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**SUBMITTAL OF FMPC MODIFICATION PROJECTS FOR THE PERIOD  
FEBRUARY 6, 1985 THROUGH DECEMBER 31, 1987 FOR A  
DETERMINATION UNDER 40 CFR 61.06 AS TO WHETHER EPA  
ADMINISTRATOR APPROVAL IS REQUIRED TO MODIFY**

08/09/88

DOE-1256-88

DOE-FN USEPA

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LETTER



## Department of Energy

Oak Ridge Operations  
P.O. Box 2001  
Oak Ridge, Tennessee 37831 - 8739

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August 9, 1988  
DOE-1256-88

Mr. David Kee, Director  
Air and Radiation Division  
U.S. Environmental Protection Agency  
Region V, Mail Code 5AC-26  
230 South Dearborn Street, 13th Floor  
Chicago, Illinois 60604

Dear Mr. Kee:

**SUBMITTAL OF FMPC MODIFICATION PROJECTS FOR THE PERIOD OF FEBRUARY 6, 1985 THROUGH DECEMBER 31, 1987 FOR A DETERMINATION UNDER 40 CFR 61.06 AS TO WHETHER EPA ADMINISTRATOR APPROVAL IS REQUIRED TO MODIFY**

Reference is made to your letter to J. A. Reafsnyder dated April 1, 1988, "Compliance with 40 CFR 61, Radionuclide NESHAPS, Feed Materials Production Center, Fernald, Ohio." In order to bring FMPC into technical compliance with 40 CFR 61, Subpart A for calendar years 1985 and 1986, you requested that DOE submit documentation for all projects which affect radionuclide emissions (1) which have been implemented, or (2) which have received State of Ohio Permits to Install during the period February 6, 1985 through December 31, 1986. The accompanying submittals are responsive to that request and extend the period through December 31, 1987.

Meetings between EPA-V, EPA-HQ, DOE-ORO, and WMCO personnel regarding NESHAP for radionuclide issues were held on June 3 and July 30, 1987 in Chicago. In these meetings it was concluded that the FMPC site was a single source and that any construction or operation that increases emissions over existing levels is a modification. Since a major part of the FMPC upgrade activity involves the replacement of many pieces of existing equipment or the addition of equipment to operating ventilation systems, most of which have little impact on current total plant emissions, the need for a de minimis level was discussed. The EPA-HQ representative stated that it is unlikely that EPA will promulgate a general de minimis dose standard below which NESHAP documentation will not be required. He stated that it was more likely that U.S. EPA would consider modifications to the existing source on a case-by-case basis and concur or disagree that a given modification is insignificant enough not

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to require submission of NESHAP documentation. Therefore, we are submitting in response to your request and also with the goal of eventually building a case for exemption of certain classes of equipment fourteen (14) applications for a determination by the Administrator under 41 CFR 41.06 of whether the equipment to be installed is a modification as defined by 40 CFR 61.15. If it is so determined, then please consider the submittals as an application for approval to modify under the requirements of 40 CFR 61.07. Enclosure 1 and 2 are summaries of the information requested in your letter.

The application format followed is that required by the Ohio EPA for Permits to Install (PTIs). The methodology for calculating the dose to members of the public at the point of maximum annual air concentration in an unrestricted area where any members of public resides or abides is given in Enclosure 3. Enclosures 4-17 are the applications for a determination as to whether the modifications are subject to the standard. The data submitted are believed to fulfill the requirements of 40 CFR 61.07.

We would appreciate a timely review of these applications under 40 CFR 61.06 and 40 CFR 61.07 if the latter is applicable. Also, we would appreciate your response to the concept of establishing a de minimis based on the type of equipment or operation as suggested in paragraph 2 or other means of processing these insignificant sources.

If you have any questions or require additional information, please contact W. D. Dillow of our Environmental Operations Branch at FTS 626-1354.

Sincerely,

  
James A. Reafsnyder  
Site Manager

SE-311:Dillow

Enclosures:  
See Attached List

cc w/enclosures:  
R. F. Hodanbosi, OEPA-Columbus  
M. L. Galper, WMCO

cc w/o enclosures:  
J. C. Tseng, Eh-23, FORSTL  
L. C. Goidell, SRO  
M. Neal, WMCO

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## ENCLOSURES

1. PTIs issued for period of February 6, 1985 through December 31, 1987.
2. Equipment installed between February 6, 1985 through December 31, 1987 with the potential to increase site emissions.
3. Methodology for calculating the dose to the maximally exposed member of the public.
4. FMPC No. 9-016, Ingot O.D. Lathe--Application for a determination if installation of FMPC No. 9-016 is a modification pursuant to 40 CFR 61.15.
5. FMPC No. 5-086, Plasma Spray Crucible Coating Station - Application for a determination if installation of FMPC No. 5-086 is a modification pursuant to 40 CFR 61.15.
6. FMPC No. 5-085, Crucible Grit Blaster - Application for a determination if installation of FMPC No. 5-085 is a modification pursuant 40 CFR 61.15.
7. FMPC No. 5-084, West Wagner Cold Saw - Application for a determination if installation of FMPC No. 5-084 is a modification pursuant to 40 CFR 61.15.
8. FMPC No. 5-093, Graphite Band Saw - Application for a determination if installation of FMPC No. 5-093 is a modification pursuant to 40 CFR 61.15.
9. FMPC No. 5-080, W. Mold Reconditioning Booth - Application for a determination if installation of FMPC No. 5-080 is a modification pursuant to 40 CFR 61.15.
10. FMPC No. 5-083, W. Melt Crucible Lid Cleaner - Application for a determination if installation of FMPC No. 5-083 is a modification pursuant to 40 CFR 61.15.
11. FMPC No. 6-064, Flat Ingot Model 4 Milling Machine - Application for a determination if installation of FMPC No. 6-064 is a modification pursuant to 40 CFR 61.15.
12. FMPC No. 6-001, Flat Ingot 4A Milling Machine - Application for a determination if installation of FMPC No 6-001 is a modification pursuant to 40 CFR 61.15.
13. FMPC No. 6-002, Flat Ingot 4B Milling Machine - Application for a determination if installation of FMPC No. 6-002 is a modification pursuant to 40 CFR 61.15.

14. FMPC No. 6-060, Flat Ingot 425-20 Milling Machine - Application for a determination if installation of FMPC No. 6-060 is a modification pursuant to 40 CFR 61.15.
15. FMPC No. 6-061, Flat Ingot No. 6 Milling Machine - Application for a determination if installation of FMPC No. 6-061 is a modification pursuant to 40 CFR 61.15.
16. FMPC No 6-062, Flat Ingot K&T A Milling Machine - An application for a determination if installation of FMPC No. 6-062 is a modification pursuant to 40 CFR 61.15.
17. FMPC No. 6-063, Flat Ingot K&T B Milling Machine - An application for a determination if installation of FMPC No. 6-063 is a modification pursuant to 40 CFR 61.15.

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All Permits to Install (PTI) for equipment that have the potential to emit radionuclides that were issued by the Ohio EPA between 2/6/85 and 12/31/87. This list includes the installation or modification date and the date the process or equipment began operation. (No source for which a PTI was issued during the period 2/6/85-12/21/87 was installed prior to 12/85. Beginning in 1985 and continuing through the end of 1987, OEPA refused to process PTIs claiming DOE had not demonstrated compliance with NESHAP for radionuclides on a site basis for 1985 and 1986).

PTI#	Date Issued	Equipment/Process Description	FMPC#	Date Installed	Date Operated	Expected Net Increase In U Emissions grams (curies)/yr	Committed Dose Equivalent (mrem)		
							Effective	Lung	Endosteal Bone
14-761	4/24/85	Ingot 0.D. Lathe	9-016	(1)	(1)	50 (3.25 x 10 <sup>-5</sup> )	2.2 x 10 <sup>-3</sup>	1.3 x 10 <sup>-2</sup>	1.3 x 10 <sup>-2</sup>
14-744	4/24/85	Plasma Spray-Crucible Coating Station	5-086	12/85	Not Operated	0.0 (0.0)	0.0	0.0	0.0
14-743	5/01/85	Crucible Grit Blaster	5-085	12/85	Not Operated	0.0 (0.0)	0.0	0.0	0.0
14-742	5/01/85	West Wagner Cold Saw	5-084	3/86	Not Operated	177 (1.17 x 10 <sup>-4</sup> )	6.5 x 10 <sup>-3</sup>	4.0 x 10 <sup>-2</sup>	3.9 x 10 <sup>-2</sup>
14-762	7/10/85	Graphite Band Saw	5-093	7/86	Not Operated	3.6 (2.4 x 10 <sup>-6</sup> )	1.3 x 10 <sup>-4</sup>	8.2 x 10 <sup>-4</sup>	7.9 x 10 <sup>-4</sup>

(1) This PTI expired and installation never commenced. A new PTI application is currently in process under FMPC #9-016A.

Equipment Installed Between 2/6/85-12/31/87 with the Potential to Increase Site Emissions

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All sources that have the potential to emit radionuclides where installation, modification, or operation of the process or equipment took place between 2/6/85 and 12/31/87.

<u>Equipment/Process Description</u>	<u>FMPC #</u>	<u>Date Installed</u>	<u>Date Operated</u>	<u>Expected Net Increase in U Emissions grams (curies)/YR</u>	<u>Committed Dose Equivalent (mrem)</u>		
					<u>Effective</u>	<u>Lung</u>	<u>Endosteal Bone</u>
W.Mold Reconditioning Booth	5-080	8/86	Not Operated	16 (1.1 x 10 <sup>-5</sup> )	5.9 x 10 <sup>-4</sup>	3.6 x 10 <sup>-3</sup>	3.5 x 10 <sup>-3</sup> (2)
W.Melt Crucible Lid Cleaner	5-083	8/86	Not Operated	8.2 (5.4 x 10 <sup>-6</sup> )	3.0 x 10 <sup>-4</sup>	1.9 x 10 <sup>-3</sup>	1.8 x 10 <sup>-3</sup> (2)
Flat Ingot Model 4 Milling Machine	6-064	6/86	7/86 (1)	10.9 (7.15 x 10 <sup>-6</sup> )	4.4 x 10 <sup>-4</sup>	2.7 x 10 <sup>-3</sup>	2.6 x 10 <sup>-3</sup> (3)
Flat Ingot Model 4A Milling Machine	6-001	3/85	4/85	10.9 (7.15 x 10 <sup>-6</sup> )	4.4 x 10 <sup>-4</sup>	2.7 x 10 <sup>-3</sup>	2.6 x 10 <sup>-3</sup> (3)
Flat Ingot Model 4B Milling Machine	6-002	3/85	4/85	10.9 (7.15 x 10 <sup>-6</sup> )	4.4 x 10 <sup>-4</sup>	2.7 x 10 <sup>-3</sup>	2.6 x 10 <sup>-3</sup> (3)
Flat Ingot 425-20 Milling Machine	6-060	10/85	11/85	10.9 (7.15 x 10 <sup>-6</sup> )	4.4 x 10 <sup>-4</sup>	2.7 x 10 <sup>-3</sup>	2.6 x 10 <sup>-3</sup> (3)
Flat Ingot No. 6 Milling Machine	6-061	7/85	8/85	10.9 (7.15 x 10 <sup>-6</sup> )	4.4 x 10 <sup>-4</sup>	2.7 x 10 <sup>-3</sup>	2.6 x 10 <sup>-3</sup> (3)
Flat Ingot K&T A Milling Machine	6-062	1/86	2/86	10.9 (7.15 x 10 <sup>-6</sup> )	4.4 x 10 <sup>-4</sup>	2.7 x 10 <sup>-3</sup>	2.6 x 10 <sup>-3</sup> (3)
Flat Ingot K&T B Milling Machine	6-063	1/86	2/86	10.9 (7.15 x 10 <sup>-6</sup> )	4.4 x 10 <sup>-4</sup>	2.7 x 10 <sup>-3</sup>	2.6 x 10 <sup>-3</sup> (3)

(1) This machine was operated for a very brief period and shutdown.

(2) Emissions determined by the use of emission factors. Assumes control system will utilize cyclone separators with cartridge and HEPA filtration in series for an overall removal efficiency of 99.9999%. Also, assumes U content of total particulate is 10%.

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(3) The total combined uranium emissions for the new equipment which started operation during the period 2/6/85 through 12/31/87 based on stack samples data coupled with engineering judgment are estimated to be 0.168 pounds (76.2 grams) per year under maximum operating conditions. Please note that other processes which contributed to the site wide uranium emissions were removed from operation in late 1984. Consequently, the contribution of 0.024 pounds per year by each piece of equipment represents a conservative increase in uranium emissions from the entire FMPC site.

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Methodology for Calculating the Dose to the Maximally Exposed Members of the Public

I. Plant 5 and 9 Equipment

By letter dated January 11, 1988, DOE-ORO transmitted AIRDOS-EPA Computer code printouts of the dose equivalents to the maximally exposed offsite members of the public from emissions from Plant 5 and 9 for 1986. Also by letter dated July \_\_, 1988, DOE-ORO provided AIRDOS-EPA computer code printouts validating that the maximally exposed resident lives 1108 meters north of the plant center--the same location as used in the 1986 Plant 5 and 9 calculations.

II. The Plant 5 1986 printouts indicated the following:

Uranium Emissions

U-234 -  $1.55 \times 10^{-3}$  Ci or 0.25 g  
 U-235 -  $7.7 \times 10^{-5}$  Ci or 36 g  
 U-238 -  $1.65 \times 10^{-3}$  Ci or 4955 g  
 Total U -  $3.3 \times 10^{-3}$  Ci or 4991 g

Dose equivalents from Plant 5 1985 emissions which includes uranium, fission products, radium, thorium, neptunium, and plutonium were calculated to be:

Effective committed dose equivalent --  $1.83 \times 10^{-1}$  mrem  
 Lung committed dose equivalent -- 1.14 mrem  
 Endosteal bones committed dose equivalent -- 1.10 mrem

Then the committed dose equivalents from the increased emissions from the Plant 5 West Wagner Cold Saw, FMPC #5-084, which are estimated to be 0.39 lbs/yr or 177 grams/yr of uranium with the accompanying other radionuclides are:

Effective committed dose equivalent from FMCP #5-084

$$\frac{1.77 \times 10^2 \text{ g}}{4.991 \times 10^3 \text{ g}} \times 1.83 \times 10^{-1} \text{ mrem} = 6.5 \times 10^{-3} \text{ mrem}$$

Lung committed dose equivalent from FMPC #5-084

$$\frac{1.77 \times 10^2 \text{ g}}{4.991 \times 10^3 \text{ g}} \times 1.14 \text{ mrem} = 4.0 \times 10^{-2} \text{ mrem}$$

Endosteal bone committed dose equivalent from FMPC #5-084

$$\frac{1.77 \times 10^2 \text{ g}}{4.991 \times 10^3 \text{ g}} \times 1.10 \text{ mrem} = 3.9 \times 10^{-2} \text{ mrem}$$

Similarly, the dose equivalents were calculated for each of the Plant 5 pieces of equipment.

