

Meeting Minutes Transmittal/Approval  
Unit Manager's Meeting: Remedial Action and Waste Disposal Unit/Source Operable Unit  
3350 George Washington Way, Room 1B45, Richland, Washington  
January 16, 1997

FROM/APPROVAL: Nancy Werdel Date 2-20-97  
Nancy Werdel/Glenn Goldberg, 100 Area Unit Managers, RL (H0-12)

APPROVAL: Keith K. Holliday Date 2-20-97  
Wayne Soper/Keith Holliday, 100 Aggregate Area Unit Manager, Ecology (B5-18)

APPROVAL: Dennis Faulk Date 6-11-97  
Dennis Faulk/Kevin Oates, 100 Aggregate Area Unit Managers, EPA (B5-01)

APPROVAL: N/A Date \_\_\_\_\_  
Bryan Foley, 200 Area Unit Manager, RL (H0-12)

APPROVAL: N/A Date \_\_\_\_\_  
Gary Freedman/Norman Hepner, 200 Aggregate Area Unit Managers, Ecology (B5-18) Joan Bartz / Shri Mohan

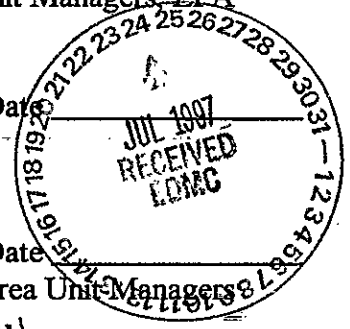
APPROVAL: N/A Date \_\_\_\_\_  
David Einan/Paul Beaver, 200 Area Aggregate Area Unit Managers, EPA (B5-01)

APPROVAL: Robert G. McLeod Date Feb. 20, 1997  
Robert G. McLeod, 300 Area Unit Manager, RL (H0-12)

APPROVAL: Jeanne Wallace Date 5/21/97  
Jeanne Wallace, 300 Area Aggregated Area Unit Manager WA Dept of Ecology (B5-18)


APPROVAL: David R. Einan Date 20 Feb 97  
David R. Einan, 300 Area Aggregated Unit Manager, EPA (B5-01)


APPROVAL: Ted A. Wooley Date 20 Feb 97  
Ted A. Wooley, 300 Area Process Trenches Subproject Manager



Meeting Minutes are attached. Minutes are comprised of the following:

- Attachment #1 - Agenda
- Attachment #2 - Attendance Record
- Attachment #3 - Meeting Minutes
- Attachment #4 - Status Package
- Attachment #5 - 300 Area Process Trenches Waste Designation Briefing 12/19
- Attachment #6 - 300 Area Process Trenches Waste Designation Briefing 12/23
- Attachment #7 - 300 Area Process Trenches Cadmium Data Information

Prepared by:  Date 6/12/97  
Gary Gosell/Tamen Lundquist (H0-17)

Concurrence by:  Date 6/12/97  
Vern Dronen, BHI Remedial Action and Waste Disposal Project Manager  
(H0-17)

047602

**UNIT MANAGER'S MEETING AGENDA**  
**3350 George Washington Way, Room 1B45**  
**January 16, 1997**

**1:00 p.m. 300 Area**

**300 FF-1**

- Remedial Action RFP
- 300 APT Independent PE RFP
- RDR/RAWP
- Project Shutdown Period

**300-FF-2**

- Status of LFI Report
- Groundwater Monitoring Sampling

**2:00 p.m. 100 Area**

**100 Area ROD Amendment**

- Plan and schedule for Responsiveness Summary
- Format, schedule, and responsible agency for preparation
- Anticipated timing for RL review
- Status of Ecology's RCRA RPP input (flowcharts, text)

**Overall ROD Strategy for 100 Area for Remaining Sites**

- Next steps
- Status of Appendix C update

**100, 200, 300, and 1100 Area Decant Liquid Disposal**

- Status of Liquid Disposal

**100-D Ponds Closure Report**

- Validation report to be transmitted from RL to Ecology
- Status of equivalency demonstration

**100-B/C**

- 100-B/C project status
- Additional waste plume at 116-C-1
- Encapsulation and disposal of lead
- 116-B-5 verification package and backfill
- RDR/RAWP and SAP Revision 1

**NOTE:** The 200 Area UMM for the 200-UP-2 will meet on an as-needed basis, per the November 1996 UMM minutes.



047602

**Unit Managers' Meeting Minutes  
January 16, 1997**

**100 AREAS**

**100 Area Record of Decision (ROD) Amendment**

On January 15, 1997, the 30-day public comment period closed on the proposed plan to amend the September 1995 Record of Decision (ROD) by adding 34 additional radioactive liquid waste disposal sites from the 100-D, 100-F, and 100-K reactor areas. The U.S. Environmental Protection Agency (EPA) indicated that they had received only one (favorable) comment from the Washington State Department of Health (DOH). As a result, EPA's preparation of the Responsiveness Summary will be routine. The EPA stated that they have nearly completed a draft amendment to the September 1995 ROD. The EPA anticipates providing the amendment to Region 10 and the Washington State Department of Ecology (Ecology) for review during the week of January 20, 1997. Ecology's discussion in the amendment on *Resource Conservation and Recovery Act of 1976* past practice units is expected to be brief. Following these reviews, the U.S. Department of Energy (DOE), Richland Operations Office (RL) will review and comment on the draft amendment.

