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October 7, 1991

Mr. Martin Hestmark
U.S. Environmental Protection Agency
Region VIII
999 18th Street, Suite 500, 8WM-C
Denver, Colorado 80202-2405

RE: Draft Phase I RFI/RI Workplan for OU 3, the Off-site Areas,
July, 1991

Dear Mr. Hestmark,

The Colorado Department of Health, Hazardous Materials and Waste Management Division (the Division), has reviewed the above referenced document prepared by DOE and it's prime operating contractor, EG&G. The Division's comments along with those from the Rocky Flats Program Unit are attached.

The Division is pleased with the overall content of this plan and believes that, with minor modifications, it can successfully characterize the contamination and risk in OU 3. However, the Division feels that some additional samples and additional analytical suites need to be added to certain portions of the plan. The attached comments reflect these suggested additions and the reasons that the Division believes they are important.

If you have any questions regarding these matters, please call Joe Schieffelin of my staff at 331-4421.

Sincerely,

Gary W. Baughman
Unit Leader, Hazardous Waste Facilities
Hazardous Materials and Waste Management Division

cc: Frazer Lockhart, DOE
Bob Birk, DOE
Paul Bunge, EG&G
Michael Guillaume, EG&G
Barbara Barry, RFPU
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ADMIN RECORD

A-0003-000025

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Colorado Department of Health

Review and Comment

Draft RFI/RI Workplan for OU 3 - Offsite Areas
July, 1991

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General Comments:

None

Specific Comments:

Executive Summary: On page two of this section an additional bullet needs to be added to the list of bullets presented. This bullet could say "Describe the fate and transport of contaminants found in OU 3." This RFI/RI Workplan should make an effort to go beyond only determining the nature and extent of the contaminants. It needs to begin to determine how these contaminants move through environmental media (see IAG Statement of Work, Section VII).

Executive Summary: Within the "SOIL" subsection, the Executive Summary needs to clarify that soil sampling will be done in a 1000-meter grid covering an area that extends approximately three miles east from Indiana Street and over four miles north-south along the entire eastern boundary of the Plant.

Section 1.3: An effort needs to be made to construct the subsections of Section 1.3 so that they address the specifics of OU 3. OU 3 is not a part of RFP and the physical setting, physiography, geologic setting, bedrock, surficial deposits, hydrology, surface water, groundwater, and ecology need more site-specific treatment in these subsections of the text.

Section 1.3.3.1: The fifth sentence in the first paragraph of the section needs to be deleted. The depositional environment of the Arapahoe sands is still being developed.

Figure 1-2: The color code on this figure needs to be changed. Because the color shades are similar and many of the ponds are very small on the map, the colors are hard to distinguish.

Figure 1-3: The location of Church Ditch needs to be added to this figure.

Section 1.3.6.1: Please change "Single (unincorporated) residents

are located . . ." to "Single family dwellings are located in the unincorporated areas . . ."

Section 2.1.1: The word "contiguous" needs to be deleted from the first sentence of the second paragraph of this section.

Section 2.1.2: This section should be re-named "Significant Historical Events in IHSS 199." This needs to be done so that the explanation of the litigation that follows in Section 2.1.2.1 will not be construed as comprehensively covering all portions of IHSS 199.

Section 2.1.3.2: This section should be more comprehensive in it's discussion of the OU 3 surface water environment. Discussion should be added to include average and maximum flow rates in Walnut and Woman Creeks, Smart, Church, and the Mower Diversion Ditches. There should also be a discussion of the normal flow periods for each of the ditches. In addition, an explanation of the surface water-ground water interchange should be included.

Contrary to text in the first paragraph of Section 2.1.3.2, the Jefferson County acreage in section 18 does not surround Mower Reservoir.

Section 2.2.2.2: Please include the normal surface water elevation of Great Western Reservoir in this section along with the average seasonal fluctuations of the water level. Please also include an estimate of the land surface exposed at the minimum water level.

