administrator	33491 NW Reeder Road, Portland, OR 97231 14141 Midland Dist. Rd, Clatskanie, OR 97016 P.O. Box 278, St. Helens, OR 97051
Marshland Drainage Improvement Co., Margaret Magruder	12589 Highway 30, Clatskanie, OR 97016
Ruben & Ilma Lehto Arnold Leppin Lone Star Northwest, Eric Muller	20787 Johns Dist. Road, Clatskanie, OR 97016 68251 Col. Riv. Hghwy, Rainier, OR 97048 P.O. Box 1225, Scappoose, OR 97056
Reichold Chemicals, John Oldham	P.O. Box 13582, RTP, NC 29709
Scapoose Sand and Gravel Scott Parker	P.O. Box AF, Scappoose, OR 97056
Martin Phillip George and Roberta Price	163 SW Freeman, Ste B, Hillsboro, OR 97123 13800 Webb District Rd., Clatskanie, OR 97016
Jerome and Joan Parson Columbia County Courthouse, Jack Peterson	23000 NW Gillihan, Portland, OR 97231 St. Helens, OR 97051
Larry D. Poor OR DSL, Steve Purchase ODFW, C. W. Rawlins	13876 River Front Road, Clatskanie, OR 97016 774 Summer St., NE, Salem, OR 97310 P.O. Box 59, Portland, OR 97208
Larson and Mason Karsten & Edith Sjoli New Brix Maritime Co. M.A. Skiles	P.O. Box 823, Rainier, OR 97048 20665 Johns Dist. Rd., Clatskanie, OR 97016 P.O. Box 83018, Portland, OR 97283-0018
Chris and Lyn Soter Martin and Linda Sunnes Lone Star Northwest, Bob Short	14460 NW Oak Hills Drive, Beavertn, OR 97006 163 SW Freeman, Ste. B, Hillsboro, OR 97123 050 North River Street, Portland, OR 97227
Dennis and Sandra Sisseck Louise A. Skaggs Svenson Island Landowner Becki Smith	35257 Sykes Road, St. helens, OR 97051 20619 Johns Dist. Rd., Clatskanie, OR 97016 Route 6, Box 598, Astoria, OR 97103
Patrick Sprague Port or Portland Alan Willis Port of St. Helens,	17365 Clatskanie Dist. Rd., Cltskanie, OR 97016 P.O. Box 3529, Portland, OR 97208 P.O. Box 598, St. Helens, OR 97051-0598

Peter Williamson
Columbia County Courthouse, St. Helens, OR 97051
Joel Yarbor

DESCRIPTION OF PROPOSED PROJECT

Proposed Action

The proposed action is to deepen the Columbia River portion of the Columbia and lower Willamette Rivers federal navigation channel from its current authorized 40- foot depth with advanced maintenance to 45-feet, to an authorized depth of 43-feet with advanced maintenance to 48- feet based on the recommendations in the Columbia River Channel Improvement Project: *Final Integrated Feasibility Report and Environmental Impact Statement*, dated January 2003, beginning at river mile three at the mouth of the Columbia River and proceeding generally eastwards to river mile 106.5 at the Interstate 5 bridge at Vancouver, WA. Actions to deepen the Willamette River portion of the federal navigation channel have been deferred until completion of Superfund cleanup efforts and will be subject to a separate 404(b)(1) evaluation and 401 certification. The proposed action also includes several ecosystem restoration sites.

The project includes the following actions:

1. Potential wetland fills at two sites totaling 16.1 acres. Both sites are located in Washington: 10.7 acres at Mt. Solo (W-62.0) and 5.4 acres at Puget Island (W-44.0).
2. In-water (flowlane) disposal for the 43-foot channel alternative includes three million cubic yards (mcy) for construction and 24 mcy of maintenance material during the first 20 years. Flowlane disposal sites are in or adjacent to the Columbia River federal navigation channel in both Oregon and Washington at depths generally ranging from 50 to 65 feet. New flowlane disposal areas will be used at depths below 65 feet and above 35 feet at locations described in Section II(c) below.
3. Placement of material at three beach nourishment sites: Sand Island, Oregon, Skamokawa Beach, Washington, and Miller Sands Spit, Oregon. Sump locations at Columbia River Mile (CRM) 21 (Harrington Sump) and at CRM 18-20 (Tongue Point, Oregon) would also be used for placement of dredged material.
4. In-water placement of dredged material for restoration of intertidal emergent marsh habitat at Martin Island embayment, Washington.
5. In-water placement of dredged material for restoration of tidal marsh-intertidal flat habitat at Lois Island embayment, Oregon, and at Miller/Pillar between Pillar Rock and Miller Sands Islands, Oregon.
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water control structures would be constructed at three locations to direct Columbia River waters into the interior sloughs to improve fisheries access and improve water quality and circulation in the interior sloughs.

7. The long-term measure at Tenasillahe Island involves breaching the flood control levee surrounding Tenasillahe Island at five locations. These breach locations include the two existing tidegates and the three proposed inlet sites for the interim restoration measures. This action will improve conductivity of interior channels and restore tidal circulation to approximately 1,778 acres of estuarine habitat; a substantial gain in salmonid habitat is envisioned.
8. Tidegate retrofits for salmonid passage at Burris Creek in Woodland Bottoms, Washington.
9. The Shillapoo Lake, Washington, ecosystem restoration feature creates waterfowl and wildlife habitats on 470 to 839 acres. The concept for the restoration feature would be to create cells hydraulically separated by levees, but interconnected by water control channels and structures. This will require modifications to the outlet structure involving excavation and/or fill and emplacement of a porous rock levee to block carp access to the wetland management cells comprising the project feature.
10. Development of managed wetland habitat at the Webb and Woodland Bottoms mitigation sites.

Tidegate retrofits associated with the above components of the project will be covered under existing Corps' Clean Water Act Section 404 permits.

With the use of the above disposal sites, the applicant projects that use of the deepwater ocean disposal site will not be necessary for initial deepening of the channel, and should not be necessary for the continuing maintenance of the channel.

General Description of Dredged or Fill Material

The material to be dredged and disposed as part of the Columbia River channel deepening and maintenance is predominately medium grain sand with some fine and coarse grain sand. The proposed 43-foot deepening alternative would result in flowlane disposal of an estimated 3 mcY during construction and an estimated 24 mcY over the first 20-years of maintenance. This maintenance quantity is estimated to be 20-30 mcY less than if current dredging and disposal practices were continued.

As described in Section 5.1.7 of the Final IFR/EIS, since the 1930s, the Corps has collected sediment data on the Columbia and Willamette Rivers. A comprehensive Sediment Quality Evaluation was prepared for the study (See Appendix B of the Final IFR/EIS). Since issuance of the Final IFR/EIS, the Corps has reviewed the analysis of thousands of collected samples from within and outside the channel. The likelihood of contaminants in the Columbia River portion of the federal navigation channel is low based upon all of the past testing and evaluation discussed

in the Final and Supplemental IFR/EIS. All material dredged will be evaluated under joint USEPA and Corps Dredged Material Evaluation Guidelines prior to disposal. The Sediment Quality Evaluation and compliance with USEPA/Corps Guidelines prior to dredging meet the evaluation and testing requirements of 40 CFR Part 230 Subpart G.

Ecosystem restoration activities at Tenasillahe Island, Shillapoo Lake, and the tidegate retrofit at Burris Creek will include the construction of cofferdams and levees. The fill material used for these activities will consist of clean sand and/or insitu material. A porous rock dam will also be constructed at Shillapoo Lake.

Mitigation at Webb and Woodland Bottoms will include construction of levees with insitu material.

Description of the Proposed Activities

Flowlane sites are in or adjacent to the Columbia River federal navigation channel at depths generally from 50 to 65 feet. However, there would be exceptions to the general depth criteria for the channel improvement project. The actual disposal sites cannot be designated beyond the general description in the first sentence of this section. They vary from year to year depending on the condition of the channel. Flowlane disposal could occur at depths of 35 to 65 feet between CRMs 64 and 68 and CRMs 90 and 101. Flowlane disposal could occur in areas over 65 feet deep in four specific areas: downstream of CRM 5; CRMs 29 to 40; CRMs 54 to 56.3 on the Oregon side of the channel; and CRMs 72.2 to 73.2 on the Washington side. The substrate at these locations is predominately medium grain sand with some fine and coarse grain sand.

The two wetland discharge sites total approximately 16.1 acres. Both sites are located in Washington [10.7 acres at Mt. Solo (W-62.0) and 5.4 acres at Puget Island (W-44.0)]. These sites lie behind flood control levees, and are drained and used for a variety of agricultural purposes.

Harrington Sump is a deepwater (~40 foot Columbia River Datum (CRD)) site located between RM 20-22 in Oregon waters that historically and currently is used for placement of dredged material by hopper dredges. The sandy substrate at this location is comparable to the dredged material placed there. The sump is typically filled over a 2-3 year period, to approximately 35 foot CRD and then dredged to approximately 45 foot CRD with material disposed on Rice Island.

The temporary (two-year) sump to be used near Tongue Point (CRM 18-20), on the Oregon side, and immediately adjacent to the navigation channel, occurs in-water 38 to 60+ feet deep. The sandy substrate at this location is comparable to the dredged material to be placed there from the adjacent navigation channel.

The three sites selected for beach nourishment Sand Island, Oregon, Skamokawa Beach, Washington, and Miller Sands Spit, Oregon are non-vegetated erosive shoreline areas with sandy substrate.

The Lois Island embayment totals 357 acres, and was dredged as a mooring basin for decommissioned WWII ships. This restoration action would restore approximately 190 acres of the embayment to marsh habitat. The existing substrate averages about -18 feet CRD and consists of predominately medium grain sand with some fine and coarse grain sand. The Miller/Pillar restoration feature between Pillar Rock and Miller Sands Islands is approximately 230 acres. The existing substrate averages about -25 feet CRD and consists of predominately medium grain sand with some fine and coarse grain sand. Since the site is naturally erosive, a pile dike field would be constructed to stabilize the site and maintain bathymetry comparable to pre-erosion conditions. A stable bathymetry at historic depths is anticipated to improve benthic invertebrate productivity and fisheries resource use.

The Martin Island embayment is an approximately 34-acre area formed via excavation of material to provide fill for an adjacent portion of Interstate 5, and was subsequently used for log moorage and recreational boating, including moorage. The average depth of the embayment is approximately -20 feet CRD. Silt that settled in this quiet backwater and bark debris from log storage activities likely make up the bottom substrate.

The Tenasillahe Island (interim) sites affected by temporary cofferdam construction are silty to fine sand substrates at 2 to 4 foot depths. The inlet structures would principally entail construction through the flood control levee with minor construction activities in adjacent intertidal lands with a silt substrate. Long-term activities at Tenasillahe Island would include breaching the levees to restore full tidal circulation.

Tidegate retrofits proposed at the five primary locations would primarily entail construction work in levee material with a minor construction element potentially in the adjacent intertidal zone comprised primarily of silts.

Construction actions associated with the Shillapoo Lake ecosystem restoration feature would primarily occur inland to the main flood control levee on agricultural lands. Some construction work would occur in levee material with a minor construction element potentially in the adjacent intertidal zone comprised primarily of silts. Sediment discharge to adjacent waters would be minimal. Rock fill would occur in the existing discharge channel from the pump station to serve as a carp access barrier to the interior managed wetlands.

The Webb and Woodland Bottoms mitigation sites will be developed for wetland and riparian habitat by constructing low levees inside the main flood control dike and constructing gradual sloping banklines within the mitigation sites.

Upland Disposal Sites (Includes two Wetland Sites)

The process used for screening upland disposal sites is described in Section 4.4.3.4 of the Final IFR/EIS. Over 157 sites were reviewed. Multiple environmental and engineering criteria were applied to screen the sites and select those proposed for disposal of project dredged materials.

One of the environmental criteria applied was avoidance of wetlands to the extent practicable. As a result of the screening process, comments on the draft EIS, and subsequent adjustments in

disposal site boundaries, the total area of wetland fill was reduced from 30 acres for the plan evaluated in the draft EIS to 16.1 acres in the current recommended plan.

The two areas of wetland fill, 10.7 acres at Mt. Solo and 5.4 acres at Puget Island, are in river areas where the in-water disposal capacity is insufficient to handle the amount of material to be dredged. No other practicable means exists for disposing of dredged material without impacting a comparable or greater amount of wetland habitat. Other upland or in-water sites are not available in the vicinity or are already being used to capacity. The disposal sites containing wetland habitat lie behind flood control dikes, are actively drained and are used for agricultural purposes. These wetlands provide limited wildlife habitat value. The Puget Island and Mt. Solo disposal sites lie behind flood control dikes and are outside the Federal Emergency Management Agency 100-year floodplain.

In-water Disposal

Flowlane disposal is used in areas where no other disposal alternatives exist or where the quantity of material to be dredged is too small to warrant use of a pipeline dredges that would be necessary for upland disposal. Flowlane disposal is not expected to have a significant impact on aquatic resources. Benthic invertebrate productivity is generally low in the deeper channel areas and impacting these areas would not affect the overall productivity of the Columbia River.

Shoreline disposal locations were selected because of beneficial use that they provide. Sand Island protects a county/public park and riparian habitat. Skamokawa beach provides the resale of material and protects the public beach. Miller Sands protects an important aquatic habitat.

The Harrington Sump is necessary in the estuary in order to eventually place material upland on Rice Island. The Rice Island upland disposal site is located within the estuary adjacent to Harrington Sump. Material is temporarily placed in the sump when river conditions or equipment availability does not allow direct placement of material on Rice Island. Pipeline dredges later remove the material from Harrington Sump and place it upland for permanent disposal. The sump has been used for decades and is a disturbed area with low productivity.

Use of Harrington Sump reduces the need for flowlane disposal elsewhere in the estuary. The Tongue Point Sump is to be used during construction to temporarily store disposal material that will ultimately be placed on the Lois Island ecosystem restoration site by a pipeline dredge.

Two ecosystem restoration sites will be constructed utilizing dredge material in the estuary to help restore valuable habitat. The Lois Island embayment will be filled with material to an elevation approx 7 feet mean lower low water (MLLW) in order to develop tidal marsh habitat. This action would occur during the two-year construction period. The Miller Pillar ecosystem restoration feature will restore subtidal and/or intertidal habitat in a naturally erosive area. Both of these restoration sites have been identified through the ESA consultation as beneficial to listed salmonid stocks.