**Overall ROD Strategy for 100 Area Remaining Sites**

RL indicated that a meeting with Tri-Party and Environmental Restoration Contractor (ERC) senior management has been scheduled for January 24, 1997, to present status reports and a proposed path forward regarding a strategy for future 100 Area decision documents. RL anticipates that an empowered Tri-Party team will be formed to address this critical issue. The goal is to place decision documents soon enough so as to not impact remedial action schedules and to allow maximum flexibility in procuring remedial action subcontract services. RL has scheduled a preparatory meeting with team members from RL, EPA, Ecology, and ERC on January 23, 1997, to discuss burial ground issues. In the interim, a Tri-Party team continues to update waste site lists presented in the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) Handbook appendices.

**100, 200, and 300 Area Decant Liquid Disposal**

RL is pursuing disposal of investigation derived waste decant liquids from the 100, 200, and 300 Areas at the 300 Area Treatment Effluent Disposal Facility and/or the 200 Area Effluent Treatment Facility. Following completion of reviews and approval of an internal DOE Memorandum of Understanding (between EM-30 and EM-40), RL plans to meet with the EPA

and Ecology to review the plans and schedule. Implementation of the Memorandum of Understanding is anticipated during the January/February 1997 timeframe. Actual disposal is not anticipated to commence until freezing winter temperatures have subsided, and could be as early as March 1, 1997.

### **100-D Ponds Closure Report**

RL indicated that transmittal of the final data validation report to Ecology is anticipated during the week of January 20, 1997. Work on revising the closure plan is ongoing. RL plans to submit an "equivalency demonstration" addressing the need for postclosure groundwater monitoring for Ecology's consideration during the March/April 1997 timeframe. This will be an advanced submittal of that portion of the revised closure plan addressing groundwater monitoring, and is intended to initiate early discussions with the agency on this critical issue.

### **100-B/C**

#### 100-B/C Project Status

The 116-C-5 excavation is in progress.

#### Additional Waste Plume at 116-C-1

Plume excavation cannot start until subcontractor equipment is available (few months).

#### Encapsulation and Disposal of Lead

Decontamination and recycle options are being evaluated, as well as possible treatment by macroencapsulation.

#### 116-B-5 Verification Package and Backfill

The verification package has been signed by RL and the EPA; backfill is pending first available opportunity.

#### Remedial Design Report (RDR)/Remedial Action Work Plan (RAWP) and SAP Rev. 1

RL will transmit changes to the EPA and Ecology for approval.

## 300 AREA

### 300-FF-1

#### Remedial Action Request for Proposal (RFP)

Bids are due on January 16, 1997, which incorporated the new schedule (primary change). If the bottom three bids remain the same, it will progress quickly; the technical evaluation will take 2 to 3 weeks. Depending on the price of the bids, it could take an additional 1 to 2 weeks.

#### 300 APT Independent PE RFP

Questions were received and returned to the bidders. Responses will be received on January 17, 1997, and then finalized.

#### RDR/RAWP

The RDR/RAWP needs signature approval. It was agreed that the project Tri-Party Agreements' milestones do not need to be indicated on the RAWP schedule. The excavation of the process trenches will begin in August 1997, and excavation of the total operable unit will be completed in May 1999 (previous agreed-upon dates).

#### Burial Ground Milestones

- The 1998 budget is being discussed and the numbers are low (\$132 million per RL). The 1998 budget will be reviewed; it is basically uncertain at this point.
- The EPA was asked if they had a problem with the burial ground excavation beginning around October 20. Data will be collected to write either a Bechtel Hanford, Inc. (BHI) or DOE document; a DOE document would have many reviews and the schedule could conflict with the 300-FF-2 Focused Feasibility Study. The EPA agreed on a BHI document and also suggested an interim milestone; RL will report back to the EPA.
- RL wants the EPA to provide a list of items to consider while digging the burial ground (which facts are most important).

#### Project Shutdown Period

The remedial action subcontractor will begin submittals/design work on April 29, 1997. The EPA said the shutdown may not be as long as originally stated (2 to 3 months instead of 9 months).

### Waste Designation of the Process Trenches

Action: Schedule a meeting with Ted Wooley to address issues with cadmium.

Air Permitting: The EPA will keep RL posted on discussions/agreements between DOH and the EPA. The DOH may need to concur on an appendix in the RDR.

### **300-FF-2**

#### Status of Limited Field Investigation (LFI) Report

The Administrative Record received two documents (BHI-00768 and WHC-EP-0573-3). RL completed the ARAR review. The LFI is being converted to Revision 0. No comments are expected from Ted Wooley on the document (redline version).

Larry Hulstrom suggested scheduling a meeting to discuss the LFI schedule, the plates, etc. The comment dispositions have been finalized. A meeting was scheduled for January 23, 1997, among BHI, RL, and the EPA.

#### Groundwater Monitoring Sampling

Annual sampling of wells 699-S6-E4-A and 699-13-3A is scheduled for January 22, 1997.



STATUS PACKAGE

UNIT MANAGERS' MEETING - JANUARY 1997

SOURCE OPERABLE UNITS

100-B/C, 100-K, 100-D, 100-H, 100-F

200 AREAS

300 AREA

prepared by

DOE-RL

## 100 AREAS

### Assessment Activities

100 Area Remaining Sites ROD Amendment/Group-B Explanation of Significant Differences (ESD) - Plans are being made with the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology) to resolve Record of Decision (ROD) strategy issues for 100 Area source operable unit waste sites. A meeting is scheduled with the regulatory agencies for January 23, 1997. A Tri-Party team continues to address revisions to the waste site list presented in Appendix C of the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement).