III. The Plant 9 1986 printouts indicated the following:

Uranium Emissions

U-234 -  $3.4 \times 10^{-4}$  Ci or 0.06 g  
U-235 -  $1.68 \times 10^{-5}$  Ci or 7.85 g  
U-238 -  $3.7 \times 10^{-4}$  Ci or 1111 g  
Total U -  $7.27 \times 10^{-4}$  Ci or 1119 g

Committed Dose Equivalent from Plant 9 1986 emissions which include uranium, fission products, radium, thorium, neptunium, and plutonium were calculated to be:

Effective committed dose equivalent --  $4.82 \times 10^{-2}$  mrem  
Lung committed dose equivalent --  $3.01 \times 10^{-1}$  mrem  
Endosteal bone committed dose equivalent --  $2.89 \times 10^{-1}$  mrem

Then the committed dose equivalents from the emissions from the Plant 9 Ingot O.D. Lathe FMPC #9-016 which are estimated to result in at net increase of 0.11 lbs/yr or 50 grams/yr of uranium plus accompanying radionuclides are calculated to be:

Effective committed dose equivalent from FMPC #9-016

$$\frac{5.0 \times 10^1 \text{ g}}{1.119 \times 10^3 \text{ g}} \times 4.82 \times 10^{-2} \text{ mrem} = 2.2 \times 10^{-3} \text{ mrem}$$

Lung committed dose equivalent from FMPC #9-016

$$\frac{5.01 \times 10^1 \text{ g}}{1.119 \times 10^3 \text{ g}} \times 3.01 \times 10^{-1} \text{ mrem} = 1.3 \times 10^{-2} \text{ mrem}$$

Endosteal bone committed dose equivalent from FMPC #9-016

$$\frac{5.0 \times 10^1 \text{ g}}{1.119 \times 10^3 \text{ g}} \times 2.89 \times 10^{-1} \text{ mrem} = 1.3 \times 10^{-2} \text{ mrem}$$

IV. No separate calculations for Plant 6 were made for the 1986 emissions, therefore, the emissions and committed dose equivalents for the entire FMPC site for 1986 are used in calculating the committed dose equivalents for Plant 6 equipment. Therefore, uranium site emissions for FMPC for 1986 were as follows:

Uranium Emissions

U-234 -  $9.10 \times 10^{-3}$  Ci or 1.47 g  
 U-235 -  $4.53 \times 10^{-4}$  Ci or 212 g  
 U-238 -  $9.72 \times 10^{-3}$  Ci or 29200 g  
 Total U emissions -  $1.93 \times 10^{-2}$  Ci or 29413 g

Committed dose equivalents from the FMPC 1986 emissions which include uranium, fission products, radium, thorium, neptunium, and plutonium are:

Effective committed dose equivalent -- 1.18 mrem  
 Lung committed dose equivalent -- 7.38 mrem  
 Endosteal bone committed dose equivalent -- 7.14 mrem

Then the committed dose equivalents from the emissions from the Plant 6 Flat Ingot Cutting Model 4 FMPC #6-064 which are estimated to result in a net increase of 0.024 lbs/yr or 10.9 g/yr are:

Effective committed dose equivalent from FMPC #6-064

$$\frac{10.9 \text{ g}}{2.941 \times 10^4 \text{ g}} \times 1.18 \text{ mrem} = 4.4 \times 10^{-4} \text{ mrem}$$

Lung committed dose equivalent from FMPC #6-064

$$\frac{10.9 \text{ g}}{2.941 \times 10^4 \text{ g}} \times 7.38 \text{ mrem} = 2.7 \times 10^{-3} \text{ mrem}$$

Endosteal bone committed dose equivalent from FMPC #6-064

$$\frac{10.9 \text{ g}}{2.941 \times 10^4 \text{ g}} \times 7.14 \text{ mrem} = 2.6 \times 10^{-3} \text{ mrem}$$

The committed dose equivalents from all of the other Plant 6 machines denoted by 6-xxx would be same since they are all estimated to emit the same quantity as FMPC #6-064.

- V. Although these are not rigorous calculations, particularly for Plant 6 equipment, which are based on site-wide emissions, they are accurate enough to indicate the equipment installed will have a very minor effect on site emissions and will not effect compliance with the site dose equivalent standards.

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ENCLOSURE 4  
INGOT O.D. LATHE  
PLANT 9  
FMPC #9-016

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EMISSIONS ESTIMATE FOR NEW PLANT 9 INGOT O. D. LATHE, #9-016

ASSUMPTIONS:

(1) American Air Filter Blanket Collector Efficiency = 80% [Estimated]

(2) Design airflow through dust collection system = 23,430 CFM  
Assume airflow from new O. D. Lathe = 600 CFM

(3) DUST LOADING:

$1.9 \times 10^{-5}$  grains/cubic foot (CF) average hourly  
 $2.9 \times 10^{-5}$  grains/cubic foot (CF) maximum hourly

NOTE: Representative data from 1984, 1985, 1986 and 1987 test periods [durations unknown] resulted in an estimate of 1.50 lbs/yr of particulate being exhausted from stack EP9-1; this equates to  $1.9 \times 10^{-5}$  grains/CF to the dust collector based on a nominal airflow of 23,000 CFM, a removal efficiency of 80%, and a 5 day, 8 hr/day work week.

(4) 1 grain =  $1.429 \times 10^{-4}$  lbs

(5) Reference data obtained during the same test periods referenced above [(3)] indicted an average of approximately 29 lbs U/100 lbs of particulate, [inherent in type of machining operations performed].  
Assume average uranium weight % = 29 [2 ingots/hr]  
Assume maximum uranium weight % = 43.5 [3 ingots/hr]

(6) The percentage of particles exhausting stack EP9-1 with a diameter less than 10 microns is unknown.

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## EMISSIONS ESTIMATE (#9-016)

## I. EMISSION ESTIMATE FOR PARTICULATES ATTRIBUTABLE TO NEW O. D. LATHE (#9-016):

$$\text{Average Hourly Emission} = \frac{(600 \text{ CFM})(60 \text{ min/hr})(1.429 \times 10^{-4} \text{ lb/gr})}{(1.9 \times 10^{-5} \text{ gr/CR})} = 9.77 \times 10^{-5} \text{ lbs/hr to collector}$$

$$\text{EP9-1 Stack Exhaust} = (9.77 \times 10^{-5} \text{ lbs/hr})(0.20) = 1.95 \times 10^{-5} \text{ lbs/hr}$$

$$\text{Maximum Hourly Emission} = 9.77 \times 10^{-5} \text{ lbs/hr} \left[ \begin{array}{l} \text{3 ingots/hr max.} \\ \text{2 ingots/hr avg.} \end{array} \right]$$

$$= [1.47 \times 10^{-4} \text{ lbs/hr to collector}]$$

$$1.95 \times 10^{-5} \text{ lbs/hr} (1.5) = 2.93 \times 10^{-5} \text{ lbs/hr out stack EP9-1}$$

$$\text{Average Yearly Particulate Emission} = (1.95 \times 10^{-5} \text{ lbs/hr})(8 \text{ hrs/day}) \\ (5 \text{ days/wk})(50 \text{ wks/yr}) = 0.039 \text{ lbs/yr} = 1.95 \times 10^{-5} \text{ tons/yr} \\ \text{[From 9-016]}$$

$$\text{Maximum Yearly Particulate Emission} = (2.93 \times 10^{-5} \text{ lbs/hr})(24 \\ \text{hrs/day})(7 \text{ days/wk})(50 \text{ wks/yr}) = 0.25 \text{ lbs/yr} = 1.23 \times 10^{-4} \\ \text{tons/yr [From 9-016]}$$

## II. EMISSION ESTIMATE FOR URANIUM ATTRIBUTABLE TO NEW O. D. LATHE (#9-016)

$$\text{Average Hourly Emission} = 1.95 \times 10^{-5} \text{ lbs/hr} \times 29\% \text{ wt\% U} \\ = 5.66 \times 10^{-6} \text{ lbs U/hr}$$

$$\text{Maximum Hourly Emission} = 2.93 \times 10^{-5} \text{ lbs/hr} \times 43.5\% \text{ wt\% U} \\ = 1.27 \times 10^{-5} \text{ lbs U/hr}$$

$$\text{Average Yearly Emission} = .039 \text{ lbs/yr} \times 29\% \text{ U} = 0.011 = 5.5 \times 10^{-6} \\ \text{ton U/yr}$$

$$\text{Maximum Yearly Emission} = 0.25 \text{ lbs/yr} \times 43.5\% \text{ U} = 0.11 \text{ lbs U/yr} \\ = 5.5 \times 10^{-5} \text{ tons U/yr}$$

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Plant 9 - Ingot O.D. Lathe, FMPC #9-016

Estimated uranium emissions from lathe 9-016 are 0.11 pounds (50 g) per year or  $3.25 \times 10^{-5}$  per year Ci of uranium plus associated fission products, radium, thorium, neptunium, and plutonium. Quantity of nonuranium radionuclides may be calculated from 1986 Plant 9 source term by multiplying the total quantity of a given radionuclide emitted by Plant 9 by the ratio of uranium emitted by FMPC #9-016 to total 1986 Plant 9 uranium emissions, i.e.

$$\text{Ra-226} = \frac{5 \times 10^1 \text{ g}}{1.119 \times 10^3 \text{ g}} \times 1.5 \times 10^{-6} \text{ Ci} = 6.7 \times 10^{-8} \text{ Ci, etc.}$$

Effective committed dose equivalent --  $2.2 \times 10^{-3}$  mrem  
Lung committed dose equivalent --  $1.3 \times 10^{-2}$  mrem  
Endosteal bone committed dose equivalent --  $1.3 \times 10^{-2}$  mrem

For Office Use Only  
Check Appropriate Box(es)

- Air Discharge
- Water Discharge to New Source Treatment Works
- Solid Waste Disposal Facility
- Hazardous Waste Disposal Facility

For Office Use Only

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PTI Application No. \_\_\_\_\_

Date Received \_\_\_\_\_

Premise No. \_\_\_\_\_

OHIO ENVIRONMENTAL PROTECTION AGENCY  
Application for Permit to Install

U. S. Department of Energy, Feed Materials Production Center  
Applicant's Name

P. O. Box E  
Mailing Address

Oak Ridge	TN	37831	615/576-0845
City	County	State	Zip Code Telephone Number

Ms. Margaret Wilson, Environ. Engineer, Environmental Protection Division 615/576-08  
Person to contact (Name and Title and Telephone Number)

The facility will be located within the production area of the DOE.  
Location of Proposed Facility (State the location as completely and precisely as possible)\*

Feed Materials Production Center, 7400 Willey Road

Fernald	Hamilton	45030
City or Township	County	Zip Code

Directions: A Permit to Install is required for new or modified sources of pollution under the provisions of OAC Rule 3745-31. An application cannot be considered complete unless all applicable questions are answered and the required information has been submitted. This application must be signed in accordance with OAC Rule 3745-31-04(B) or it cannot be accepted.

Applicants for permits involving air emissions or wastewater treatment facilities will be required to pay a permit to install fee as shown in Section 3745.11(B) and (C) of the Ohio Revised Code. This fee is payable fifteen days after the date of final issuance of the permit.

Name of new or modified source or facility: Ingot O.D. Lathe (9-016)

Product of new or modified source/facility: Machined Uranium Ingots

Will the proposed source/facility involve any of the following: Check all that apply.

- A.  Air Discharge
- B.  Wastewater Treatment Works
- C.  Solid Waste Disposal Facility
- D.  Hazardous Waste Disposal Facility

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\*Example: "The source will be constructed on a 20 Acre plot to be located on Franklin Township Road No. 17, approximately 1 1/4 miles north of the intersection of State Route 60 and Franklin Township Road No. 17 "

The following information must be submitted on a separate piece of paper and attached to this application.

FOR ALL PERMITS TO INSTALL

1. Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.
2. List the name and quantity of all materials and chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.
3. State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shutdown for \_\_\_\_\_ years? (State number of years)
4. Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.
5. Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U.S. EPA?

FOR AIR POLLUTION SOURCES

6. State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.
7. Are the proposed sources required to comply with the following federal requirements?
  - i. New Source Performance Standards (NSPS)
  - ii. National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - iii. Prevention of Significant Deterioration (PSD)
  - iv. Appendix "S" - Emission Offset Policy
8. Will the proposed sources employ best available technology?
9. Will the proposed sources cause the significant degradation of air quality?
10. Will the proposed sources interfere with the attainment and maintenance of the ambient air quality standards?
11. Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.
12. Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?
13. Complete and attach an anticipated construction schedule for each proposed source. (See attached).
14. Please include the estimated cost of any air pollution control equipment to be installed on the proposed sources.
15. An appendix for each air contaminant source must accompany this application. From the following description of the appendices, determine which should accompany your application.

PERMIT TO INSTALL  
Ingot O.D. Lathe

FOR ALL PERMITS TO INSTALL

1. The Feed Materials Production Center (FMPC) is a contract operated federal facility for the production of uranium metal for the United States Department of Energy (DOE). NLO, Inc. operates the facility under contract to the Oak Ridge Operations Office of the DOE. The installation of a new ingot outside diameter lathe is proposed for the FMPC Special Products Plant (Plant 9). The lathe will be utilized to machine the outer surfaces of uranium metal ingots prior to extrusion operations. At maximum conditions the lathe will machine six (6) ingots per hour. At average conditions, five (5) ingots per hour will be machined by the lathe.

The proposed lathe will be ventilated by an existing electrostatic precipitator (G9E2-400) located at Plant 9. The 23430 CFM American Air Filter precipitator will provide approximately 600 CFM of ventilation capacity to the lathe at average conditions. The lathe, which will utilize a 30 to 1 water-to-oil quench, will emit only a trace quantity particulates (<2 pounds per year) to the intake side of the electrostatic precipitator.

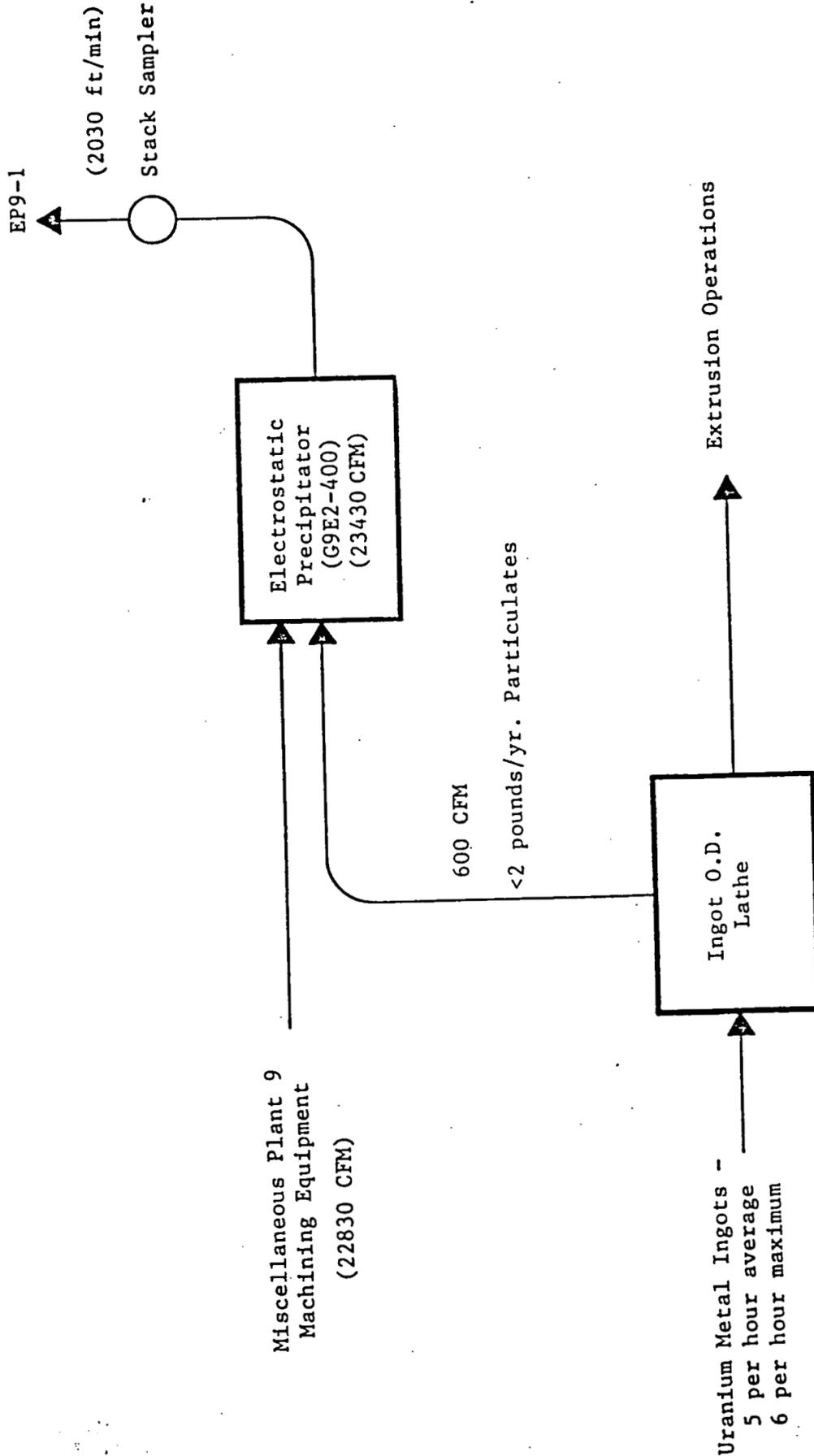
2. The O.D. lathe will perform an intermediate machining operations on uranium ingots in preparation for extrusion. The lathe will operate on an as-needed basis. On average, it is anticipated that five (5) ingots per hour will be machined by the new lathe. A 30 to 1 water-to-oil quench will be recirculated thru the lathe during machining operations.
3. A new lathe is proposed to be installed in the FMPC Special Products Plant. The lathe will be ventilated by an existing electrostatic precipitator.
4. No previous Ohio EPA application or plan submission has been filed for the proposed Ingot O.D. Lathe.
5. The proposed ingot lathe will comply with all rules, laws and regulations of the Ohio EPA and U.S. EPA.
6. Air contaminant emissions from the ingot O.D. lathe to the intake of the electrostatic precipitator (G9E2-400) are anticipated to be minimal (<2 pounds per year of air particulates). Only trace quantities of air particulates are expected to be emitted to the atmosphere from the ESP which are attributable to the proposed ingot O.D. lathe.
7. The proposed installation of the ingot O.D. lathe would not be affected by these federal requirements.
8. The proposed ingot O.D. lathe will employ best available technology with the utilization of a highly efficient electrostatic precipitator as an emission control system.
9. The proposed ingot O.D. lathe will not cause significant degradation of air quality.