The mitigation habitat development at the Martin Island embayment will also utilize dredged material to accomplish the habitat objective. Project mitigation, including mitigation for wetland

impacts such as the proposed creation of intertidal emergent marsh at Martin Island, was developed through an interagency team approach. The mitigation team included representatives from the Corps, Washington Departments of Ecology and Fish and Wildlife, US Fish and Wildlife Service (USFWS), and Oregon Department of Fish and Wildlife.

Other Restoration

The ecosystem restoration features described in the Final IFR/EIS that involve discharges of dredged or fill material into the waters of the U.S. include Tenasillahe Island and Shillapoo Lake. The purpose of these restoration features is to benefit listed ESA species, including salmonid ESUs and also to improve fish and wildlife habitat conditions. The Shillapoo Lake restoration feature and the Burris Creek tidegate retrofit feature were formulated as the result of a series of workshops with federal and state resource agencies. Tenasillahe Island restoration was a result of the ESA consultation process between the Corps, NOAA Fisheries and USFWS. The discharges that are a part of these features are necessary in order to realize the purpose of the features. There are no practicable alternatives to these discharges.

Other Wildlife Mitigation

The wildlife habitat mitigation described in the Final IFR/EIS that involve discharges into the waters of the U.S. includes Martin Island (Martin Island embayment was addressed in paragraph b above), Woodland Bottoms, and Webb mitigation sites. The purpose of these wildlife mitigation actions is to offset project-related wildlife habitat losses for riparian, wetland and agricultural lands. These mitigation actions were developed through an interagency process (WDFW, ODFW, USFWS, WDOE and Corps) utilizing the USFWS's Habitat Evaluation Procedures to assess project related losses and net gains in habitat units at potential mitigation sites. The selected mitigation sites produced the best net gain in habitat units at the least cost. The discharges that are a part of these mitigation actions are necessary in order to attain the wildlife habitat improvements. There are no practicable alternatives to these discharges.

SUMMARY OF APPLICANT'S DESCRIPTION OF WATER QUALITY IMPACTS

Physical Substrate Determinations

Sediments in the mainstem Columbia River typically are composed of fine to coarse sand with less than one percent in the silt to clay size classification and less than one percent volatile solids. The dredging sites within the navigation channel, access channels, and all flowlane disposal sites and sumps are located within the mainstem of the Columbia River. Flowlane disposal sites are typically located near associated dredging sites and are subject to similar hydraulic forces. The riverbed generally consists of sand waves that have minimal compaction or consolidation. Therefore, the materials in the extraction sites and the substrate of the in-river discharge sites are similar in particle size, shape and compaction.

The disposal of dredged material would alter the depth and/or gradient of the flowlane disposal sites and sumps via raising the bottom elevation. As previously noted, the disposal location and depth of flowlane sites cannot be determined until shortly before the time of discharge due to the dynamic nature of the river bottom. However, rise in bottom elevation is expected to range from two to six feet depending on individual flowlane sites. This range of rise is not expected to cause significant changes in-water circulation, current pattern, water fluctuation and water temperature. The elevation rise in the disposal sites may affect the contours of the surrounding substrate; however, any such affect is expected to be insignificant. The physical characteristics of bottom sediments would not change significantly as the dredged material is essentially the same composition as material found at the discharge site.

The substrate of both disposal sites containing wetland habitat is primarily silty clay loam. Placement of dredged material at the sites would change the physical composition to primarily sand. The top one foot of topsoil would be removed at the Puget Island disposal site and stockpiled prior to deposition and then replaced on the surface as each of the three disposal cells at the location are filled. All wetland function and value will be lost at these locations.

The sandy substrate of the three-shoreline disposal sites is the same as the material that will be placed there. Disposal will raise the riverbed of shallow water areas along the beach. Some areas could change from shallow water to beaches. Disposal would erode away in three to four years. All of these sites have been used in the past to maintain the Columbia River. These sites tend to be non-vegetated erosive sites with low benthic productivity. There are no expected impacts to downstream habitat as a result of these sites.

The substrate of the two ecosystem restoration sites and one wildlife mitigation site utilizing dredged material for fill ranges from coarse sand to silt. Placement of dredged material at Miller/Pillar would raise the bottom elevations from six to 24 feet with predominately medium grain sand with some fine and coarse grain sand. For Lois Island embayment, the elevation increase would range from one to 32 feet and average about 24 feet. The bottom elevation of Martin Island embayment would rise approximately 20 feet to an intertidal level post-construction.

Implementation of the interim measure at Tenasillahe Island would result in a temporary modification to the physical substrate associated with placement of cofferdams established to allow construction in the dry. These structures would be removed once the outlets are modified. The improved outlets are not anticipated to modify the physical substrate at the outlets beyond existing condition. Some modification to the substrate will occur at the three inlet works to be established. These may include excavation of entrance and exit channels either mechanically or in combination with hydraulic forces associated with the initiation of flows at these locations.

The long-term restoration measure at Tenasillahe Island will entail breaching (excavation) the flood control levee at the two existing outlets and three proposed inlet locations associated with the interim measure. The restoration of tidal flows to the interior of Tenasillahe Island may result in the natural development of channels and/or modification to the existing drainage channels and substrate from the reintroduction of hydraulic forces. Disposal of excavated material from the breaches will be atop the remaining levee section to the extent practicable but deposition on interior lands that are currently pastures (drained wetlands) may occur, subject to further evaluations, for development of riparian forest habitat.

Tidegate retrofits at Burris Creek would have minimal impacts to the existing substrate. Typically, construction earthwork would be limited to the flood control levee if it proceeded beyond a simple replacement or modification of the tidegate at the end of the culvert. No change in the existing condition of the surrounding substrate due to changes in flow is anticipated with these modifications.

The Shillapoo Lake ecosystem restoration feature will entail construction of water control levees interior to the main flood control levee and modifications to the outlet works. The interior levees are per the Washington Department of Fish and Wildlife's management desires for the presently agricultural and Shillapoo Wildlife Management Area lands comprising the restoration feature. Structural modifications to the present outlet works will primarily encompass the flood control levee with minor disturbance to the outlet channel to Lake River. Another project feature entails placement of a porous rock fill (levee) across the outlet channel to block carp access to the interior managed wetlands. The substrate of the area is composed of silty clay loam. The levees will be constructed from these native soils.

The discharges at the Webb and Woodlands Bottoms mitigation sites will use clean sand and insitu materials, and will not adversely impact the existing substrate.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affect physical substrate (*e.g.* existing filling and diking, ongoing maintenance dredging, maintenance of the mouth of the Columbia River, operation of the Federal Columbia River power system, and existing development along the Columbia River) are reflected in the current substrate conditions found at the sites discussed above. Future activities, including potential future upland development, are not anticipated to affect physical substrate except in the immediate vicinity of such projects. While future cleanup of the Willamette River under the federal superfund program could potentially affect substrate in a limited area downstream of the Willamette's confluence with the Columbia, the cleanup plan

has not been developed yet and therefore the potential effect of the cleanup cannot be predicted at this time.

Water Circulation, Fluctuation and Salinity Determinations

The proposed in-water disposal, including flowlane, two sumps, and shoreline disposal, would affect minor changes in hydrologic features such as circulation patterns, downstream flows, or normal water level fluctuations. Discharges at shoreline disposal sites are intended to offset shoreline erosion. However, the minor changes in hydraulic features are not expected to otherwise result in any significant impacts to aquatic communities, shoreline and substrate erosion and deposition rates, the deposition of suspended particulates, the rate and extent of dissolved and suspended components of the water body. Water quality characteristics such as water chemistry, clarity, color, odor, taste, dissolved gas levels, temperature, or nutrients would not be affected to any measurable degree. As discussed in Sections 6.2.2.2 and 6.2.2.3 of the Final and Supplemental IFR/EIS and Appendix F of the Final IFR/EIS, channel deepening and related disposal could cause a minor increase in salinity in the main channel in the lower part of the estuary. The hydraulic analysis of water surface elevations and salinity concentrations support the expectations of minor changes. Since the water surface profiles and thus the energy gradients are essentially unchanged, the flow in side channels and shallows would also be unchanged. The results of salinity intrusion modeling show insignificant changes in salinity concentrations outside the main channel. This result indicates that there would be very little hydraulic change away from the main channel. Based on the results of sediment analysis, and that dredged material would originate from nearby in-water locations, physical or chemical characteristics of the receiving water would not be adversely affected. Additional analysis of salinity and hydraulic effects, including potential minor changes in the location of the Estuarine Turbidity Maximum (ETM) associated with deepening (as opposed to disposal of dredged or fill material), is included in the Supplemental IFR/EIS.

The proposed restoration actions at Tenasillahe Island, and the tidegate retrofits at Burris Creek are intended to improve water circulation within these sloughs, backwaters and embayments. The creation of tidal marsh habitat within the Lois Island embayment is not anticipated to alter flow or water circulation patterns in the adjacent area. The placement of a pile dike field and subsequent fill between the pile dikes at Miller/Pillar to restore subtidal and or intertidal elevations would have a negligible impact to flows into lower Cathlamet Bay. The porous rock levee across the outlet/inlet for the Shillapoo Lake restoration effort is intended to maintain flow through the existing tidegate and pumping station at this location but preclude the passage of carp to the interior managed waters.

The creation of the intertidal habitat in the Martin Island embayment is in a protected area and is therefore not expected to alter circulation patterns adjacent to this site. The discharges at the Webb and Woodlands Bottoms mitigation will occur behind the main flood control dikes and will have no effect on water circulation, fluctuation and salinity.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affects water circulation, fluctuation and salinity are reflected in the current conditions described in the Final and Supplemental IFR/EIS. Future activities, including potential future upland development, are not anticipated to affect water circulation, fluctuation or salinity except in the immediate vicinity of such projects. While future

cleanup of the Willamette River under the federal superfund program could potentially affect water circulation, fluctuation and salinity in a limited downstream area, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup cannot be predicted.

Suspended Particulate/Turbidity Determination

Hopper dredges discharge through doors in the bottom of the hull while under power and traveling at slow speeds, generally around one or two knots. Hopper dredges typically discharge their load in less than a 20 minute period. A hopper dredge may make up to 15 disposal cycles per day. Loaded draft depths for hopper vessels vary with their capacity but will typically fall in the 15-30 foot depth range which is essentially the range for load discharge. The hopper dredges generates a turbidity plume that is limited in extent to the area below the discharge depth and immediately along the vessel path for the disposal duration. The discharged sand settles quickly to the river bottom. The sediment concentrations in the plume are limited because of the small amount of fines in the disposal material. River currents will carry the plume a short distance before it mixes with the river.

For pipeline dredges, dredged material is continuously pumped through a discharge diffuser that is located 20 feet below the water surface. The discharged sand settles rapidly to the bottom and a plume of fine grained sediments is carried away by the river currents. The downstream extent of the plume will depend on the river velocities and channel geometry at each discharge site.

Short-term minor increase in turbidity would occur in the mixing zones of Project in-water disposal sites and in-water work areas associated with mitigation and ecosystem restoration features. This condition would temporarily inhibit light penetration through the water column for a short period of time (hours) and would not significantly affect aquatic organisms. The dredging and disposal activity in the Project will involve the same type of sandy material, and will be performed with the same type of equipment and the same method of operations, as existing maintenance dredging of the 40-foot channel. Both states have previously issued state water quality certifications that have included approved mixing zones. With the issuance of state water quality certifications containing approved mixing zones and/or short-term modifications as appropriate, the expected increase in turbidity levels would not violate state water quality standards. Best management practices (BMP) would be utilized for the dredge and fill actions associated with the deepening and all in-water disposal, as well as the Lois Island embayment, Miller/Pillar ecosystem restoration features and Martin Island embayment development for wildlife mitigation. Best management practices would also be implemented for other ecosystem restoration features entailing work in-water, including construction of temporary cofferdams to contain and allow settling time for suspended sediments at Tenasillahe Island, and potentially for the Burris Creek tidegate retrofits.

All other discharges will occur in upland areas, except for two wetland areas in the State of Washington. These discharges are not expected to involve flowing or standing water where turbidity would be an issue.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affect suspended particulates and turbidity are

reflected in the current conditions described in the Final and Supplemental IFR/EIS. Future activities, including potential future upland development, are not anticipated to affect suspended particulates or turbidity except in the immediate vicinity of such projects. While future cleanup of the Willamette River under the federal superfund program could potentially affect suspended particulates and turbidity in a limited downstream area, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup cannot be predicted at this time.

Contaminant Determinations

With the exception of some discharge of materials associated with the mitigation sites and several of the ecosystem restoration features (Tenasillahe Island, Burris Creek tidegate retrofit, Shillapoo Lake), all of the material proposed to be discharged pursuant to this 404(b) evaluation is dredged material from the navigation channel and from existing access channels between the navigation channel and shoreside berths at three grain facilities, one gypsum plant and one container terminal. Actual deepening of these berths will require separate Section 404 permitting and review.

The discharges into the mitigation sites and several ecosystem restoration sites that do not involve material dredged from the navigation channel will be either insitu material or clean sand or rock from non-contaminated sources. Currently available information indicates no reason to suspect contaminants in the insitu material.

Sediments in the mainstem Columbia River typically are composed of sand with less than one percent in the silt to clay size classification and less than one percent volatile solids. The material present in the mainstem Columbia River meets exclusionary criteria as defined under the Marine Protection, Research, and Sanctuaries Act (MPRSA) and the CWA and, therefore, would not be subject to further testing under these two environmental laws. However, this material has been subjected to both physical and chemical testing as part of this project. The mainstem sediment has been determined, in accordance with the 1998 Dredged Material Evaluation Framework (DMEF), Lower Columbia River Management Area (USEPA/Corps 1998), to be suitable for unconfined in-water disposal by the USEPA, Corps, and the States of Oregon and Washington.

Sediment testing still will be required for material dredged from the turning basin at Astoria. The evaluation would be conducted by and coordinated with the appropriate agencies prior to any dredging and disposal action.

Material from the areas dredged in the Columbia River has been collected and analyzed since dredging first began in the early 1900s. Prior to the passage of the MPRSA and CWA physical analyses were conducted to determine dredging capability and to estimate production. After passage of these two environmental laws, analyses were expanded to include chemical and biological analyses as well as the traditional physical analyses. Physical analyses are also conducted as a regular parameter evaluated during benthic in fauna studies conducted in the river. Many of these in fauna studies have been conducted along the slopes and outside of the navigational channel during dredged material disposal site evaluation studies. The Corps has identified and is entering into a SEDQUAL database over 100 separate studies that have been

conducted on the Columbia River by the Corps since 1980. This includes sampling of over 3,100 stations for a total of over 4,100 samples.