On December 16, 1996, a 30-day public comment period began for a proposed plan that will be used to support an amendment to the September 1995 ROD for the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units. The proposed plan recommends adding 34 waste sites to the current ROD. Decisions need to be made on the content, format, and preparation schedule for the ROD amendment.

The regulatory agencies have informed the U.S. Department of Energy, Richland Operations Office (RL) that the overall strategy for 100 Area RODs will not include a second ROD amendment. Therefore, the Group B ESD project, including 16 candidate sites, has been delayed (and probably canceled) pending resolution of the 100 Area ROD strategy issues with EPA and Ecology.

Remaining Sites Confirmatory Sampling Effort (CSE)/Focused Feasibility Study (FFS) - The draft Sampling and Analysis Plan (SAP) for the CSE remains on hold. Completion and implementation of the SAP is dependent upon resolution of 100 Area ROD strategy issues with EPA and Ecology.

### 100, 200, and 300 Area Decant Liquid Disposal

The final activity needed to complete disposal of the backlog of investigation-derived waste (IDW) is to dispose of the free liquid from decanting operations. Plans are being formulated to dispose of water decanted from IDW at the Treated Effluent Disposal Facilities in the 300 Area and the Effluent Treatment Facility in the 200 Areas. Final approval, briefings with EPA and Ecology, and implementation of an internal RL Memorandum of Understanding are anticipated during January/February 1997. Actual disposal is not expected until subfreezing winter temperatures have subsided.

## **100-D Ponds Closure Plan Revision**

Data validation was completed during late November 1996. Preliminary results indicate that cleanup goals for 100-D Ponds have been achieved. An equivalency demonstration to dispense with postclosure groundwater monitoring will be submitted to Ecology during March/April 1997. Work on revising the 100-D Ponds Closure Plan is ongoing. Ecology's request for deep vadose zone borehole samples has not been resolved.

## **100-B/C-1**

Remedial Action - Excavation of the base excavation at the 116-C-1 Trench was completed on November 15, 1996. A waste plume extending to the north will also require excavation to meet cleanup standards. Additional soils and scrap steel from the 116-C-5 Retention Basins and the effluent pipelines were excavated in November and December 1996. An asbestos-containing wrap was discovered on some of the effluent piping. More than 90,000 tons of waste have been excavated and shipped to the Environmental Restoration Disposal Facility. Revisions to the Remedial Design Report (RDR)/Remedial Action Work Plan (RAWP) and to the SAP have been completed. The EPA and Ecology have reviewed and approved the cleanup verification package for the 116-B-5 Crib.

## **200 AREAS**

### **200-UP-2 Operable Unit**

200-UP-2 FFS - A Tri-Party Agreement change package deleting the FFS and proposed plan for the 200-UP-2 was signed; consequently, this scope was deleted from the Fiscal Year (FY) Work Plan. Some wrap-up activities are being performed to ensure the documentation for the operable unit is complete and reflected appropriately in the Administrative Record.

### **200 Areas Strategy**

The Waste Site Grouping Report is awaiting EPA concurrence before being issued Rev. 0. Working meetings are continuing on Tri-Party Agreement change package and public involvement efforts. A presentation to the Results Management Team is being developed to provide the latest Tri-Party Agreement change package proposal. A Public Involvement Plan is being developed based on joint RL, EPA, and Ecology direction

### **200-BP-1 Operable Unit**

The barrier testing program continues to provide data on water infiltration, vegetation growth, and biointrusion associated with the Hanford Site Barrier. Additional asphalt testing has been deferred to FY 1998.

### **200-BP-11 Operable Unit**

The data quality objective (DQO) for the Tank Waste Remediation System privatization project emergency egress and pipe transfer lines routing across the 216-A-29 Ditch (a treatment, storage, and disposal unit) has begun.

### **200-IU-3 Operable Unit**

Non-Radioactive Dangerous Waste Landfill (NRDWL) - NRDWL activities are awaiting finalization of solid waste landfill data needs decisions. Field work is anticipated to commence in June 1997.

## **300 AREA**

### **300-FF-1 Operable Unit**

Remedial Action (RA) - Submittal of a Best Revised Offer (BRO) was requested of the RA subcontract bidders on December 13, 1996. The BRO was issued primarily to address a change in the project schedule start date, which has been delayed due to FY 1997 funding constraints. Bids are due January 16, 1997, for a final evaluation with the intent to award in early February 1997. The bidders are to assume a Notice to Proceed authorization date of April 29, 1997, which will initiate technical and design submittals. Mobilization and construction of the subcontractor's support facilities will occur from mid-June to July 1997. Excavation of contaminated waste will begin in early August 1997.

Regulator comments on the DQO summary report were received, addressed, and closed. The document has been revised and is undergoing a final technical edit before issuance. The RDR/RAWP is completed, and the schedule is being revised to reflect the delayed start date for remediation. The document will be issued upon completion of the revised schedule. The issuing transmittal letter for the document will include new proposed Tri-Party Agreement milestones for the project.

