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STATE OF COLORADO

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MEMORANDUM

TO: Jeff Swanson
FROM: Diane Niedzwiecki DMN
DATE: August 5, 1994
RE: Comments on Final Phase III RFI/RI Report for OU1, 881 Hillside, RF-DOE Plant.

General Comments:

It is obvious that DOE has made some effort to incorporate some of CDH's and EPA's comments on previous versions of this report. Much of the editorializing regarding EPA methodology and guidance for estimating cancer incidence and the errors in the discussion of removal of the hotspots by sampling, for instance, have been appropriately deleted. In addition, many of the tables are greatly improved.

However, other CDH comments have still not been incorporated. The most important of CDH's comments that were not incorporated is: intakes should be calculated for all complete exposure pathways, regardless of whether the exposures currently are thought to be significant or not, or whether there are any available toxicity factors to use to calculate risk. That way when more toxicity data becomes available, risks can then easily be evaluated quantitatively, even if they can't be now. DOE did not calculate the intakes after inhalation of PAHs or other semivolatiles, the exposure to external irradiation from soil surfaces, or the dermal intake after contact with surface water or sediments, for example. Not calculating these intakes can result in an apparent underestimation of risk since it is easy to ignore pathways for which no intakes are calculated. The risks from these pathways should at least be assessed qualitatively (RAGS). This was not done. While some of these underestimations of risk are discussed in the text, or mentioned in Table F7-27, Public Health Evaluation Uncertainty Factors at OU1 Rocky Flats Plant, others are not mentioned at all either in this table or in the text, e.g., inhalation of PAHs and other semivolatile chemicals. DOE states that other exposures i.e., the dermal exposure to chemicals in surface water, will be assessed during the OU5 evaluation. Overall, these omissions, along with several portions of the uncertainty discussion, give the impression DOE is trying to downplay the risks from OU1, and in particular, those risks that stem from the soil and groundwater hotspots and from exposure to soil PAHs.

The second general comment is that it is still unclear what specific criteria under professional judgement DOE used to eliminate potential contaminants or contaminants of concern, and how professional judgement was weighted compared to more objective measures such as the agreed upon statistical methodology.

Finally, a number of toxic chemicals were eliminated because of the 1000xRBC criteria, even though they are present at relatively high concentrations. This 1000xRBC criteria injects a lot of arbitrariness and a lack of conservatism into the COC selection process. If there is any possibility of getting rid of this criteria for other OUs, I would advocate that it be replaced by a simple comparison with the RBC.

Specific Comments:
F2.2 Nature and Extent of Contamination
F2.2.6.1 IHSS 119.1 Page F2-12. Has the eastern end of the French Drain been demonstrated to effectively capture all USHU groundwater?

F2.2.6.3 Semivolatile Organic compounds. Page F2-15.
DOE persists in ignoring the possibility that PAHs may have come not only from general, widespread sources such as urban fallout from vehicles, asphalt dust and furnace exhaust, but also from incineration at RFP and from the 1957 and 1969 fires at the RFP. Both DOE and CDH have consistently commented on this omission in previous versions of this report. Since there has been no change, the only conclusion is that DOE is deliberately attempting to underplay the possibility that RFP may have contributed to the presence of these pollutants.

F2.2.6.4 Polychlorinated Biphenyls. Page F2-15.
CDH has previously commented that oil may be the source of PCBs found on the RFP. Again DOE has not considered oil used by RFP in industrial or other processes as a possible source.

F3.3 Screening of Contaminants. Page F3-4.
When the 1000 x RBC screen was agreed to, exposure to all media by all routes were to be examined, not just oral exposure.

Tables F3-1a to F3-14. Summary Statistics.
Please explain why the calculated mean concentration is often greater than the maximum concentration detected or less than the minimum concentration detected. If outliers or nondetects were included in the calculated mean but not in the lists of maximums and minimums, this practice should be clearly explained somewhere in the text. Without an explanation, the numbers are confusing and lead to less confidence in any of the numbers presented by DOE.

