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ENV RESTORATION DIVISION

FAX NO. 4871

P. 03

P. 02

DOE F USBA

United States Government

Department of Energy

Rocky Flats Office

memorandum

COPY

DATE: MAR 30 1994

REPLY TO: ---
ATTN OF: ER:SRG:03600

SUBJECT: Resumption of All Work on Operable Unit Baseline Risk Assessments

TO: Sue Stiger, Associate General Manager
Environmental Restoration Management
EG&G Rocky Flats, Inc.

Memorandum ER:SRG:03599 provides instruction for you to resume all work associated with Environmental Restoration Operable Unit (OU) baseline risk assessments that were stopped by memorandum ERD:SRG:08450, dated August 18, 1993.

We reference the following memorandums concerning resumption of work for contaminants of concern and statistical comparisons with background for the baseline risk assessments:

- ERD:SRG:11731; October 13, 1993: resumption of Contaminant of Concern selection and statistical comparisons of data to background for OU2.
- ERD:EAD:13759; December 22, 1993: resumption of statistical comparisons of data to background for all operable units.
- EG&G memorandum 94-RF-02971 - SG-179-94; March 14, 1994: methodology for statistical comparisons of data to background.

We have just recently reached agreement with the Environmental Protection Agency (EPA) and the Colorado Department of Health on the methodology for data aggregation and the methodology is attached.

You are directed to revise the schedules for the Operable Units to incorporate the agreed-upon risk assessment methodology by April 25, 1994. In particular, the data aggregation methodology represents "additional work or modifications to work" as per Part 32 of the Interagency Agreement (IAG). As a result, we must determine revised schedules and cost, including the additional scope to incorporate the revised methodology, and make a request to EPA and CDH as per Part 42 (Extensions) of the IAG.

Your April 25, 1994 deliverable to us will include schedule extensions for all Operable Units affected by the stoppage of work, and will specifically denote the time needed (with sufficient rationale) for the "additional work." This is an important distinction because the IAG allows a day-for-day schedule extension (Paragraph 164 of the IAG) for the time the work stoppage was in affect and a schedule extension should easily be granted. However, the time needed for additional work is not as straightforward, and as a result, needs a substantial rationale to support the request for additional time needed.

ADMIN SECRET

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ENV RESTORATION DIVISION

FHA NO. 4011

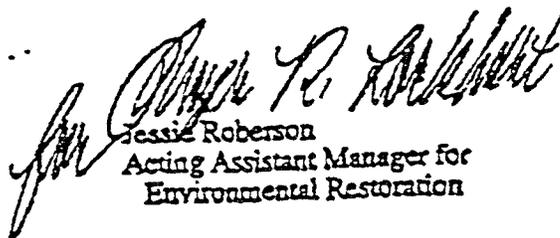
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S. Stiger
ER-SRG-03600

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MAR 30 1994

If you have any questions please contact Frazer Lockhart at extension 7846.



Jessie Roberson
Acting Assistant Manager for
Environmental Restoration

cc w/attachment:
A. Rampertaap, EM-453
F. Lockhart, ER, RFO
B. Thatcher, ER, RFO
S. Grace, ER, RFO
J. Pepe, ER, RFO
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H. Rose, ER, RFO
W. Busby, EG&G
R. Roberts, EG&G

DATA AGGREGATION FOR HEALTH EXPOSURE ASSESSMENT

Specific Data Aggregation Methodology for Rocky Flats

The first consideration of data aggregation is the exposure scenario (land use). Example exposure areas for the Rocky Flats Plant site may be (1) for the industrial/commercial land use scenario, the area of a typical industrial park (2) for the ecological preserve scenario, the area of a preserve, and (3) for the residential land use scenario, the area of a residential neighborhood unless the consideration of a receptor's activity patterns and the mechanisms of toxicity of a particular contaminant indicate that a residential lot size is appropriate.

Following the application of the attached conservative screen (which identifies areas of elevated contaminant concentration which will be the focus of the baseline risk assessment), data must be aggregated for each environmental medium to arrive at the exposure point concentration estimates which will be used in the exposure assessment. Aggregation of all contaminant data, including data below background or detection limits, will be accomplished over the scenario-specific exposure areas within the area of concern identified by the screening process. The recommended data aggregation procedure is as follows:

- 1) Identify the exposure scenario(s) which will be assessed.
- 2) Agree on the size of the exposure area for each scenario by considering the receptors, the toxicity of the contaminants of concern (COCs), the exposure pathways, and contaminant variability. Determination of the appropriate exposure area requires an understanding of the mechanisms of toxicity as well as the concepts of exposure. For this reason, experienced risk assessors, toxicologists, and health physicists from all three agencies (EPA, CDH, and DOE) must be consulted.
- 3) Plot the COC data, including data points below background or detection limit, on a map of the operable unit, delineating the area of concern*.
- 4) Consult with toxicologists and health physicists from all three agencies (EPA, CDH, and DOE) to place a grid of exposure areas over the area of concern. The grid placement must be approved by the three agency toxicologists and health physicists due to considerations of mechanisms of toxicity. Of course, involvement of other scientific disciplines will also be required.

* Area of Concern = One or several sources** grouped spatially in close proximity.

