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AUG 3 0 2001

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Gerald L. Gels
SIGNAL Corporation
100 Crisler Ave - Suite 102
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DOE-0833-01

Dear Mr. Gels:

THE ENVIRONMENTAL MONITORING PROGRAM

Thank you for your interest in the Environmental Monitoring Program at the Fernald Environmental Management Project (FEMP). Your comments on the July 17, 2001, Cleanup Progress Briefing have been reviewed and considered. As a preface to responding to your comments in technical detail, it is important to note that the Cleanup Progress Briefing was an attempt to summarize the information presented in the 2000 Integrated Site Environmental Report (ISER) in a manner that best met the informational needs of stakeholders. In the effort to concisely communicate the large amount of technical data and information contained in the 2000 ISER in a brief presentation, there was insufficient time to explain all of the reference methods and calculations used to assess the environmental monitoring data in all cases. The progress and continued success of stakeholders' involvement in the cleanup of Fernald depends on straightforward and open communications, and it is not the Department of Energy's (DOE) intent to mislead stakeholders during presentations related to any FEMP activities.

After reviewing your comment on Slide #7074.33, it became apparent that additional detail may be helpful in explaining how the ~200 mrem background dose for the maximally exposed individual was calculated. The dose was estimated by summing the following doses:

0.37 mrem	Estimated dose from inhalation of particulate as measured at FEMP background air monitors using dose conversion factors from 40 CFR 61 National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart H
69 mrem	Estimated dose from direct radiation dose as measured at FEMP background Thermoluminescent Dosimeter (TLD) locations

Recycled and Recyclable

39 mrem	Reference dose from radionuclides in the body (Table 2.4 National Council on Radiation Protection and Measurements (NCRP) Publication 93)
53 mrem	Reference average annual dose from medical examinations (Table 7.4 NCRP Publication 93)
36 mrem	Estimated dose from radon using International Commission on Radiological Protection (ICRP) 65 methodology with data from FEMP background locations

197.37 mrem (~200 mrem)

From the above, it is clear that the 200 mrem background dose incorporates dose information and dose models from several sources and dose methodologies. This approach was taken in an attempt to provide stakeholders with a more relevant background dose (that incorporates FEMP background data and the most recent radon dose methodology) for evaluating the dose to the maximally exposed individual.

Regarding the comment on calculating radon dose, it is recognized that there are several different methods for calculating dose from radon. The most widely recognized methods are explained in some detail in the 2000 ISER (Page 112) to inform stakeholders of the range of radon doses possible using the various methods. Radon dose methodologies have been revised and updated over the years with the primary effect being a decrease in the estimated health detriment per unit of radon exposure. The ICRP 65 methodology is one of the more recent (1994) methods for calculating dose from radon and is considered an advancement in the study of the health risks from radon when compared to dose methodology referenced in NCRP Publication 93. Regardless of the dose methodology used, the FEMP contribution to radon dose above background as shown in slide 7074.31 remains well below the dose associated with the radon concentration limit of 3 pCi/liter above background. To illustrate this, please refer to Table 6-2 of the 2000 ISER (enclosed), which contains radon dose estimates generated using the NCRP 78 dose methodology referenced in NCRP Publication 93. As indicated in Table 6-2, using the NCRP 78 dose methodology leads to a background dose of 144 mrem. The FEMP radon dose contribution to the nearest receptor is also 144 mrem, and the DOE dose limit associated with the concentration limit of 3 pCi/liter above background is 2,160 mrem. Using the NCRP 78 dose methodology in slide 7074.31 would clearly change the magnitude of the doses, but the relative size of the background and FEMP doses with respect to the dose associated with the 3 pCi/liter standard would remain the same.

Regarding track-etch radon detectors, the FEMP has carefully considered their use in the environmental monitoring program. While this technology offers some advantages in that it does not require electrical power and can integrate radon levels over long time periods, these advantages do not address the data quality control problems the FEMP has

experienced with the track-etch detector. Data quality control problems continued even though the FEMP utilized calibrated spiked track-etch detectors in combination with six month sampling intervals. The electronic radon detectors are providing continuous, real-time data on the environmental radon concentrations at 34 locations at the FEMP and background locations. This is particularly advantageous as the remediation of the site progresses, in particular the excavation of the waste pits and preparation for the Accelerated Waste Retrieval (AWR) project for Silos 1 and 2. It should also be mentioned that the electronic detectors are equipped with back-up batteries in the event of a power outage and, according to the instrument specifications, can be programmed to integrate radon concentrations for periods ranging from one second to 99 hours.

If you have any additional questions or concerns on the Environmental Monitoring Program at the FEMP, Please contact Kathleen Nickel at 648-3166.