Activities to set up the Environmental Restoration Contractor (ERC) remedial action support facilities at the 300-FF-1 Operable Unit are completed, except for inspection of the septic holding tank system by the Washington State Department of Health (DOH). An inspection had

been planned for December 31, 1996, but was delayed due to inclement weather. However, the DOH has authorized use of the system before their inspection pending satisfactory inspection by the ERC professional engineer. The DOH inspection is now planned for January 14, 1997.

The bid period for the Independent Registered Professional Engineer was extended to December 9, 1996, which revised the schedule to reflect the change to the remedial action schedule. Three of the five bids were received and are undergoing technical evaluation.

Two 300 Area Process Trenches (300 APT) waste designation meetings were held on December 19 and 23 with Ecology and RL. The 300 APT revised waste designation was presented at the December 19 meeting, which incorporated changes requested by Ecology at an earlier meeting; Ecology was satisfied with the changes. However, a new issue related to the statistical distribution of the 300 APT cadmium data and resultant representative cadmium value to use for the waste designation has developed. The issue is currently being worked by Ecology and RL.

### **300-FF-2 Operable Unit**

Limited Field Investigation (LFI) Report - Comments from the regulators on the 300-FF-2 LFI report (DOE/RL-96-42, Draft A) were received on November 8, 1996. A meeting with RL and the regulators to discuss the comments took place on November 27, and an additional meeting took place on December 11. The process of comment dispositioning and incorporation has been completed. The redline version of the LFI report was provided to the regulators on December 19. The LFI report (Rev. 0) will be completed after discussions with RL and the regulators and dispositions have been finalized regarding the redline version of the document.

Radiological analytical results from the sampling of well 699-S6-E4A, which occurred on September 27, 1996, were received on November 8, 1996. Chemical data was received on November 19, 1996. Data evaluation has been completed, and the results have been incorporated into the redline version of the 300-FF-2 LFI report. Plans for the FY 1997 groundwater sampling of wells 699-S6-E4A and 699-13-3A have been initiated. Sampling is presently scheduled to occur during January 1997. Constituents to be analyzed are based on those discussed in the LFI report. Well 699-S6-E4A will be sampled again in July 1997. Data will be reported in an annual summary report to be issued in September 1997.

Environmental  
Restoration  
Contractor **ERC Team**  
**Meeting Minutes**

Job No. 22192  
Written Response Required? NO  
Closes CCN: N/A  
OU: 300-FF-1  
TSD: 300 APT, D-3-1  
ERA: N/A  
Subject Code: 4170, 8260.

041195

**SUBJECT** 300 Area Process Trenches Waste Designation Briefing

**TO** Distribution

**FROM** R. A. Carlson *RA*

**DATE** December 19, 1996

**ATTENDEES**

R. A. Carlson, H0-17  
R. G. McLeod, H0-12  
T. A. Wooley, B5-18  
P. G. Doctor, H0-02  
G. J. Borden, X1-86

**DISTRIBUTION**

Attendees  
V. R. Dronen, H0-17  
C. R. Johnson, H0-17  
D. R. Einan, B5-01  
BHI Document Control, H0-09

A meeting on the above subject was held on December 19, 1996, at 3350 GW Way, Room 2B59.

The following is a summary of the meeting discussion. The purpose of the meeting was to present the revised 316-5 Process Trenches Waste Designation to Mr. Wooley of Ecology. Mr. Wooley had reviewed a draft version of the waste designation earlier and had made comments that were addressed in this completed and internally reviewed version of the designation. Mr. Greg Borden from the waste management organization presented the changes to the waste designation from the draft to present and addressed several of Mr. Wooley's questions during the discussion.

All questions regarding the waste designation were answered to Mr. Wooley's satisfaction, except the cadmium data distribution. Dr. Pam Doctor, the project statistician presented the statistical evaluation of cadmium data. The significance of the discussion is that the maximum cadmium values if used, would cause the Process Trenches waste to designate as WT02. This has no bearing on the ability to ship the waste to ERDF, but has significance in that extra paper work and cost are associated with shipping the waste if it designates. Dr. Doctor evaluated the data and determined that the data is neither normally or lognormally distributed. If it was, the mean of the data could be used instead of the maximum values, per Ecology guidance. However, if the data is not normally or lognormally distributed, Ecology guidance provides a non-parametric procedure to follow. This was done and the median of the cadmium data was determined to be well below the parameters that would cause the waste to designate.

However, during the meeting, Mr. Wooley expressed a concern that the data could have a bi-modal distribution based on the histogram plot of the data and that the description in the text does not match the histogram. Dr. Doctor explained that the two humps in the histogram which could imply a bimodal distribution, are artifacts of the scale of the horizontal axis. If one plotted the data on a log scale, the humps would not be seen. It was explained that there is no physical reason for there to be two populations of cadmium data. The range of both the humps is about 4 ppm. Given these low concentration levels, it is hard to justify that separate populations could be a meaningful concept. Nor could they be defined that precisely, (the measurement error is on the order of +/- 20%, according to Mr. Borden). Mr. Wooley requested that an evaluation for a bi-modal distribution be

The meeting ended with the following agreements:

041195

- Another meeting is tentatively scheduled for Monday, December 23, 1996 at 1:00 p.m.
- Mr. Wooley will have done a complete review of the Waste Designation and have had an Ecology statistician review the analysis performed by the ERC.