** Source = Area defined by (1) contaminant levels exceeding background mean plus 2 standard deviations for inorganics and/or (2) detection limits for organics.

- 5) Risk assessment requires characterization of each exposure area for the site (OSWER Directive 9285.7-09A, April, 1992, p. 55). Generally this requires aggregation of data and a subsequent calculation of risk within each exposure area. This is especially important for heterogeneous data sets. However, at the Rocky Flats site, all parties agree that it is sufficient to calculate risks for only one exposure area per source: the exposure area associated with the highest risk, identified by considering the concentrations of COCs, the affected environmental media, and the number of exposure pathways. If the exposure area associated with the highest risk is not readily identifiable, several exposure areas may be analyzed. This decision will be made on a case-by-case basis. In general, not more than one exposure area per source will need to be evaluated unless the exposure pathways differ between exposure areas within the source. Data within the exposure area(s) will be aggregated using the following procedure:
- a. Using the complete operable unit data set, determine the statistical distribution for each COC in each environmental media. Present the statistical distribution graphically, along with the data plotted in a histogram which presents the frequency of detection and the magnitude.
 - b. Use EPA's "Supplemental Guidance to RAGS: Calculating the Concentration Term" to calculate the 95th percent upper confidence limit (95% UCL) of the arithmetic mean over each exposure area for each COC. If the COC data is log-normally distributed, highlight 5 of this guidance document should be used. If the COC data is normally distributed or is determined to be non-parametric, highlight 6 should be used. The guidance states that calculation of the 95% UCL using data sets with fewer than 10 samples per exposure area provides a poor estimate of the mean concentration. Data sets with 20 to 30 samples per exposure area provide fairly consistent estimate of the mean. All parties agree that uncertainties in the estimates of the mean concentrations will be addressed in the uncertainty analysis. For OUs 2-7, additional field sampling in support of baseline risk assessment must be mutually agreed to by EPA, CDH, and DOE. On a case-by-case basis, with the approval of the regulators, geostatistics may be utilized to incorporate spatial continuity of data.
- 6) Use the results of step 5(b) as the exposure point concentration term in the exposure assessment. Consider all COCs in calculating cumulative risks for each exposure area analyzed.

Summary

The above procedure provides the arithmetic average of the exposure concentration that is expected to be contacted over the exposure period within the exposure area associated with the maximum risk within the source. Although this concentration does not reflect the maximum concentration that could be contacted at any one time, it is explicitly stated in OSWER Publication 9285.7-081, "Supplemental Guidance to RAGS: Calculating the Concentration Term", the average is used for two reasons:

1. carcinogenic and chronic noncarcinogenic toxicity criteria are based on lifetime average exposures; and
2. average concentration is most representative of the concentration that would be contacted over time if it is assumed that an exposed individual moves randomly across an exposure area.

Considerations of risk due to exposure to a source of contamination will be addressed because all COC data will be considered with respect to how a potential receptor may be exposed, not simply how the contamination is distributed in the environment.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
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MAR 24 1994

Ref: 8HWM-FF

Mr. Richard Schassburger
U.S. Department of Energy
Rocky Flats Office
P.O. Box 928
Golden, CO 80402-0928

RE: Operable Unit 3
Comparisons to Background Data

Dear Mr. Schassburger:

Representatives of EPA, CDH, and DOE contractors met on March 10, 1994, to discuss options for comparing the remedial investigation data collected from Mower Reservoir, Standley Lake Reservoir, and Great Western Reservoir to background data. The intent of this letter is to document the agreement reached at this meeting.

EPA and CDH agree that a weight of evidence approach may be used to address the question of whether metals and radionuclides in the reservoirs are above background levels. The evidence considered should include, but may not be limited to the following:

1. A comparison of stream sediment data in the Operable Unit 3 (OU 3) drainages to background concentrations of stream sediments in the Background Geochemical Report. Those constituents above background in the drainages should be considered as potentially above background in the reservoirs.
2. A comparison of reservoir data to appropriate background values taken from the existing scientific literature.
3. A consideration of the results of remedial investigation sediment sampling in the Woman Creek and the Walnut Creek drainages (Operable Unit 5 and Operable Unit 6) to determine potential releases into the off site reservoirs.

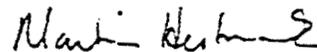
We understand that this approach deviates from the standard protocol for making background comparisons at the Rocky Flats site which was recommended by Dr. Richard Gilbert of Battelle Pacific Northwest Laboratories and accepted by all three Interagency Agreement parties in a facilitated process (EPA letter dated October 25, 1993; CDH letter dated

October 13, 1993). The protocol is highly statistically based. A key assumption is that the background data set is representative.

The available data characterizing background concentrations of reservoir sediments is sparse, therefore, a deviation from Dr. Gilbert's approach is warranted in the case of OU 3 reservoir sediments. In fact, we believe that if DOE were to use Dr. Gilbert's approach, the conclusions would be less supportable than a weight of evidence approach.

If there are any questions regarding this issue, please direct them to Bonnie Lavelle of EPA at (303) 294-1067, or Dave Norberry of CDH at (303) 692-3415.

Sincerely,



Martin Hestmark, Manager
Rocky Flats Project

cc: Bob Birk, DOE
Mark Buddy, EG&G
Joe Schieffelin, CDH
Dave Norberry, CDH