Sincerely,

Johnny Reising

FEMP:Nickel

Johnny W. Reising
Associate Director
Remediation Management

Enclosure: As Stated

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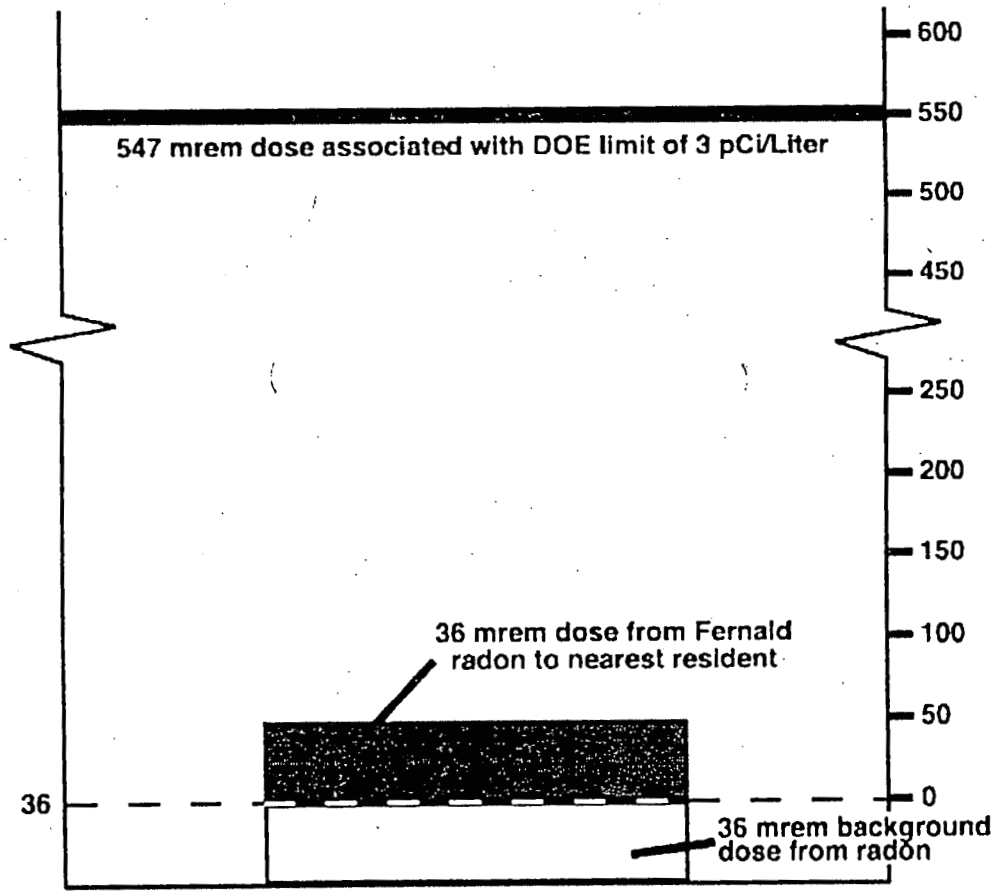
RADON DOSE COMPARISON TO BACKGROUND



Note: The DOE Order limit for radon is 3 pCi/Liter
(This is equivalent to 547 mrem using ICRP 65 method)

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AIR MONITORING SUMMARY
Dose Comparison (mrem)

	1999 RESULT (Net above bkg.)	2000 RESULT (Net above bkg.)	BACKGROUND
Particulate	0.29	1.1	0.37
Direct Radiation	8.3	10	69
Produce	--	0.9	--
Maximally Exposed Individual	8.4	11.2	~200
Radon (International Commission on Radiological Protection Method 65)	36	36	36

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Table 6-2 presents the 2000 radon dose estimates, which includes concentration values for fenceline and background locations, as well as DOE radon concentration limit values. Estimated working level-month exposures are given for each concentration value, as well as effective dose equivalents utilizing both the NCRP 78, ICRP 66, and ICRP 65 methods. Doses were calculated from annual average continuous radon data (assuming the suggested environmental radon daughter product equilibrium concentration of 70 percent). All dose estimates are for a hypothetical maximally exposed reference man of average body size and breathing rate who continuously breathed air at the FEMP western fenceline while engaged in light, physical activity 24 hours a day for the entire year. This exposure scenario is highly conservative, but suggests that in using the ICRP 65 methodology the dose at the nearest public receptor from FEMP radon emissions is 36 mrem per year above background.

Although there are no regulatory limits for dose from radon and its daughters, the radon concentration limits imposed by DOE Order 5400.5 provide a benchmark for evaluating the estimated doses from radon at the FEMP boundary. In DOE Order 5400.5, the annual average radon concentration limit at the facility boundary is 3 pCi/L above background. Using the ICRP 65 methodology, a concentration of 3 pCi/L equates to an effective dose equivalent of 547 mrem. As presented in Table 6-2, the maximum measured radon concentration and corresponding dose at the FEMP boundary are well below the limits associated with DOE Order 5400.5.

TABLE 6-2

2000 RADON DOSE ESTIMATE[a]

Location	Radon Concentration (pCi/L)	Exposure in Working Level-Months (WLM)	NCRP 78 Effective Dose Equivalent Equation (mrem)[b]	NCRP 78 Effective Dose Equivalent Equation (mrem)[c]	ICRP 65 Effective Dose Equivalent (mrem)[d]
Average Background	0.2	0.072	144	48	36
FEMP Fenceline Nearest Receptor (net, above background)	0.2	0.072	144	48	36
Maximum Fenceline (net, above background)	0.4	0.144	288	96	73
DOE Order 5400.5 Limit (net, above background)	3	1.08	2,160	720	547

[a]Assuming the suggested environmental radon daughter product equilibrium concentration of 70 percent

[b]NCRP 78 suggests whole lung tissue weighting factor of 0.12

[c] NCRP 78 calculation using the ICRP 66 bronchial epithelium weighting factor of 0.04

[d]Utilizing the dose conversion factor for the maximally-exposed reference man

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