Tables F3-15 to F3-24.
The Risk Factors presented have the wrong exponent because DOE did not convert concentration units.

Tables F3-33,35,36 Contaminant and COC Screening Process, Surface Soil.
I do not understand whether and if so, how the potential for air-borne contamination by both chemicals and radionuclides was considered during the use of spatial and temporal considerations in professional judgement. Air-borne contamination would likely be spread over a larger area than a localized spill, and it is likely

that this pathway resulted in significant contamination in the past.

Table F3-28. Contaminant and COC Screening Process, Groundwater Organics.
Several OU1 contaminants were eliminated as OU1 COCs by the 1000xRBC Screen because of a lack of an RBC. This is inappropriate. If no toxicity values are available for a chemical, that chemical should be included in the qualitative risk assessment. It should not be dropped (US-EPA, 1989. RAGS. page 5-24). These chemicals include: 2-butanone, 2-hexanone, 4-methyl-2-pentanone, 1,2,4-trimethylbenzene, naphthalene, p-chlorotoluene, p-cymene, and tert-butylbenzene.

Table F3-31. Contaminant and COC Screening Process, Geologic Materials Total Radiochemistry.
Uranium-235 cannot be screened out due to less than 1% of the carcinogenic risk when no noncarcinogenic toxicity data is available for it.

Table F3-32. Contaminant and COC Screening Process, Geologic Materials Organics.
Phenanthrene should not have been screened out because of a lack of toxicity data.

Table F3-36. Contaminant and COC Screening Process, Surface Soil Organics.
Anthracene, benzo(ghi)perylene, chrysene, indeno(1,2,3-cd)pyrene, and phenanthrene should not have been eliminated as OU1 COCs simply because of a lack of toxicity data. They need to be discussed in the qualitative risk assessment. Acenaphthylene should not have been eliminated by the 1000xRBC Screen as an OU1 contaminant of concern simply because of a lack of toxicity data. I do not understand why the spatial/temporal considerations were "not applicable" (NA) for so many of the chemicals found in the surface soil.

Tables F3-37-44. Contaminant and COC Screening Process, Surface Water and Sediment.
What is the end of the sentence under footnote (a) that starts, "Surface soil COCs were not detect..."?

Section 4 Identification of scenarios and pathways.
It has recently been brought to CDPHE's attention that DOE does not own the mineral rights under Rocky Flats. Western Aggregates has applied for gravel mining permits from the State of Colorado for two portions of the buffer zone on the west side of RFP. To date, DOE has not discussed the fact that they do not own the mineral rights under Rocky Flats in any of their risk assessment documents that I have seen. However, it seems that gravel mining is a definite possibility in the buffer zone at Rocky Flats. Is this scenario possible for OU1 sometime in the future, perhaps after the hot spots are remediated? The exposure scenarios DOE has chosen to analyze would significantly underestimate the exposure of gravel

pit workers to sediments, surficial and subsurface soil, as well as to groundwater. The construction worker scenario would come the closest, but gravel pit workers would be expected to work longer than 1 year at a site. Because DOE completely "missed" this possibility in any of their documents, the rest of their judgement about which scenarios in the future are credible or improbable may not be accurate either.

Page F4-18.
The exposure because of external irradiation should be calculated regardless of whether DOE considers this to be a significant pathway or not and regardless of whether EPA's current external radiation risk values are applicable to small hotspots or not. Not calculating the intakes from this pathway downplays any potential risk that might result from exposures by this route.

Figure F4-4. Conceptual Site Model.
I do not understand the rationale DOE used to justify resuspension of soil as a negligible or incomplete pathway for both current and future <u>on-site</u> receptors, but an insignificant pathway for current and future <u>off-site</u> receptors? Doesn't "insignificant" connote a larger number than "negligible or incomplete"? Was this distinction done to simplify modeling?

Table F5-1. Chemical-specific Dermal Exposure Constants.
What is the source of the dermal permeability constant for selenium?