While the nature of the mainstem material meets the exclusion from testing as provided in the regulations and evaluation guidelines, the Corps and USEPA decided to conduct confirmatory testing for the entire project. Sixty-seven separate shoal areas were identified for sampling through assessment of the 1994 navigation channel bathymetry. In June 1997, 89 surface grab samples were collected from the 67 shoals in the Columbia River project area (CRMs 3.0 to 106.2). In addition to physical analysis, 23 were further analyzed for chemical contaminants.

In accordance with the DMEF, chemical tests were performed including; inorganic total metals (9), polynuclear aromatic hydrocarbons (PAHs), total organic carbon (TOC), total volatile solids (TVS), acid volatile sulfide (AVS), pesticides and polychlorobiphenyls (PCBs), pore water tributyltin (TBT), and P450 reporter gene system (RGS), a dioxin/furan screen. Information regarding the sediment testing and results can be found in Appendix B of the Final IFR/EIS, *Columbia and Willamette River Sediment Quality Evaluation*. The dredged material was determined to be suitable for unconfined in-water disposal.

Additional evaluation of materials proposed for dredging was conducted as part of the ESA re-consultation and can be found in Appendix B of the Biological Assessment and in the Biological Assessment amendment letter (both found at Exhibit H of the Supplemental IFR/EIS). The additional evaluation confirmed the earlier conclusion that the primarily sandy dredged material does not contain unacceptable concentrations of contaminants and is suitable for unconfined in-water disposal. No additional testing is necessary.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affect contaminants are reflected in the current conditions described in the Final and Supplemental IFR/EIS. Future activities, including potential future upland development, are not anticipated to affect contaminants except in the immediate vicinity of such projects. While future cleanup of the Willamette River under the federal superfund program could potentially affect contaminants in a limited downstream area, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup can not be predicted at this time. Further, because the purpose of the cleanup is to effectively control contaminants and protect human health and the environment, it is likely that a major focus of cleanup design will be on avoiding and eliminating any off-site contaminant impacts.

Aquatic Ecosystem and Organism Determinations

Impacts to the aquatic ecosystem associated with discharge of dredged material will occur. Impacts associated with flowlane discharge of dredged material are expected to be minimal since the substrate of the main navigation channel consists primarily of sand naturally formed into sand waves by river currents. These sand waves are constantly eroding and reforming and do not provide the stable habitat needed for productive benthic communities. Sampling in the channel areas has confirmed their low productivity for benthic invertebrates. Additionally, those portions of the sand waves in the dredging prism are disturbed by annual dredging operations that typically occur from May through September for the navigation channel.

In-water disposal operations consist of flowlane disposal, use of two sumps and three shoreline disposal sites. Flowlane disposal is done in or adjacent to the channel margins typically at depths from 50-65 feet. These areas are generally similar to the channel areas and are not considered very productive for benthic communities. Static benthic communities would be covered and would not likely recover because of the continuous use of the sites. However, populations of these organisms are not considered to be very high because of the dynamic nature of the flowlane habitat.

Mobile organisms present in flowlane disposal areas, such as smelt, sturgeon and crab, are adapted to the dynamic nature of the habitat arising from continuous movement of sand via river currents. They are mobile organisms and generally should be physically capable of avoiding the disposal in most instances. Sturgeon live in the flow lane disposal sites as both adults and juveniles. The behavioral research by the USGS, funded by the Corps, will be used to manage the dredging and disposal operations to minimize impacts to sturgeon populations. Dungeness crabs are located primarily in the lower reaches of the estuary but can occur as far upriver as mile 18 when river flow is low and up river salinity is high. Crabs could be present in Harrington Sump as well as the flowlane site at RM 5. Studies have shown that crab are able to dig out of disposal materials, although some individual crab do not dig out and are smothered. The number of crabs impacted will depend upon how many are in the disposal site, which is dependent upon river and tide conditions. A study to develop a model of crab abundance versus salinity has been developed by Battelle NW Labs for the Portland District. This model will be used to schedule dredging and disposal to avoid periods of high crab abundance to the extent practicable in order to minimize impacts.

Studies have shown that smelt spawning is not successful in the high-energy areas like those used for flowlane disposal. Larval smelt move up into the water column after hatching, consequently, it is likely that smelt larvae would not be affected by aquatic disposal operations. Based on the above, it is likely that smelt populations would not be affected by flowlane disposal. The Corps has developed in-water work windows with the Oregon and Washington Fish and Wildlife agencies to avoid potential impacts to smelt.

Shoreline disposal sites are located in areas that are highly erosive and do not provide much, if any, habitat for benthic communities. Consequently, use of these sites is not expected to have a significant impact on the benthic productivity of the area. Through consultation with the NOAA Fisheries, only three shoreline disposal sites (Sand Island and Miller Sands Spit, Oregon and Skamokawa, Washington) are cleared for disposal operations.

Proposed wildlife mitigation actions would restore wetland functions of high value on approximately 210 acres over the three wildlife mitigation areas. Wetland habitat development would occur in the context of a larger, diverse, natural area, with a substantial riparian forest component, at each mitigation site. Riparian habitat restoration would restore approximately 228 acres of this habitat feature compared to the approximately 50 acres impacted by disposal. Fill activities associated with the Martin Island embayment mitigation site will convert the aquatic ecosystem at the site to intertidal emergent marsh.

Proposed ecosystem restoration features at Lois Island embayment and Miller/Pillar would restore approximately 590 acres of low to moderately productive subtidal habitat to highly productive shallow subtidal and tidal marsh habitat. Tidegate improvements at Burris Creek and inlet structures (interim action) at Tenasillahe Island would improve water quality and salmon habitat in several sloughs within the island complex. Implementation of the long-term feature at Tenasillahe Island, breaching the flood control dikes, would restore approximately 1,778 acres of habitat to tidal influence in the future. Depending on acquisitions, the Shillapoo restoration feature creates waterfowl and wildlife habitat on 470 to 839 acres.

The USFWS and the NOAA Fisheries have both determined that the proposed action, including ecosystem restoration features, is not likely to jeopardize the continued existence of threatened or endangered species under their purview. NOAA Fisheries believes that the most predictable impacts from the proposed action to ESA-listed salmonids and their habitats in the lower Columbia River, estuary, and river mouth are short-term, physical changes during the construction and subsequent maintenance period of the project. Expected impacts to key physical processes will be limited and short-term in nature during construction and maintenance. Further discussions of aquatic impacts are included in the Final IFR/EIS, Supplemental IFR/EIS and Biological Assessments prepared by Portland District for this action and in the biological opinions prepared by the USFWS and NOAA Fisheries.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affect the aquatic ecosystem and organisms are reflected in the current conditions described in the Final and Supplemental IFR/EIS. Future activities, including potential future upland development, are not anticipated to affect the aquatic ecosystem and organisms except in the immediate vicinity of such projects. Further, any such projects that may affect the aquatic ecosystem and organisms are likely to require independent evaluation under the Endangered Species Act and NEPA. While future cleanup of the Willamette River under the federal superfund program could potentially affect the aquatic ecosystem and organisms in a limited downstream area, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup cannot be predicted.

Proposed Disposal Site Determinations

In-water disposal, flowlane and sump disposal may be conducted by either hopper or pipeline dredges. The aerial extent of the mixing zone for in-water disposal is influenced by river conditions, material type, and dredge equipment. These factors are discussed in detail in the BA, SEIS, and the FEIS.

Flowlane disposal sites are located in or adjacent to the Columbia River federal navigation channel from CRM 3 to CRM 106, at depths generally from 50 to 65 feet. However, there would be exceptions to the general depth criteria for the channel improvement project. The actual disposal sites cannot be designated beyond the general description in the first sentence of this section. They vary from year to year depending on the condition of the channel. Flowlane disposal could occur at depths of 35 to 65 feet between CRMs 64 and 68 and CRMs 90 and 101. Flowlane disposal could occur in areas over 65 feet deep in four specific areas: downstream of CRM 5; CRMs 29 to 40; CRMs 54 to 56.3 on the Oregon side of the channel; and CRMs 72.2 to

73.2 on the Washington side. The sump sites are located near CRM's 18-20 and 20-22. River currents along the river are influenced by upstream discharges and ocean tides and typically vary from -1 fps to +3 fps. The Columbia River is generally not stratified except in the estuary where salinity intrusion causes stratification. The stratification is not expected to significantly influence mixing of the disposal plume.

The substrates at the flowlane and sump locations are predominately medium grain sand with some fine and coarse grain sand with less than one percent silt or clay. Columbia River suspended sediment concentrations vary seasonally, but are generally between 10-20 mg/l during the dredging season.

Hopper dredges discharge through doors in the bottom of the hull while under power and traveling at slow speeds, generally around one or two knots. Hopper dredges typically discharge their load in less than a 20 minute period. A hopper dredge may make up to 15 disposal cycles per day. Loaded draft depths for hopper vessels vary with their capacity but will typically fall in the 15-30 foot depth range which is essentially the range for load discharge. The hopper dredges generates a turbidity plume that is limited in extent to the area below the discharge depth and immediately along the vessel path for the disposal duration. The discharged sand settles quickly to the river bottom. The sediment concentrations in the plume are limited because of the small amount of fines in the disposal material. River currents will carry the plume a short distance before it mixes with the river.

For pipeline dredges, dredged material is continuously pumped through a discharge diffuser that is located 20 feet below the water surface. The discharged sand settles rapidly to the bottom and a plume of fine grained sediments is carried away by the river currents. The downstream extent of the plume will depend on the river velocities and channel geometry at each discharge site.

For flowlane and sump disposal the river current would carry away fine sediment but since the disposal material would be mostly sand which settles rapidly, the extent and duration of the plume would be minor. No mud flats and vegetated shallows would be affected by disposal in these areas as it occurs in and adjacent to the navigation channel which is generally distant from these habitat types. The material would not introduce toxic substances (see above discussion of contaminant determinations) into the surrounding waters.

Shoreline disposal can generate elevated suspended sediment concentrations near the shoreline at the three shoreline disposal sites. The suspended sediment concentrations decrease rapidly as the disposal water mixes with the river discharges.

The Lois Island and Miller-Pillar restoration sites will be filled by pipeline dredge. The disposal operation will be similar to a shoreline disposal. The suspended sediment plume will also be similar to that caused by shoreline disposal. The currents at the Lois Island site are generally lower than those in the main river channel and the plume will move away more slowly than at the shoreline disposal sites. The Miller-Pillar site will have reduced current velocities within the pile dike field, but the plume will rapidly mix with the river currents outside of the dike field.

The Martin Island mitigation site will be filled by pipeline dredge. The disposal operation will be similar to a shoreline disposal. The suspended sediment plume will also be similar to that caused by shoreline disposal. The currents at the Martin Island site are generally lower than those in the main river channel and the plume will move away more slowly than at the shoreline disposal sites.

Potential Effects on Human Use Characteristics.

Municipal and Private Water Supplies: There are no municipal or private water supply intakes in the vicinity of the disposal areas.

Recreational and Commercial Fisheries: Impacts to recreational and commercial fisheries will occur. Fill at Lois Island embayment will reduce by 19 percent the area available for recreational fishermen, principally for sturgeon, and commercial fisherman who utilize this area as part of the Select Area Fishery established in the lower Columbia River. The Miller/Pillar location would impact a portion of the Miller Sands gill net drift rendering it unsuitable for commercial fishing use. As indicated by the evaluation of contaminants above, the commercial and recreational fisheries are not anticipated to be impacted by contaminants. Disposal operations are not expected to disrupt migration and spawning areas. Dredging impacts to crab, including flowline discharge of dredged material, are anticipated to impact a small fraction of the crab population in the estuary. The crab population in the estuary is only part of the total crab population in the area. Therefore, the project is not anticipated to adversely affect the crab fishery.

Water-related recreation: Water related recreation in the project area consist of: pleasure craft, jet skies, water skiing, wind surfing, canoeing, and kayaking. Impact to water related recreation is expected to be minor in areas where disposal will occur. Dredges will be operating in localized areas within the project area for short periods of time. Although there may be some disturbances to individual recreators, these disturbances will be minimal. Disposal within the Martin Island embayment to create emergent marsh habitat will prevent the recreational boaters' use of that area.

Aesthetics: No impacts to aesthetics are anticipated.

Parks, etc: There are two public beaches that are also shoreline disposal locations. While material is being disposed of at this location, there will be minor disturbances to shoreline use by individuals using the beach. The periodic placement of material at these locations enables continued public use of these areas. There are no national and historical monuments, national seashores, wilderness areas, and research sites within the discharge areas.

Determination of Cumulative Effects on the Aquatic Ecosystem

The proposed discharge of dredged material is not expected to have any significant adverse cumulative effects on the aquatic ecosystem.

The wetlands proposed for dredged material disposal do not contribute much value to the

aquatic ecosystem in their current state as they lie behind flood control dikes, are subject to drainage, and are impacted by current agricultural activities. Proposed enhancement and development of wetlands through implementation of the wildlife mitigation plan, and shallow water, riparian, slough and tidal marsh habitat improvements through restoration, would add cumulative resource value to the lower Columbia River ecosystem.

Other discharges of dredged material associated with the project are not predicted to have significant adverse effects either alone or in combination with other existing or reasonably predicted discharges of dredged or fill material. As discussed above, the cumulative effects of other ongoing and currently authorized activities involving discharges of dredged or fill material (e.g., existing filling and diking, ongoing maintenance dredging, maintenance of the mouth of the Columbia River, operation of the Federal Columbia River power system, and existing development along the Columbia River) are reflected in the current conditions described in the Final and Supplemental IFR/EIS.

While not caused by or connected to channel improvement, some future development of port, marine, and industrial facilities is reasonably foreseeable within the project area. Similarly, continued urban and industrial development in the project area is reasonably foreseeable in response to regional and national economic trends. Future urban, industrial and port development as it is implemented, would likely include some discharge of dredged or fill material which would in turn result in localized impacts to aquatic ecosystems (e.g., wetlands, riparian and shallow water habitat, and water quality).

The NOAA Fisheries and USFWS May 2002 Biological Opinions discuss such potential development and its potential impacts (e.g. increased localized demand for electricity, water and buildable land with indirect effects to water quality; and, the increased need for transportation, communication and other infrastructure;) on listed species, as well as state, local, tribal and private actions to benefit listed species.