Section 2.3.2.2: See comment to Section 2.2.2.2 above and apply it to Standley Lake Reservoir.

Section 2.5.1: The Division appreciates the OU 3 dilemma that existing data is almost exclusively for Plutonium. However, this should not preclude discussions in this section of the text from including non-Plutonium contaminants. The conceptual models presented here should include comprehensive coverage of radionuclides and non-radionuclides. The text makes a small effort to do this, but discussions of release mechanisms, transport media, contaminant fate and transport, and contaminant mobility only cover plutonium. Please expand these sections to include other possible contaminants.

Section 3.0: Pending the results of the regulatory agencies request for a meeting regarding the ARAR approach for Rocky Flats RFI/RI's, the Division is withholding comments on the issue of TBC's and State standards. We will also withhold comments on the completeness of the list of constituents included in this workplan. However, in the following comments we have pointed out a few discrepancies.

On the first page of Table 3-1, under the column entitled "Tables

A and B - Statewide," there is a standard of 15 pCi/l listed for Plutonium 239+240. Tables A and B include carcinogenic and non-carcinogenic organic chemicals only, and do not cover radionuclides. The standard for plutonium is incorrectly placed.

On the second page of Table 3-3, under the column entitled "Table 2 Radionuclides - Woman Creek, Walnut Creek," the standard of 0.05 pCi/l should be added for Americium 241 and for Plutonium 239+240.

Table 5-1: The Division has been repeatedly assured that sampling and analysis will be conducted to determine if contamination to OU 3 has resulted from chemicals other than plutonium and americium. This would include other radionuclides. However, with few exceptions, this table only refers to analysis for plutonium and americium and neglects the other radionuclides. The Division believes that the sampling and analysis covered in this table should be for all radionuclides and should not be specific to only plutonium and americium.

In characterizing the nature and extent of soil contamination, the Division believes that analyses should be included for metals and any other potentially windblown chemicals or constituents that are or have been in use at RFP. Again, soil contamination may not be confined to just plutonium and americium.

To completely characterize the hydrology, a full suite of analyses needs to be done on any recovered groundwater. This would include analysis for TAL metals and TCL volatiles.

In addition to the analyses mentioned, air samples need to be analyzed for gross alpha, and gross beta.

Table 6-1 - SOIL: As stated above, the Division does not believe that analyzing soil samples for only plutonium and americium is sufficient to completely characterize any soil contamination in OU 3. We think that the surface soils need to be analyzed for all radionuclides and that 25% or more of the samples should also be tested for the TAL metals and any other potentially windblown chemicals or constituents that are or have been in use at RFP. Because the plant history is now 40 years long, releases could have occurred long ago that, at the time, were considered of no consequence. Operations over the life of the plant are not well documented or understood. Whether or not a "source" or release can be pointed to for potential off-site soil contamination, the Division believes that some of the soil samples should get a full-suite analysis.

Table 6-1 - SEDIMENT: Sample locations need to be added to the sediment sampling program in the ephemeral streams north of Great Western Reservoir and in all ephemeral streams between Great Western and Standley Lake Reservoirs. Samples also need to be collected in Church Ditch. In addition, sediment data from the

municipalities should be incorporated into this workplan and the data used to more effectively and efficiently design sediment sample collection.

Table 6-1 - SURFACE WATER: Sampling for SW-1 should include, when possible, water from any ditches that transect OU 3.

Table 6-1 - GROUNDWATER: As stated previously, the Division believes that full suite analysis should be done on the groundwater from OU 3. This should include all radionuclides, TAL metals, and TCL volatiles. We also believe that any groundwater monitoring wells should be drilled and the geologic material from these wells sampled in the same manner that on-site wells are drilled and sampled. This would include coring, core sampling, core description, and well construction and development.

Table 6-1 - AIR: As stated previously, The Division would like any air samples to be analyzed for gross alpha, gross beta, and uranium.

Figure 6-4: Please refer to the attached copy of Figure 6-4 for the Division's recommendation for additional sampling locations.