Tables F5-4 & F5-5; F5-8,9,10,11; F5-14,15,16,17; F5-20 & F5-21; F5-24,25,26; F5-29,30,31; F5-34,35,36; F5-39,40,41; F4-44,45,46. RME Carcinogenic and Noncarcinogenic Intakes for all receptors.
Why were intakes from inhalation of nonradionuclides in dust particles not calculated? DOE agreed to calculate inhalation of airborne particulate matter for these receptors as shown in the Conceptual Site Model and as mentioned in the text on pages F4-20,21,23,24 & 26. Moreover, DOE has modeled the airborne particulate RME concentrations of the chemical COCs as shown in Tables F5-3, F5-7, F5-12, F5-19, F5-23, F5-28, F5-33, F5-38 & F5-43. Furthermore, because intakes were not calculated for this pathway, risks from inhalation of chemicals were not calculated, potentially resulting in a large underestimation of risk. Inhalation toxicity values for many of these chemicals are not yet available. However, as mentioned in the general comments, intakes should still be calculated, otherwise, a misleading picture of potential exposures and risks is presented.

Table F5-13. Estimated RME Concentrations of COCs for the Future On-site Construction Worker.
Why were no airborne particulate concentrations for chemicals presented for this receptor? Does DOE believe there would not be any dust at a construction site, or are the RME values the same as those for the future office worker? Also, please present the rationale for why a concentration for toluene is presented in the airborne particulate column.

Table F5-11. Exposure Parameters-Future On-site Industrial Worker. Where does the 10 day/year exposure value for a construction worker come from? What sources did DOE use to come up with this number?

Table F5-18. Exposure Parameters-Future On-site Ecological Researcher.
We did not comment on this exposure factor before, but the ingestion rate of 0.00002 liters/event pertains to sediments, not to surface water. It may be appropriate for sediments, but it is not appropriate for incidental ingestion of surface water. Rather, the EPA recommended RME value of 50 ml should be used (EPA, 1989, RAGS). However, since the bulk of the surface water assessment will be included in the OU5 assessment, it is not necessary to make a big deal about it here. We do need to make a note of it for the future, however.

Table F5-22 and all other tables showing exposure parameters for the child future on-site resident.
We did not comment on this exposure factor before, but both the child body surface area and the adult body surface area recommended by HMWMD in the "Interim Final Policy and Guidance on Risk Assessments for Corrective Action at RCRA Facilities" for the dermal contact with soil pathway are greater than the values used here. The adult body surface area DOE used is the default 25% of total surface area recommended by EPA in the Dermal Exposure Assessment (1992) guidance, and the value for children was obtained from the EPA 1989 Exposure Factors Handbook. Therefore, the values DOE used are not unreasonable.

Similarly, we did not comment about the child value for ingestion of fruits and vegetables in previous versions of this document, mainly because we were simply glad they had finally agreed to assess children. The ingestion rate DOE has listed is simply one half of the adult value. DOE references EPA's Exposure Factors Handbook for this value. However, this value could not be found in this referenced source. Moreover, children often have quite different diets both qualitatively and quantitatively than adults. Information taken from the U.S. Dept of Agriculture's Nationwide Food Consumption Survey (1977-78) and (1987-88), and the U.S.EPA's Office of Pesticide Programs' "Tolerance Assessment System (TAS)" shows that infants (<1 yr) and children (1-6 yr) often have diets much higher in dairy products, fruits and vegetables, and cereals than adults (U.S.EPA, 1990 Methodology for Assessing Health Risks Associated with Indirect Exposure to Combustor Emissions EPA/600/6-90/003). Therefore, it is inappropriate to simply assume that children eat only one half the amount of fruits and vegetables compared to adults. The suggested ingestion rate for children in HMWMD's Interim Final Policy and Guidance on Risk Assessments for Corrective Action at RCRA Facilities is equal to that for adults. I consider this ingestion rate to be more reasonable than that recommended by DOE. Again, it may not be necessary to make a big deal over this, especially since the calculated intakes and risks for children on this pathway turned out to be greater than those for adults, even using DOE's

ingestion factor of one half the adult value. However, the actual risk is probably greater for children than what DOE stated, assuming all the other assumptions for this scenario are accurate.