Given the large geographic area involved and the uncertainties associated with state, local, tribal and private actions, the precise nature and timing of future development, and its environmental impact, are extremely difficult to predict. However, given the minimal adverse effects to aquatic ecosystems (if any) anticipated for the discharge of dredged materials associated with the entire Columbia River channel improvement project (including the ecosystem restoration features and mitigation measures), the discharges under the proposed project are not anticipated to contribute significantly to any adverse cumulative effects resulting from unrelated development projects. Further, all significant future development, including future discharge of dredged or fill material, will likely be subject to additional independent environmental reviews by state and federal agencies under the NEPA, CWA, ESA, and similar state programs.

Cleanup of the lower Willamette River under the federal Superfund program is also reasonably foreseeable and may directly affect the Columbia River and its aquatic ecosystem. At this time, the remedial investigation and feasibility study have not yet been completed and a cleanup plan has not been selected. Therefore, it is not possible at this time to determine the nature or magnitude of any short-term or long-term impacts of the cleanup action

on the aquatic ecosystem or whether such impacts would be cumulative to any impacts (positive or negative) of the channel improvement project.

Determination of Secondary Effects on the Aquatic Ecosystem

The proposed action would not result in fluctuating river levels. Surface runoff from disposal sites would be negligible as precipitation is expected to readily percolate into the sand. The rehandling (sale) of sand from upland disposal and shoreline disposal sites would not affect the aquatic ecosystem as the activity would occur behind containment dikes and/or above the high tide line. No other secondary effects resulting from the discharge of dredge material are anticipated.

Findings of Compliance (40 CFR § 230.12)

No significant adaptations of the guidelines were made regarding this evaluation.

Alternatives to the proposed action were considered, including the no-action alternative. Upland disposal of all Columbia River dredged material is not practicable from a physical or economic standpoint and would affect substantially more wetlands and wildlife habitat if it were implemented. All alternative disposal actions have been evaluated for engineering and environmental suitability using an array of screening criteria. Avoidance of wetlands, critical (ESA) riparian habitat and habitat important to threatened and endangered species are among the screening criteria considered in the analysis. Any remaining wetlands or riparian areas affected by disposal were considered unavoidable in achieving a practicable disposal plan. A wildlife mitigation plan addressing impacts to agricultural, wetland and riparian habitats has been developed in cooperation with federal and state resource agencies. Ecosystem restoration features were formulated as the result of a series of workshops with federal and state resource agencies and the public, and through the ESA reconsultation process between the Corps, NOAA Fisheries and USFWS, and was based on review of potential alternative actions that would benefit listed ESA species, including salmonid ESUs and Columbian white-tailed deer, and also improve fish and wildlife habitat conditions generally.

Water Quality Standards [40 CFR § 230.10(b)(1)]

The project complies with state water quality standards. The Corps has applied to the States of Oregon and Washington for water quality certifications under Section 401 of the Clean Water Act for all discharges of dredged material into waters of the United States associated with the project. Issuance of these certifications will reflect the states' reasonable assurance of compliance with state water quality standards.

Toxic Effluent Standards [40 CFR § 230.10(b)(2)]

The USEPA has designed 65 substances and compounds as toxic pollutants under section 307 (see 40 CFR § 401.15), but it has adopted effluent standards under this subsection only for manufacturers and formulators of aldrin, dieldrin, DDT, DDD, DDE, endrin, toxaphene, benzidene, and polychlorinated biphenyls (PCBs; see 40 CFR part 129). The disposal of dredged

material associated with this project would not violate toxic effluent standards of Section 307 of the CWA.

ISSUANCE OF PUBLIC NOTICE

Public notice of the Corps' application was released on December 2, 2002. A second, subsequent public notice was issued on April 29, 2003.

Public Hearings

Three public hearings were held on the application, as follows:

Columbia River Maritime Museum
1792 Marine Drive
Astoria, OR 97103

State Office Building
800 NE Oregon Street
Portland, OR 97232

Date: January 6, 2003
Time: 7:30 p.m.

Date: January 7, 2003
Time: 8:00 p.m.

Columbia River Maritime Museum
1792 Marine Drive
Astoria, OR 97103

Date: May 29, 2003
Time: 7:00 p.m.

All three hearings were preceded by a brief informational/question and answer session.

Written Comments

The deadline for acceptance of public written comments was set at 5:00 p.m. on January 15, 2003. Representations were made to extend the public comment period. These requests were based on the fact that the Corps had not released its Final Supplemental EIS, and that the public wanted to be able to view this. DEQ considered this argument but decided not to extend the public comment period, as the project under consideration for this certification is the one contained in the application before DEQ, not the one contained in the Final Supplemental EIS.

DEQ subsequently received a letter from the Corps dated March 28, 2003. In this letter, the Corps requested that DEQ consider additional information in the form of the Final Supplemental Integrated Feasibility Report and Environmental Impact Statement. Because this material arrived after the close of the public comment period, DEQ issued a second public notice extending the previous comment period and opening a new comment period during which the public could provide comments to DEQ on the new material. DEQ decided to extend the comment period from the close of the earlier comment period to enable it to accept late comments that had been received after the close of the previous period.

The second public comment period extended until 5:00 p.m. on June 2, 2003.

APPLICABLE WATER QUALITY REGULATIONS AND DEQ EVALUATIONS

Oregon's water quality regulations are contained in Oregon Administrative Rules (OAR) Chapter 340, Divisions 40 through 53. Division 40 contains the state's groundwater standards. Division 41 entitled "State-Wide Water Quality Management Plan: Beneficial Uses, Policies, Standards, and Treatment Criteria for Oregon" contains the surface water standards, and is the most significant with respect to §401 certification of a proposed project. The requirements and standards set forth in Division 41 were adopted to comply with the surface water quality protection provisions of both state and federal law. The water quality standards in Division 41 are composed of three elements: beneficial uses, water quality criteria, and the antidegradation policy.

Beneficial Uses

Both Oregon Law and the federal Clean Water Act are structured to require that water quality be protected and maintained so that existing and potential beneficial uses of public waters are not impaired or precluded by degraded water quality. The regulatory approach used is to:

1. identify beneficial uses that are recognized as significant with regard to water quality protection;
2. develop and adopt standards of quality for significant water quality parameters to define the quality that is necessary to protect the identified beneficial uses;
3. establish and enforce case-by-case discharge limitations for each source that is permitted to discharge treated wastes into public waters to assure that water quality standards are not violated and beneficial uses are not impaired; and
4. establish and implement "best management practices" for a variety of "land management" activities to minimize their contribution to water quality standards violations or impairment of beneficial uses.

The beneficial uses of surface water for the Columbia River in the reaches subject to the proposed project are contained in Tables 1 (North Coast – Lower Columbia Basin, OAR 340-41-202); and Table 6 (Willamette Basin, OAR 340-41-442). The listed beneficial uses are shown in Table 1.

Table 1: Beneficial Uses for the Columbia River

Use	Mouth-R.M. 86	R.M. 86-120
Public Domestic Water Supply	X	X
Private Domestic Water Supply	X	X
Industrial Water Supply	X	X
Irrigation	X	X
Livestock Watering	X	X
Anadromous Fish Passage	X	X
Salmonid Fish Rearing	X	X
Salmonid Fish Spawning	X	X
Resident Fish and Aquatic Life	X	X
Wildlife and Hunting	X	X
Fishing	X	X
Boating	X	X
Water Contact Recreation	X	X
Aesthetic Quality	X	X
Hydro Power		X
Commercial Navigation & Transportation	X	X

Water Quality Standards

Water quality standards are developed for varying geographic areas to protect beneficial uses. Generally, if a water quality standard fully protects the most sensitive beneficial use, then all beneficial uses are fully protected. Water quality standards have been adopted for water quality parameters that are most significant or useful in regulating pollution. These standards take the form of both numeric limits and narrative criteria and have been established based on best available information at the time they were adopted. Development of standards is a continuing process. As new information becomes available, standards for additional parameters may be added and existing numeric standards or narrative criteria may be revised to better reflect the intent of protection of the identified beneficial uses.

Antidegradation Policy

Oregon's antidegradation policy (OAR 340-41-026) applies to all surface waters. In the case of bodies of water that meet water quality standards, it provides for the maintenance of existing water quality. Specifically, it states that the existing quality of high quality waters (i.e., waters meeting water quality standards) shall be maintained and protected unless the Environmental Quality Commission makes certain rigorous findings of need. For water quality-limited waters, water quality may in no circumstances be lowered; that is, these waters have a nondegradation status.

POTENTIAL MODIFICATION OF SURFACE WATER QUALITY

Biological Criteria

340-41-027 Waters of the State shall be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.

340-41-006 defines "without changes in the resident biological community" as "no loss of ecological integrity when compared to natural conditions at an appropriate reference site or region." "Biological criteria" are defined as "numerical values or narrative expressions that describe the biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use." "Ecological integrity" is defined as "the summation of chemical, physical and biological integrity capable of supporting and maintaining a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of the natural habitat for the region." An "appropriate reference site or region" is further defined as "a site on the same water body, or within the same basin or ecoregion that has similar habitat conditions, and represents the water quality and biological community attainable within the area of concern."

Application of Standard: The biological criteria standard is meant to complement the other parameter-specific criteria in the following manner. The parameter-specific criteria are designed to give full protection to the most sensitive beneficial use, with the implicit assumption that if the most sensitive beneficial use is protected, then all uses will be protected. However, the application of these criteria is very limited in considering multiple stressors and cumulative effects. By contrast, the biological criteria are aimed at gaining the ability to assess total impact to the community in situ. Biological criteria make it possible to evaluate the impact of a source without a need for measuring every possible water quality variable. Thus, the standard is applied as a measure of the impact of a source by comparing the biological integrity (as represented by appropriate expressions) downstream of the source with that at a reference site or region.

Present Condition: There are several salmonid species listed under federal and state endangered species statutes that inhabit the Columbia River. While the factors that have led to their decline are manifold, water quality has played a role. A number of NOAA Fisheries and US Fish and Wildlife Service Biological Opinions cover these species.

Sturgeon is present in areas proposed for dredging and disposal. Presence seems to be greater in summer, lower in winter and at some intermediate level in the spring.

Eulachon (smelt) densities vary by season, but seem to be at their greatest abundance in the spring.

Dungeness crab are present in the river up to river mile 18.

Applicant's Position: Impacts to the aquatic ecosystem associated with discharge of dredged material will occur. Impacts associated with flowlane discharge of dredged material are expected to be minimal since the substrate of the main navigation channel consists primarily of

sand naturally formed into sand waves by river currents. These sand waves are constantly eroding and reforming and do not provide the stable habitat needed for productive benthic communities. Sampling in the channel areas has confirmed their low productivity for benthic invertebrates. Additionally, those portions of the sand waves in the dredging prism are disturbed by annual dredging operations that typically occur from May through September for the navigation channel.

In-water disposal operations consist of flowlane disposal, use of two sumps and three shoreline disposal sites. Flowlane disposal is done in or adjacent to the channel margins typically at depths from 50-65 feet. These areas are generally similar to the channel areas and are not considered very productive for benthic communities. Static benthic communities would be covered and would not likely recover because of the continuous use of the sites. However, populations of these organisms are not considered to be very high because of the dynamic nature of the flowlane habitat.

Mobile organisms present in flowlane disposal areas, such as smelt, sturgeon and crab, are adapted to the dynamic nature of the habitat arising from continuous movement of sand via river currents. They are mobile organisms and generally should be physically capable of avoiding the disposal in most instances. Sturgeon live in the flow lane disposal sites as both adults and juveniles. The behavioral research by the USGS, funded by the Corps, will be used to manage the dredging and disposal operations to minimize impacts to sturgeon populations. Dungeness crabs are located primarily in the lower reaches of the estuary but can occur as far upriver as mile 18 when river flow is low and up river salinity is high. Crabs could be present at the flowlane disposal site at river mile five. Studies have shown that crabs are able to dig out of disposal materials, although some individual crab do not dig out and are smothered. The number of crabs impacted will depend upon how many are in the disposal site, which is dependent upon river and tide conditions. A study to develop a model of crab abundance versus salinity is being developed by Battelle NW Labs for the Portland District. This model will be used to schedule dredging and disposal to avoid periods of high crab abundance to the extent practicable in order to minimize impacts. The applicant estimates incremental impacts to Dungeness crab from initial deepening from 3,000 to 26,000 harvestable crabs, and an impact of between 4,000 to 9,000 harvestable crabs during annual maintenance. This compares with an annual harvest of 5.3 million crabs.

Studies have shown that smelt spawning is not successful in the high-energy areas like those used for flowlane disposal. Larval smelt move up into the water column after hatching, consequently, it is likely that smelt larvae would not be affected by aquatic disposal operations. Based on the above, it is likely that smelt populations would not be affected by flowlane disposal.

Shoreline disposal sites are located in areas that are highly erosive and do not provide much, if any, habitat for benthic communities. Consequently, use of these sites is not expected to have a significant impact on the benthic productivity of the area. Through consultation with the NOAA Fisheries, only three shoreline disposal sites (Sand Island and Miller Sands Spit, Oregon and Skamokawa, Washington) are cleared for disposal operations.

Proposed wildlife mitigation actions would restore wetland functions of high value on approximately 194 acres over the three wildlife mitigation areas. Wetland habitat development would occur in the context of a larger, diverse, natural area, with a substantial riparian forest component, at each mitigation site. Riparian habitat restoration would restore approximately 202 acres of this habitat feature compared to the approximately 50 acres impacted by disposal. Fill activities associated with the Martin Island embayment mitigation site will convert the aquatic ecosystem at the site to intertidal emergent marsh.

Proposed ecosystem restoration features at Lois Island embayment and Miller/Pillar would restore approximately 590 acres of low to moderately productive subtidal habitat to highly productive shallow subtidal and tidal marsh habitat. Tidegate improvements at Burris Creek and inlet structures (interim action) at Tenasillahe Island would improve water quality and salmon habitat in several sloughs within the island complex. Implementation of the long-term feature at Tenasillahe Island, breaching the flood control dikes, would restore approximately 1,778 acres of habitat to tidal influence in the future. Depending on acquisitions, the Shillapoo restoration feature creates waterfowl and wildlife habitat on 470 to 839 acres.