Environmental  
Restoration  
Contractor **ERC Team**  
**Meeting Minutes**

Job No. 22192  
Written Response Required? NO  
Closes CCN: N/A  
OU: 300-FF-1  
TSD: 300 APT. D-3-1  
ERA: N/A  
Subject Code: 4170: 8260.

041194

**SUBJECT** 300 Area Process Trenches Waste Designation Meeting

**TO** Distribution

**FROM** R. A. Carlson *rac*

**DATE** December 23, 1996

**ATTENDEES**

R. A. Carlson, H0-17  
R. G. McLeod, H0-12  
T. A. Wooley, B5-18  
P. G. Doctor, H0-02  
G. J. Borden, X1-86  
D. D. Teel, H0-02  
C. R. Johnson, H0-17

**DISTRIBUTION**

Attendees  
V. R. Dronen, H0-17  
D. R. Einan, B5-01  
BHI Document Control. H0-09

A meeting on the above subject was held on December 23, 1996, at 3350 GW Way, Room 2B59.

The following is a summary of the meeting discussion. During the course of the meeting, Mr. Wooley's questions brought up as a result of the December 19th meeting were addressed. The questions are provided as Attachment No. 1.

Mr. Wooley started the meeting by indicating he had discussed the Process Trenches cadmium data distribution with Mr. Stu Lombard from the laboratory accreditation program. Mr. Lombard stated that the process being used to prepare the distribution and statistics appears to be acceptable, but based solely on the appearance of the histogram would not have expected the distribution to fail a standard distribution test. Mr. Wooley brought up the use of the outlier test to potentially eliminate the 3 high cadmium data points. However, in an earlier 300-FF-1 Sampling and Analysis Plan DQO meeting, it had already been agreed by the Tri-Parties that the high cadmium data would be included in the data set and therefore would also be included in the waste designation data set.

Dr. Doctor and Mr. Borden stated that using MTCA Stat software, a test for normal and lognormal distributions was performed on the cadmium data with the high values removed and both tests still failed. Dr. Doctor explained that with a total spread of only 28 ppm that the data is very likely not bimodal. The two humps in the histogram which are only a few ppm apart could be due to sampling and/or laboratory analytical error. It was stated that if there really were a bimodal distribution to this data set, it would be the low values (less than 28 ppm) and the 3 very high values (in the thousands of ppm.). However, for this to occur there needs to be a physical explanation to match the statistics. In other words, maybe some clean and some contaminated area samples are included in the same data population. There is no such physical explanation for the Process Trenches data set.

Mr. Wooley then introduced a new but related topic, the D007 waste code. Mr. Wooley asked whether the project has TCLP data to address the 20X rule. Mr. Borden indicated that Process Trenches specifically have



both TCLP and EP toxic test data on cadmium that shows that cadmium does not leach. Testing on samples prior to CERCLA was performed using the EP toxic test and the CERCLA samples were tested under the TCLP protocols. Mr. Borden did indicate however, that the leach tests were not performed on the highest samples found.

Mr. Wooley discussed an option to only look at cadmium for waste designation. Mr. Borden summarized how much the different contaminants were contributing to the equivalent concentration (EC) value. The high cadmium values alone would fail the EC test.

There was some discussion between Dr. Doctor and Mr. Wooley about the relationship of the Z test to the non-parametric analysis. This was a technical question that would require more research to explain.

Mr. Borden addressed one of Mr. Wooley's questions regarding costs for filling out waste designation forms. Mr. Borden estimated that approximately one hour of time would be required to fill out, track, and send reports to the State for each hazardous waste manifest (one per waste container) shipped to ERDF. The labor was roughly estimated at about \$50K to \$60K. The rough estimate does not include any other potential delays to the subcontractor that are not currently considered in the contract and which could result in claims and additional costs.

It was agreed that the technical discussion type questions as stated above and a conclusion on the question of the histogram distribution and use of non-parametric analysis should be addressed through Nigel, Ecology's statistician. Dr. Doctor indicated she knows Nigel and would not mind discussing these issues with him. Mr. Wooley said that would be OK, but he would need to be in the discussions. It was agreed that Dr. Doctor would prepare a list of proposed questions that would address the issues at hand for presentation to Nigel via teleconference. The questions will be reviewed by Mr. Wooley before the teleconference. Mr. Wooley will try to establish a time for the teleconference, potentially during New Years week, if all parties are available.

Mr. Carlson addressed Mr. Wooley's question regarding the appropriate sample/data set by indicating that there was an error in the data set presented at the December 19th meeting. The <sup>77 T.W.</sup>109 samples presented included data from the soils being left in place at the Process Trenches. The data set has been revised to reflect the Zimmerman and Kossick and CERCLA sample locations as agreed to in the 300-FF-1 SAP DQO. The tests were rerun and the median went up to 9 ppm. Both the normal and lognormal distributions still failed.

Mr. Wooley indicated that he did not have any other comments on the Process Trenches Waste Designation.

Before ending the meeting, a brief discussion on a separate issue was held with Mr. Wooley, Mr. McLeod, Mr. Johnson, and Mr. Carlson. Mr. Wooley was asked by Mr. Carlson if he agreed with dispositions to his comments on the 300-FF-1 DQO Summary Report (questions and comment responses are included as Attachment 2). The responses were reviewed in the meeting. Mr. Wooley indicated he was OK with the responses, but wanted to make one final check in the WAC regarding whether it specifies Type II error levels.