Please note that the additional sampling locations are within Church Ditch (3 samples), and the two ephemeral streams northeast of Mower Reservoir (4 samples). The Division believes these samples are justified because 1), these sediment locations are directly down the major wind vector from the plant and within the main plutonium contamination plume and 2), no data is currently being collected in these streams to study the collection and concentration role that they may be playing in the migration of plutonium in the surface system.

Figure 6-5: Please refer to the attached copy of Figure 6-5 for the Division's recommendation for additional sampling locations.

These sample locations have been added for reasons similar to those stated above for the additional sediment sampling locations. These additions are necessary to gain a complete understanding of the surface water system.

Section 6.2.1.2: In the third sentence of the first paragraph in this section, the word "potential" needs to be added as an adjective for the acronym "ARAR." Tables 6-3, 6-4, and 6-5 do not present finalized ARAR values, but only present the lowest existing standard. This value may or may not become the actual ARAR.

Tables 6-3, 6-4, and 6-5: The titles of these tables need to be expanded to clarify that the values presented come from groundwater, surface water, and sediment collected along Indiana Street.

Table 6-6: As has been indicated in previous comments, the Division believes that this table needs to be changed. Specifically, TCL VOAs and TCL metals should be added to the groundwater analyses; TCL acid extractables and base/neutrals should be added to the sediment analyses; TCL pesticides and PCBs and TCL metals should be added to a percentage of the soil analyses.

Section 6.2.2.1.1: Groundwater should be analyzed for volatiles.

Section 6.2.2.1.5: Groundwater should be analyzed for inorganics and metals.

Section 6.2.2.3.2: At least a percentage of sediment samples should be analyzed for the semivolatiles.

Section 6.2.2.4: At least a percentage of the soil samples need to be analyzed for pesticides and PCB's as well as metals.

Section 6.3.1.1: The Division was unable to find the soil profile sampling on a map. Please either add a map indicating where these samples will be collected or add this information to an existing map.

Table 6-9: Attached, please find some comments to Table 6-9 from Jeb Love of the Rocky Flats Program Unit. These comments concern inadequate detection limits for some of the listed analytes as well as some analytes that have been incorrectly omitted.

Table 6-10: Please see the attached copy of Table 6-10 for the Division's suggested additions and changes.

The reasons for the additions are as follows:

1) Gross alpha and gross beta need to be added to profile soil sampling, the soil grid survey, reservoir vertical profiles, and air sampling because a more complete understanding is necessary to characterize the radionuclide contamination and background and associated risk in OU 3.

2) TAL metals need to be added to a percentage of the soil grid survey so that metals can be characterized and the risk analyzed in the off-site areas. Unless metals are sampled and analyzed for, the risk from them remains a quantity that cannot be quantified. The text was unable to present any historically collected soil data for metals because the soils have never been tested for anything but plutonium. The groundwater also needs to be tested for TAL metals. This is a good opportunity to extend RFP's understanding of metal occurrence and migration in the subsurface.

3) The groundwater also needs to be tested for TCL volatiles, both to extend RFP's data base eastward and to prove that absence

or presence of volatiles (the principle on-site contaminant) in the off-site subsurface.

In addition, Table 6-10 should be expanded to clarify which sample types will be analyzed for pesticides and PCBs and semi-volatiles.

Also, the table indicates that analysis will be performed to break down the relative amounts of each uranium isotope. Please verify that the planned analysis method will, in fact, be able to accomplish this goal.

Section 8.0: Comments to Section 8 from Jeb Love of the Rocky Flats Program Unit are attached. Mr. Love has been participating in the Risk Assessment Technical Working Group that has been attempting to establish some site-wide protocols for the Environmental Evaluations. Please address his comments with this in mind.