The USFWS and the NOAA Fisheries have both determined that the proposed action, including ecosystem restoration features, is not likely to jeopardize the continued existence of threatened or endangered species under their purview. NOAA Fisheries believes that the most predictable impacts from the proposed action to ESA-listed salmonids and their habitats in the lower Columbia River, estuary, and river mouth are short-term, physical changes during the construction and subsequent maintenance period of the project. Expected impacts to key physical processes will be limited and short-term in nature during construction and maintenance. Further discussions of aquatic impacts are included in the Final IFR/EIS, Supplemental IFR/EIS and Biological Assessments prepared by Portland District for this action and in the biological opinions prepared by the USFWS and NOAA Fisheries.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affect the aquatic ecosystem and organisms are reflected in the current conditions described in the Final and Supplemental IFR/EIS. Future activities, including potential future upland development, are not anticipated to affect the aquatic ecosystem and organisms except in the immediate vicinity of such projects. Further, any such projects that may affect the aquatic ecosystem and organisms are likely to require independent evaluation under the Endangered Species Act and NEPA. While future cleanup of the Willamette River under the federal superfund program could potentially affect the aquatic ecosystem and organisms in a limited downstream area, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup cannot be predicted.

Public Testimony: Sturgeon will be entrained during dredging and will be smothered during disposal. Their prey will be destroyed. Filling of areas greater than 65 feet deep will adversely impact sturgeon habitat

Impacts to Eulachon (smelt) are not well understood. No in-water disposal should take place during the peak eulachon outmigration downstream from spawning areas.

There are no in-water work windows proposed to protect beneficial uses.

No dredging of channel side slopes should occur while salmon are migrating.

The project will result in discharges that will result in habitat degradation

DEQ Evaluation: Issuance of a biological opinion by NOAA Fisheries has evaluated the project for its impacts on species listed under the Endangered Species Act. That biological opinion contains provisions which, if implemented will be protective of the listed species.

Species other than those listed inhabit the lower Columbia River. These include sturgeon, lamprey, smelt (eulachon) and crabs. Studies have shown minimal entrainment of sturgeon during dredging. Smelt are more susceptible, though little data exists on entrainment rates. Pacific lamprey is another species upon which little data exists on entrainment rates.

Other than dredging, the other major impact occurs with sediment disposal. Again, NOAA Fisheries has evaluated this relative to species listed under the Endangered Species Act. Disposal of sediments in depths between 35 and 65 feet is not expected to have a significant impact on aquatic resources. Benthic communities will not have their over all productivity affected, as it is already generally low in the deeper channel areas. During disposal, only a few inches of sediment will deposit on the bottom. Most fish will avoid and/or recover from this.

Disposal in areas of greater than 65 feet of depth may impact white sturgeon. As with the shallower water disposal, only a few inches of sediment will deposit on the bottom, and sturgeon can easily avoid this. There may be some young-of-year juvenile sturgeon which will be unable to avoid this. Habitat will still be usable by sturgeon after disposal.

Flowlane disposal impacts on lampreys are unknown, since their distribution in the lower river is not well documented. If they are near the bottom, they can likely avoid sediment disposal.

The likelihood of invasive species introductions from ballast water, and organisms adhering to vessels is not greater than at present as a result of this project. There are likely to be fewer, but larger vessels transiting the navigation channel, which may reduce the risk of introductions.

DEQ Finding: In order to protect migrating juvenile salmonid smolts in-water work windows should be adhered to. Because juveniles migrate high in the water column, or at the edges of the river, in-water work period are not as critical within the existing navigation channel itself. However, for those areas outside the channel, the agreed fishery in-water work windows should be followed.

Disposal of dredged spoils in deeper areas of the river may destroy sturgeon habitat. Disposal in areas of the river of greater than 65 feet in depth should not be undertaken.

Flowlane disposal of sediments below eulachon (smelt) spawning areas in the peak of the migration season should not be undertaken.

Nuisance Phytoplankton Growth

340-41-150 The following values and implementation program shall be applied to lakes, reservoirs, estuaries and streams, except for ponds and reservoir less than 10 acres in surface area, marshes and saline lakes:

- (1) The following average Chlorophyll *a* values shall be used to identify waterbodies where phytoplankton may impair the recognized beneficial uses:
 - (a) Natural lakes which thermally stratify: 10 µg/l
 - (b) Natural lakes which do not thermally stratify, reservoirs, rivers and estuaries: 15 µg/L
- (2) Average Chlorophyll *a* values shall be based on the following methodology (or other methods approved by DEQ): a minimum of three (3) samples collected over any three consecutive months at a minimum of one representative location (e.g., above the deepest point of a lake or reservoir or at a point mid-flow of a river) from samples integrated from the surface to a depth equal to twice the secchi depth or the bottom (the lesser of the two depths); analytical and quality assurance methods shall be in accordance with the most recent edition of *Standard Methods for the Examination of Water and Wastewater*.
- (3) Upon determination by DEQ that the values in OAR 340-41-150(1) are exceeded, DEQ shall:
 - (a) In accordance with a schedule approved by the Commission, conduct such studies as are necessary to describe present water quality; determine the impacts on beneficial uses; determine the probable causes of the exceedance and beneficial use impact; and develop a proposed control strategy for attaining compliance where technically and economically practicable. Proposed strategies could include standards for additional pollutant parameters, pollutant discharge load limitations, and other such provisions as may be appropriate.

Where natural conditions are responsible for exceedance of the values in OAR 340-41-150(1) or beneficial uses are not impaired, the values in OAR 340-41-150(1) may be modified to an appropriate value for that water body;
 - (b) Conduct necessary public hearings preliminary to adoption of a control strategy, standards or modified values after obtaining Commission authorization;
 - (c) Implement the strategy upon adoption by the Commission;

- (4) In cases where waters exceed the values in OAR 340-41-150(1) and the necessary studies are not completed, DEQ may approve new activities (which require DEQ approval), new or additional (above the current approved permit limits) discharge loadings from point sources provided that it is determined that beneficial uses would not be significantly impaired by the new activity or discharge.

Application of Standard: Certain types of wastes in water, under proper ambient conditions, may stimulate nuisance algal growths. The magnitude of such growths is determined by measuring chlorophyll a, a photosynthetic pigment which is very closely correlated to biomass. OAR 340-41-150 sets forth a process for determining when phytoplankton growths may be reaching nuisance proportions. This rule is designed to trigger further study and control strategies if the chlorophyll a values exceed specified levels in streams or lakes. Where natural conditions are responsible for the algal blooms, the existing level of chlorophyll a is considered to be the upper level of acceptability.

Present Condition: There is no monitoring data on nuisance phytoplankton growth in the lower Columbia River.

Applicant's Position: The applicant did not provide data,, nor an evaluation of the project on nuisance phytoplankton growth.

Public Testimony: No public testimony was offered on this criterion.

DEQ Evaluation: The potential for nuisance phytoplankton growth arising from this project is not apparent.

DEQ Finding: No violation of the standard for nuisance phytoplankton growth will arise from this project.

Dissolved Oxygen

340-41-0205/340-41-0445 (2) No wastes shall be discharged and no activities shall be conducted which either alone or in combination with other wastes or activities will cause violation of the following standards in the waters of the North Coast -- Lower Columbia River Basin:

- (a) Dissolved oxygen (DO): The changes adopted by the Commission on January 11, 1996, become effective July 1, 1996. Until that time, the requirements of this rule that were in effect on January 10, 1996, apply:
 - (A) For waterbodies identified by DEQ as providing salmonid spawning, during the periods from spawning until fry emergence from the gravels, the following criteria apply:
 - (i) The dissolved oxygen shall not be less than 11.0 mg/l. However, if the minimum intergravel dissolved oxygen, measured as a spatial median, is 8.0 mg/l or greater, then the DO criterion is 9.0 mg/l;
 - (ii) Where conditions of barometric pressure, altitude, and temperature preclude attainment of the 11.0 mg/l or 9.0 mg/l criteria, dissolved oxygen levels shall not be less than 95 percent of saturation.
 - (B) For waterbodies identified by DEQ as providing salmonid spawning during the period from spawning until fry emergence from the gravels, the spatial median intergravel dissolved oxygen concentration shall not fall below 6.0 mg/l;
 - (C) A spatial median of 8.0 mg/l intergravel dissolved oxygen level shall be used to identify areas where the recognized beneficial use of salmonid spawning, egg incubation and fry emergence from the egg and from the gravels may be impaired and therefore require action by DEQ. Upon determination that the spatial median intergravel dissolved oxygen concentration is below 8.0 mg/l, DEQ may, in accordance with priorities established by DEQ for evaluating water quality impaired waterbodies, determine whether to list the waterbody as water quality limited under the Section 303(d) of the Clean Water Act, initiate pollution control strategies as warranted, and where needed cooperate with appropriate designated management agencies to evaluate and implement necessary best management practices for nonpoint source pollution control;
 - (D) For waterbodies identified by DEQ as providing cold-water aquatic life, the dissolved oxygen shall not be less than 8.0 mg/l as an absolute minimum. Where conditions of barometric pressure, altitude, and temperature preclude attainment of the 8.0 mg/l, dissolved oxygen shall not be less than 90 percent of saturation. At the discretion of DEQ, when

DEQ determines that adequate information exists, the dissolved oxygen shall not fall below 8.0 mg/l as a 30-day mean minimum, 6.5 mg/l as a seven-day minimum mean, and shall not fall below 6.0 mg/l as an absolute minimum (Table 21);

- (E) For waterbodies identified by DEQ as providing cool-water aquatic life, the dissolved oxygen shall not be less than 6.5 mg/l as an absolute minimum. At the discretion of DEQ, when DEQ determines that adequate information exists, the dissolved oxygen shall not fall below 6.5 mg/l as a 30-day mean minimum, 5.0 mg/l as a seven-day minimum mean, and shall not fall below 4.0 mg/l as an absolute minimum (Table 21);
- (F) For waterbodies identified by DEQ as providing warm-water aquatic life, the dissolved oxygen shall not be less than 5.5 mg/l as an absolute minimum. At the discretion of DEQ, when DEQ determines that adequate information exists, the dissolved oxygen shall not fall below 5.5 mg/l as a 30-day mean minimum, and shall not fall below 4.0 mg/l as an absolute minimum (Table 21);
- (G) *For estuarine water, the dissolved oxygen concentrations shall not be less than 6.5 mg/l (for coastal waterbodies);
- (H) *For marine waters, no measurable reduction in dissolved oxygen concentration shall be allowed.

* Applies to the North Coast – Lower Columbia sub-basin only.

Application of Standard: Dissolved oxygen is essential for maintaining aquatic life. Historically, the depletion of dissolved oxygen was one of the most frequent water pollution problems. Its effect on aquatic organisms, especially at low concentrations, has been studied extensively. Sensitivity to low dissolved oxygen concentrations differs between species, between various life stages (egg, larvae, and adults), and between different life processes (feeding, growth, and reproduction).

Present Condition: The water quality standard for dissolved oxygen for the lower Columbia River is for cold-water aquatic life. Monitoring data held in Storet disclose dissolved oxygen concentrations ranging between 9.0 mg/l and 15.8 mg/l.

Applicant's Position: Dredging has the potential to cause short-term localized decreases in dissolved oxygen in confined areas of fine-grained organic rich sediments. The potential for such impacts from the proposed project is negligible due to the location and nature of the material to be dredged. Specifically, dredging will predominantly occur in the open channel where the sediments are low in organic material. Water quality effects for the channel improvement project would be similar to what is encountered during maintenance of the current 40-foot channel. It is not anticipated that construction or maintenance of the project would contribute to dissolved

oxygen concentration reductions that exceed the applicable water quality criterion (Corps, 2003, 6-18).

Public Testimony: As organic matter is disturbed, dissolved oxygen levels will decrease.

The Miller-Pillar and Lois Island ecosystem restoration sites and the temporary sump adjacent to Lois Island will fail to meet the dissolved oxygen criteria.

Dissolved oxygen reductions should be allowed at no greater level than 0.1 mg/l. There is no data to support that the project will be able to meet this.

DEQ Evaluation: DEQ concurs with the applicant that dredging and disposal will result in short-term, highly localized reductions in the quantity of dissolved oxygen in those areas in which finer grained sediment and organics may be present. This is not the nature of the sediments in the current navigation channel itself. For areas outside the navigation channel, there is insufficient data.

DEQ Finding: The Columbia River has more than sufficient flow to attenuate small reductions in dissolved oxygen levels. DEQ does not believe this will be a problem in the main navigation channel. However, due to lack of characterization of sediments on the side slopes of the channel, and areas outside the channel, dissolved oxygen should be monitored, and activity modified, or stopped, if dissolved oxygen levels fall below the criteria.

Temperature

340-41-0205/340-41-0445 (b) Temperature: The changes adopted by the Commission on January 11, 1996, become effective July 1, 1996. Until that time, the requirements of this rule that were in effect on January 10, 1996, apply. The method for measuring the numeric temperature criteria specified in this rule is defined in OAR 340-041-0006(54):

- (A) To accomplish the goals identified in OAR 340-041-0120(11), unless specifically allowed under a Department-approved surface water temperature management plan as required under OAR 340-041-0026(3)(a)(D), no measurable surface water temperature increase resulting from anthropogenic activities is allowed:
 - (i) In a basin for which salmonid fish rearing is a designated beneficial use, and in which surface water temperatures exceed 64.0°F (17.8°C);
 - (ii) In the Columbia River or its associated sloughs and channels from the mouth to river mile 309 when surface water temperatures exceed 68.0°F (20.0°C);
 - (iii) In waters and periods of the year determined by DEQ to support native salmonid spawning, egg incubation, and fry emergence from the egg and from the gravels in a basin which exceeds 55.0°F (12.8°C);
 - (iv) In waters determined by DEQ to support or to be necessary to maintain the viability of native Oregon bull trout, when surface water temperatures exceed 50.0°F (10.0°C);
 - (v) In waters determined by DEQ to be ecologically significant cold-water refugia;
 - (vi) In stream segments containing federally listed Threatened and Endangered species if the increase would impair the biological integrity of the Threatened and Endangered population;
 - (vii) In Oregon waters when the dissolved oxygen (DO) levels are within 0.5 mg/l or 10 percent saturation of the water column or intergravel DO criterion for a given stream reach or subbasin;
 - (viii) In natural lakes.
- (B) An exceedance of the numeric criteria identified in subparagraphs (A)(i) through (iv) of this subsection will not be deemed a temperature standard violation if it occurs when the air temperature during the warmest seven-day period of the year exceeds the 90th percentile of the seven-day average daily maximum air temperature calculated in a yearly series over the historic record. However, during such periods, the anthropogenic sources must still continue to comply with their surface water temperature management plans developed under OAR 340-041-0026(3)(a)(D);

- (C) Any source may petition the Commission for an exception to subparagraphs (A)(i) through (viii) of this subsection for discharge above the identified criteria if:
- (i) The source provides the necessary scientific information to describe how the designated beneficial uses would not be adversely impacted; or
 - (ii) A source is implementing all reasonable management practices or measures; its activity will not significantly affect the beneficial uses; and the environmental cost of treating the parameter to the level necessary to assure full protection would outweigh the risk to the resource.
- (D) Marine and estuarine waters: No significant increase above natural background temperatures shall be allowed, and water temperatures shall not be altered to a degree which creates or can reasonably be expected to create an adverse effect on fish or other aquatic life.