PERMIT TO INSTALL  
Ingot O.D. Lathe

FOR ALL PERMITS TO INSTALL (cont'd)

- 10. The proposed lathe will not interfere with the attainment and maintenance of ambient air quality standards.
- 11. The proposed ingot lathe will utilize an existing American Air Filter Electrostatic Precipitator which is currently operating at the FMPC Special Products Plant. The exhaust stack associated with the ESP is equipped with a NLO-developed continuous flow stack sampler. The sampler draws a continuous sample at an isokenetic rate from a fixed point within the exhaust stack. Collected samples are analyzed to determine both particulate and radionuclide emission rates from the facility exhaust.
- 12. No.
- 13. See attached.
- 14. Not applicable.

6201



PLANT 9 - INGOT O.D. LATHE

000019

Premise No.     /    /    /      
 Source No.     /    /      
 Application No.     /    /    

APPENDIX A, PROCESS

PROCESS DATA

- 1. Name of process Ingot O.D. Turning
- 2. End product of this process Machined Ingots
- 3. Primary process equipment Ingot O.D. Lathe  
 Your identification N/K Year Installed 1985
- 4. Manufacturer NK Make or model NK
- 5. Capacity of equipment (lbs./hr): Rated 5 ingots/hr. Max. 6 ingots/hr.
- 6. Method of exhaust ventilation:  Stack  Window fan  Roof vent  
 Other, describe \_\_\_\_\_  
 Are there multiple exhausts?  Yes  No

OPERATING DATA

- 7. Normal operating schedule: 16 hrs./day, 5 days/wk., 50 wks./year.
- 8. Percent annual production (finished units) by season:  
 Winter 25 Spring 25 Summer 25 Fall 25
- 9. Hourly production rates (lbs.): Average 5 ingots/hr. Maximum 6 ingots/hr.
- 10. Annual production (indicate units) 20,000 ingots  
 Projected percent annual increase in production 10
- 11. Type of operation:  Continuous  Batch
- 12. If batch, indicate Minutes per cycle 8 Minutes between cycles 3
- 13. Materials used in process:

List of Raw Materials	Principal Use	Amount (lbs./hr.)
Uranium Ingots		5 Ingots/hr.

14. A PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit points of all raw materials, intermediate products, by-products and finished products, Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment.

CONTROL EQUIPMENT

6201-1

Control Equipment Code:

- (A) Settling chamber
- (B) Cyclone
- (C) Multiple cyclone
- (D) Electrostatic precipitator
- (E) Fabric filter
- (F) Spray chamber
- (G) Cyclonic scrubber
- (H) Impingement scrubber
- (I) Orifice scrubber
- (J) Venturi scrubber
- (K) Plate or tray tower
- (L) Packed tower
- (M) Adsorber
- (N) Condenser
- (O) Afterburner - catalytic
- (P) Afterburner - thermal
- (Q) Other, describe \_\_\_\_\_

15. Control Equipment data:

Item	Primary Collector	Secondary Collector
(a) Type (See above code)	D	
(b) Manufacturer	American Air Filter	
(c) Model No.	E-2 Electromatic	
(d) Year installed	≈1960	
(e) Your identification	G9E2-400 (EP9-1)	
(f) Pollutant Controlled	Particulates	
(g) Controlled pollutant emission rate (if known)	NK	
(h) Pressure drop	>6"	
(i) Design efficiency	NK	
(j) Operating efficiency	>99%	

STACK DATA

16. Your stack identification EP9-1
17. Are other sources vented to this stack?  Yes  No 900569009  
 If yes, identify sources Miscellaneous Plant 9 Machining Equipment 9-012, 9-014
18. Type:  Round, top inside diameter dimension 46"  
 Rectangular, top inside dimensions (L) \_\_\_\_\_ x (W) \_\_\_\_\_
19. Height: Above roof N/A ft., above ground ≈25 ft.
20. Exit gas: Temp. 80 °F, Volume 23430 ACFM, Velocity 2030 ft./min.
21. Continuous monitoring equipment:  Yes  No  
 If yes, indicate: Type NLO Developed, Manufacturer N/A  
 Make or Model N/A, Pollutant(s) monitored Particulates
22. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
 If yes, check method:  Stack Test  Emission factor  Material balance

Completed by D. J. Carr, Date 11/21/84

000021



OHIO ENVIRONMENTAL PROTECTION AGENCY

INSTALLATION SCHEDULE

TO ACCOMPANY APPLICATION FOR PERMIT TO INSTALL

THIS FORM CONSTITUTES PART OF THE APPLICATION OF:

FACILITY NAME: Feed Materials Production Center

ADDRESS: 7400 Willey Road, Fernald, OH 45030

FOR A PERMIT TO INSTALL THE FOLLOWING AIR CONTAMINANT SOURCE:

IDENTIFICATION: Ingot O.D. Lathe

DESCRIPTION: Lathe to machine the outside diameter of uranium ingots prior to extrusion operations.

THE INSTALLATION OF THE ABOVE AIR CONTAMINANT SOURCE IS PLANNED TO FOLLOW THE TIME SCHEDULE DESCRIBED BELOW:

	<u>DATE</u>
1. EQUIPMENT ORDERED - - - - -	<u>January, 1985</u>
2. COMMENCE CONSTRUCTION - - - - -	<u>October, 1985</u>
3. STARTUP - - - - -	<u>October, 1985</u>
4. PERFORMANCE TESTING - - - - -	<u></u>

000023

**Ohio EPA**

Re: Permit to Install  
Hamilton County  
Application No. 14-761

April 24, 1985

U.S. Department of Energy  
Feed Materials Production Center  
P.O. Box E  
Oak Ridge, Tennessee 37831

Attention: Ms. Margaret Wilson

CERTIFIED MAIL

Dear Sir:

Enclosed please find an Ohio EPA Permit to Install which will allow you to install the described source(s) in a manner indicated in the permit. Because this permit contains several conditions and restrictions I urge you to read it carefully.

You are hereby notified that this action by the Director is final and may be appealed to the Environmental Board of Review pursuant to Chapter 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Board of Review within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency and the Environmental Law Division of the Office of the Attorney General within three (3) days of filing with the Board. An appeal may be filed with the Environmental Board of Review at the following address:

Environmental Board of Review  
250 East Town Street, Room 101  
Columbus, Ohio 43215

Very truly yours,

*Patricia P. Walling*

Patricia P. Walling, Manager  
Authorization & Compliance Section  
Division of Air Pollution Control

PPW/gc

cc: US EPA  
Southwestern Ohio Air Pollution Control Agency

## Permit to Install Terms and Conditions

Application No. 14-761APS Premise No. 1431110128Permit Fee: \$585.00Name of Facility: U.S. Department of Energy  
Feed Materials Production Center

Person to Contact: Ms. Margaret Wilson

Address: P.O. Box E  
Oak Ridge, Tennessee 37831Location of proposed source(s): 7400 Willey Road, Plant 9  
Fernald, OhioDescription of proposed source(s): Uranium Ingot Outside Diameter  
Lathe Controlled with an Existing  
Electrostatic Precipitator

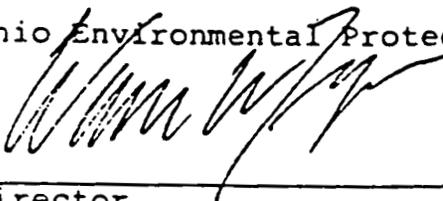
Date of Issuance: April 24, 1985

Effective Date: April 24, 1985

The above named entity is hereby granted a permit to install for the above described source(s) pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the above described source(s) of environmental pollutants will operate in compliance with applicable State and Federal laws and regulations, and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans and specifications, the above described source(s) of pollutants will be granted the necessary permits to operate (air) or NPDES permits as applicable.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency



Director

000025

U.S. Department of Energy - Feed Materials Production Center  
Application No. 14-761  
Page Two  
April 24, 1985

Substantial construction for installation must take place within eighteen months of the effective date of this permit. This deadline may be extended by up to twelve months, if application is made to the Director no less than sixty days before the expiration of this permit and the party shows good cause for any such extension.

The Director of the Ohio Environmental Protection Agency, or his authorized representatives, may enter upon the premises of the above-named applicant during construction and operation at any reasonable time for the purpose of making inspections, conducting tests, examining records or reports pertaining to the construction, modification or installation of the above described source of environmental pollutants.

The proposed source shall be constructed in strict accordance with the plans and application submitted for this permit to the Director of the Ohio Environmental Protection Agency. There may be no deviation from the approved plans without the express, written approval of the Agency. Any deviations from the approved plans or the above conditions may lead to such sanctions and penalties as provided under Ohio law. Approval of these plans does not constitute an assurance that the proposed facilities will operate in compliance with all Ohio laws and regulations. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed sources are inadequate or cannot meet applicable standards.

The specified permit fee must be remitted within 15 days of the effective date of this permit to install.

This permit shall apply only to the source(s) shown on the application approved by the Ohio Environmental Protection Agency.

The source covered by this permit and the applicable Ohio Administrative Code rules are listed below:

<u>Source</u>	<u>Applicable Rules</u> <u>(OAC 3745-)</u>
Ingot O.D. Lathe	31-05(A) 17-07 17-11 15-07

000026

The source will be operated and maintained so that the emissions from the source shall not be in such manner or in such amounts as to endanger the health, safety or welfare of the public, or cause unreasonable injury or damage to property, per OAC 3745-15-07.

The total actual emissions from the source will be less than 0.000005 pound per hour or 0.02 tons per year.

A maximum of six (6) ingots per hour or ninety-six (96) ingots per day may be processed by the source.

The source will not be operated more than four thousand (4000) hours per year.

The use of a high efficiency electrostatic precipitator constitutes the use of Best Available Technology as specified in OAC rule 3745-31-05(A)(3).

This source and its associated air pollution control system(s) shall be maintained regularly in accordance with good engineering practices and the recommendations of the respective manufacturers in order to minimize air contaminant emissions.

Any malfunction of this source or its associated air pollution control system(s) shall be reported immediately to the SWOAPCA in accordance with OAC rule 3745-15-06.

Except as provided by OAC rule 3745-15-06, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of the air pollution control equipment shall be accompanied by the shutdown of this source.

The applicant shall not cause or allow the disposal of hazardous waste produced by the operation of this process to be transported to a hazardous waste facility in the state of Ohio unless the hazardous waste disposal facility has received appropriate approval from the Ohio EPA to receive and dispose of such hazardous waste.

The proposed ingot lathe will utilize an existing American Air Filter Electrostatic Precipitator which is currently operating at the FMPC Special Products Plant. The exhaust stack associated with the ESP will be equipped with a NLO-developed continuous flow stack sampler. The sampler will draw a continuous sample at an isokenetic rate from a fixed point within the exhaust stack. Collected samples will be analyzed to determine both particulate and radionuclide emission rates from the facility exhaust.

U.S. Department of Energy - Feed Materials Production Center  
Application No. 14-761  
Page Four  
April 24, 1985

Results of the sampling analysis will be maintained for a minimum of 24 months and will be made available to the Southwestern Ohio Air Pollution Control Agency (or any agent of the Ohio EPA) upon request.

000028

6201 - A

ENCLOSURE 5  
PLASMA SPRAY CRUCIBLE COATING STATION  
PLANT 5  
FMPC #5-086

000029

**EMISSIONS ESTIMATE FOR PLANT 5 PLASMA SPRAY CRUCIBLE  
COATING STATION FMPC # 5-086**

No radioactive emissions are expected from the equipment for normal operating conditions and expected operational occurrences.

000030



PERMIT TO OPERATE APPLICATION  
PLANT 5 CRUCIBLE COATING - PLASMA SPRAY (5-086)

1. Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.

The Feed Materials Production Center (FMPC) is a contract operated federal facility for the production of uranium metal for the United States Department of Energy (DOE). Westinghouse Materials Company of Ohio (WMC) operates the FMPC under prime contract with the DOE.

This proposed source is a Crucible Coating Plasma Spray Booth (5-086), to be located in the FMPC Metals Production Plant (Plant 5). The booth will be utilized for the coating of graphite crucibles used in the production of uranium metal. The spray booth will employ zirconium oxide as the surface coating agent, and will coat approximately 25 crucibles per day under average operation, 35 crucibles per day under maximum operation. The coating will be applied at the rate of approximately 1.5 pounds per crucible coated.

The Plasma Spray Booth will be ventilated by a scrubber and an existing Plant 5 dust collector, G5-262, in series. The stack associated with dust collector G5-262 (EP5-17) has a continuous flow stack sampler.

2. List the name and quantity of all materials and chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.

Powdered zirconium oxide ( $ZrO_2$ ) is flame sprayed to the interior surfaces of graphite crucibles at a rate of approximately 1.5 pounds per crucible coated. Approximately 25 crucibles per day will be handled at the coating station on average. Maximum design capacity is approximately 35 crucibles per day.

3. State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shutdown for \_\_\_ years? (State number of years)

This project involves the installation of a new plasma spray coating booth in the casting area of the FMPC Metals Production Plant. The proposed plasma spray coating booth will be a potential source of particulate air emissions, in the form of non-radioactive zirconium oxide ( $ZrO_2$ ).

4. Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.