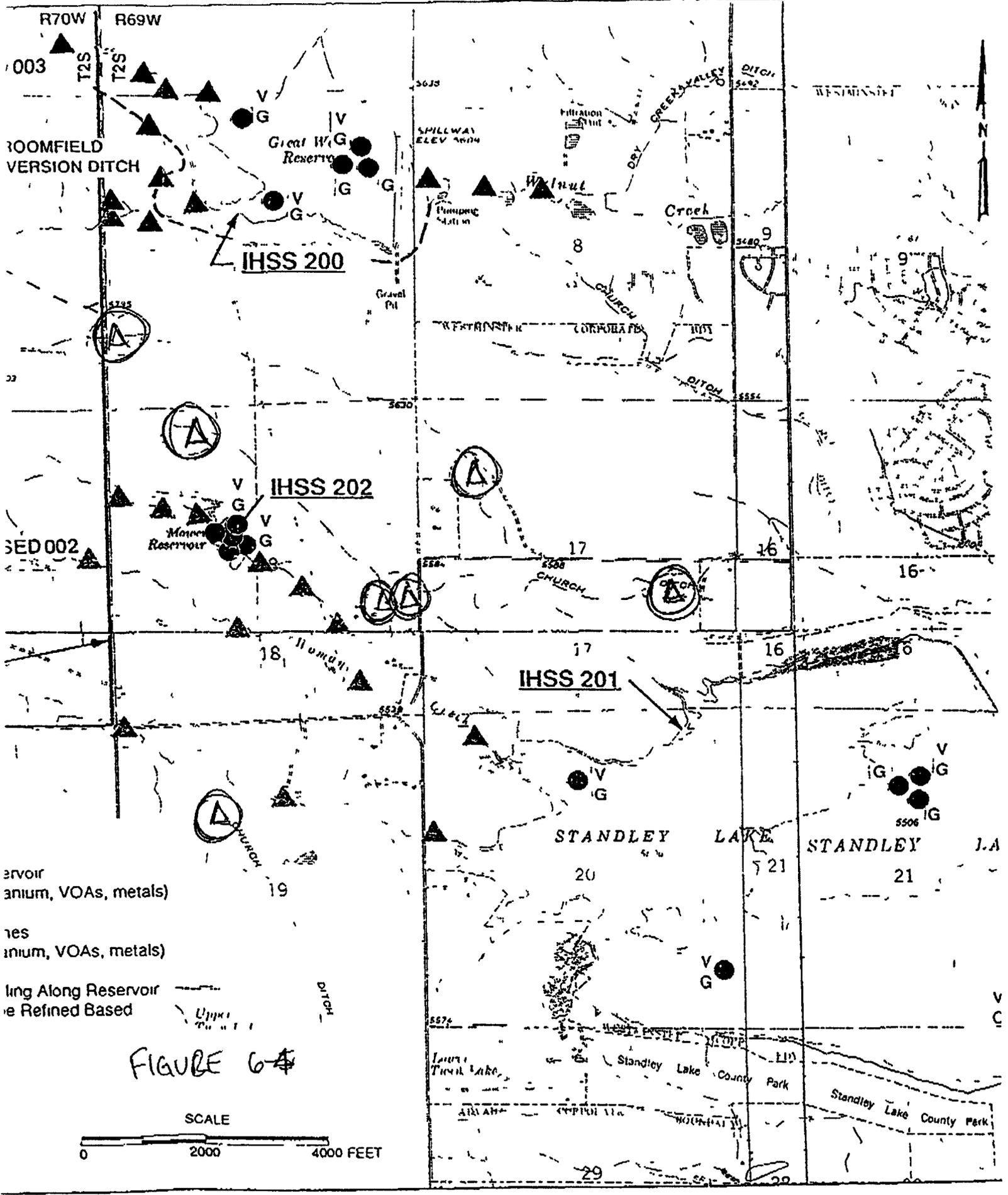
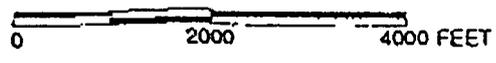


FIGURE 6A

SCALE



Reservoir
(Lead, Cadmium, Vanadium, VOAs, metals)