Application of Standard: Oregon's water temperature standard for the Columbia River was adopted by the Environmental Quality Commission (EQC) based on research regarding effects of water temperature on salmonid productivity, modeling temperature effects of various activities, and identification of sensitive habitats.

Water quality criteria produced by national fishery experts, and provided by the federal Water Pollution Control Administration, recommended a maximum not-to-be exceeded temperature of 68°F. for salmonid growth and migration routes and 55°F. for salmonid spawning and egg development waters. Because of the number of trout and salmon waters that had been destroyed or made marginal or non-productive nationwide, it was further recommended that the remaining trout and salmon waters be protected. "Inland trout streams and headwaters of salmon streams should not be warmed."

As temperatures increase above the optimal range, spawning and egg development becomes rapidly impaired, thus limiting reproduction. With increasing temperature, trout experience sublethal effects of impaired feeding, decreased growth rates, reduced resistance to disease and parasites, increased sensitivity to toxics, intolerance with migration, reduced ability to compete with more temperature resistant species, and increased vulnerability to predation. If temperatures are high enough for sustained periods, mortality occurs. In addition, other water quality parameters (such as dissolved oxygen) may also be adversely affected by elevated temperatures. Based on the available information, the temperature standard was established with the primary intent of protecting the resident trout populations. It was recognized that natural temperatures may exceed the desirable upper limit for protection of trout -- established in the standard as 68°F. However, the determination made in the adoption of the standard was that when temperatures are above the 68°F. optimum established as the upper limit in the standard, discharges of waste or activities which cause a measurable increase should not be allowed.

At the time the temperature standard was adopted, the water pollution control program in Oregon arguably focused on point source discharges. As a result, the temperature standard was worded

to apply to point source discharges of heated wastewater. The reference to "mixing zone", "a control point immediately upstream from a discharge", and "single source discharge" all apply to point source discharges. However, the initial wording of the standard in OAR 340-41-basin(2) which reads "No wastes shall be discharged and no *activities* shall be conducted which either alone or in combination with other wastes or *activities* will cause violation....." (*emphasis added*) clearly implies an intent to have broader application than just to point source discharges.

DEQ has traditionally applied the temperature standard to activities that cause a change in temperature as well as to discharges that cause a change in temperature. The intent is to protect the fishery values that the standard was adopted to protect. Thus, if natural temperatures are above 68°F., a point source discharge will not be approved if it will cause a measurable increase in temperature outside of a limited size "mixing zone" which is established in the waste discharge permit for the source. (The mixing zone size and shape is established to assure that beneficial uses are not impaired, including fishery uses.) Similarly, an activity or project that does not result in a discharge of waste but would cause a measurable increase in the temperature of the stream compared to the temperature that would exist without the activity or project would not be approved.

Another consideration in applying the existing temperature standard is a determination of what is measurable in terms of a temperature increase. The wording of the standard itself implies that something less than 0.5°F. is measurable. Since temperature in water naturally varies due to influence of sunlight and air temperatures, effective measurement of temperature changes in the stream can be difficult. Evaluation of temperature impacts of proposed discharges or activities generally is done using a variety of modeling techniques. In interpreting model results, DEQ has typically assumed that a calculated temperature increase of less than 0.25°F would not be measurable in the stream.

Present Condition: The Columbia River mainstem is listed on the 303(d) list as water quality limited for temperature from the mouth to Bonneville Dam. The listings pertain to the summer months. Modeling work on a temperature TMDL for the mainstem Columbia River and the Snake River from its mouth at the Columbia to its confluence with the Salmon River discloses that the major impacts to temperature occur as a result of impoundments behind dams, and with the confluence of the Snake River. For the numerous point sources along the river, their impact is de minimus. Only a very few of the largest dischargers have any effect on the river.

Applicant's Position: The current temperature regime in the river is captured in the evaluation of existing conditions. Temperature changes could occur within the river and estuary for a number of reasons, including salinity changes, depth changes, and velocity changes. Modeling results reviewed by NOAA Fisheries and USFWS indicate that these potential factors for changing temperature conditions are not significantly altered by the proposed project activities. Therefore, no impact to salmonids is anticipated due to temperature change.

Hydraulic analyses have predicted no change in water surface elevations downstream of CRM 80 and only very slight (0.0-0.2 feet) upstream of CRM 80. The impact on summer water temperatures, if any, for such a small change in elevation of the river is not expected to be

measurable. The potential for temperature change, if any, was considered during the SEI expert panel ESA review and is included in the BA.

There is no evidence the proposed action will increase river stratification. There is very little stratification in the river now. Thermistor strings deployed in the forebays of the three lower Columbia River dams show that stratification is a temporary event that occurs during extended runs of hot weather, and then the stratification only extends a few feet below the surface and lasts for only a few days. These are deep sites so we can expect even less stratification to occur in the shallower water between Bonneville and the estuary. In the estuary, the salinity intrusion modeling results did not indicate any alteration of existing stratification patterns.

Public Testimony: The project will result in an increase in surface water temperatures at low flows.

Increased turbidity as a result of the project will absorb more solar radiation, increasing temperatures.

Dredged spoils placed in areas of the river greater than 65 feet in depth will result in loss of depth, and therefore loss of cooling.

The deeper channel could cool water in the estuary, and this may not be good for salmon.

The creation of shallow water habitat by the ecosystem restoration projects may result in an increase in water temperatures. This will harm salmon directly and may encourage the presence of warm water predators.

DEQ Evaluation: Given the very high flows, even at low flow times, in the river, this project will neither contribute to, nor detract from the temperature regime in the river. Temperature standard exceedances on the river are produced by very large contributors such as dam forebays and the Snake River. This project is miniscule compared to these.

DEQ Finding: No violation of the numeric or narrative criteria for temperature is expected.

Turbidity

340-41-0205/340-41-0445 (c) Turbidity (Nephelometric Turbidity Units, NTU): No more than a ten percent cumulative increase in natural stream turbidities shall be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity. However, limited duration activities necessary to address an emergency or to accommodate essential dredging, construction or other legitimate activities and which cause the standard to be exceeded may be authorized provided all practicable turbidity control techniques have been applied and one of the following has been granted:

- (A) Emergency activities: Approval coordinated by DEQ with DEQ of Fish and Wildlife under conditions they may prescribe to accommodate response to emergencies or to protect public health and welfare;
- (B) Dredging, Construction or other Legitimate Activities: Permit or certification authorized under terms of Section 401 or 404 (Permits and Licenses, Federal Water Pollution Control Act) or OAR 141-085-0100 et seq. (Removal and Fill Permits, Division of State Lands), with limitations and conditions governing the activity set forth in the permit or certificate.

Application of Standard: Turbidity in water results from particulate matter being held in suspension. The standard is designed to minimize the addition of soil particles or any other suspended substances that would cause significant increases in the river's normal, seasonal turbidity pattern.

Present Condition: A review of Storet data for the past two years discloses the following turbidity levels. The sampling station is located at river mile 102.5 on the Columbia River.

Table 2: Columbia River Turbidity 1998-1999

Sampling Date	Turbidity (NTUs)
Oct-13-1997	7
Jan-27-1998	5
Apr-14-1998	-
Jun-2-1998	26
Aug-24-1998	4.5
Oct-5-1998	3
Dec-15-1998	4
Feb-2-1999	10
Apr-22-1999	9
Jul-7-1999	12
Aug-31-1999	3
Oct-13-1999	3

Applicant's Position: Dredging of fine-grained organic rich sediments could result in limited short-term elevations of chemicals and possible decrease in dissolved oxygen in the immediate area of the dredging and disposal sites. However, Columbia River navigation channel sediments are predominately medium to coarse grain sand with less than 1% silt or clay and thus differ significantly from the discussion in this paragraph regarding fine-grained, organic rich sediments. Short-term turbidity increases (cloudiness of the water caused by suspended particles) would also be expected from inwater disposal actions. Turbidity measurements were conducted at a beach nourishment site and at an in-water (flowlane) disposal site in the Columbia River. Additional monitoring was conducted at Morgan's Bar during placement of material dredged from the Willamette River. Most material was found to settle rapidly to the bottom with minimum suspension of sediment. This also was true for the fine-grained material from the Willamette River placed at Morgan's Bar.

Background turbidity levels upstream of the disposal site prior to disposal were measured at 3.55, 3.28 and 3.10 NTUs (nephelometric turbidity unit, a unit of measure for turbidity levels in water). Many readings were subsequently measured below this level during disposal site turbidity monitoring. A minimum turbidity reading of 1.82 NTU was recorded while a maximum of 14.38 NTU was recorded. A reading of 12.38 NTU was recorded from water noted to be discolored washing around the front of the open scow while the disposal scow turned to return after disposal. The scow had not yet closed the hopper. This was the only station where water was visibly discolored on the surface. The area affected was minimal and the effect transitory. No other significant discoloration was noted on the surface during or after discharge of the dredged material.

Turbidity induced by dredging and dredged material discharge in the Columbia River appears to be limited and transitory in nature. This is attributable to the coarseness of the dredged material and the lack of fines present. Compared to natural fluctuations in suspended sediment levels, dredging-induced turbidity would be a minor constituent to the Columbia River system.

Public Testimony: The turbidity standard will be exceeded during flowlane disposal, use of the sump adjacent to Lois Island, during discharge at Lois Island, the Miller-Pillar restoration project, and at Martin Island.

Of the increased turbidity produced by dredging, some sediments will settle out, but others will remain in suspension due to particle size.

During upland disposal, return water contains silt. This will remain near the shore in a plume where migrating salmon prefer to be.

Dredging may decrease natural turbidity as sediments sink into the channel.

Turbidity will bring up heavy metals from the bottom.

DEQ Evaluation: Naturally occurring turbidity levels in the river are highly variable, rising to high levels during high flow events. Contributions to turbidity from dredging will be negligible

compared to natural variations. The incidence of fine sediments in the navigation channel is very low. Sediments suspended during dredging will, therefore, settle out quickly. Such contributions as there will be are covered under the short-term exception criteria in the standard.

Nonetheless, areas outside the 600-foot navigation channel that have not been extensively characterized are suspected to contain greater quantities of fine-grained material, that may contribute to elevated turbidity.

DEQ Finding: No exceedances of the turbidity standard are expected in the navigation channel during dredging. In order to ensure that the turbidity criteria are not violated within the channel, and especially in areas outside the channel, turbidity measurements are to be made and documented. If turbidity levels exceed the ten percent standard 100 feet below dredging or flowlane disposal, the activity must be modified or halted until turbidity returns to within the ten percent standard.

A definition of "limited duration," as applied here is the measurement point 100 feet downstream from dredging or disposal activity.

pH (Hydrogen Ion Concentration)

340-41-0205/340-41-0445 (d) pH (hydrogen ion concentration): pH values shall not fall outside the following ranges:

- (A) Marine waters: 7.0 - 8.5;
- (B) Estuarine and fresh waters: 6.5 - 8.5. The following exception applies:
Waters impounded by dams existing on January 1, 1996, which have pHs that exceed the criteria shall not be considered in violation of the standard if DEQ determines that the exceedance would not occur without the impoundment and that all practicable measures have been taken to bring the pH in the impounded waters into compliance with the criteria.
- (C) * Cascade lakes above 3,000 feet altitude: pH values shall not fall outside the range of 6.0 to 8.5.

* Applies only to the Willamette Basin

Application of Standard: pH values relate to the balance of acid and alkaline substances in the water. The theoretical range is from 1 (very acid) to 14 (very alkaline). Most streams in Oregon have pH values falling somewhere between 6.5 and 8.5. There may be seasonal fluctuations in the pH number due to substances entering the water from land or bio-chemical activity in the water. Since the fish and other aquatic life in any particular stream have evolved under rather specific pH conditions, it is important to set a pH standard that reflects natural conditions and will prevent any intolerable acid/alkalinity imbalances.

Present Condition: Monitoring on the river shows that the river meets the hydrogen ion concentration criteria.

Applicant's Position: The proposed project will have little impact on the chemical, physical and biological properties of the lower Columbia River because the proposed action involves dredging primarily clean sand from the navigation channel. There have been numerous physical and chemical tests of the riverbed material that indicate it is clean sand (see sediment quality comments). The project will neither add to nor decrease the contribution of pH to the river. Therefore, there should be no reasonable potential to violate the pH water quality standard.

Public Testimony: No public testimony was received for this criterion.

DEQ Evaluation: The project will not contribute to hydrogen ion concentrations.

DEQ Finding: No violation of this standard is expected as a result of this project.

Bacteria**340-41-0205/340-41-0445** (e) Bacteria standards:

- (A) **Numeric Criteria:** Organisms of the coliform group commonly associated with fecal sources (MPN or equivalent membrane filtration using a representative number of samples) shall not exceed the criteria described in subparagraphs (i) and (ii) of this paragraph:
- (i) **Freshwaters and Estuarine Waters Other than Shellfish Growing Waters:**
 - (I) A 30-day log mean of 126 *E. coli* organisms per 100 ml, based on a minimum of five (5) samples;
 - (II) No single sample shall exceed 406 *E. coli* organisms per 100 ml.
 - (ii) **Marine Waters and Estuarine Shellfish Growing Waters:** A fecal coliform median concentration of 14 organisms per 100 milliliters, with not more than ten percent of the samples exceeding 43 organisms per 100 ml.
- (B) **Raw Sewage Prohibition:** No sewage shall be discharged into or in any other manner be allowed to enter the waters of the State unless such sewage has been treated in a manner approved by DEQ or otherwise allowed by these rules;
- (C) **Animal Waste:** Runoff contaminated with domesticated animal wastes shall be minimized and treated to the maximum extent practicable before it is allowed to enter waters of the State;
- (D) **Effluent Limitations and Water Quality Limited Waterbodies:** Effluent limitations to implement the criteria in this rule are found in OAR 340-041-0120(12) through (16). Implementation of the criteria in this rule in water quality limited waterbodies is described in OAR 340-041-0026(3)(a)(I) and OAR 340-041-0120(17).

Application of Standard: This is a stream standard of public health significance which takes into account the cumulative impacts of all coliform bacteria discharges; however, its major emphasis is on the control of human fecal coliform bacteria sources.