This source has been issued a Permit To Install (Application #14-744), issued May 1, 1985.

5. Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U. S. EPA?

The proposed Plasma Spray Booth will comply with all rules, laws, and regulations of Ohio EPA and U. S. EPA.

6. State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.

Summary of Emissions from Plant 5 Plasma Spray Booth (5-186):

Particulate

Hourly (Average) =  $1.6 \times 10^{-5}$  lbs/hr  
 Hourly (Maximum) =  $2.2 \times 10^{-5}$  lbs/hr

Annual (Average) =  $6.8 \times 10^{-5}$  tons/yr  
 Annual (Maximum) =  $9.6 \times 10^{-5}$  tons/yr

See Emissions Calculations page, included.

7. Are the proposed sources required to comply with the following federal requirements?
- i. New Source Performance Standards (NSPS)
  - ii. National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - iii. Prevention of Significant Deterioration (PSD)
  - iv. Appendix "S" - Emission Offset Policy

This source is not impacted by these federal regulations.

8. Will the proposed source employ Best Available Technology?

The proposed plasma spray booth will employ best available technology in the form of a scrubber and fabric filter dust collector in series.

9. Will the proposed source cause the significant deterioration of air quality?

The proposed source will not cause the significant deterioration of air quality.

10. Will the proposed source interfere with the attainment or maintenance of the ambient air quality standards?

The proposed source will not interfere with the attainment or maintenance of the ambient air quality standards.

11. Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.

The existing dust collector G5-262 exhaust stack is equipped with a continuous flow stack sampler. The sampler draws a continuous sample at an isokinetic rate from a fixed point within the exhaust stack. Collected samples are analyzed to determine both particulate and radionuclide emission rates from the dust collector exhaust. Dust collector G5-262 services three other sources which emit radionuclides.

The source described in this application will emit only non-radioactive particulate.

12. Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?

No.

13. Complete and attach an anticipated construction schedule for each proposed source.

Not applicable. This source has been issued a Permit To Install (Application #14-744, issued May 1, 1985).

14. Please include the estimated cost of any air pollution control equipment to be installed on the proposed source.

Not applicable.

FOR OFFICIAL USE ONLY

Premise No.     /    /    /      
Source No.     /    /    /      
Application No.     /    /    /    

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APPENDIX D

SURFACE COATING OR PRINTING OPERATION

1. This appendix is submitted for a:

Surface coating operation (check one below):

- Paint spray booth
- Dip tank
- Spray Coating (Other than paint spray booth)
- Other surface coating operation, describe \_\_\_\_\_
- Flow coating
- Roller coating

Printing or lithographic operation.

2. Name of operation Crucible Coating - Plasma Spray; Your identification 5-086  
Year Installed \_\_\_\_\_

3. Is this operation succeeded by a heated drying or baking operation?  Yes  No  
If yes, indicate operating temperature of oven \_\_\_\_\_ °F.

4. Normal operating schedule: 24 hours/day, 7 days/wk., 50 wks./year.

PAINT SPRAY BOOTH

5. Type of spray booth:  Enclosed  Conveyor  Downdraft  
 Other, describe \_\_\_\_\_

6. Booth manufacturer \_\_\_\_\_ Make or Model No. \_\_\_\_\_

7. Type of spraying:  Air gun  Airless  Electrostatic  
 Other, describe \_\_\_\_\_

8. Spraying operation is:  Manual  Automatic

9. Fan manufacturer \_\_\_\_\_ Make or Model No. \_\_\_\_\_

10. Booth's exhaust is equipped with:  Water wash (Complete item 11)  
 Exhaust filters (Complete item 12)  
 Baffles  
 Other, describe \_\_\_\_\_  
 None

11. Water wash: (a) Is water recirculated?  Yes  No  
(b) Is a chemical added to the water?  Yes  No  
(c) Is material reclaimed from wash water.  Yes  No  
(d) Describe method for disposal of waste materials: \_\_\_\_\_

Does not include metal plating

000035

12. Exhaust filters:

- (a) Type of material:  Fiberglass  Aluminum  
 Other, describe \_\_\_\_\_
- (b) Filter size (inches): Length \_\_\_\_\_ Width \_\_\_\_\_ Thickness \_\_\_\_\_  
 No. of filters: \_\_\_\_\_ No. of filter changes: \_\_\_\_\_ times per year

13. Describe material painted \_\_\_\_\_

ALL OPERATIONS (Except paint spray booth)

14. Describe type of operation Plasma arc coating of inside crucible walls with zirconium oxide

15. Describe method of coating or printing Plasma arc coating of inside crucible walls with zirconium oxide (Metco 201 or equivalent)

16. Identify and describe type(s) of material coated or printed see above

ALL OPERATIONS

17. Complete the following information for each general type of surface coating of printing material. Report on the material as it is employed after the addition of any pigments, solvents, etc. If there are more than three types of materials, furnish the same data for the additional materials on a separate sheet or another appendix form.

- (a) Material employed Metco 201 zirconium oxide Density 5.2 g/cc lbs./gallon  
 Solids content 100 % by volume or 100 % by weight  
 Solvent content 0 % by volume; Solvent density NA lbs./gallon  
 Normal application schedule 24 hrs./day, 7 days/wk., 50 wks./year.  
 Quantity used (gallons/hour): Normal 1.56 lbs/hr Maximum 2.19 lbs/hr  
 (gallons/year): \_\_\_\_\_

Complete the solvent composition by identifying each solvent component and its respective % by volume of the total solvent. (The % by volume should total to 100%).

Solvent Composition		
Solvent	% by Volume	*
NONE		

Solvent Composition		
Solvent	% by Volume	*
NONE		

\* If solvent is photochemically reactive enter "Y", if not photochemically reactive enter "N", if unknown enter "U".

Is the material photochemically reactive?  Yes  No  Do not know

(b) Material employed NA Density \_\_\_\_\_  
 Solids content \_\_\_\_\_ % by volume or \_\_\_\_\_ % by weight  
 Solvent content \_\_\_\_\_ % by volume Solvent density \_\_\_\_\_ lbs./gallon  
 Normal application schedule: \_\_\_\_\_ hrs./day, \_\_\_\_\_ days/wk., \_\_\_\_\_ wks./year.  
 Quantity used (gallons/hour): Normal \_\_\_\_\_ Maximum \_\_\_\_\_  
 (gallons/year): \_\_\_\_\_

Complete the solvent composition by identifying each solvent component and its respective % by volume of the total solvent. (The % by volume should total to 100%).

Solvent Composition		
Solvent	% by Volume	*
NONE		

Solvent Composition		
Solvent	% by Volume	*
NONE		

\* If solvent is photochemically reactive enter "Y", if not photochemically reactive enter "N", if unknown enter "U".

Is the material photochemically reactive?  Yes  No  Do not know

(c) Material employed NA Density \_\_\_\_\_ lbs./gallon  
 Solids content \_\_\_\_\_ % by volume or \_\_\_\_\_ % by weight  
 Solvent content \_\_\_\_\_ % by volume Solvent density \_\_\_\_\_ lbs./gallon  
 Normal application schedule: \_\_\_\_\_ hrs./day, \_\_\_\_\_ days/wk., \_\_\_\_\_ wks./year.  
 Quantity used (gallons/hour): Normal \_\_\_\_\_ Maximum \_\_\_\_\_  
 (gallons/year): \_\_\_\_\_

Complete the solvent composition by identifying each solvent component and its respective % by volume of the total solvent. (The % by volume should total to 100%).

Solvent Composition		
Solvent	% by Volume	*
NONE		

Solvent Composition		
Solvent	% by Volume	*
NONE		

\* If solvent is photochemically reactive enter "Y", if not photochemically reactive enter "N", if unknown enter "U".

Is the material photochemically reactive?  Yes  No  Do not know

18. Identify all liquid organic cleanup materials for this process and indicate the amount used per average operating day and per year. NA

Cleanup Material	*	Gallons Used	
		Daily	Yearly
NONE			

\* If material is photochemically reactive enter "Y", if not photochemically reactive enter "N", if unknown enter "U".

19. A PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit points of all materials and finished products. Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment.

Attached

CONTROL EQUIPMENT

20. Type of control equipment:  None  
 Incinerator, Temp. \_\_\_\_\_ °F, Thermal/Catalytic (Circle one)  
 Adsorption, describe \_\_\_\_\_  
 Condensation, describe \_\_\_\_\_  
 Other, describe Scrubber
21. Manufacturer Metco, Inc. Model No. 4CW777 Year Installed 1986
22. Percent collection or removal efficiency: Design 99.5 % Operating 99.5
23. For non-incineration method identify specific pollutant controlled ZrO<sub>2</sub>, particulate

CONTROL EQUIPMENT

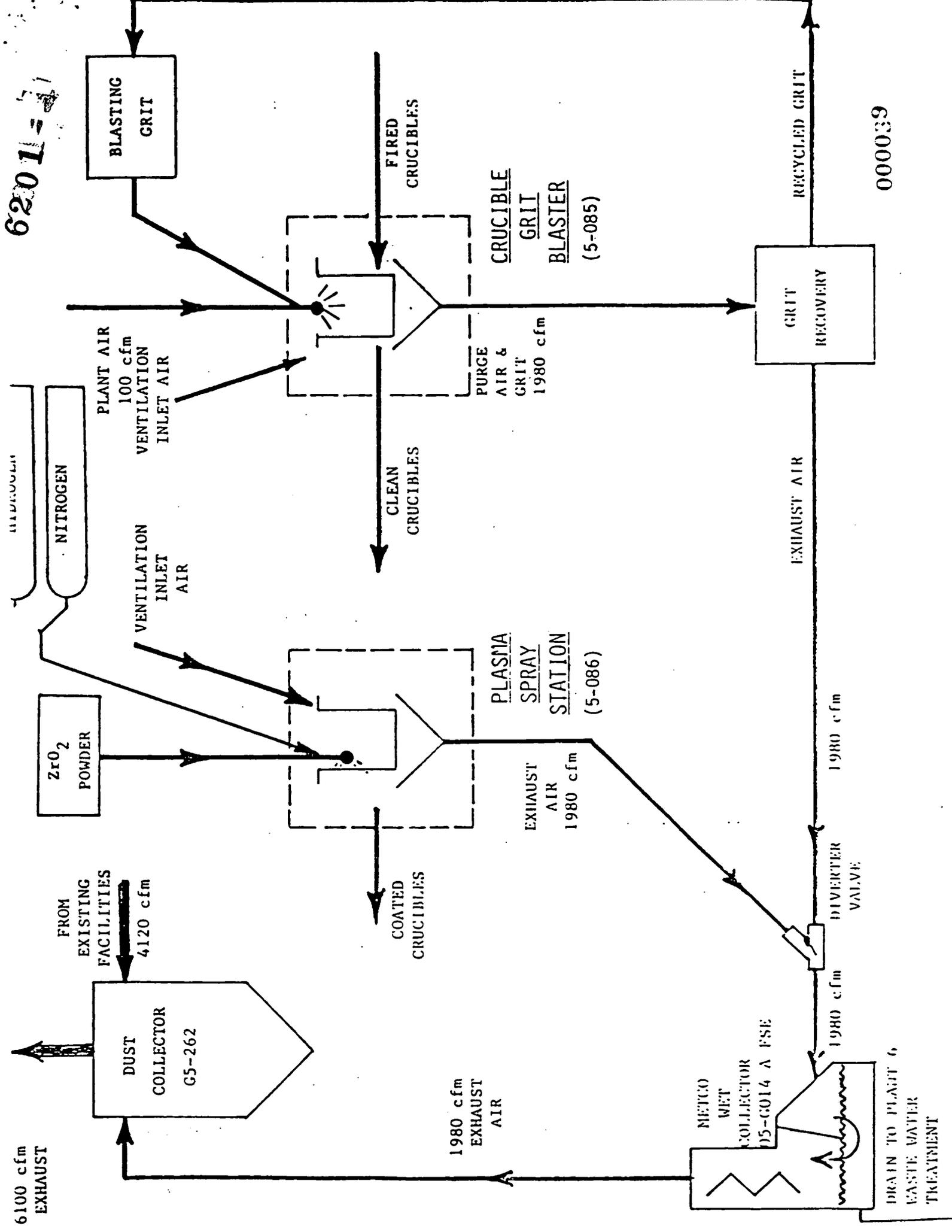
20. Type of control equipment:  None  
 Incinerator, Temp. \_\_\_\_\_ °F, Thermal/Catalytic (Circle one)  
 Adsorption, describe \_\_\_\_\_  
 Condensation, describe \_\_\_\_\_  
 Other, describe Fabric Filter Dust Collector
21. Manufacturer Day Company Model No. 112 Year Installed 1960
22. Percent collection or removal efficiency: Design unknown % Operating 99
23. For non-incineration method identify specific pollutant controlled ZrO<sub>2</sub>, particulate

STACK DATA

24. Your stack identification EP5-17
25. Are other sources vented to this stack?  Yes  No  
If yes, identify sources 5-058 - 5-066, 5-085
26. Type:  Round, top inside diameter dimension 23 inches  
 Rectangular, top inside dimensions (L) \_\_\_\_\_ x (W) \_\_\_\_\_
27. Height: Above roof 17 ft., above ground 57 ft.
28. Exit gas: Temp Ambient °F, Volume 6100 ACFM, Velocity 2100 ft./min.
29. Continuous monitoring equipment:  Yes  No  
If yes, indicate Type continuous sampler, Manufacturer Ludlum  
Make or Model \_\_\_\_\_, Pollutant(s) monitored particulate
30. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
If yes, check method:  Stack Test  Emission factor  Material balance

Completed by V.A. Barto / R.C. Worsley, Date 2-29-86

6201-1



000039

## EMISSIONS CALCULATIONS FOR PLANT 5 PLASMA SPRAY BOOTH (5-086)

### ASSUMPTIONS

- 1) Of the 1.5 pounds of zirconium oxide sprayed onto each crucible, 0.3 pounds (20%) goes to the scrubber inlet.
- 2) 100% of particulate is zirconium oxide ( $ZrO_2$ ).
- 3) Estimated overall efficiency of scrubber is 99.5%.
- 4) Estimated overall efficiency of dust collector is 99%.