## ATTACHMENT 1

Author: Ted A Wooley at ~HANFORD02A  
Date: 12/20/96 11:16 AM  
Priority: Normal  
Receipt Requested  
TO: Richard A Carlson at ~BHI004  
TO: Pamela G Doctor at ~BHI012  
TO: Robert G (Bob) McLeod at ~DOE6  
Subject:

## ----- Message Contents -----

Bob\Pamela

I wanted to restate my questions and add some for Mondays meeting so that everyone's time is well spent.

- 1) Does any of the 109 samples include sampling after the ERA scrapping took place? In other words are you including data that represents soils still left in the trenches proper? I am trying to assess the representativeness of the data in terms of the spoils pile.
  - 2) Was an Outlier test used prior to determining the distributional forms?. If not how would this effect the outcome assessing central tendency?
  - 3) Again what was the reasoning for using the median value (and Non-parametric statistics) for evaluating central tendency of the data VS a mean value (and parametric statistics) when the histogram shows a good potential for at least a lognormal distribution, or possibly a bi-modal form? Using the mean value would most likely assign the WT02 code, therefore this will be an important part of Monday's talk.
  - 4) What will be the cost for filling out the dangerous waste forms and a justification for those costs.
- ) Justify why a median value can be used as opposed to a mean for evaluating central tendency

## ATTACHMENT 2

Author: Pamela G Doctor at ~BHI012  
Date: 12/19/96 4:10 PM  
Priority: Normal  
TO: Richard A Carlson at ~BHI004  
CC: Darci D Teel at ~BHI015  
Subject: Justification for one cadmium distribution

----- Message Contents -----

Ted and Dave, please find attached comment dispositions to Ecology comments on the DQO summary report. As you can note below, Rich noted one item not discussed in detail at the DQO meetings. We talked about taking a total of 6 samples from collected "clean" overburden for verification sampling. We did not specify any difference between overburden and top soil. As you can see from Rich's note, he is taking the conservative route and adding 6 more samples specifically for the top soil. Please let us know if you concur or feel that 6 samples would be adequate for both the soil and overburden (vs 12). Also, please give us feedback on the other responses.

Thanks, Bob

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Bob,

Please find attached draft comment dispositions to Ecology comments on the DQO summary report. In responding to one of the comments, I have agreed to create a summary table that shows waste site or subsites and associated number of samples. In preparing this table, it occurred to me that we are separating burial ground 618-4 top soil from the rest of the overburden. During the DQO we did not discuss sampling the topsoil portion of the overburden as being unique from the rest of the overburden. In the attached table, I have assumed that we would sample the topsoil as well as the overburden pile. Please let me know if you concur with this approach. Note the overburden pile (which will be stockpiled in one of two clean soil stockpile areas) will also include any overburden from the landfills as well any clean soils that need to be stockpiled during any of the remediation activities. I am ready to forward the revised text to editing for issuance after we get ok's back from Ted.

Rich

Responses to Ecology Comments on the 300-FF-1 DQO Summary Report Text

- 1) Page 21, middle of paragraph 1: ".....a one-sided 95 % upper confidence limit(UCL on the arithmetic or geometric mean.....(depending on the distribution)..."

Comment: I would suggest talking with one of your stat heads regarding use of a one-tailed UCL with other than a geometric mean. I am trying to envision a "one-tailed" curve that would not be lognormally distributed, unless we are talking 1/2 of a bell curve.

Recommendation: check to see if we actually have a choice between the two types of means, with a one-tail distribution.

RESPONSE: A one tailed upper confidence limit test can be performed with either an arithmetic or geometric mean. However, a geometric mean is not well suited for use with normal distributions and is often not used with lognormal distributions. Arithmetic means are normally used, however, per the decision makers agreement, at Ecology's request during the the DQO, a geometric mean will be used if the data is lognormally distributed and an arithmetic mean if the data is normally distributed. Use of the geometric mean is a much more conservative approach. Both normal and lognormal distributions have two tails, the tails just happen to be the same shape for a normal distribution. Either one or two tailed (upper and lower) confidence limits can be calculated for either type of distribution. We have agreed to use the upper 95% confidence limit on the mean of the data. No change to the text is required.

- 2) Page 21, bottom 3rd of paragraph 1:

Comment: The discussion on sample number is still not correct. Other sites beside the South Process Pond will require more than 6 verification samples. I have made this comment previously. Unless the idea is to provide examples of such sites(as in e.g., "the South Process Pond) it is important to state specifically which site will require more than six.

Requirement: Add in the 300 APT into this discussion, as being a site that will require greater than six verification samples.

RESPONSE: The DQO text says, " The minimum number of samples per waste site or waste site sub-area to provide a one-sided 95% upper confidence limit (UCL) on the arithmetic or geometric mean concentration of each COC (depending on the data distribution) was identified as six (n=6) for all but the South Process Pond. Because of the presence and variability of cobalt-60 concentrations near the cleanup level in the South Process Pond, 13 samples will be needed in the area above cleanup levels and 19 samples will be needed in the area below cleanup levels to confirm site cleanup". This wording was agreed to for the RDR/RAWP. However, a summary table will be added to the DQO Summary report to avoid any possible confusion regarding the number of samples to be taken for verification at the waste sites and sub site areas.