Present Condition: Bacteria discharges to the Columbia River occur at Portland and Astoria as a result of municipal wastewater discharges. Both of these sources are under agreed Orders from DEQ.

Applicant's Position: The applicant does not see the project contributing to bacteria.

Public Testimony: No public testimony was received for this parameter.

DEQ Evaluation: The project will not involve the discharge of bacteria.

DEQ Finding: No violation of this water quality standard is expected.

Bacterial Pollution

340-41-0205/340-41-0445 (f) Bacterial pollution or other conditions deleterious to waters used for domestic purposes, livestock watering, irrigation, bathing, or shellfish propagation, or otherwise injurious to public health shall not be allowed;

Application of Standard: This standard is designed to allow the regulation of bacterial sources other than coliform organisms that may be a public health hazard.

Present Condition: There is no data on this condition. There is, however, nothing to indicate that it is a problem.

Applicant's Position: The applicant provided no information on bacterial pollution.

Public Testimony: No public testimony was received related to this criterion.

DEQ Evaluation: No bacteria will be produced as a result either of dredging or of sediment disposal.

DEQ Finding: No violation of this water quality standard is expected.

Dissolved Gasses

340-41-0205/340-41-0445 (g) The liberation of dissolved gases, such as carbon dioxide, hydrogen sulfide, or other gases, in sufficient quantities to cause objectionable odors or to be deleterious to fish or other aquatic life, navigation, recreation, or other reasonable uses made of such waters shall not be allowed;

Application of Standard: This rule refers to noxious gases that sometimes result from putrescible substances in the water. Such substances may be from discharged wastes or they may be from accumulations of naturally occurring organic debris settled in stream or reservoir bottoms. Such gases have two primary adverse properties when in excess concentrations: (1) some can be directly toxic to aquatic life, and (2) others consume dissolved oxygen which may lead to indirect mortalities. Also, some decomposition gases stink, especially hydrogen sulfide.

Present Condition: There is no data on this condition. There is, however, nothing to indicate that it is a problem.

Applicant's Position: The applicant provided no information relating to this standard.

Public Testimony: No public testimony was received relating to this parameter.

DEQ Evaluation: Neither dredging nor sediment disposal is expected to cause, or contribute to the liberation of dissolved gases in water.

DEQ Finding: No violation of this water quality standard is expected.

Fungi or Other Growths

340-41-0205/340-41-0445 (h) The development of fungi or other growths having a deleterious effect on stream bottoms, fish or other aquatic life, or which are injurious to health, recreation, or industry shall not be allowed;

Application of Standard: The discharge of certain nutrient laden wastes may stimulate deleterious growths of fungi, bacterial slime, sulfur bacteria, stalked diatoms, or nuisance levels of algae in receiving streams. Likewise, the slowing of a riverine system to a lake-like reservoir may encourage troublesome accumulations of dead algae and rotting aquatic weeds. The standard was developed to allow preventive regulation of discharges and activities that result in objectionable or deleterious growths.

Present Condition: There is no data on this condition. There is, however, nothing to indicate that it is a problem.

Applicant's Position: The applicant provided no information relating to this standard.

Public Testimony: No public testimony was received relating to this criterion.

DEQ Evaluation: Neither dredging nor sediment disposal is expected to cause, or contribute to fungal or other growths.

DEQ Finding: No violation of this water quality standard is expected.

Deleterious Tastes, Odors or Toxics

340-41-0205/340-41-0445 (i) The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish shall not be allowed;

Application of Standard: This standard is self-explanatory in its purpose to prohibit the discharge of substances or creation of conditions that would be toxic to aquatic life, or impart unnatural tastes and odors to water to fish flesh.

Present Condition: There is no data on this condition. There is, however, nothing to indicate that it is a problem.

Applicant's Position: The applicant provided no information relating to this standard.

Public Testimony: No public testimony was received relating to this criterion.

DEQ Evaluation: Neither dredging nor sediment disposal is expected to cause, or contribute to deleterious tastes, odors or toxics. On the issue of toxics, see the discussion under the Toxics standard.

DEQ Finding: No violation of this water quality standard is expected.

Bottom Sludge or Deposits

340-41-0205/340-41-0445 j) The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry shall not be allowed;

Application of Standard: Bottom or sludge deposits may have several adverse impacts:

- (1) toxicity;
- (2) blanketing and smothering bottom dwelling aquatic life;
- (3) decimation of fish food organisms; and/or
- (4) hindering the percolation of oxygen bearing water to buried fish eggs.

Present Condition: There is no data on this condition. There is, however, nothing to indicate that it is a problem.

Applicant's Position: The applicant notes that the channel of the Columbia River is quite dynamic, being characterized by long-period sand waves that migrate downstream as sand is transported by the river flow. This contrasts with the habitats at the margins of the river that are characterized by higher deposition areas and finer substrate.

In-water disposal is the placement of material back into the river. In the Columbia River the most common practice is flowlane disposal. Flowlane disposal is in-water disposal within or adjacent to the navigation channel. For the 40-ft channel, flowlane disposal sites may be at depths between 35 and 65 feet deep, but are typically greater than 50 feet deep and downstream of the dredging site. Occasionally disposal depths exceed 65 feet, but only in previously agreed upon locations. Flowlane disposal is distributed along the riverbed to avoid creating mounds. These flowlane disposal practices minimize the amount of material that can return to the dredging area and also minimize the disruption to the natural downstream movement of sand.

Public Testimony: This standard will be violated during dredging and flowlane disposal. Sediments will deposit in slower moving, shallow, depositional areas. Sediments will build up in deeper sturgeon habitat areas.

DEQ Evaluation: This project can be expected to result in suspension, redeposit and redistribution of bottom sediments. The project has the potential to create accretions of sediment on the bottom of the river and in slower moving depositional areas.

DEQ Finding: Application of best management practices for both dredging and disposal will be required to meet this standard.

No flowlane disposal should occur in areas of the river that are greater than 65 feet in depth.

Flowlane disposal should occur in such a way as to ensure that sediments redeposit in a thin layer on the bottom of the river.

Objectionable Discoloration

340-41-0205/340-41-0445 (k) Objectionable discoloration, scum, oily sleek, or floating solids, or coating of aquatic life with oil films shall not be allowed;

Application of Standard: A considerable number of industrial and domestic wastes have one or more of the water polluting properties identified in the standard. Their impact on water quality may range from simple annoyance to humans and aquatic life to mortality of fish and aquatic life. The control and clean-up of oil spills is also regulated under OAR 340-47-005/025.

Present Condition: There is no data on this condition. There is, however, nothing to indicate that it is a problem.

Applicant's Position: The applicant provided no information relating to this standard.

Public Testimony: No public testimony was received on this parameter

DEQ Evaluation: Neither dredging nor sediment disposal is expected to cause, or contribute to objectionable discoloration of the water. There is always the risk of accidental spills into waters of the State, although with reasonable care these can be avoided. The Oregon Emergency Response System should be notified immediately if any spill occurs.

DEQ Finding: No violation of this water quality standard is expected. The applicant should contact the Oregon Emergency Response System in the event of any spills into waters of the State.

Aesthetic Conditions

340-41-0205/340-41-0445 (l) Aesthetic conditions offensive to the human senses of sight, taste, smell, or touch shall not be allowed;

Application of Standard: Waters of the state should not be made aesthetically offensive to the human senses by the addition of wastes or other adverse manipulation of natural water quality conditions.

Present Condition: There is no data on this condition. There is, however, nothing to indicate that it is a problem.

Applicant's Position: The applicant provided no information relating to this standard.

Public Testimony: No public testimony was received relating to this parameter.

DEQ Evaluation: Dredging and disposal may cause short lived and highly localized turbidity within the bounds of the turbidity standard. However, no aesthetically offensive condition will result from this project.

DEQ Finding: No violation of this water quality standard is expected.

Radioisotope Concentrations

340-41-0205/340-41-0445 (m) Radioisotope concentrations shall not exceed maximum permissible concentrations (MPC's) in drinking water, edible fishes or shellfishes, wildlife, irrigated crops, livestock and dairy products, or pose an external radiation hazard;

Application of Standard: Radioisotopes, by virtue of their ionizing radiation, are harmful to life. There is no accepted safe dosage of radioactivity: all exposure carries risk. The purpose of the standard is to limit their concentration in waters of the state to levels deemed reasonably safe by national and international authorities.

Present Condition: There is no data on this condition.

Applicant's Position: The applicant provided no information relating to this standard.

Public Testimony: No public testimony was received on this parameter.

DEQ Evaluation: Dredging and disposal will not contribute radio nuclides.

DEQ Finding: No violation of this water quality standard is expected.

Total Dissolved Gas

340-41-0205/340-41-0445(n)

- (A) The concentration of total dissolved gas relative to atmospheric pressure at the point of sample collection shall not exceed 110 percent of saturation, except when stream flow exceeds the ten-year, seven-day average flood. However, for Hatchery receiving waters and waters of less than two feet in depth, the concentration of total dissolved gas relative to atmospheric pressure at the point of sample collection shall not exceed 105 percent of saturation;
- (B) The Commission may modify the total dissolved gas criteria in the Columbia River for the purpose of allowing increased spill for salmonid migration. The Commission must find that:
 - (i) Failure to act would result in greater harm to salmonid stock survival through in-river migration than would occur by increased spill;
 - (ii) The modified total dissolved gas criteria associated with the increased spill provides a reasonable balance of the risk of impairment due to elevated total dissolved gas to both resident biological communities and other migrating fish and to migrating adult and juvenile salmonids when compared to other options for in-river migration of salmon;
 - (iii) Adequate data will exist to determine compliance with the standards; and
 - (iv) Biological monitoring is occurring to document that the migratory salmonid and resident biological communities are being protected.
- (C) The Commission will give public notice and notify all known interested parties and will make provision for opportunity to be heard and comment on the evidence presented by others, except that the Director may modify the total dissolved gas criteria for emergencies for a period not exceeding 48 hours;
- (D) The Commission may, at its discretion, consider alternative modes of migration.

Application of Standard: The supersaturation of atmospheric gases in water may cause either crippling or lethal gas bubbles to form in the tissues of fish. The standard, based on scientifically derived evidence, is designed to prohibit discharges or activities that will result in atmospheric gases reaching known harmful concentrations. There are six ways that total dissolved gas supersaturation can occur (EPA 1976 and American Fisheries Society 1979):

1. Excessive biological activity--dissolved oxygen concentrations often reach supersaturation because of excessive algal photosynthesis. Renfro (1963) reported gas bubble disease in fishes resulting, in part, from algal blooms. Algal blooms often

accompany an increase in water temperature and this higher temperature further contributes to supersaturation.

2. Lindroff (1957) reported that water spillage at hydropower dams caused supersaturation. When excess water is spilled over the face of a dam, it entrains air as it plunges to the stilling or plunge pool at the base of the dam. The momentum of the fall carries the water and entrained gases to great depths in the pool; and, under increased hydrostatic pressure, the entrained gases are driven into solution, causing supersaturation of dissolved gases.
3. Natural waterfalls with deep plunge basins can cause supersaturation and subsequent adverse effects to fish (Harvey and Cooper 1962).
4. The use of air in turbine intakes to avoid cavitation creates supersaturation--a condition that can be avoided if identified (McDonald and Hyatt 1973).
5. Venturi action caused by improper engineering of hatchery water supplies has also been described by Harvey and Smith (1961), Wyatt and Beniningen (1971), and Rucker and Tuttle (1948).
5. Gas bubble disease may be induced by discharges from power-generating and other thermal sources (Marcello, et al. 1975). Cool, gas-saturated water is heated as it passes through the condenser or heat exchanger. As the temperature of the water rises, percent saturation increases because of the reduced solubility of gases at high temperatures. Thus, the discharged water becomes supersaturated with gases and fish or other organisms living in the heated water may exhibit gas bubble disease (DeMont and Miller 1972; Malouf, et al. 1972; Keup 1975).

Present Condition: A TMDL has been developed for the lower Columbia River for this parameter. This standard has been exceeded by hydroelectric projects spilling water over dam spillways.

Applicant's Position: The applicant offered no information or data on this standard.

Public Testimony: No public testimony was received relating to this standard.

DEQ Evaluation: The production of elevated total dissolved gas levels requires the entrainment of large quantities of air, and its compression into solution at depth. These factors are not present in this project.

DEQ Finding: No violation of this standard will occur as a result of this project.

Total Dissolved Solids

340-41-0205/340-41-0445 (o) Total Dissolved Solids: Guide concentrations listed below shall not be exceeded unless otherwise specifically authorized by DEQ upon such conditions as it may deem necessary to carry out the general intent of this plan and to protect the beneficial uses set forth in OAR 340-041-0202:

- (A) Columbia River -- 500.0 mg/l;
- (B) *All Other Fresh Water Streams and Tributaries -- 100.0 mg/l.
- (B) **Willamette River and Tributaries - - 100.0 mg/l

* Applies to North Coast – Columbia Basin Only.

** Applies to Willamette basin Only.

Application of Standard: Certain dissolved chemicals in water are known to be toxic to aquatic life and antagonistic to higher animals when in drinking water at low concentrations. Maximum allowable concentrations of the known toxic or offensive substances have been incorporated in standards for the protection of both aquatic and human life. Water quality may also be affected by a number of other substances (e.g., calcium, sodium, phosphorus, iron, etc.) that may be undesirable either individually or collectively to domestic, industrial, or agricultural uses when in high concentrations. A measurement of their collective concentration in water is specific conductance, which can be used as a surrogate for total dissolved solids.

Present Condition: There is no data on this condition.

Applicant's Position: The applicant provided no information relating to this standard.

Public Testimony: Contaminants may be resuspended during dredging and in-river disposal, and may become bio-available to fish and other aquatic organisms.

DEQ Evaluation: Dredging and disposal may cause short lived and highly localized turbidity within the bounds of the turbidity standard. However, total dissolved solids should remain within standards.

DEQ Finding: No violation of this water quality standard is expected.