Table F5-27. Exposure Parameters-Future On-site Resident.
The body surface area values DOE chose for dermal contact with groundwater are consistent with EPA's recommendations for the shower pathway.

F7.3.1. Sources of Uncertainty.
Page F7-14.
The lack of inhalation RfCs or RfDs for PAHs, and the reasons why DOE did not calculate inhalation intakes of these chemicals in airborne dust were not discussed as sources of uncertainty. DOE is commended, however, on finally including a discussion of many of the other chemicals which do not yet have toxicity values in this section.

Page F7-16.
I agree with DOE that an area weighted average might give a more representative site-wide average. However, it is not clear from DOE's explanation why the concentrations of 1,1-DCE and CCl_4 in groundwater are more representative than the concentrations of plutonium and americium are in soil. Didn't the groundwater data also include the detects at the source just like the soil data did? Without some discussion of the size of the groundwater plume relative to the size of the hotspots in soil, DOE's overemphasis on the tiny relative size of the soil hotspots seems overblown, simply because it is repeated so often. Furthermore, Colorado under RCRA requires an estimate of risk at the source in order to get an idea of the risks from the areas that might actually need further action. Therefore, regardless of whether the DOE thinks the hotspots bias the site-wide risks or not, it is useful to determine the hotspot risks.

F7.4.2 Expected Impact to the Community.
DOE's opening paragraph in this section gives the impression right off the bat that DOE wants to minimize risks, rather than present them objectively. One should not assume up front that risks are minimal. Rather, the uncertainty of the risks should be presented, and conclusions drawn from that. The first paragraph belongs at the end of this section rather than at the beginning.

Page F7-27.
DOE's presentation of the relative risks to the population at various distances from RFP was not clear at all. Since this is to be a public document, DOE should consider rewriting this section so that it is understandable. Part of the reason for the lack of clarity in this section is that DOE's method for calculating a collective dose is convoluted at best, and is definitely not a standard approach. It is not clear why DOE presented the normalized risk factors (NRFs) and then tried to come up with a per capita average. Simple calculation of the collective dose would show how a dose would decrease with distance. If one wants to

present the average risk to an individual, one can do it by dividing the collective dose by the number of people, and plotting the ratio as a fraction for each area. DOE's focus on the NRF, i.e., the collective dose for a population/the maximum dose for an off-site individual, again gives me the impression they are trying very hard to minimize the risks resulting particularly from Pu exposures, rather than just presenting them objectively.

Furthermore, DOE's NRFs as presented in Figures F7-19, F7-20 and F7-21 were calculated based on data from only one year. DOE should total up the risks for a 30 year period and present the relative risks for that time period also. Otherwise, it gives the impression, again, that DOE is trying to minimize the risks.

Page F7-28.

DOE's discussion of the lack of causal links in the literature between radiation exposure from nuclear facilities and noticeable public health effects reinforces the impression that DOE is trying to minimize the risks in this section. What 40 radiological studies were in the review? What is the reference? DOE continues to focus on cancer fatalities, even though cancer incidence is not an insignificant public health effect. I got the impression that DOE is trying to use lack of statistical proof in the epidemiological studies performed so far as an indication that there is no effect, when the question is still open.

F7.5 Summary of risk characterization.
Page F7-35.

Where is Table F7-31 which presents the quantitative uncertainty analyses of both 1,1-DCE and carbon tetrachloride? It was referred to on this page, but couldn't be found in this document. In the text DOE discusses 1,1-DCE, where the calculated site-wide RME value is higher than the 95th percentile, but does not discuss carbon tetrachloride, where the calculated site-wide RME value was lower than the 95th percentile. Again, by not presenting data or calculations that show that the RME values are not so unrepresentative, DOE has left the impression that they want to minimize the risks.