### NEW SOURCE PARTICULATE EMISSIONS

#### Average Hourly and Annual Particulate Emissions

$(25 \text{ crucibles sprayed/day})(0.3 \text{ lbs } ZrO_2/\text{crucible sprayed})(0.005)(0.01) = 3.8 \times 10^{-4} \text{ lbs } ZrO_2 \text{ emitted/day at average operation.}$

$(3.8 \times 10^{-4} \text{ lbs } ZrO_2/\text{day})(1 \text{ day}/24 \text{ hrs}) = \underline{1.6 \times 10^{-5} \text{ lbs/hr } ZrO_2 \text{ emitted at average operation.}}$

$(1.56 \times 10^{-5} \text{ lbs } ZrO_2/\text{hr})(24 \text{ hr}/1 \text{ day})(7 \text{ days}/1 \text{ week})(50 \text{ weeks}/\text{year})$   
 $(1 \text{ ton}/2000 \text{ lbs}) = \underline{6.6 \times 10^{-5} \text{ tons/yr } ZrO_2 \text{ emitted at average operation.}}$

#### Maximum Hourly and Annual Particulate Emissions

$(35 \text{ crucibles sprayed/day})(0.3 \text{ lbs } ZrO_2/\text{crucible sprayed})(0.005)(0.01) = 5.25 \times 10^{-4} \text{ lbs } ZrO_2 \text{ emitted/day at maximum operation.}$

$(5.25 \times 10^{-4} \text{ lbs } ZrO_2/\text{day})(1 \text{ day}/24 \text{ hrs}) = \underline{2.2 \times 10^{-5} \text{ lbs/hr } ZrO_2 \text{ emitted at maximum operation.}}$

$(2.19 \times 10^{-5} \text{ lbs } ZrO_2/\text{hr})(8760 \text{ hr}/\text{yr})(1 \text{ ton}/2000 \text{ lbs}) = \underline{9.6 \times 10^{-5} \text{ tons/yr } ZrO_2 \text{ emitted at maximum operation.}}$

6201 - -

ENCLOSURE 6  
CRUCIBLE GRIT BLASTER  
PLANT 5  
FMPC #5-085

000041

5-08

## EMISSIONS CALCULATIONS FOR PLANT 5 CRUCIBLE GRIT BLASTER (5-085)

### ASSUMPTIONS

- 1) Approximately 1.5 lbs of particulate is removed from each crucible per blasting.
- 2) On the average, 15% by weight of particulate removed per crucible blasted is uranium; 15% is slag grit, and the remaining 70% is graphite.
- 3) Estimated overall efficiency of scrubber is 99.5%
- 4) Estimated overall efficiency of dust collector is 99%

### NEW SOURCE PARTICULATE EMISSIONS

#### Average Hourly and Annual Particulate Emissions

$(25 \text{ crucibles/day})(1.5 \text{ lbs particulate/crucible}) = 37.5 \text{ lbs particulate/day to inlet side of scrubber}$

$(37.5)(0.005)(0.01) = 0.00188 \text{ lbs particulate emitted/day}$   
 $(0.00188 \text{ lbs/day})(1 \text{ day/24 hours}) = \underline{7.8 \times 10^{-5} \text{ lbs particulate/hour under average operation.}}$

$(0.000078 \text{ lbs/hour})(24 \text{ hours/1 day})(7 \text{ days/1 week})(50 \text{ weeks/year})(1 \text{ ton/2000 lbs}) = \underline{3.3 \times 10^{-4} \text{ tons per year particulate emitted under average operation.}}$

#### Maximum Hourly and Annual Particulate Emissions

$(35 \text{ crucibles/day})(1.5)(0.005)(0.01) = 0.00263 \text{ lbs particulate emitted/day}$   
 $(0.00263 \text{ lbs/day})(1 \text{ day/24 hours}) = \underline{1.1 \times 10^{-4} \text{ lbs particulate/hr under maximum operation.}}$

$(0.000109 \text{ lbs/hour})(8760 \text{ hrs/year})(1/2000 \text{ tons/lb}) = \underline{4.8 \times 10^{-4} \text{ tons per year particulate emitted under maximum operation.}}$

### NEW SOURCE URANIUM EMISSIONS

#### Average Hourly and Annual Uranium Emissions

$(0.000078 \text{ lbs particulate/hour})(0.15 \text{ lbs uranium/lb particulate}) = \underline{1.2 \times 10^{-5} \text{ lbs uranium emitted/hour under average operation.}}$

$(1.17 \times 10^{-5} \text{ lbs/hour})(24 \text{ hours/1 day})(7 \text{ days/1 week})(50 \text{ weeks/1 year})(1/2000 \text{ tons/lb}) = \underline{4.9 \times 10^{-5} \text{ tons per year uranium emitted under average operation.}}$

#### Maximum Hourly and Annual Uranium Emissions

$(0.000109 \text{ lbs particulate/hour})(0.15 \text{ lbs uranium/lb particulate}) = \underline{1.6 \times 10^{-5} \text{ lbs uranium emitted/hour under maximum operation.}}$

$(1.64 \times 10^{-5} \text{ lbs/hour})(8760 \text{ hours/year})(1/2000 \text{ tons/lb}) = \underline{7.2 \times 10^{-5} \text{ tons per year uranium emitted under maximum operation.}}$

**CONCLUSION**

The new Plant 5 Crucible Grit Blaster (5-085) will replace the Crucible Grit Blaster (13-014) currently operating in the FMPC Pilot Plant.

The Plant 5 Crucible Grit Blaster hourly and annual production rates (Appendix A, questions #9 and #10) will be no greater than those for the existing Pilot Plant Crucible Grit Blaster. The emission control system for the new Plant 5 Crucible Grit Blaster (which consists of both a scrubbing tower and dust collector in series) is an improvement over the existing Pilot Plant Crucible Grit Blaster emission control system (which consists of only a dust collector). Therefore, there will be no potential for increase in radionuclide emissions from the Plant 5 Crucible Grit Blaster over the existing Pilot Plant Crucible Grit Blaster.

Because there is no potential for increase in the rate or the total annual amount of emission of radionuclides to the atmosphere as a result of the replacement of existing equipment, this physical change does not constitute a modification as defined in 40 CFR 61.15. Therefore, U. S. EPA regulation does not require an application for approval, as required for a modification under 40 CFR 61.07.

000043



# Permit to Install Terms and Conditions

Application No. 14-743

APS Premise No. 1431110128

Permit Fee: \$200.00

Name of Facility: U.S. Department of Energy  
Feed Materials Production Center  
Person to Contact: Ms. Margaret Wilson

Address: P.O. Box E  
Oak Ridge, Tennessee 37831

Location of proposed source(s): 7400 Willey Road  
Plant 5, Casting Area  
Fernald, Ohio

Description of proposed source(s): Crucible Grit Blaster Controlled  
with a Dust Collector

Date of Issuance: May 1, 1985

Effective Date: May 1, 1985

The above named entity is hereby granted a permit to install for the above described source(s) pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the above described source(s) of environmental pollutants will operate in compliance with applicable State and Federal laws and regulations, and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans and specifications, the above described source(s) of pollutants will be granted the necessary permits to operate (air) or NPDES permits as applicable.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

Director

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U.S. Department of Energy - Feed Materials Production Center  
 Application No. 14-743  
 Page Two  
 May 1, 1985

Substantial construction for installation must take place within eighteen months of the effective date of this permit. This deadline may be extended by up to twelve months, if application is made to the Director no less than sixty days before the expiration of this permit and the party shows good cause for any such extension.

The Director of the Ohio Environmental Protection Agency, or his authorized representatives, may enter upon the premises of the above-named applicant during construction and operation at any reasonable time for the purpose of making inspections, conducting tests, examining records or reports pertaining to the construction, modification or installation of the above described source of environmental pollutants.

The proposed source shall be constructed in strict accordance with the plans and application submitted for this permit to the Director of the Ohio Environmental Protection Agency. There may be no deviation from the approved plans without the express, written approval of the Agency. Any deviations from the approved plans or the above conditions may lead to such sanctions and penalties as provided under Ohio law. Approval of these plans does not constitute an assurance that the proposed facilities will operate in compliance with all Ohio laws and regulations. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed sources are inadequate or cannot meet applicable standards.

The specified permit fee must be remitted within 15 days of the effective date of this permit to install.

This permit shall apply only to the source(s) shown on the application approved by the Ohio Environmental Protection Agency.

The source covered by this permit and the applicable Ohio Administrative Code rules are listed below:

<u>Source</u>	<u>Applicable Rules</u> <u>(OAC 3745-)</u>
Crucible Grit Blaster	31-05(A) 17-07 17-10 15-07

The source will be operated and maintained so that the emissions from the source shall not be in such manner or in such amounts as to endanger the health, safety or welfare of the public, or cause unreasonable injury or damage to property, per OAC 3745-15-07.

U.S. Department of Energy - Feed Materials Production Center  
Application No. 14-743  
Page Three  
May 1, 1985

The total actual particulate emissions from the source will be less than 0.12 lb/hr and 0.36 tons/year.

No more than thirty-five (35) crucibles per day and four (4) crucibles per hour may be grit blasted by the source.

The source will not be operated more than six thousand (6000) hours per year.

The use of high efficiency fabric filter constitutes the use of Best Available Technology as specified in OAC rule 3745-31-05(A)(3).

This source and its associated air pollution control system(s) shall be maintained regularly in accordance with good engineering practices and the recommendations of the respective manufacturers in order to minimize air contaminant emissions.

Any malfunction of this source or its associated air pollution control system(s) shall be reported immediately to the SWOAPCA in accordance with OAC rule 3745-15-06.

Except as provided by OAC rule 3745-15-06, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of the air pollution control equipment shall be accompanied by the shutdown of this source.

The applicant shall not cause or allow the disposal of hazardous waste produced by the operation of this process to be transported to a hazardous waste facility in the State of Ohio unless the hazardous waste disposal facility has received appropriate approval from the Ohio EPA to receive and dispose of such hazardous waste.

Samples of particulate matter in the ambient air are to be continuously collected at permanent sampling stations located on the facility's outer boundary. Seven stations will be operated and located as shown in Figure I. At each boundary station, air will be drawn at a rate of about one cubic meter per minute through an 8 inch x 10 inch filter which will be changed weekly.

Filters will be weighed before use and then reweighed after changing to obtain the weight of collected dust. After reweighing, the filter and its collection of dust will be dissolved in acid and the solution analyzed for uranium and gross beta radioactivity. After these analyses are complete, the remaining solution will be held to provide a long-term composite for analyses of other nuclides.

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Page Four  
May 1, 1985

On an annual basis the Feed Materials Production Center will provide the Southwestern Ohio Air Pollution Control Agency with an Environmental Monitoring Annual Report. This annual report will be submitted by June 15th of each operations year.

The crucible grit blaster will be controlled by an existing dust collector equipped with a continuous flow stack sampler. The sampler will draw a continuous sample at an isokinetic rate from a fixed point within the exhaust stack. Collected samples will be analyzed to determine both particulate and radionuclide emission rates from the facility exhaust. Results of the sampling analysis will be maintained for a minimum of 24 months and will be made available to the Southwestern Ohio Air Pollution Control Agency (or any agent of the Ohio EPA) upon request.

14-743  
APPLICATION  
NUMBER

U.S. D.O.E. Feed Materials Production  
FACILITY  
NAME Center

\$200.00  
AMOUNT  
DUE

### STATEMENT OF THE OHIO ENVIRONMENTAL PROTECTION AGENCY

- THIS PERMIT FEE IS DUE WITHIN FIFTEEN (15) DAYS OF THE EFFECTIVE DATE OF THIS PERMIT.
- FAILURE TO REMIT THE FULL AMOUNT DUE WILL RESULT IN REVOCATION OF THIS PERMIT AND AN ORDER TO CEASE ALL EMISSIONS.
- MAKE CHECKS PAYABLE TO THE TREASURER OF THE STATE OF OHIO.
- RETURN THIS STATEMENT WITH YOUR REMITTANCE USING THE ENCLOSED ENVELOPE.
- ALL QUESTIONS REGARDING THIS FEE SHOULD INCLUDE THE APPLICATION NUMBER SHOWN ABOVE.

EPA 3157

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PERMIT TO INSTALL  
CRUCIBLE GRIT BLASTER

2.

1. Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.

The Feed Materials Production Center (FMPC) is a contract-operated federal facility for the production of uranium metal for the United States Department of Energy (DOE). NLO, Inc. operates the FMPC under prime contract with the DOE. As a result of increased production delivery schedules of uranium metal, modifications are being planned to the casting area of the FMPC Metals Production Plant (Plant 5). These alterations include the installation of a crucible grit blaster unit for cleaning graphite crucibles prior to plasma coating and eventual reuse in the remelt furnaces. The grit blaster will utilize a slag grit which will be recycled in a ventilated closed system. The grit blaster will be ventilated by an existing Plant 5 dust collector (G5A-100). Minimal quantity of particulates will be emitted from the grit blaster to the intake side of the G5A-100 dust collector. At maximum design conditions or approximately 35 crucibles per day, the grit blaster will emit less than 12 pounds per hour of particulates. At a level of 25 crucibles per day, or average design conditions, the grit blaster will emit less than 8 pounds per hour of particulates.

The existing Plant 5 dust collector G5A-100 is a high efficiency collector (>99%) with a rated capacity of approximately 12,000 cfm. The collector will provide approximately 700 CFM of ventilation capacity to the proposed crucible grit blaster.

2. List the name and quantity of all materials and chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.

The crucible grit blaster will utilize a slag grit for cleaning crucibles. The slag grit will be recycled in a ventilated closed system. Propellant will be a 100 cfm plant air source. The major components of the slag grit are: FeO - 23%; Fe<sub>2</sub>O<sub>3</sub> - 4%; Silica - 43%; Al<sub>2</sub>O<sub>3</sub> - 21%; and CaO - 6%.

3. State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shut-down for \_\_\_\_\_ years? (State number of years)

This project involves the installation of a new crucible grit blaster in the casting area of the FMPC Metals Production Plant. The proposed grit blaster is a potential (although minimal) source of particulate air emissions.

4. Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.

There has been no previous Ohio EPA application or plan submission filed for the proposed crucible grit blaster.

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PERMIT TO INSTALL  
CRUCIBLE GRIT BLASTER

6201-1 3.

5. Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U.S. EPA?

The proposed grit blaster will comply with all rules, laws and regulations of the Ohio EPA and the U.S. EPA.

FOR AIR POLLUTION SOURCES

6. State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.

Anticipated particulate emissions from the crucible grit blaster and dust collector at maximum and average conditions are as follows:

	<u>Estimated Particulate Emissions</u>			
	<i>Max.</i>	<u>Average</u>	<u>Maximum</u>	<i>Average</i>
	<u>#/hr.</u>	<u>tons/yr.</u>	<u>#/hr.</u>	<u>tons/yr.</u>
Grit Blaster	12	36	8	24
Dust Collector*	.1	.4	.1	.2

\*NOTE: Dust collector emission rates are based on an estimated operating efficiency of 99 percent.

7. Are the proposed sources required to comply with the following federal requirements?
- New Source Performance Standards (NSPS)
  - National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - Prevention of Significant Deterioration (PSD)
  - Appendix "S" - Emission Offset Policy

The proposed source will not be affected by these federal requirements.

8. Will the proposed sources employ best available technology?

The proposed grit blaster will employ best available technology with the usage of a high efficiency dust collector.

9. Will the proposed sources cause the significant degradation of air quality?

The proposed source will not cause the significant degradation of air quality.

10. Will the proposed sources interfere with the attainment and maintenance of the ambient air quality standards?

The proposed source will not interfere with the attainment or maintenance of the ambient air quality standards.

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11. Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.

The existing dust collector G5A-100 exhaust stack is equipped with a NLO-developed continuous flow stack sampler. The sampler draws a continuous sample at an isokinetic rate from a fixed point within the exhaust stack. Collected samples are analyzed to determine both particulate and radionuclide emission rates from the facility exhaust.

12. Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?

No.

13. Complete and attach an anticipated construction schedule for each proposed source.

See Attachment.

14. Please include the estimated cost of any air pollution control equipment to be installed on the proposed sources.

Not applicable.

INSTALLATION SCHEDULE  
TO ACCOMPANY APPLICATION FOR PERMIT TO INSTALL

THIS FORM CONSTITUTES PART OF THE APPLICATION OF:

FACILITY NAME: Feed Materials Production Center

ADDRESS: 7400 Willey Road, Fernald, OH 45030

FOR A PERMIT TO INSTALL THE FOLLOWING AIR CONTAMINANT SOURCE:

IDENTIFICATION: Crucible Grit Blaster

DESCRIPTION: Equipment used for cleaning interior surfaces of graphite crucibles prior to coating operations.

THE INSTALLATION OF THE ABOVE AIR CONTAMINANT SOURCE IS PLANNED TO FOLLOW THE TIME SCHEDULE DESCRIBED BELOW:

	<u>DATE</u>
1. EQUIPMENT ORDERED - - - - -	<u>6-15-84</u>
2. COMMENCE CONSTRUCTION - - - - -	<u>2-1-85</u>
3. STARTUP - - - - -	<u>3-15-85</u>
4. PERFORMANCE TESTING - - - - -	<u></u>

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Under OAC 3745-31-04, These signatures shall constitute personal affirmation that all statements or assertions of fact made in the application are true and complete, comply fully with applicable state requirements, and shall subject the signatory to liability under applicable state laws forbidding false or misleading statements.