Toxic Substances

340-41-0205/340-41-0445 (p) Toxic Substances:

- (A) Toxic substances shall not be introduced above natural background levels in the waters of the state in amounts, concentrations, or combinations which may be harmful, may chemically change to harmful forms in the environment, or may accumulate in sediments or bioaccumulate in aquatic life or wildlife to levels that adversely affect public health, safety, or welfare; aquatic life; wildlife; or other designated beneficial uses;
- (B) Levels of toxic substances shall not exceed the criteria listed in Table 20 which were based on criteria established by EPA and published in Quality Criteria for Water (1986), unless otherwise noted;
- (C) The criteria in paragraph (B) of this subsection shall apply unless data from scientifically valid studies demonstrate that the most sensitive designated beneficial uses will not be adversely affected by exceeding a criterion or that a more restrictive criterion is warranted to protect beneficial uses, as accepted by DEQ on a site specific basis. Where no published EPA criteria exist for a toxic substance, public health advisories and other published scientific literature may be considered and used, if appropriate, to set guidance values;
- (D) Bio-assessment studies such as laboratory bioassays or instream measurements of indigenous biological communities, shall be conducted, as DEQ deems necessary, to monitor the toxicity of complex effluents, other suspected discharges or chemical substances without numeric criteria, to aquatic life. These studies, properly conducted in accordance with standard testing procedures, may be considered as scientifically valid data for the purposes of paragraph (C) of this subsection. If toxicity occurs, DEQ shall evaluate and implement measures necessary to reduce toxicity on a case-by-case basis.

Application of Standard: A wide variety of herbicides, pesticides, fungicides, metals, industrial chemicals, and other anthropogenic waste products are toxic to biological species. Through widespread use and/or improper disposal, some of these substances resisted degradation and have bioaccumulated to injurious levels in parts of the world. Toxic substances such as heavy metals may be naturally present, but may be mobilized and made available as surface water contaminants by certain anthropogenic activities such as mining or excavation. This standard has been adopted in Oregon to affect a toxic substances management strategy using best available technologies.

Present Condition: The lower Columbia River is currently listed for arsenic, DDT and its metabolites, PAHs and PCBs.

Applicant's Position: The applicant has undertaken sampling and analysis of sediments from the navigation channel and has determined that they are clean coarse-grained sand. In addition, a group of scientists empanelled by the Sustainable Ecosystems Institute (SEI) met in 2001 and

agreed that the likelihood of toxics or metals in the sediments of the navigation channel is extremely low.

The applicant however, notes that there are several sites along the shoreline that have contaminated sediment concerns. Most of these sites are more than 1,000 feet from the channel, and will not likely be affected by dredging.

Public Testimony: More public testimony was offered on this than on any other water quality parameter.

There are already water quality listings for PCBs, DDT, DDE and dioxin and fish advisories to protect human health issued for the lower Columbia River.

Contaminants will be resuspended during dredging and flowlane disposal.

Additional testing for tributyltin needs to be undertaken. It has been identified at the east end of the mooring basin in Astoria and in other berthing areas.

Insufficient numbers, and depth, of samples have been undertaken by the Corps.

Turbidity will bring up heavy metals from the bottom.

Toxics are resident in cracks in rocks that will be resuspended during blasting operations.

DEQ Evaluation: DEQ concurs with the applicant's position relative to sediments in the navigation channel. However, the project envisages dredging in areas outside the navigation channel, specifically, turning bays and areas that may need to be dredged to stabilize the sides of the channel, or where compacted sediments or rock force the channel to be reconfigured.

DEQ Finding: No toxic contaminants or metals are expected to be liberated or redistributed as a result of dredging the navigation channel. However, additional characterization of sediments in areas outside the navigation channel will be required prior to dredging and disposal.

Natural Conditions

340-41-205 (3) Where the naturally occurring quality parameters of waters of the North Coast - Lower Columbia River Basin are outside the numerical limits of the above assigned water quality standards, the naturally occurring water quality shall be the standard. However, in such cases special restrictions, described in OAR 340-041-0026(3)(a)(C)(iii), apply to discharges that affect dissolved oxygen.

340-41-0445 (3) Where the naturally occurring quality parameters of waters of the Willamette River Basin are outside the numerical limits of the above assigned water quality standards, the naturally occurring water quality shall be the standard. However, in such cases special restrictions, described in OAR 340-041-0026(3)(a)(C)(iii), apply to discharges that affect dissolved oxygen.

Application of Standard: The purpose of this standard is to ensure that where natural (non-anthropogenic) causes result in water quality that exceeds the criteria specified above, that the naturally occurring condition shall be the standard.

Present Condition: While there is limited data on parameters other than those on DEQ's 303(d) list of water quality limited water bodies, there is nothing to suggest that water quality criteria are above criteria in the river.

Applicant's Position: The applicant offered no information or data on this parameter.

Public Testimony: No public testimony was received for this criterion.

DEQ Evaluation: This is a "catch-all" standard, providing that standards be set at current criteria where these are better than the criteria. Some existing conditions are better than the criteria, for example, temperature in the high flow, cooler months. Nothing in this project is expected to result in a criterion that is lower than existing.

DEQ Finding: No violation of this criterion is expected.

Antidegradation

340-41-0026 (1) In order to maintain the quality of waters in the State of Oregon, the following is the general policy of the EQC:

- (a) **Antidegradation Policy for Surface Waters.** The purpose of the Antidegradation Policy is to guide decisions that affect water quality such that unnecessary degradation from point and nonpoint sources of pollution is prevented, and to protect, maintain, and enhance existing surface water quality to protect all existing beneficial uses. The standards and policies set forth in OAR 340-041-0120 through 340-041-0962 are intended to implement the Antidegradation Policy;
 - (A) **High Quality Waters Policy:** Where existing water quality meets or exceeds those levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, and other designated beneficial uses, that level of water quality shall be maintained and protected. The Environmental Quality Commission, after full satisfaction of the intergovernmental coordination and public participation provisions of the continuing planning process, and with full consideration of sections (2), (3) and (5) of this rule, however, may allow a lowering of water quality in these high quality waters if they find:
 - (i) No other reasonable alternatives exist except to lower water quality; and
 - (ii) The action is necessary and justifiable for economic or social development benefits and outweighs the environmental costs of lowered water quality; and
 - (iii) All water quality standards will be met and beneficial uses protected.
 - (B) The Director or a designee may allow lower water quality on a short term basis in order to respond to emergencies or to otherwise protect public health and welfare;
 - (C) **Water Quality Limited Waters Policy:** For water quality limited waterbodies, the water quality shall be managed as described in section (3) of this rule;

Application of Standard: These sections, which are part of Oregon's water quality standards, require that existing high quality waters where quality exceeds the levels necessary to protect fish, shellfish, wildlife, and recreation shall be maintained and protected unless the Environmental Quality Commission chooses to allow lowered water quality for justifiable reasons, or unless the Director allows lower water quality on a short-term basis to respond to emergencies or otherwise protect public health and welfare. These sections further require DEQ to minimize degradation of high quality waters and protect the recognized beneficial uses of such waters by requiring the highest and best practicable control of all waste discharges and activities. These sections, in conjunction with other provisions of the water quality standards contained in OAR 340- 41-0445(2), are intended to assure that water quality is not changed so as to impair designated beneficial uses of the water.

DEQ is required to interpret and apply the EQC water quality standards, including the antidegradation policy, in a manner consistent with the guiding federal rules. DEQ has traditionally interpreted the antidegradation policy to allow approval of new discharges or activities that may have some theoretical or detectable impact on high quality waters provided that:

1. Adverse impact on water quality will not be significant,
2. Any change in water quality will not adversely affect designated beneficial uses, and
3. Highest and best practicable treatment and control of waste discharges and activities is employed to minimize any adverse effects on water quality.

Under ordinary circumstances, compliance with the water quality standards in OAR 340-41-0205 and 340-41-0445 would be considered sufficient to assure that beneficial uses will be protected. However, if a standard has not been adopted for a pollutant parameter of concern, or if new information indicates that an existing standard is not adequate to prevent adverse water quality impact on a beneficial use in the particular situation, DEQ is required to impose more stringent water quality protection measures to protect designated beneficial uses, including denial of project approval if necessary.

Present Condition: The waters of the Columbia River are not a high quality waters. The lower Columbia River is listed on DEQ's 303(d) list of waterbodies not meeting standards for temperature, arsenic, DDT and its metabolites, PAHs and PCBs. Total maximum daily loads (TMDLs) exist of total dissolved gas and dioxin.

Applicant's Position: The applicant offers no specific comment on this water quality parameter, but believes that the project will not result in degradation of the Columbia River's water quality below current levels.

Public Testimony: This project will result in releases of contaminants already listed on DEQ's 303(d) list of waterbodies failing to meet water quality standards.

DEQ Evaluation: The waters of the Columbia River are not high quality waters. Further, the narrative and numeric criteria, in conjunction with applicable TMDLs are protective of beneficial uses. No degradation of water quality is expected from this project that will cause impairment to beneficial uses.

DEQ Finding: No lowering of water quality is expected from this project if best management practices are employed, and the conditions formulated by DEQ in the certification are followed.

EVALUATION OF WATER QUALITY-RELATED REQUIREMENTS OF STATE LAW

DEQ has reviewed the information in the record and the requirements of the state laws to determine the water quality-related requirements that may be applicable to the applicant's proposed project. In determining whether particular requirements may be water quality-related, DEQ has relied on the following considerations:

- a. The statute, or rules promulgated pursuant to the statute, contain explicit reference to water quality and are applicable to the proposed project.
- b. The statute, or rules promulgated pursuant to the statute, address factors that are necessary for maintenance of water quality in conjunction with the proposed project, or for evaluation of water quality impacts of the proposed project.
- c. The statute, or rules promulgated pursuant to the statute, authorize, require, or control actions or activities that may, in conjunction with the proposed project, be reasonably expected to impact water quality.

Based on these initial criteria, DEQ has identified the following as potential water quality-related requirements of state law:

Laws Administered by the Oregon Division of State Lands

ORS 541.605-695 requires that permits be obtained from the Division of State Lands prior to any fill and removal of material from the bed or banks of any stream. Such permits, when issued, may be expected to contain conditions to assure protection of water quality so as to protect fish and aquatic habitat.

Laws Administered by DEQ of Fish and Wildlife

ORS 496.435 addresses restoration of native stocks of salmon and trout to historic levels of abundance.

OAR 635-007-510 prevents serious depletion of any indigenous fish species through protection of native ecological communities.

OAR 635-007-523 requires support of habitat protection and restoration on private and public lands.

OAR 635-500-020 requires protection and restoration of steelhead spawning and rearing habitat.

OAR 635-500-120 requires protection, restoration, and enhancement of trout habitat.

Laws Administered by DEQ of Environmental Quality

ORS 454.705 et. seq. and OAR Chapter 340, Divisions 71 and 73 contain requirements which govern on-site disposal of sewage. The purpose of such rules is to prevent health hazards and protect the quality of surface water and groundwater. DEQ administers and enforces on-site sewage disposal systems and requirements in Counties.

ORS 466.605 et. seq. and ORS 468.780-815 establish requirements for reporting and cleanup of spills of petroleum products and hazardous materials.

ORS 468.742 requires submittal of plans and specifications for water pollution control facilities to DEQ for review and approval prior to construction. One of the purposes of these statutes, and rules promulgated pursuant thereto, is to prevent contamination of surface or groundwater.

Laws Administered by DEQ of Land Conservation and Development

ORS Chapter 197 contains provisions of state law requiring the development and acknowledgement of comprehensive land use plans. This chapter also requires state agency actions to be consistent with acknowledged local land use plans and implementing ordinances.

In addition to this state agency review of the § 401 certification documents, the Clatsop County Planning Department has provided a Land Use Compatibility Statement indicating areas in which the project is inconsistent with the local comprehensive plan.

DEQ of Land Conservation and Development has developed a Coastal Zone Management Act consistency determination for this project.

Laws Administered by Water Resources Department

Laws administered by the Water Resources Department relate to issuance and administration of water withdrawal rights. No water withdrawals requiring State water rights are contemplated in this project.

Summary

Pursuant to 33 USC 1341(d) and OAR 340-048-0025, DEQ has included conditions in the § 401 certification that are consistent with these other requirements of state law.

EVALUATION OF COMPLIANCE WITH SECTIONS 301, 302, 303, 306, AND 307 OF THE CLEAN WATER ACT

In order to certify a project pursuant to § 401 of the federal Clean Water Act, DEQ must find that the project complies with Sections 301, 302, 303, 306, and 307 of the Act and state regulations adopted to implement these sections.

Sections 301, 302, 306, and 307 of the federal Clean Water Act deal with effluent limitations, water quality related effluent limitations, national standards of performance for new sources, and toxic and pretreatment standards. All of these requirements relate to point source discharges and are the foundation for conditions to be incorporated in National Pollutant Discharge Elimination System (NPDES) permits issued to the point sources.

Section 303 of the Act relates to Water Quality Standards and Implementation Plans. The federal Environmental Protection Agency (EPA) has adopted regulations to implement Section 303 of the Act. The EQC has adopted water quality standards consistent with the requirements of Section 303 and the applicable EPA rules. The EQC standards are codified in Oregon Administrative Rules Chapter 340, Division 41. The Environmental Protection Agency has approved the Oregon standards pursuant to the requirements of Section 303 of the Act. Therefore, the applicant's project must comply with Oregon Water Quality Standards and TMDLs to qualify for certification. The Water Quality Standards Section of this evaluation and findings report detailed the conditions considered necessary by DEQ to ensure compliance with water quality standards and TMDLs.

Section 306 of the Clean Water Act provides that new sources of pollutant discharge meet particular standards of performance for the control and reduction of pollutants being discharged. The project is not a new source since maintenance dredging has occurred for many years over the same stretch of river.

Section 307 of the Clean water Act provides that dischargers of toxic pollutants meet certain pretreatment and effluent requirements. The likelihood of contaminants within the navigation channel has been determined to be extremely low. Conditions have been developed to cover dredging outside the channel. As a result, the project complies with Section 307 of the Act.

Finding

DEQ is reasonably assured that conducting this project will comply with Sections 301, 302, 303, 304, and 306 of the Clean Water Act if the applicant meets the conditions provided for in the certification for this project.

CONCLUSIONS

This project has gone through a number of iterations, and the applicant has provided a project that has addressed many water quality issues. Those matters that are not addressed by the applicant, or that may result in water quality violations can be addressed through the implementation of best management practices, and the conditions identified herein and in the accompanying water quality certification.

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Appendix A	Engineering Appendix
Appendix B	Columbia and Willamette River Sediment Quality
Appendix C	Economics
Appendix D	Real Estate Plan
Appendix E	HTRW Preliminary Assessment Screening
Appendix F	Salinity Intrusion Studies
3. US Army Corps of Engineers (1998) *Appendix G: Wildlife Mitigation: Draft Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel*, Portland District, October
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8. US Army Corps of Engineers (1999) *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement: Columbia and Lower Willamette River Federal Navigation Channel, Appendix G: Wildlife Mitigation*, Portland District, August
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