Streams
(Lead, Cadmium, Vanadium, VOAs, metals)

Monitoring Along Reservoir
(Lead, Cadmium, Vanadium, VOAs, metals)

Upper
Tributary

DITCH

2

TABLE 8-10
ANALYTICAL PROGRAM
FOR OPERABLE UNIT NO 3

Sample Activity	Media	Pu 239/240	Am 241	U 233/234	U 238	H3' H3'	Gross *
Profile soil sampling	Soil	X	X				⊗
Soil grid survey	Soil	X	X	X	X		⊗
Sediment sample in drainages	Sediment	X	X	X	X		X
Sediment sample near reservoir shoreline	Sediment	X	X	X	X		X
Reservoir vertical profile sediment samples	Sediment	X	X				⊗
Reservoir grab sediment samples	Sediment	X	X	X	X		X
Surface water samples in drainages	Water	X	X	X	X	X	X
Surface water samples in reservoirs	Water	X	X	X	X		X
Groundwater monitoring wells	Water	X	X	X	X		X
Air sampling	Air	X	X				⊗

DRAFT

¹Samples collected along Walnut Creek only.
²Twenty percent of the samples
³Mower Reservoir only

TABLE 6-10

ANALYTICAL PROGRAM
FOR OPERABLE UNIT NO. 3
(Concluded)

Sample Activity	Gross B	TAL Metals	TCL VOAs	TCL TOC ¹	Bulk ² Density	Grain ² Size	Major Cations/Anions	Field pH, EC, DO
Profile soil sampling	⊗			X	X	X		
Soil grid survey	⊗			X	X	X		
Sediment sample in drainages	X		X					
Sediment sample near reservoir shoreline	X		X		X	X		
Reservoir vertical profile sediment samples	⊗	X	X	X	X	X		
Reservoir grab sediment samples	X		X	X	X	X		X
Surface water samples in drainages	X		X	X			X	X
Surface water samples in reservoirs	X		X	X ²			X	X
Groundwater monitoring wells	⊗		⊗	⊗			X	X
Air sampling								

DRAFT

¹Samples collected along Walnut Creek only

²Twenty percent of the samples.

³Mower Reservoir only

Memorandum to Gary Baughman
From Jeb Love *JLB*
Re. Comments on Operable Unit 3 Rf1/R1 Workplan and OU4
Date September 30, 1991

OU 3 and OU 4 workplans were completed before the workplans drafted for OU 5 and OU 6. So the format and content of the earlier workplans lack inclusion of the results of the efforts of the environmental evaluation workgroup.

The area of concern throughout these workplans is the protocol used to figure out the nature and extent of contamination in the surface and subsurface waters, ecological structure and effects on biota.

Initial screening of water, sediment and aquatic data are examined to look not only for in-stream concentrations that exceed stream standards, groundwater standards or ARARs. The evaluation of historical and screening data attempt to account for loadings from location to location and from time to time. This is a very systematic approach, based on sound engineering practice, resulting in a conceptual model providing a framework for quantifying the nature and extent of contamination.

The initial sampling plans, with historical data, form the basis of comprehensive conceptual models of the site and of localized areas. Localized areas in need of further resolution are determined where concentrations exceed numeric criteria, environmental effects are noted or loads do not balance. The initial sampling plans, therefore, need to be screened to insure the right data is gathered to answer these major areas of concern.

The locations of surface sampling stations are critical to the ability to account for various loadings of chemicals of concern. The initial sample location selection process needs to recognize the need to balance the loadings through the area being evaluated.

The workgroup has reached consensus on the process for selection of contaminants of concern, communities to be evaluated, tissue studies, sediment, surface and subsurface analyte lists, aquatic toxicity testing, etc for OU5. An area yet to be completely resolved is a consensus on the initial selection of sampling locations, and the process for evaluating the data to account for differences, over time and space, modeling. The models selected and the areas in need of higher levels of resolution dictate the sampling plan; location, analyte list, coordination, methods etc. This is a fine tuning of the work planning process and coordination among the parties. Since the site-wide models do not exist at this time this exercise needs to be done so we are all on the same line of the same page, so to speak.