*M R Theisen*

12/12/84

\_\_\_\_\_  
Authorized Signature (for facility)  
M. R. Theisen

\_\_\_\_\_  
Date

\_\_\_\_\_  
Director, Weapons Division  
Title

U. S. Department of Energy  
P. O. Box E  
Oak Ridge, TN 37831

\_\_\_\_\_  
Address

For Wastewater  
Treatment Plants:

\_\_\_\_\_  
Signature of General Contractor or Agent  
Performing installation, if selected.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Company

\_\_\_\_\_  
Address

6201 = 1

- 1. Name of process Crucible Grit Blaster
- 2. End product of this process Cleaned Graphite Crucible
- 3. Primary process equipment Crucible Grit Blaster
- Your identification Grit Blaster Year Installed 1985
- Manufacturer Metco, Inc. Make or model Custom built
- Capacity of equipment (lbs./hr): Rated 25 crucibles/day Max. 35 crucibles/day
- Method of exhaust ventilation:  Stack  Window fan  Roof vent  
 Other, describe \_\_\_\_\_
- Are there multiple exhausts?  Yes  No

OPERATING DATA

- Normal operating schedule: 24 hrs./day, 5 days/wk., 50 wks./year.
- Percent annual production (finished units) by season:  
Winter 25 Spring 25 Summer 25 Fall 25
- Hourly production rates (lbs.): Average 25 crucibles/day Maximum 35 crucibles/day
- Annual production (indicate units) 18,000 crucibles
- Projected percent annual increase in production 10
- Type of operation:  Continuous  Batch
- If batch, indicate Minutes per cycle 15 Minutes between cycles 5
- Materials used in process:

List of Raw Materials	Principal Use	Amount (lbs./hr.)
Grit Blasting Slag	Cleaning graphite crucibles	Recycled in a ventilated closed system.

A PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit points of all raw materials, intermediate products, by-products and finished products, Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment.

CONTROL EQUIPMENT

Control Equipment Code:

- |                                |                          |                             |
|--------------------------------|--------------------------|-----------------------------|
| (A) Settling chamber           | (G) Cyclonic scrubber    | (M) Adsorber                |
| (B) Cyclone                    | (H) Impingement scrubber | (N) Condenser               |
| (C) Multiple cyclone           | (I) Orifice scrubber     | (O) Afterburner - catalytic |
| (D) Electrostatic precipitator | (J) Venturi scrubber     | (P) Afterburner - thermal   |
| (E) Fabric filter              | (K) Plate or tray tower  | (Q) Other, describe _____   |
| (F) Spray chamber              | (L) Packed tower         |                             |

15. Control Equipment data:

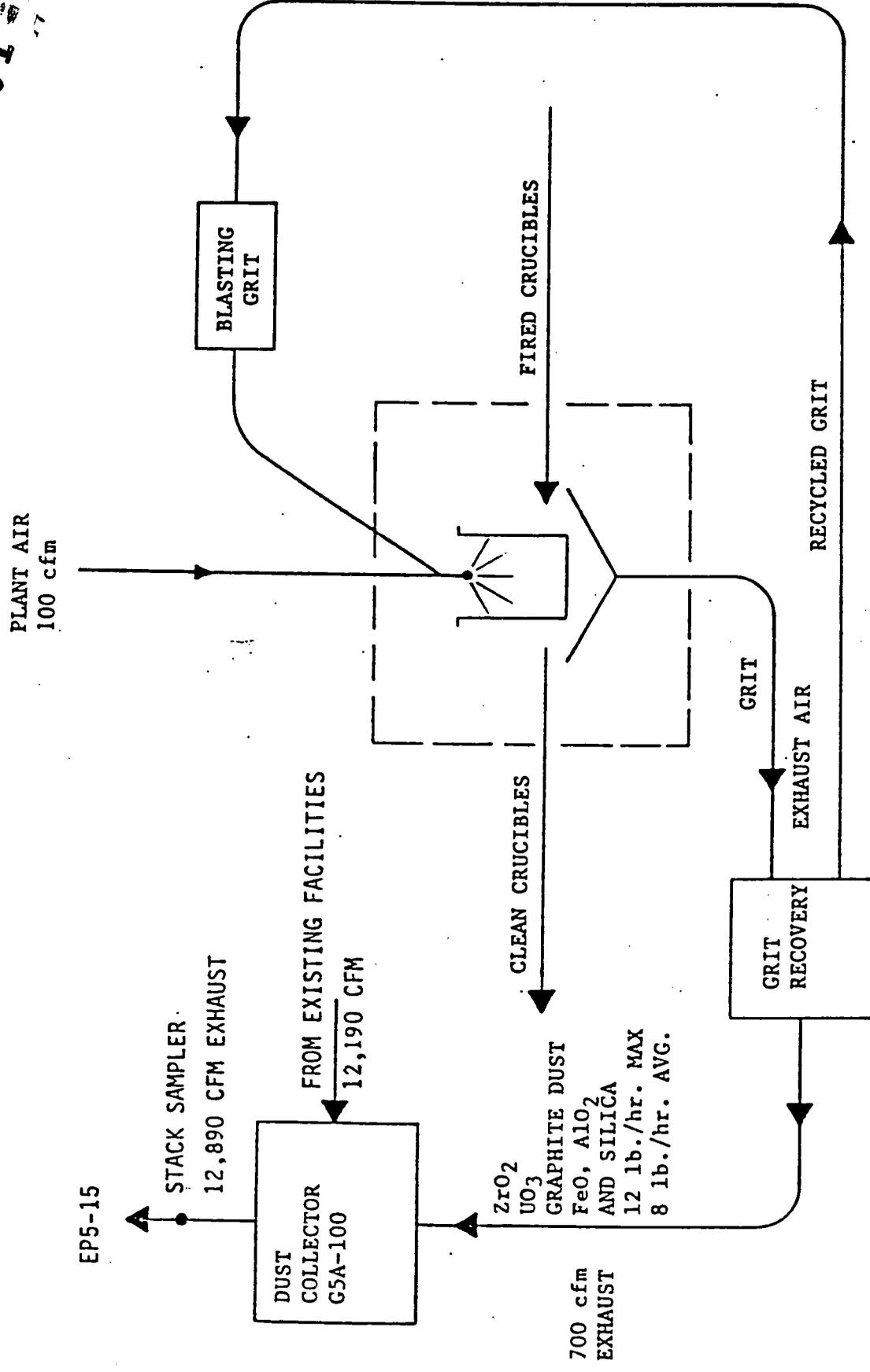
Item	Primary Collector	Secondary Collector
(a) Type (See above code)	E	
(b) Manufacturer	W. W. Sly Mfg.	
(c) Model No.	112	
(d) Year installed	1960	
(e) Your identification	G5A-100	
(f) Pollutant Controlled	Particulates	
(g) Controlled pollutant emission rate (if known)	NK	
(h) Pressure drop	1"-4"	
(i) Design efficiency	NK	
(j) Operating efficiency	>99%	

STACK DATA

16. Your stack identification EP5-15
- Are other sources vented to this stack?  Yes  No  
 If yes, identify sources Existing graphite lathe, separation booth and mold cleaning and coating station
18. Type:  Round, top inside diameter dimension 30"  
 Rectangular, top inside dimensions (L) NA x (W) NA
19. Height: Above roof 13 ft., above ground 57 ft.
20. Exit gas: Temp. 80 °F, Volume 12,890 ACFM, Velocity 2,630 ft./min
21. Continuous monitoring equipment:  Yes  No  
 If yes, indicate: Type NLO Developed, Manufacturer NA  
 Make or Model NA, Pollutant(s) monitored Particulates
22. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
 If yes, check method:  Stack Test  Emission factor  Material balance

Completed by D. J. Carr, Date 11/7/84

6201



CRUCIBLE GRIT BLASTING

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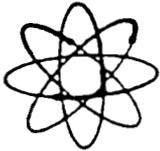
NLO, INC., CINCINNATI, OHIO 45239

THE ACCOMPANYING CHECK IS IN SETTLEMENT OF THE ITEMS STATED BELOW IF NOT CORRECT RETURN AT ONCE

INVOICE DATE	REFERENCE	AMOUNT OF INVOICE	DEDUCTIONS	AMOUNT
11/8/84	EPA PERMIT FEE			15.00

PLEASE TEAR THIS MEMORANDUM OFF BEFORE DEPOSITING CHECK

NLO-AC-1091 (REV 5/84)



NLO, Inc.

CINCINNATI, OHIO 45239

CHECK NUMBER 45699

56-19  
422

PAYABLE THROUGH  
THE FIRST NATIONAL BANK  
OF CINCINNATI  
MILFORD OFFICE  
CINCINNATI, OHIO 45202

NOVEMBER 12, 1984

PAY EXACTLY **15 00 00**

\$15.00

PAY TO THE ORDER OF

VOID 90 DAYS FROM DATE

THE TREASURER OF THE STATE  
OF OHIO

NLO, INC  
GENERAL ACCOUNT

*L. A. Harrod*  
*Business*

⑈045699⑈ ⑆042201948⑆ ⑈950 1263⑈

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ENCLOSURE 7  
WEST WAGNER COLD SAW  
PLANT 5  
FMPC #5-084

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EMISSIONS ESTIMATE FOR NEW PLANT 5 INGOT COLD SAW: #5-084

Assumptions:

- 1) G5A-100 Overall Control System Removal Efficiency = 95%

Basis: Calculation performed for control system based on historical data.

Note: The existing G5A-100 dust collector is scheduled to be replaced by a new high efficiency dust collector. Construction should start within one year.

- 2) Design airflow through dust collection system = 29,000 CFM  
Normal airflow through dust collection system = 27,000 CFM  
Based on six sources - airflow/source = 27,000 CFM/6 = 4,500 CFM  
- Assume airflow from new Wagner Cold Saw (#5-084) = 4,500 CFM

- 3) Dust Loading:

2.2 ( $10^{-4}$ ) Grains/Cubic Foot (CF) Average Hourly  
2.9 ( $10^{-4}$ ) Grains/Cubic Foot (CF) Maximum Hourly

Note: Representative data from a 1987 test period (1 month) resulted in an estimate of 5.07 lbs/yr of particulate being exhausted from stack EP5-15, this equates to 2.2 ( $10^{-4}$ ) grains/CF based on a nominal airflow of 27,000 CFM, a removal efficiency of 95%, and a 5 day, 8 hr/day work week for 50 weeks a year.

- 4) I Grain -  $1.429 \times 10^{-4}$  lbs

- 5) Dust analyzed during the same test referenced above (3) was found to contain an average of 6.2% uranium by weight -  
- Assume Average Uranium Weight % = 6.2  
& Maximum Uranium Weight % = 8.3

- 6) The percentage of particulates exhausting stack EP5-15 with a diameter less than 10 microns is unknown.

I. Emission Estimate for Particulates Attributable to New Wagner Cold Saw (#5-084)

$$\text{Average Hourly Emission} = (4,500 \text{ CFM})(60 \text{ Min/Hr})(1.429 \times 10^{-4} \text{ lb/gr})(2.2 \times 10^{-4} \text{ gr/CF}) = \underline{8.49 \times 10^{-3} \text{ lbs/hr to G5A-100}}$$

$$\text{EP5-15 Stack Exhaust} = (8.49 \times 10^{-3} \text{ lbs/hr})(0.05) = \underline{4.25 \times 10^{-4} \text{ lbs/hr}}$$

Maximum Hourly Emission =

$$\frac{(2.9)}{2.2} \times 8.49(10^{-3}) \frac{\text{lbs}}{\text{hr}} = 1.12 (10^{-2}) \frac{\text{lbs}}{\text{hr}} \text{ to G5A-100}$$

$$\frac{(2.9)}{2.2} \times 4.24(10^{-4}) \frac{\text{lbs}}{\text{hr}} = 5.60(10^{-4}) \frac{\text{lbs}}{\text{hr}} \text{ Out Stack EP5-15}$$

Average Yearly Particulate Emission =

$$(4.25(10^{-4}) \frac{\text{lbs}}{\text{hr}})(8 \text{ hr/day})(5 \text{ days/wk})(50 \text{ wks/yr}) =$$

$$0.85 \text{ lbs/yr} = \frac{4.25 \times 10^{-4} \text{ tons/yr}}{[\text{From 5-084}]}$$

Maximum Yearly Particulate Emission =

$$(5.60(10^{-4}) \frac{\text{lbs}}{\text{hr}})(24 \text{ hr/day})(7 \text{ days/wk})(50 \text{ wks/yr})$$

$$= 4.70 \text{ lbs/yr} = \frac{2.35 \times 10^{-3} \text{ tons/yr}}{[\text{from 5-084}]}$$

II. Emission Estimate for Uranium Attributable to New Wagner Cold Saw (#5-084)

$$\text{Average Hourly Emission} = 4.25 \times 10^{-4} \text{ lbs/hr} \times 6.2\% \text{ Wt \% U} = \frac{2.64 \times 10^{-5} \text{ lbs U/hr}}$$

$$\text{Maximum Hourly Emission} = 5.60 \times 10^{-4} \text{ lbs/hr} \times 8.3\% \text{ Wt \% U} = \frac{4.65 \times 10^{-5} \text{ lbs U/hr}}$$

$$\text{Average Yrly Emission} = 0.85 \text{ lbs/yr} \times 6.2\% \text{ U} = \frac{0.053 \text{ lbs U/yr}}{2.65 \times 10^{-5} \text{ tons U/yr}}$$

$$\text{Maximum Yrly Emission} = 4.70 \text{ lbs/yr} \times 8.3\% \text{ U} = \frac{0.39 \text{ lbs U/yr}}{1.95 \times 10^{-4} \text{ tons U/yr}}$$

Summary of New Source Emissions for New Wagner Cold Saw

	<u>Particulate</u>	<u>Uranium</u>
Hourly Average (lbs/Hr):	$4.25 \times 10^{-4}$	$2.64 \times 10^{-5}$
Hourly Average (Lbs/Hr):	$5.60 \times 10^{-4}$	$4.65 \times 10^{-5}$
Yearly Average (Lbs/Yr):	0.85	0.053
Yearly Average (Tons/Yr):	$4.25 \times 10^{-4}$	$2.65 \times 10^{-5}$
Yearly Maximum (Lbs/Yr):	4.70	0.39
Yearly Maximum (Tons/Yr):	$2.35 \times 10^{-3}$	$1.95 \times 10^{-4}$

Notes:

1. Existing source emissions for this service are non-existent since the previous source was demolished when the new Wagner Cold Saw was installed.
2. Existing source emissions are sample results from a single point fixed isokinetic sampler.

Applicable Regulations

Ohio Administrative Code Rule 3745-17-11 for Particulate - Compliance

Ohio Administrative Code Rule 3745-31-05 (A) - Best Available Technology

The Best Available Technology for this equipment is being utilized as shown by the preceding data and calculations.

