

memorandum

Fernald Environmental Management Project

DATE: MAY 30 2002

REPLY TO
ATTN OF: FEMP:Skintik

DOE-0500-02

SUBJECT: 2001 NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS ANNUAL REPORT FOR THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT AND DOE-EH 232 SUPPLEMENTAL INFORMATION

TO: Gustavo Vazquez, EH-232/FORS

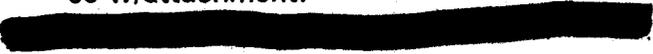
Attached is the Calendar Year 2001 National Emissions Standards for Hazardous Air Pollutants (NESHAP) Annual Report for the Fernald Environmental Management Project (FEMP). This report must be submitted by the Department of Energy (DOE) to the United States Environmental Protection Agency (USEPA) Headquarters and USEPA Region V by June 1, 2001, as stipulated in the USEPA-approved Integrated Environmental Monitoring Plan. In addition, supplemental information, as requested by DOE-EH 232 guidance from previous years, is included as a separate attachment. The supplemental information does not need to be submitted to the USEPA.

The 2001 NESHAP Subpart H Annual Report marks the fourth consecutive year that environmental air particulate data were used to demonstrate compliance with the requirements of NESHAP Subpart H. Prior to 1998, annual reports utilized emission estimates and computer modeling to demonstrate compliance. Using 2001 environmental air particulate monitoring data, the NESHAP Annual Report presents a calculated effective dose equivalent to the maximally exposed individual of 0.8 millirem (mrem), which is in compliance with the NESHAP Subpart H standard of 10 mrem.

If you or your staff have any questions, please contact Edward Skintik at (513) 648-3151.


Stephen H. McCracken
Director

Attachments: As Stated

cc w/attachment:


cc w/o attachment:
B. McKenna, OH/FEMP
J. Byrne, Fluor Fernald, Inc./MS90
M. Frank, Fluor Fernald, Inc./MS90

**SUPPLEMENTAL INFORMATION FOR
THE CY 2001 NESHAP SUBPART H COMPLIANCE REPORT
REQUESTED IN DOE-EH 23 GUIDANCE**

**SUPPLEMENTAL INFORMATION FOR THE CY 2001 FEMP NESHAP SUBPART H
COMPLIANCE REPORT REQUESTED IN DOE-EH 23 GUIDANCE**

1. **Provide an estimate of collective effective dose equivalent (person-rem/year) for CY 2001 releases. Computation of collective effective dose is a requirement of DOE Order 5400.5.**

The Fernald Environmental Management Project (FEMP) collective effective dose equivalent as defined in U.S. Department of Energy (DOE) Order 5400.5 for Calendar Year (CY) 2001 emissions was calculated to be 3.51 person-rem/year. This includes 3.35 person-rem/year from FEMP airborne emissions (excluding radon) and 0.16 person-rem/year from the direct radiation component.

The air inhalation dose component was estimated by using the population within 50 miles of the site as it is distributed between four equally sized quadrants. The four quadrants are based on general wind directions (northeast, southeast, etc.). A dose is estimated for each population quadrant based on the average fenceline air concentration in the quadrant, the population at varying distances from the site, and the dose conversion factors. The following conservative assumptions are used in the calculations:

- Inhalation rate of 1.2 m³ per hour for 8,760 hours per year (ICRP Publication 23)
- Population distribution in area (1996 Fernald Site Environmental Report, Table 2)
- Wind rose data (refer to Figure D-2)
- Average fenceline concentrations are applied as a constant out to 3 miles (the nearest FEMP background monitor). For populations beyond this distance, the applied concentration is proportional to the inverse square of the distance (i.e. 1/R²).
- Inhalation dose conversion factors (DOE/EH-0071).

The direct radiation dose component was estimated by using the population distribution within 50 miles of the site as it is distributed between 16 equally sized sectors. The 16 sectors are based on the compass directions (north, north-northeast, northeast, etc.). A dose is estimated for each population sector based on the net increase in direct radiation levels at the site fenceline as measured by thermoluminescent dosimeters (TLD) and the distance between the location of the population and the major source of radiation at the FEMP (i.e., K-65 Silos). The following conservative assumptions are used in the calculations:

- Population lives 8,760 hours per year in area (1996 Site Environmental Report, Table 2)
- The number of people per household is estimated by total population per sector per mile divided by number of households per sector per mile.
- K-65 Silos are modeled as a point source of radiation.
- The net direct radiation levels are calculated from fenceline TLD results minus average background results.
- The direct radiation levels attributable to the K-65 Silos extends up to 4,400 feet away from the K-65 Silos.

