

August 31,2001

MEMORANDUM TO: Dwight D. Chamberlain, Director
Division of Nuclear Materials Safety
Region IV

FROM: Larry W. Camper, Chief
Decommissioning Branch /RA/
Division of Waste Management, NMSS

SUBJECT: RESULTS OF STAFF'S REVIEW OF IMC FAB METALS AND
URANYL RESEARCH SITES

The purpose of this memorandum is to transmit the results of Decommissioning Branch (DCB) staff's review of documentation regarding the previous remediation of the International Mining Corporation (IMC) Fab Metal site and the Uranyl Research site. DCB staff has concluded that both of these sites were remediated to a level which meets the U.S. Nuclear Regulatory Commission's (NRC) current criteria for unrestricted release. Based on this conclusion we recommend that Region IV proceed with closing-out the review of these two sites.

Background

As part of the terminated license review project, Region IV staff identified these two sites, which were previously licensed by the Atomic Energy Commission, as requiring follow-up. After learning that the sites were previously remediated by the Wyoming Abandoned Mine Land (AML) Program, Region IV requested information from AML documenting the remediation. By letter dated June 19, 2001, Evan Green, Administrator of the Wyoming AML Program, responded to Region IV's request by providing NRC with a report detailing the remediation of the two sites. This report was the subject of DCB staff's review.

Technical Review

Although the sites were originally uranium recovery sites, which should be remediated to the concentration criteria in 10 CFR 40 Appendix A, staff determined that, because of the information given in the AML report, it was more appropriate to review the sites against the 25 mrem/yr dose criteria in 10 CFR 20 Subpart E. Specifically, the lack of justified, site-specific background concentrations in AML's report did not allow for an accurate determination of whether or not the concentration criteria in 10 CFR 40 Appendix A (i.e., 5 pCi/g over background for Radium-226) was met. However, staff was able to use the analytical data reported by AML for developing dose estimates.

CONTACT: Eric Pogue
(301)415-6064

To develop information for estimating the dose at the sites, staff used site information from the AML report. DCB staff also met with other technical staff from the Office of Nuclear Material Safety and Safeguards to discuss aspects of developing models for the sites. Specifically, staff from the Uranium Recovery and Performance Assessment Sections contributed to the selection of appropriate exposure scenarios for the two sites.

Based on the location of the sites and the descriptions provided in the AML report, the rancher scenario was determined to be the most appropriate scenario for both sites. However, to be conservative a worker scenario was also considered as a bounding dose estimate.

The physical parameters that were selected for RESRAD 6.1, the dose modeling program used to evaluate the sites, are provided in the attached table.

Results

Using the rancher scenario and the parameters given in the attached table, the maximum dose calculated for both sites over the next 1,000 years was 10 mrem/yr. Additionally, the bounding worker scenario did not exceed the 25 mrem/yr dose criterion.

As neither of these doses exceed NRC's 25 mrem/yr unrestricted release criteria, in accordance with NRC's Temporary Instruction 2800/026, no further remedial action is necessary at either site.

This information should be sufficient to enable Region IV to complete the review of these two sites. However, if you have any questions regarding DCB's review, please contact Eric Pogue, of my staff, at 301-415-6064.

Attachment: RESRAD Input Table

cc: (w/attachment) John Buckley

D.D. Chamberlain

2.

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Ticket No.: n/a

ADAMS Accession No. ML

DOCUMENT NAME: C:\MYFILES\Copies\7.25.01.memo to RIV closing fab and uranyl sites.wpd

OFC	NMSS		NMSS		NMSS		NMSS			
NAME	E.Pogue		G.Purdy		S.Moore		L.Camper			
DATE	8/23/01		8 /23/01		8/23/01		8 /31/01		/ /01	

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ATTACHMENT

RESRAD Input Parameters

Input Parameters	Rancher	Worker
Radionuclides (deterministic)	10 pCi/g Pb-210 10 pCi/g Ra-226 10 pCi/g Th-230	10 pCi/g Pb-210 10 pCi/g Ra-226 10 pCi/g Th-230
Radionuclides (probabilistic) Poisson distribution with 10 pCi/g mean	Pb-210 Ra-226 Th-230	Pb-210 Ra-226 Th-230
Dose Deterministic	10 mrem/yr	25 mrem/yr
Dose Probabilistic	10 mrem/yr	25 mrem/yr
Time spent (outdoors only)	438 hours	2000 hours
Pathways:		
Inhalation	on/default value	on/default value
Milk Ingestion	on/default value	off
Meat Ingestion	on/default value	off
Plant Ingestion	on/5% of yearly intake	off
Aquatic Food	off	off
Drinking Water	off	off
Soil Ingestion	on	on
External Radiation	on	on
Area of Contamination	10000 m ²	10000 m ²
Thickness of Contamination	2 m	2 m
Contaminated zone:		
Erosion Rate	1X10 ⁻⁵ m/yr	1X10 ⁻⁵ m/yr
b Zone	4.9	4.9
Total Porosity	0.25	0.25
Hydraulic Conductivity	5 m/yr	5 m/yr
Evaporation Coefficient	0.99	0.99
Precipitation	0.25 m/yr	0.25 m/yr

Irrigation	0 m/yr	0 m/yr
Density of Saturated Zone	1.6 g/cm ³	1.6 g/cm ³
Input Parameters	Rancher	Worker
Saturated Zone:		
Effective Porosity	0.3	0.3
Hydraulic Conductivity	150 m/yr	150 m/yr
Hydraulic Gradient	0.08	0.08
Unsaturated Zone:		
Thickness	9 m	9 m
Density	2	2
Effective Porosity	0.3	0.3
Hydraulic Conductivity	5 m/yr	5 m/yr
Plant Root Depth	0.3 m	0.3 m
Ra Soil to Plant Transfer Factor	7.44X10 ⁻³	7.44X10 ⁻³
Pb Soil to Plant Transfer Factor	1.55X10 ⁻³	1.55X10 ⁻³
Soil Ingestion	20 g/yr	20 g/yr
Wind Speed	5.5 m/s	5.5 m/s
Inhalation Rate	10512 m ³ /yr	10512 m ³ /yr