Plant 5 - West Wagner Cold Saw, FMPC #5-084

Estimated uranium emissions from saw 5-084 (see calculations) are 0.39 pounds (177g) per year or  $1.17 \times 10^{-4}$  Ci/yr plus associated fission products, radium, thorium, neptunium, and plutonium. Quantity of nonuranium radionuclides may be calculated from 1986 Plant 5 source term by multiplying the total quantity of a given radionuclide emitted by Plant 5 by the ratio of uranium emitted by FMPC #5-084 to total 1986 Plant 5 uranium emissions, i.e.

$$\text{Ra-226} = \frac{1.77 \times 10^2 \text{ g}}{4.991 \times 10^3 \text{ g}} \times 7 \times 10^{-6} \text{ Ci} = 2.5 \times 10^{-7} \text{ Ci, etc.}$$

Effective committed dose equivalent --  $6.5 \times 10^{-3}$  mrem  
Lung committed dose equivalent --  $4.0 \times 10^{-2}$  mrem  
Endosteal bone committed dose equivalent --  $3.9 \times 10^{-2}$  mrem



# County of Hamilton

## SOUTHWESTERN OHIO AIR POLLUTION CONTROL AGENCY

### BOARD OF COMMISSIONERS

JOSEPH M. DeCOURCY  
NORMAN A. MURDOCK  
ROBERT A. TAFT II

### MAIN OFFICE

2400 Beekman Street  
Cincinnati, Ohio 45214  
Phone: (513) 251-8777

### LABORATORY

1675 Gest Street  
Cincinnati, Ohio 45204  
Phone: (513) 251-8863

MICHAEL J. MALONEY  
*Administrator*  
CHARLES E. SCHUMANN  
*Director*

May 7, 1985

PTI 14-742  
FMPC # 5-084

U.S. Department of Energy  
Feed Materials Production Center  
P. O. Box E  
Oak Ridge, Tennessee 37831

Attn: Margaret Wilson

Dear Sir:

On 5/1/85 Ohio EPA issued your final permit to install. At this time you are required to apply for a permit to operate the following air contaminant source(s):

Uranium Ingot Cold Saw controlled by a highly efficient dust collection system (PTI 14-742) located at 7400 Willey Road, Plant 5, Casting Area, Fernald, Ohio.

Enclosed are the necessary forms required for such permit.

Please be advised that a fifteen (15.00) dollar application review fee is required according to section 3745.11 (G) of the Ohio Revised Code for each application submitted.

Send completed forms and check(s), made payable to "The Treasurer of the State of Ohio," to our main office.

Sincerely,

Charles E. Schumann,  
Director

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1727  
MAY 09 1985

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**Ohio EPA**

Re: Permit to Install  
Hamilton County  
Application No. 14-742

May 1, 1985

U.S. Department of Energy  
Feed Materials Production Center  
P.O. Box E  
Oak Ridge, Tennessee 37831

Attention: Ms. Margaret Wilson

CERTIFIED MAIL

Dear Sir:

Enclosed please find an Ohio EPA Permit to Install which will allow you to install the described source(s) in a manner indicated in the permit. Because this permit contains several conditions and restrictions I urge you to read it carefully.

You are hereby notified that this action by the Director is final and may be appealed to the Environmental Board of Review pursuant to Chapter 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Board of Review within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency and the Environmental Law Division of the Office of the Attorney General within three (3) days of filing with the Board. An appeal may be filed with the Environmental Board of Review at the following address:

Environmental Board of Review  
250 East Town Street, Room 101  
Columbus, Ohio 43215

Very truly yours,

*Patricia P. Walling*

Patricia P. Walling, Manager  
Authorization & Compliance Section  
Division of Air Pollution Control

PPW/gs

cc: US EPA  
Southwestern Ohio Air Pollution Control Agency

6415.5

1684

MAY 07 1985



# Permit to Install Terms and Conditions

Application No. 14-742  
 APS Premise No. 1431110128  
 Permit Fee: \$585.00

Name of Facility: U.S. Department of Energy  
 Feed Materials Production Center  
 Person to Contact: Ms. Margaret Wilson

Address: P.O. Box E  
 Oak Ridge, Tennessee 37831

Location of proposed source(s): 7400 Willey Road  
Plant 5, Casting Area  
 Fernald, Ohio

Description of proposed source(s): Uranium Ingot Cold Saw Controlled  
by a Highly Efficient Dust  
Collection System 5-084

Date of Issuance: May 1, 1985

Effective Date: May 1, 1985

The above named entity is hereby granted a permit to install for the above described source(s) pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the above described source(s) of environmental pollutants will operate in compliance with applicable State and Federal laws and regulations, and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans and specifications, the above described source(s) of pollutants will be granted the necessary permits to operate (air) or NPDES permits as applicable.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

Director

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Substantial construction for installation must take place within eighteen months of the effective date of this permit. This deadline may be extended by up to twelve months, if application is made to the Director no less than sixty days before the expiration of this permit and the party shows good cause for any such extension.

The Director of the Ohio Environmental Protection Agency, or his authorized representatives, may enter upon the premises of the above-named applicant during construction and operation at any reasonable time for the purpose of making inspections, conducting tests, examining records or reports pertaining to the construction, modification or installation of the above described source of environmental pollutants.

The proposed source shall be constructed in strict accordance with the plans and application submitted for this permit to the Director of the Ohio Environmental Protection Agency. There may be no deviation from the approved plans without the express, written approval of the Agency. Any deviations from the approved plans or the above conditions may lead to such sanctions and penalties as provided under Ohio law. Approval of these plans does not constitute an assurance that the proposed facilities will operate in compliance with all Ohio laws and regulations. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed sources are inadequate or cannot meet applicable standards.

The specified permit fee must be remitted within 15 days of the effective date of this permit to install.

This permit shall apply only to the source(s) shown on the application approved by the Ohio Environmental Protection Agency.

The source covered by this permit and the applicable Ohio Administrative Code rules are listed below:

<u>Source</u>	<u>Applicable Rules</u> <u>(OAC 3745-)</u>
Uranium Ingot Cold Saw	31-05(A) 17-07 17-11 15-07

The source will be operated and maintained so that the emissions from the source shall not be in such manner or in such amounts as to endanger the health, safety or welfare of the public, or cause unreasonable injury or damage to property, per OAC 3745-15-07

U.S. Department of Energy - Feed Materials Production Center  
Application No. 14-742  
Page Three  
May 1, 1985

The total actual emissions from the source will be less than 0.02 pound per year.

A maximum of four (4) ingots per hour or ninety-six (96) ingots per day may be processed by the source.

The source will not be operated more than eight thousand-four hundred (8400) hours per year.

The use of high efficiency fabric filter constitutes the use of Best Available Technology as specified in OAC rule 3745-31-05(A)(3).

This source and its associated air pollution control system(s) shall be maintained regularly in accordance with good engineering practices and the recommendations of the respective manufacturers in order to minimize air contaminant emissions.

Any malfunction of this source or its associated air pollution control system(s) shall be reported immediately to the SWOAPCA in accordance with OAC rule 3745-15-06.

Except as provided by OAC rule 3745-15-06, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of the air pollution control equipment shall be accompanied by the shutdown of this source.

The applicant shall not cause or allow the disposal of hazardous waste produced by the operation of this process to be transported to a hazardous waste facility in the State of Ohio unless the hazardous waste disposal facility has received appropriate approval from the Ohio EPA to receive and dispose of such hazardous waste.

The uranium ingot cold saw will be controlled with a 12,000 cfm dust collector equipped with differential pressure transmitters across the inlet and outlet of the unit. The PDS will provide an indication of the pressure drop across the filter medium for purposes of detecting the clogging or breakage of collector bags. A flow element and transmitter will provide a positive indication the flow for monitoring and interlocking, and to prevent the operation of the packaging station unless the exhaust fan is operational.

The source stack will be equipped with an NLO-developed continuous flow stack sampler. The sampler will draw a continuous sample at an isokinetic rate from a fixed point within the exhaust stack. Collected samples will be analyzed to determine both particulate and radionuclide emission rates from the exhaust. Results of the sampling analysis will be maintained for a minimum of 24 months, and will be made available to the Southwestern Ohio Air Pollution Control Agency (or any agent of the Ohio EPA) per request.

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14-742	U.S. D.O.E. Feed Materials Production	\$585.00
APPLICATION	FACILITY	AMOUNT
NUMBER	NAME	DUE
	Center	

### STATEMENT OF THE OHIO ENVIRONMENTAL PROTECTION AGENCY

- THIS PERMIT FEE IS DUE WITHIN FIFTEEN (15) DAYS OF THE EFFECTIVE DATE OF THIS PERMIT.
- FAILURE TO REMIT THE FULL AMOUNT DUE WILL RESULT IN REVOCATION OF THIS PERMIT AND AN ORDER TO CEASE ALL EMISSIONS.
- MAKE CHECKS PAYABLE TO THE TREASURER OF THE STATE OF OHIO.
- RETURN THIS STATEMENT WITH YOUR REMITTANCE USING THE ENCLOSED ENVELOPE.
- ALL QUESTIONS REGARDING THIS FEE SHOULD INCLUDE THE APPLICATION NUMBER SHOWN ABOVE.

EPA 3157

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1. Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.

The Feed Materials Production Center (FMPC) is a contract-operated federal facility for the production of highly pure uranium metal for the United States Department of Energy. As a result of increased production delivery schedules of uranium metal, modifications are being planned to the casting area of the FMPC Metals Production Plant (Plant 5). These alterations include the installation of a new cold saw for cropping uranium metal ingots and billets for assay purposes. The cold saw will utilize a 30 to 1 mixture water to oil quench to control particulate emissions and reduce potential fire hazards.

The proposed cold saw will be serviced by a new 12,000 cfm dust collector. The new collector will ventilate existing plant production equipment, in addition to the proposed cold saw.

2. List the name and quantity of all materials and chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.

The cold sawing process is an intermediate processing step in the production of highly pure uranium ingots in the FMPC Metals Production Plant. The cold saw is employed to saw sample croppings from finished uranium ingots for quality and production control purposes. The usage of the cold saw will be extremely variable depending on daily production schedules. The maximum production load through the cold saw will be approximately four (4) ingots per

3. State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shutdown for \_\_\_\_\_ years? (State number of years).

The project involves the installation of a new cold saw in the casting area of the FMPC Metals Production Plant

4. Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.

No previous Ohio EPA permit application or plan submission has been filed for this facility.

5. Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U.S. EPA?

The proposed facility will comply with all rules, laws, and regulations of the Ohio EPA.

FOR AIR POLLUTION SOURCES

6. State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.

The proposed cold saw will emit a trace quantity of particulate matter to the dust collection system. Maximum particulate emissions will be less than 2 lbs. per year. The emissions from the source will be less than 1 lb. per year at average conditions.

7. Are the proposed sources required to comply with the following federal requirements?
- i. New Source Performance Standards (NSPS)
  - ii. National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - iii. Prevention of Significant Deterioration (PDS)
  - iv. Appendix "S" - Emission Offset Policy

The proposed source is not affected by these federal requirements.

8. Will the proposed sources employ best available technology?

The new cold saw will employ best available technology with the usage of a highly efficient dust collection system.

9. Will the proposed sources cause the significant degradation of air quality?

The source will not cause significant degradation of air quality, \_\_\_\_\_

10. Will the proposed sources interfere with the attainment and maintenance of the ambient air quality standards?

The proposed source will not affect the attainment and maintenance of current ambient air quality standards.

11. Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.

The dust collector shall be equipped with differential pressure transmitters across the inlet and outlet of the unit. The PDS will provide an indication of the pressure drop across the filter medium for purposes of detecting the clogging or breakage of collector bags. A flow element and transmitter will provide a positive indication of flow for monitoring and interlocking, and to prevent operation of the packaging station unless the exhaust fan is operating.

The facility exhaust stack will be equipped with an NLO-developed continuous flow stack sampler. The sampler will draw a continuous sample at an isokinetic rate from a fixed point within the exhaust stack. Collected samples will be analyzed to determine both particulate and radionuclide emission rates from the facility exhaust.

PERMIT TO INSTALL  
Uranium Ingot Cold Saw

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12. Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?

No.

13. Complete and attach an anticipated construction schedule for each proposed source.

See attachment.

14. Please include the estimated cost of any air pollution control equipment to be installed on the proposed sources.

The dust collection system is estimated to cost approximately \$105,000 installed

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OHIO ENVIRONMENTAL PROTECTION AGENCY

INSTALLATION SCHEDULE

TO ACCOMPANY APPLICATION FOR PERMIT TO INSTALL

THIS FORM CONSTITUTES PART OF THE APPLICATION OF:

FACILITY NAME: Feed Materials Production Center

ADDRESS: 7400 Willey Road, Fernald, Ohio

FOR A PERMIT TO INSTALL THE FOLLOWING AIR CONTAMINANT SOURCE:

IDENTIFICATION: Uranium Ingot Cold Saw

DESCRIPTION: Equipment for cropping uranium ingots for assay purposes.

THE INSTALLATION OF THE ABOVE AIR CONTAMINANT SOURCE IS PLANNED TO FOLLOW THE TIME SCHEDULE DESCRIBED BELOW:

	<u>DATE</u>
1. EQUIPMENT ORDERED - - - - -	<u>2-1-84</u>
2. COMMENCE CONSTRUCTION - - - - -	<u>2-1-85</u>
3. STARTUP - - - - -	<u>3-15-85</u>
4. PERFORMANCE TESTING - - - - -	<u></u>

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Under OAC 3745-31-04, These signatures shall constitute personal affirmation that all statements or assertions of fact made in the application are true and complete, comply fully with applicable state requirements, and shall subject the signatory to liability under applicable state laws forbidding false or misleading statements.

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*MR Theisen*

*12/12/84*

Authorized Signature (for facility)

Date

M. R. Theisen,

Director, Weapons Division

Title

U.S. Department of Energy

P. O. Box E, Oak Ridge, TN 37831

Address

For Wastewater  
Treatment Plants:

Signature of General Contractor or Agent  
Performing installation, if selected.

