UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

MAY 29 1992

REPLY TO THE ATTENTION OF:

MEMORANDUM

SUBJECT: Air Inspection (V.E. Fugitive Dust, SO_2 and NO_x, VOC, NESHAP) at Argonne National Laboratory, Argonne, Illinois (AFH202:A2)

FROM: Gerald R. Golubski, Environmental Engineer
Central District Office (SC-9C)

TO: Steve Rothblatt, Chief
Regulation Development (AR-18J)

THRU: Willie H. Harris, Chief
Central District Office (SC-9C)

On May 4, 1992 an air inspection was conducted at this federal facility. This inspection was pursuant to your office's request for inspections during FY'92. The facility was represented by Mr. James K. Witt, Environmental Compliance Specialist. Prior to this inspection, the Illinois EPA (Maywood Office) was notified that an inspection was to take place at this time, however, they did not participate.

Background

The facility is a U.S. Department of Energy research and development laboratory which conducts research in the basic energy and related sciences. The ANL occupies 1,700 acres south of Darien, Illinois, and employs approximately 3,600 people. Of these, 3,300 work for the University of Chicago (contractor), and 300 work for the U.S. Department of Energy. The ANL is largely self-contained, having a fire department, a police force, a power plant, and a medical facility.

Particulate/Visible Emissions Observations

Although Argonne National Laboratory has a central heating plant consisting of four natural gas and one coal fired boiler, only two natural gas boilers were on line at the time of this inspection. Operating conditions of Boilers No. 1 and No. 4 were as follows:

	No. 1	No. 4
Gas Fuel Flow (1000 ft.^{3}/Hr.)	53	37
Steam Flow (Lbs./Hr.)	35,000	34,000
Feedwater Temp. (From Economizer)	273°F	280°F
Force Draft Fan (In./H_2O)	1.3"	1.3"
Furnace Draft (In./H_2O)	.22"	.2"
Economizer Draft (In./H_2O)	.3"	.3"
Economizer Draft (In./H_2O)	.9"	.9"
Induce Draft (In./H_2O)	1.4"	1.4"
Air Flow (ft.^{3}/min.)	55,000	55,000
Main Steam Pressure (psig)	188	188

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As explained by Mr. Al Carbaugh, Plant Superintendent no major malfunctions or equipment failures were occurring at the time of this inspection. Please note that these two operating boilers were basically operating on a low steam demand setting. The gas fired boilers have a rated capacity of 85,000 lbs./hr. and the coal fired boiler has a rated capacity of 170,000 lbs./hr. Currently Boiler No. 2 was down for routine maintenance (internal brickwork), Boiler No. 3 was on standby and the coal fired boiler (No. 5) is scheduled to be returned to service in the Fall when the steam demand is greater. Since these boilers were operated on natural gas no visible plume from the stacks were evident at this time.

Coal Fired Operations

Due to the availability of natural gas, the coal fired boiler has only been used sparingly in recent years. According to plant records only 598.7 tons of high sulfur coal and 2329.5 tons of low sulfur coal was burned in 1992. According to the plant superintendent, this boiler normally burns between 60 to 80 tons of coal daily. Upon examining visible emissions strip chart records for this operating time period between January and March of this year, no recorded visible emissions opacity above 8% were measured (the facility's current operating permit allows up to a 30% opacity). This is a large improvement in boiler operations since 1990 when as per 371 opacity limit excursions were reported (Argonne National Laboratory - East, Site Environmental report for calendar year 1990 page xviii).

Adjacent to the power plant are both high and low sulfur piles of coal. In addition, Argonne also maintains coal piles along a storage area known as the Lemont Seawall site. The last survey of these coal piles revealed the following reserves.

Argonne Site

High Sulfur Pile	17,737 cu. yd.
Low Sulfur Pile #1	8,469 cu. yd.
Low Sulfur Pile #2	15,827 cu. yd.

Lemont Seawall Site

High Sulfur Pile	3,435 cu. yd.	
Low Sulfur Pile	11,826 cu. yd.	
Total	57,294 yds.	(or Approximately 38,700 tons)

Since these measurements were made in December of 1991 and before the 1992 heating season of January through March (when 2,928 tons were burned) only 35,800 tons of coal currently remains in storage. This represents approximately a 500 day coal supply. Due to this excess coal reserve, no additional coal was purchased in 1991. Moreover, it is highly unlikely that any coal would be purchased this year.

Although, no coal was purchased in 1991 or 1992, a shipment of coal to Argonne occurred in November 1990. That low sulfur coal was analyzed at that time and found to contain the following:

	Coal Sample F1500-90		Coal Sample F1597-90	
	As Rec'd	Dry Basis	As Rec'd	Dry Basis
% Moisture	3.02		2.80	
% Ash	7.09	7.31	9.67	9.95

% Volatiles	31.34	32.31	32.57	33.50
% Fixed Carbon	58.55	60.38	54.96	56.55
BTU/LB.	13,687	14,112	13,346	13,730
% Sulfur	0.71	0.71	0.67	0.69

The analytical work was performed by Gabriel Laboratories, Ltd. A copy of their analysis is attached to this report.