- 3) Page 21, 3rd paragraph:

Comment: Although the discription of logic behind generating a

statistical method is good, however it makes the reader believe that things like tolerances of type I and type II errors are negotiable. This of course is not true. From the start we have used WAC-173-340 and EPA guidance which specifies much of the regulatory requirements for statistical modeling for the purposes of final site closure.

Requirement: reference MTCA in this discussion.

RESPONSE: It is correct to state that the WAC 173-340-740 is prescriptive for Type I errors for chemical contaminants. A Type II error requirement is not prescribed in WAC 173-340-740 and is negotiable as are both error levels assigned to the radionuclides. The applicable requirement from MTCA will be cited in the text.

4) Page 23 and 24, References:

Comment: MTCA and CLARC II should be added to the list of references. It is common practice not to reference documents that are not related to anywhere in the discussion, therefore see comment #3.

Requirement: add references.

RESPONSE: The MTCA reference will be added as indicated in response to comment #3. However, the cleanup standards are cited in the ROD which is included in the reference list.

TABLE 6 NUMBER OF VERIFICATION SAMPLES AT WASTE SITES OR SUBSITES

WASTE SITE OR SUBSITE	NUMBER OF SAMPLES
Process Trenches ACL	6
Process Trenches DIN	6
Process Trenches Under Apron	2
North Process Pond ACL	6
North Process Pond BCL	6
North Process Pond DIN Scrapings Area	6
North Process Ponds DIN Berm	6
South Process Pond ACL	13
South Process Pond BCL	19
South Process Pond DIN Berm	6
Ash Pits	6
Burial Ground 618-4 Overburden (Topsoil)	6
Burial Ground 618-4 Overburden (Clean Soil Stockpile Area) <sup>1</sup>	6
Burial Ground 618-4	6
Landfill 1A	6
Landfill 1B	6
Landfill 1D	6
Existing Clean Soil Stockpile	6

Footnote: Includes overburden from the landfill areas.

## 300 Area Process Trenches Cadmium Data Information Requested by Dave Einan

### Summary Discussion of the Waste Designation:

As part of 300 Area Process Trenches waste designation, ERC identified that using maximum total concentration values for cadmium would cause the Process Trenches to designate as WT02, a state only toxic waste code. ERC often uses a conservative approach to designate waste by first using contaminant maximum total concentration values in the WAC formula to calculate the equivalent concentration (EC). However, what is required by the WAC is to designate using contaminant concentration values that are representative of the waste stream. Maximum values are not representative of the waste stream at the Process Trenches considering the number of samples collected along the length of each trench and how low concentrations are for most of these values.

If use of maximum values causes the EC value to designate, then ERC takes a second look using representative values. Normally, one would then determine the distribution of the data and use the data mean to plug into the EC equation instead of the maximum value. Unfortunately, the Process Trenches cadmium data distribution fails both the normal and lognormal tests. So we are left with determining what value to use. Ecology statistical guidance appears to suggest use of nonparametric analysis in this case. ERC has proposed this approach using the data median instead of the mean. The mean and the median both represent central tendency of the data under normal and lognormal data distributions and the median continues to represent central tendency using the nonparametric analysis.

This may be more clear once you see a plot of the data or just review the data values. There are a total of 77 sample values including both data sets. 96% of the data values are below 28 ppm, most of those are below 11 ppm. Three of the 77 values are high at 4000, 6440, and 8170 ppm from the Zimmerman and Kossick data set. The data median is 9 ppm and the data mean is 249 ppm. Using the mean is clearly not representative of the data. From our discussions to date, Ecology has not accepted the ERC proposed statistical approach as briefly discussed above.

What is unclear in Ecology's cc:mail message on 1/8/97 and your cc:mail message of 1/9/97 is an apparent desire to perform TCLP tests for cadmium based on the WT02 waste designation issue. WT02 designation is based on total levels of cadmium in the waste. The ability of cadmium to leach is a non-issue with regard to the WT02 waste code. If leachability is being questioned, that has not been at the heart of our discussions over the past month and we would now have two issues to address.

#### 1. Where and when were the samples taken?

Response: There are two data sets being used for the Process Trenches waste designation. They are the same data sets as were used for the 300-FF-1 Sampling and Analysis Plan DQO which are the 1987 data reported by Zimmerman and Kossick, WHC-SP-0193, "300 Area Process Trenches Sediment Analysis Report," and the 1991 data collected during the Expedited Response Action

as reported in the 300-FF-1 Phase I RI Report.

2. What is the confidence in the results (and the units)?

Response: The CLP generated RI data set has all been validated and quality of the data is clear. There is no question about the units. However, the Zimmerman and Kossick data set quality is unknown. What is known is that the Zimmerman and Kossick samples were analyzed by US Testing and I believe much of that laboratories data was deemed suspect based on an investigation by EPA. The Zimmerman and Kossick report does not address aspects of quality pertaining to the data. As you may remember this was discussed earlier when the decision makers agreed to reinstate Zimmerman and Kossick data after the CERCLA RI risk assessment process had eliminated it.

3. Any description of the sample matrix (e.g., ion exchange resin)?

Response: The field logbooks and photos taken prior to and during the ERA suggest there was fly ash, clinkers, and ion exchange resins in the top 12 to 18 inches at the head end of the trenches that thinned out the farther you get away from the headworks. This material may account for the high cadmium values found by Zimmerman and Kossick.