I have included a copy of a presentation given to the DOE, EPA and CDH workgroup on environmental evaluations. The next meeting of this workgroup in 15 November DOE will have their environmental exposure assessment modelers present their workplans and status. Site-wide air, surface and subsurface modeling will be presented, (maybe not all at the November meeting). Additional smaller scale modeling is also being undertaken to provide the higher levels of resolution needed for the IHSSs and Operable Units.

The RFFU, WQCD and EPA are building similar models to confirm the nature and extent of contamination at the site. This is an ongoing process involving many levels of expertise and individuals and groups. All parties, including DOE and their contractors, are in the initial stages of building conceptual and mathematical models of the selected smaller scale areas and the complete models of the area.

These models will be used to explain, basic transport mechanisms, quantify source contributions, confirm exposure pathways, and eventually to simulate load reductions spatially and temporally due to treatment and remediation efforts, do sensitivity analysis and quantify uncertainty.

My recommended comment to DOE on OU3 and OU4, once updated to reflect changes in the processes, format and content made for OU 5 and OU 6, would be

DOE needs to emphasize that the workplans need to be coordinated with the exposure assessment modeling efforts developed for modeling of groundwater and surface water. The station and well location selection process, including parameters to be monitored, need to include input from DOE (EG&G) modelers. We want to have the strongest most comprehensive base possible directing efforts in those areas where; environmental effects are noted, concentrations more than numeric ARARs are noted, and locations where differences in loading of chemicals of concern cannot be accounted

Specific comments on the *Final Draft Work Plan, RFI/RI Work Plan For OU 3, Rocky Flats Plant, July 1991.*

Page 6-72, TABLE 6-9

Soil, Sediment, and Water Sampling Parameters and Their Detection Limits Operable Unit No 3.

The metal detection limits for water for cadmium, chromium, copper, and silver are not sensitive enough for the intended use of the data. Substitute the following

<u>Target Analyte</u>	<u>Detection Limit ug/l</u>	<u>EPA Method</u>
Cadmium	0.1	213.2
Chromium	1.0	218.2
Copper	1.0	220.2
Silver	0.2	272.2

Add the following analytes to the list

N-ammonia ¹	350 2
N-nitrite ²	354 1
Total phosphorus ³	365 4
Total suspended solids ⁴	
Turbidity ⁵	180 1
Chlorophyll-a ⁶	

1 Ammonia toxicity is a concern to aquatic life The ammonia levels in the on-site ponds and downstream are a compliance concern with the stream standards for ammonia on walnut creek

2 Nitrite toxicity is a concern to aquatic life

3 Total phosphorus in the reservoirs and loading to the reservoirs are needed for any baseline assessment, used to measure the health of the reservoirs With the nitrogen species a nutrient balance can be initiated

4 Total suspended solids is a parameter used in partitioning and other assessments of surface waters and should be a standard analyte

5 Turbidity or particle counting should be considered relative to the radionuclide concentrations, particularly correlations with plutonium and americium Any correlations that can be extrapolated from the data to enable the creation of an indicator for americium and plutonium should be considered

6 Chlorophyll-a should be considered in any baseline analysis of the reservoirs The sampling protocol should require sampling in the photic zone

Chlorophyll-a also may be useful in investigating a correlation between plutonium, americium and turbidity, allowing the elimination of the effects of algae on turbidity

The baseline assessment of the reservoirs needs a loading analysis of nutrients, including the storm event data and atmospheric deposition Turbidity and Chlorophyll-a analysis are recommended, but may be considered as topics for further discussion

cc Barbara Barry
Judy Bruch
Debbie Mauer
Elizabeth Potorff
Bob McConnell
Joe Schiefflien
Harlan Ainscough