2. **Provide information on the status of compliance with Subparts Q and T of 40 CFR 61, if pertinent.**

In addressing Subpart Q, DOE and the U.S. Environmental Protection Agency (EPA) signed, in 1991, a Federal Facilities Agreement regarding the Control and Abatement of Rn-222 Emissions. Compliance with the requirements of this agreement is used to document the path toward compliance with Subpart Q. Subpart T is not applicable to the FEMP.

3. **Although exempt from Subpart H, provide information on radon-220 emissions from sources containing uranium-232 and thorium-232 where emissions potentially can exceed 0.1 mrem/year to the public or 10 percent of the non-radon dose to the public.**

There are no sources identified at the FEMP where emissions of radon-220 have been identified as having potential to cause 0.1mrem/year or 10 percent of the non-radon dose to a member of the public.

4. **Provide information on non-disposal/non-storage sources of radon-222 emissions where emissions potentially can exceed 0.1 mrem/year to the public or 10 percent of the non-radon dose to the public.**

For CY 2001, the radon-222 dose to the maximally exposed individual (MEI_{Rn-222}), is estimated to be 5.4 mrem. This includes 0.3 mrem from waste pit excavations and 5.1 mrem from dryer stack emissions. Non-disposal/ non-storage sources of radon-222 emissions from the FEMP are generated at the Waste Pits Remedial Action Project (WPRAP).

WPRAP operations consist of excavations of pit materials, processing/segregation, treatment, and packaging for disposal. After the pit material has been excavated, processing could include drying for shipment to an off-site disposal facility. The primary sources for the release of radon-222 emissions at the WPRAP are waste pit excavation activities and point source emissions from the WPRAP dryer stack.

The dose to the MEI_{Rn-222} from the release of radon during pit excavations was estimated by modeling the dispersion of radon levels from the area of pit excavations (as measured by radon working level monitors) to the location of the MEI_{Rn-222} and converting to dose. The following assumptions are used in the calculations:

- The MEI_{Rn-222} lives 1,630 feet west-northwest from the boundary of the WPRAP excavations
- 506 mrem per working level-month (ICRP 65 report)
- The atmospheric dispersion of radon is inversely proportional to square (i.e., $1/R^2$) of the distance from the waste pit excavation to the location of the MEI_{Rn-222}
- The wind blew towards the MEI_{Rn-222} 3.07 percent of the year (refer to Figure D-2).

The WPRAP dryer stack includes a total radon (radon-220 and radon-222) monitoring system. In CY 2001, the annual release of total radon was 825,763 micro-Curies. The dose to the MEI_{Rn-222} from stack emissions was estimated by modeling the dispersion of radon from the stack to the location of the MEI_{Rn-222} and converting to dose. The following conservative assumptions are used in the calculations:

- The MEI_{Rn-222} lives 2,970 feet west-northwest from the stack
- 506 mrem per working level-month (ICRP 65 report)
- Dispersion based on Gaussian plume model
- Wind direction is assumed to be directed towards the MEI_{Rn-222} 100 percent of the year.

5. **For the purpose of assessing facility compliance with the NESHAP effluent monitoring requirements of Subpart H under §61.93(b), give the number of emission points subject to the continuous monitoring requirements, the number of these emission points that do not comply with the §61.93(b) requirements, and if possible, the cost for upgrades. Describe site periodic confirmatory measurement plans. Indicate the status of the quality assurance program described by Appendix B, Method 114.**

Two emission points were subject to the continuous monitoring requirements of Subpart H under 61.93(b) in CY 2001: the Building 71 Legacy Waste Repackaging Booth exhaust stack and the WPRAP Dryer exhaust stack. Both of these emission points comply with the 61.93(b) requirements. Because these stacks are continuously sampled, they do not undergo periodic confirmatory measurement testing at the FEMP.

The FEMP site maintains a list of radionuclide point sources. During CY 2001, sources subject to periodic confirmatory measurement testing were either shut down, or were not due for testing according to the FEMP's test schedule. Therefore, no periodic confirmatory measurement tests were performed in CY 2001.

Sampling and analysis at the FEMP is governed by an EPA-approved document, the 1998 Sitewide CERCLA Quality Assurance Project Plan (SCQ). The NESHAP Subpart H Project Plan, PL-3008 (NSPP) was written to address the requirements of the SCQ and 40 CFR 61 Method 114 Appendix B that pertain to continuous monitoring and periodic confirmatory measurement activities. The NSPP is reviewed and updated annually.