4. Any related samples (e.g., TCLP or EP-Tox data?) The project itself has TCLP and EP-Tox data on cadmium which all passed. However, these tests were run on samples with concentrations typical of the 74 samples that were not like the 3 high samples. Worthy of note is that the 3 high samples all came from effectively the same physical location. In other words, the samples were taken at the same place but at the surface, 4 inches, and 18 inches deep.

5. Can we use other leach/non-leach data to demonstrate a ratio > 20:1?

Response: There are some other leach test data for cadmium on 100 Area waste sites, but the total concentration values are in the same order of magnitude as the Process Trenches samples. The 100 Area data basically validates the TCLP and EP Tox data we currently have on the trenches. There aren't any existing leach test data run on ERC waste site soils with high total cadmium concentrations.



300 Area Process Trenches Waste Designation  
Interpretation of Statistical Guidance for Ecology Site Managers  
Draft Questions for Nigel Blakely  
January 14, 1997

**Objective:** Calculate representative contaminant soil concentrations for input into the waste designation formula for purposes of disposal at ERDF.

**Note:** We are not calculating final clean-up levels or comparing residual concentration levels to a standard which are the underlying purposes of the statistical methods in the Ecology guidance manual. However, the statistical methods in the Ecology manual are applicable, and we want to have a defensible technical position for this action.

**Situation:** Samples from 300 Area process trenches were taken in 1987 and just prior to and after the Expedited Response Action in 1991 for chemical and radio analysis. The measured concentrations of all the pre-ERA process trench contaminants were used to evaluate the contaminant load for purposes of determining the waste designation for transportation of the material to ERDF. For the toxic dangerous waste equivalent concentration formula, the maximum concentration (conservative approach) of each contaminant was used to assess the waste's overall hazard level. Each contaminant (with the exception of cadmium) did not contribute substantially to a toxic dangerous waste designation as defined by the State of Washington. For waste designation purposes, the representative concentration of the contaminant in the waste is appropriate. Using the maximum concentration for cadmium would cause the waste to designate. A more detailed analysis of the cadmium concentration data revealed that 74 of 77 samples had values below 28 ppm, and three samples with concentrations at 4000, 6440, and 8170 ppm. No sample or laboratory quality assurance/quality control information was available to evaluate the validity of the three high measurements. The mean of the cadmium data is 249 ppm, which is an order of magnitude larger than the 96% of the sample values.

**Issue:** The evaluation of project staff and RL is that the mean of the cadmium data is not representative of the level of contamination for waste designation purposes. The median of the cadmium data is 9 ppm and when the upper 95% confidence limit on the median concentration (also 11 ppm) is used in the waste designation formula, instead of the 95% upper confidence level of the mean, then the waste is not considered WT02. The practical implications of classifying the waste as WT02 is the additional cost of the required paper work for this waste category. The waste is going to ERDF regardless of waste designation.

**Justification for using the median as a representative cadmium concentration for waste designation purposes:** Ecology's statistical guidance recognizes the normal and lognormal distributions as applicable to environmental concentration data and suggests that statistical methods and procedures based on these distributions should be used. However, Ecology states that the validity of using these distributions need to be evaluated and if the statistical hypotheses of normality and lognormality are both rejected, then nonparametric statistical methods can be used (Section 2.1.5, page 21). The hypotheses of normality and lognormality were both rejected

for the cadmium data.

Section 5.2.1 (page 54) of the Ecology statistical guidance for soil compliance monitoring for cleanup levels based on chronic or carcinogenic effects utilizes an upper confidence limit on the mean for comparison with the standards. Methods for calculating the UCL for the mean for the normal and lognormal distributions are given in Section 5.2.1. Section 5.2.1.3 gives guidance for the situation when the normal or lognormal distribution is not appropriate for large sample sizes: but it is for an approximate UCL on the mean. However, we think the mean is inappropriate as a measure of central tendency for this set of data. Section 5.2.1.4 which discusses other distributions with small sample sizes allows the use of an upper tolerance limit for a percentile selected on a site-specific basis.

***Question: Why does the statistical guidance for the chronic and carcinogenic cleanup levels not include the provision for a UCL for the median for comparison to cleanup standards when the normal and lognormal distributions are not appropriate but the sample size is large? Section 5.2.2 provides a statistical approach for comparing compliance monitoring data to cleanup levels based on short-term or acute threats; the approach is based on the upper tolerance limit for the 90th percentile of the distribution and is designed to be more stringent than the UCL on the mean. The section provides methods for calculating the UTL for a percentile of the normal, and lognormal distributions, and nonparametric methods for calculating the UCL for a percentile for sample sizes less than 20 and greater than 20. We utilized the method for calculating the 95% UCL of a percentile of the distribution in Section 5.2.2.4, to calculate the 95% UCL for the median (which is the 50th percentile) of the cadmium data.***

***Question: There was question regarding the potential for a bimodal distribution based on the two-humped appearance of the histogram of the cadmium concentrations less than 28 ppm. It is difficult to postulate a physical reason for a bimodal distribution over such a small range of concentration values, so we attribute the bimodal appearance of the histogram to sampling variation.***

***Question: Ecology had a question on the formula for the nonparametric UCL for a percentile (for sample sizes greater than 20) having a term which is the standard normal function. This can be answered by reviewing the derivation of the UCL and is an off-line research topic.***

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