Fugitive Dust

At the time of this inspection, no fugitive dust was observed near or at the coal piles located adjacent to the central heating plant. Essentially most roads at Argonne are hard surface which do not generate significant dust due to vehicular traffic. On roadways which are constructed of gravel materials it appears that very little traffic passes over them. They are essentially service roads to Argonne's utility plants such as the wastewater treatment plant and other storage yards or areas.

Volatile Organic Compounds (VOC)

Argonne has a single vapor degreaser located in a metal fabrication shop within Building 363. This unit was issued an Illinois EPA permit on March 13, 1990 and is due to expire on March 9, 1995. According to Mr. Jim Seeth, Manager of central shops, this degreasers holds approximately one hundred gallons of perchloroethylene.

At the time of this inspection, this unit was on standby. However, as noted at this time, the unit was thoroughly covered. No odors were evident along the sides or beneath the vapor degreaser. A clip board attesting to routine inspections was affixed to the stairway leading to the unit. In summary, it appears that this unit was in very good working order. The last known service call by the manufacturer occurred in 1990.

Radionuclide Emissions

As per Argonne's site environmental report for 1990 "radionuclide emissions, the disposal of asbestos, and conventional air pollutants from ANL facilities are regulated under the Clean Air Act. A number of airborne radiological emission points at ANL are subject to the NESHAP regulations for radionuclide releases from DOE facilities (40 CFR 61, Subpart H). All such air emission sources were evaluated to ensure that the requirements were being properly addressed. The ANL individual off site dose required to be reported by these EPA regulations was 0.0091 mrem/yr. in 1990. This 0.09% of the of the 10 mrem/yr. standard" (page xvii).

Moreover, this report concluded "airborne emissions of gaseous radioactive materials from ANL were monitored and the effective dose equivalents were estimated at the site perimeter and to the maximally-exposed member of the public...., the estimated maximum perimeter dose was 1.2 mrem/yr. in the north direction, while the estimated maximum dose to a member of the public was 0.34 mrem/yr. This is 0.34% of the DOE radiation protection standard of 100 mrem/yr. for all pathways.

Finally, their report concluded "approximately 98% of this estimated dose is due to the release of 2606 curies of radon-220 in 1990. If the radon-220 impact is excluded from reporting, as required in 40 CFR 61, Subpart H, the estimated dose to the maximally-exposed individual would be 0.0091 mrem/yr. (page xxi).

Presently, the major radionuclide emissions sources at Argonne are located within Buildings 200, 205, 212, and 250. These sources consist of ventilation systems for various radionuclide. In addition, inactive reactors such as the Janus reactor located in Building 202 and the CP-5 reactor in Building 211 were nuclear emission sources in the past, however, they are no longer utilized. As previously noted in Argonne's 1990 Environmental Assessment Report "the calculated potential maximum individual off-site dose to a member of the general public for 1990 was 0.0091 mrem (excluding Radon-220), which is 0.09% of the 10 mrem per year EPA standard" (page 19). For a further explanation concerning emissions sources at Argonne please see the attachment to this report.

Hot Cells

Upon examining the tabulated summaries for potential airborne pathways of radionuclides at Argonne is within Building 200 and 211, and that the major source of these emissions was at the M-Wing Hot Cells, this area was examined. The Hot Cell areas are protected by several inches of concrete and lead as well as specially manufactured glass. At this time a complete description of the ventilation system was given by Mr. Jim McCurry a chemist on staff. As explained by him, the filters that entrap the radionuclides through the air filtration system are changed regularly. They routinely record differential pressures inside the Hot Cell area from the surrounding air with the use of magnehelic (draft gauge). Once restrictive flow occurs the filters are immediately changed. The filters are subsequently crushed and containerized and manifested offsite for disposal however, only after they have been tested for radiological content.

After the one hour inspection of the Hot Cell area was completed, this inspector was examined for any exposure to radioactive emissions. The meters used indicated that no contamination occurred during the inspection. A film Badge was also provided and subsequently turned in for analyses in order to confirm that no radiation leaks occurred.

Asbestos Abatement

At the time of the inspection some asbestos demolition activities were occurring on the roof of Building 212 (see attached Notification of Demolition and Renovation). North American Asbestos Control Corporation was removing asbestos panels that were located on a rooftop cooling tower. Attached are the wallet cards of each asbestos worker (except for one employee) who were present at the time of the inspection. Although, this employee did not have a wallet card he did provide his most recent physical and recertification. This information was kept on file at Argonne (see attached Tony Kline's record).

Upon examining the panels removed (they were brought down to street level) they appeared to be completely wrapped with heavy density plastic. As explained by Mr. Robert Utesch, an industrial hygienist at Argonne, these panels are to be removed to Argonne's solid waste landfill which is located approximately 1/2 mile away.

In summary, attached is the Notification of Demolition and Renovation for the asbestos removal project, the workers certification, a copy of the airborne pathways (emission sources) for radionuclides at Argonne, a recent estimate of coal reserves and the last analysis of coal received (November 1990). Also, I have attached a complete listing of all permits currently in effect at Argonne. Although, the air emissions listing is extensive, the most significant sources were examined at the time of this inspection and contained within this report.

If you should have any questions regarding this inspection report, please call me at 886-1968.

Attachments