Date

Company

Address



Control Equipment Code:

- (A) Settling chamber
- (B) Cyclone
- (C) Multiple cyclone
- (D) Electrostatic precipitator
- (E) Fabric filter
- (F) Spray chamber
- (G) Cyclonic scrubber
- (H) Impingement scrubber
- (I) Orifice scrubber
- (J) Venturi scrubber
- (K) Plate or tray tower
- (L) Packed tower
- (M) Adsorber
- (N) Condenser
- (O) Afterburner - catalytic
- (P) Afterburner - thermal
- (Q) Other, describe \_\_\_\_\_

15. Control Equipment data:

Item	Primary Collector	Secondary Collector
(a) Type (See above code)	E	
(b) Manufacturer	Flex-Kleen	
(c) Model No.	100-WMW-120	
(d) Year installed	1985	
(e) Your identification	G5A-102 (EP5-19)	
(f) Pollutant Controlled	Particulates	
(g) Controlled pollutant emission rate (if known)	0.04#/hr.	
(h) Pressure drop	≈6"	
(i) Design efficiency	99%	
(j) Operating efficiency	NK	

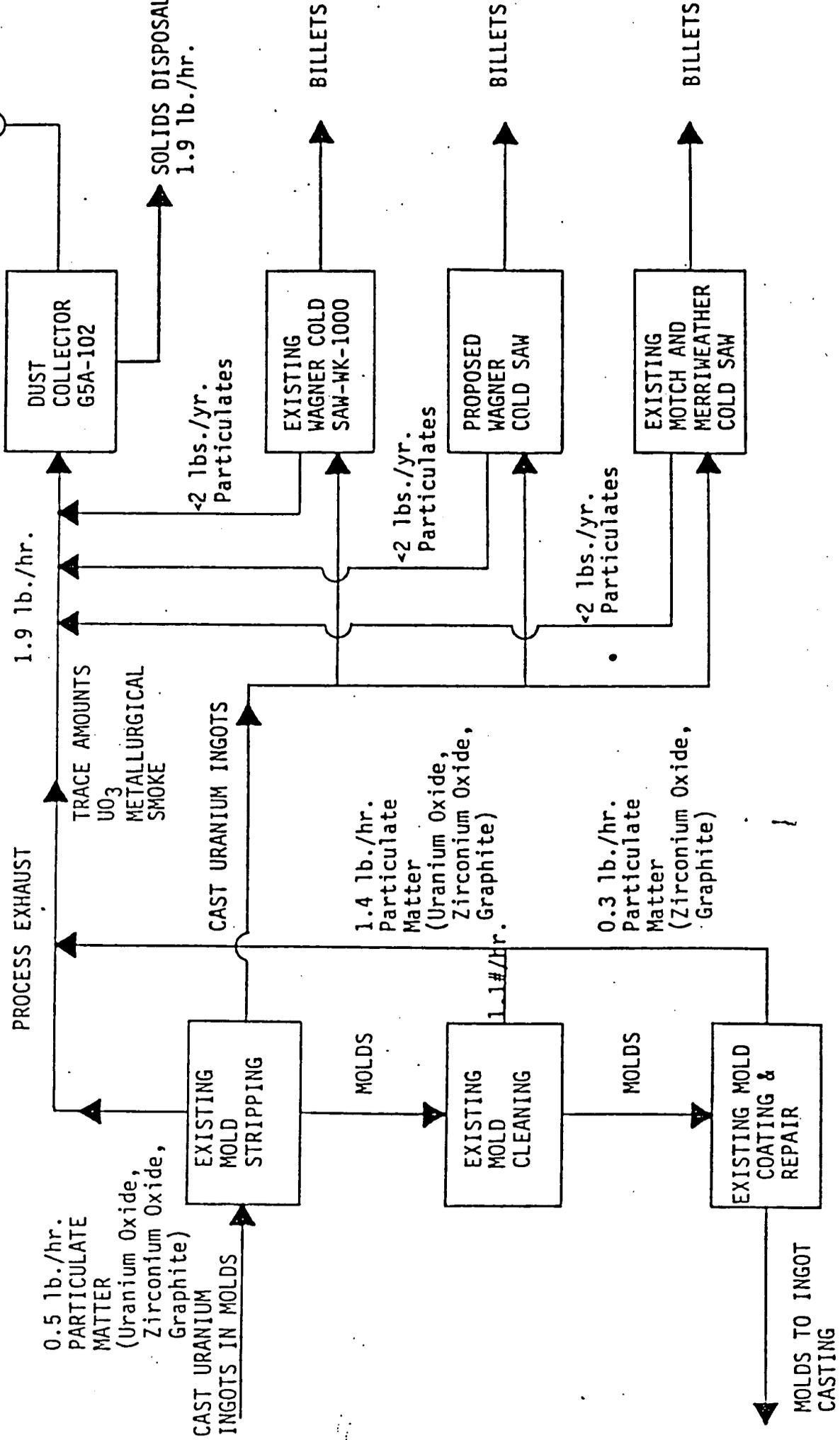
NOTE: Final selection of equipment has not yet been made. Final equipment specifications meet or exceed those of STACK DATA manufacturers and models indicated.

16. Your stack identification EP5-19
17. Are other sources vented to this stack?  Yes  No  
 If yes, identify sources Existing mold stripping, mold cleaning, mold coating a repair; two existing cold saws.
18. Type:  Round, top inside diameter dimension 24"  
 Rectangular, top inside dimensions (L) \_\_\_\_\_ x (W) \_\_\_\_\_
19. Height: Above roof NK ft., above ground NK ft.
20. Exit gas: Temp. 80 °F, Volume 12,000 ACFM, Velocity 4,000 ft./min
21. Continuous monitoring equipment:  Yes  No  
 If yes, indicate: Type NLO Developed, Manufacturer Custom Built  
 Make or Model N/A, Pollutant(s) monitored Particulates
22. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
 If yes, check method:  Stack Test  Emission factor  Material balance

Completed by D. J. Carr, Date 11/7/84

Er5-19

STACK MONITOR  
.04 lb./hr.



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NLO, INC., CINCINNATI, OHIO 45239

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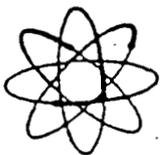
THE ACCOMPANYING CHECK IS IN SETTLEMENT OF THE ITEMS STATED BELOW IF NOT CORRECT RETURN AT ONCE

INVOICE DATE	REFERENCE	AMOUNT OF INVOICE	DEDUCTIONS	AMOUNT
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11/8/84	EPA PERMIT FEE			15.00
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PLEASE TEAR THIS MEMORANDUM OFF BEFORE DEPOSITING CHECK

O-AC-1091 (REV 5-1-84)



NLO, Inc.

CINCINNATI, OHIO 45239

CHECK NUMBER 45698

56-194  
422

PAYABLE THROUGH  
THE FIRST NATIONAL BANK  
OF CINCINNATI  
MILFORD OFFICE  
CINCINNATI, OHIO 45202

NOVEMBER 12, 1984

PAY EXACTLY **1500 CTS**

\$15.00

PAY TO THE ORDER OF

VOID 90 DAYS FROM DATE

NLO, INC  
GENERAL ACCOUNT

THE TREASURER OF THE STATE  
OF OHIO

*A. A. Harris*  
*Bressiness*

⑈045698⑈ ⑆042201948⑆

⑈950 1263⑈

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ENCLOSURE 8  
GRAPHITE BAND SAW  
PLANT 5  
FMPC #5-093

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EMISSIONS ESTIMATE FOR NEW PLANT 5 GRAPHITE BAND SAW: #5-093

Assumptions

- (1) G5-262 overall control system removal efficiency - 99.97%  
Basis: Calculation performed for control equipment based on historical data.
- (2) Design airflow through dust collection system = 7,600 CFM  
Average 1987 airflow through dust collection system = 6,000 CFM  
Based on the process flow diagram w/number from a recent study  
Assume airflow from new graphite band saw (#5-093) = 290 CFM

(3) Dust Loading:

0.016 Grains/cubic foot (cf) average hourly  
0.24 Grains/cubic foot (cf) maximum hourly

NOTE: Representative data from 1986 test period [1 yr] resulted in an estimate of 4.98 lbs/yr of particulate being exhausted from stack EP5-17, this equates to 0.16 grains/cf based on an average air flow of 6,000 CFM, a 99.97 removal efficiency, and a 5 day, 8 hr/day work week for 50 weeks.

- (4) 1 grain -  $1.429 \times 10^{-4}$  lbs
- (5) Dust analyzed during the same test referenced above [(3)] was found to contain an average of 0.55% uranium by weight.  
Assume average uranium weight % = 0.55  
& maximum uranium weight % = 0.83
- (6) The percentage of particulates exhausting stack EP5-17 with a diameter less than 10 microns is estimated to be 100%.

I. Emission Estimate for Particulates Attributable to New Graphite Band Saw (#5-093)

$$\text{Average Hourly Emission} = (290 \text{ CFM})(60 \text{ Min/Hr})(1.429 \times 10^{-4} \text{ lb/gr}) / (0.16 \text{ gr/CF}) = 3.98 \times 10^{-1} \text{ lbs/hr to G5-262}$$

$$\text{EP5-15 Stack Exhaust} = (3.98(10^{-1}) \frac{\text{lbs}}{\text{hr}}) (.0003) = 1.19 \times 10^{-4} \frac{\text{lbs}}{\text{hr}}$$

Maximum Hourly Emission =

$$\frac{(0.24)}{0.16} \times 3.98 (10^{-1}) \frac{\text{lbs}}{\text{hr}} = 5.97 (10^{-1}) \frac{\text{lbs}}{\text{hr}} \text{ to G5-262}$$

$$\frac{(0.24)}{0.16} \times 1.19(10^{-4}) \frac{\text{lbs}}{\text{hr}} = 1.79(10^{-4}) \frac{\text{lbs}}{\text{hr}} \text{ out stack EP5-17}$$

$$\text{Average Yearly Particulate Emission} = (1.19(10^{-4}) \text{ lbs/hr})(8 \text{ hr/day}) \\ (5 \text{ days/wk})(50 \text{ wks/yr}) = 0.24 \text{ lbs/yr} = 1.20 \times 10^{-4} \text{ tons/yr}$$

[From 5-093]

$$\text{Maximum Yearly Particulate Emission} = (1.79(10^{-4}) \text{ lbs/hr})(24 \text{ hr/day}) \\ (7 \text{ days/wk})(50 \text{ wks/yr}) = 1.50 \text{ lbs/yr} = 7.50 \times 10^{-4} \text{ tons/yr}$$

[From 5-093]

II. Emission Estimate for Uranium Attributable to New Graphite Band Saw (#5-093):

$$\text{Average Hourly Emission} = 1.19 \times 10^{-4} \text{ lbs/hr} \times 0.55\% \text{ WT\% U} = \\ 6.55 \times 10^{-7} \text{ lbs U/hr}$$

$$\text{Maximum Hourly Emission} = 1.79 \times 10^{-4} \text{ lbs/hr} \times 0.83\% \text{ WT\% U} = \\ 1.49 \times 10^{-6} \text{ lbs U/hr}$$

$$\text{Average Yrly Emission} = 0.24 \text{ lbs/yr} \times 0.55\% \text{ U} = 1.32 \times 10^{-3} \text{ lbs U/yr} = \\ 6.60 \times 10^{-7} \text{ tons U/yr}$$

$$\text{Maximum Yrly Emission} = 1.50 \text{ lbs/yr} \times 0.55\% \text{ U} = 8.25 \times 10^{-3} \text{ lbs U/yr} = \\ 4.13 \times 10^{-6} \text{ tons U/yr}$$

III. Summary of New Source Emissions for New Graphite Band Saw

	<u>Particulate</u>	<u>Uranium</u>
Hourly Average (lbs/Hr):	$1.19 \times 10^{-4}$	$6.55 \times 10^{-7}$
Hourly Average (Lbs/Hr):	$1.79 \times 10^{-4}$	$1.49 \times 10^{-6}$
Yearly Average (Lbs/Yr):	0.24	$1.32 \times 10^{-3}$
Yearly Average (Tons/Yr):	$1.20 \times 10^{-4}$	$6.60 \times 10^{-7}$
Yearly Maximum (Lbs/Yr):	1.50	$8.25 \times 10^{-3}$
Yearly Maximum (Tons/Yr):	$7.50 \times 10^{-4}$	$4.13 \times 10^{-6}$

Notes:

1. The existing source emission for this service (FMPC ID# 5-064, OEPA 1431110128 p171) will be replaced by the new band saw.
2. Existing source emissions are tested results from a single point fixed continuous isokinetic sampler.

Plant 5 - Graphite Band Saw, FMPC #5-093

Estimated uranium emissions from 5-093 are 0.008 pounds (3.6 g) per year or  $2.4 \times 10^{-6}$  Ci/yr of uranium plus associated fission products, radium, thorium, neptunium, and plutonium. Quantity of non-uranium radionuclides may be calculated from 1986 Plant 5 source term by multiplying the total quantity of a given radionuclide emitted by Plant 5 by the ratio of uranium emitted by FMPC #5-093 to total 1986 Plant 5 uranium emissions, i.e.

$$\text{Ra-226} = \frac{3.6 \text{ g}}{4.991 \times 10^3 \text{ g}} \times 7 \times 10^{-6} \text{ Ci} = 5 \times 10^{-10} \text{ Ci, etc.}$$

Effective committed dose equivalent --  $1.3 \times 10^{-4}$  mrem  
 Lung committed dose equivalent --  $8.2 \times 10^{-4}$  mrem  
 Endosteal bone committed dose equivalent --  $7.9 \times 10^{-4}$  mrem



# Permit to Install Terms and Conditions

Application No. 14-762

APS Premise No. 1431110128

Permit Fee: \$200.00

Name of Facility: U.S. Dept. of Energy  
Feed Materials Production Center  
Person to Contact: Ms. Margaret Wilson

Address: P.O. Box E  
Oak Ridge, Tennessee 37831

Location of proposed source(s): 7400 Willey Road  
Plant #5, Casting Area  
Fernald, Ohio

Description of proposed source(s): Graphite Band Saw Controlled with a  
Dust Collector

Date of Issuance: July 10, 1985

Effective Date: July 10, 1985

The above named entity is hereby granted a permit to install for the above described source(s) pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the above described source(s) of environmental pollutants will operate in compliance with applicable State and Federal laws and regulations, and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans and specifications, the above described source(s) of pollutants will be granted the necessary permits to operate (air) or NPDES permits as applicable.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

Director

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U.S. Dept. of Energy - Feed Materials Production Center  
 Application No. 14-762  
 Page Two  
 July 10, 1985

Substantial construction for installation must take place within eighteen months of the effective date of this permit. This deadline may be extended by up to twelve months, if application is made to the Director no less than sixty days before the expiration of this permit and the party shows good cause for any such extension.

The Director of the Ohio Environmental Protection Agency, or his authorized representatives, may enter upon the premises of the above-named applicant during construction and operation at any reasonable time for the purpose of making inspections, conducting tests, examining records or reports pertaining to the construction, modification or installation of the above described source of environmental pollutants.

The proposed source shall be constructed in strict accordance with the plans and application submitted for this permit to the Director of the Ohio Environmental Protection Agency. There may be no deviation from the approved plans without the express, written approval of the Agency. Any deviations from the approved plans or the above conditions may lead to such sanctions and penalties as provided under Ohio law. Approval of these plans does not constitute an assurance that the proposed facilities will operate in compliance with all Ohio laws and regulations. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed sources are inadequate or cannot meet applicable standards.

The specified permit fee must be remitted within 15 days of the effective date of this permit to install.

This permit shall apply only to the source(s) shown on the application approved by the Ohio Environmental Protection Agency.

The proposed graphite band saw will utilize Best Available Technology with the usage of a high efficiency dust collector (greater than 99.0% efficiency) to control particulate emissions.

The following rules of the Ohio Administrative Code establishes the applicable emission limitations and/or control requirements for this source:

<u>Source</u>	<u>Regulations</u> (OAC 3745-)
Graphite Band Saw	17-07, 17-11, 15-06, 15-07

U.S. Dept. of Energy - Feed Materials Production Center  
Application No. 14-762  
Page Three  
July 10, 1985

The Graphite Band Saw and all other sources located at the U.S. D.O.E. Feed Materials Production Center which emit or have the potential to emit radio-nuclides to the ambient air shall comply with the requirements specified in 40 CFR Part 61 subpart H effective February 6, 1985.

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**Ohio EPA**

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AUGUST 20, 1985

PD.  
10/13/85

US DEPT OF ENERGY M WILSON  
PO BOX E  
OAK RIDGE, TN 37831

RE: PERMIT FEE DUE: \$200.00  
APPLICATION NO: 14-762

GENTLEMEN:

OUR RECORDS INDICATE THAT THE FEE PAYABLE TO THE STATE FOR THE ABOVE REFERENCED PERMIT IS NOW 30 DAYS PAST DUE.

AS REQUIRED BY SECTION 115.10 OF THE OHIO REVISED CODE, WE ARE REQUESTING THAT YOU REMIT PAYMENT IN THE AMOUNT OF \$200.00 PAYABLE TO THE "TREASURER OF THE STATE OF OHIO," SUBMITTED TO OHIO ENVIRONMENTAL PROTECTION AGENCY, PERMITS BOOKKEEPER, P.O. BOX 1049, COLUMBUS, OHIO 43216.

IF YOU HAVE QUESTIONS REGARDING THE PERMIT FEE, PLEASE CONTACT THE OHIO EPA, OFFICE OF FINANCE, PERMITS BOOKKEEPER, AT (614) 466-9727. ACCOUNTS WHICH ARE 90 DAYS PAST DUE WILL BE FORWARDED TO THE AUDITOR OF STATE, WITH COLLECTION THROUGH THE OFFICE OF THE ATTORNEY GENERAL.

YOUR ATTENTION TO THIS MATTER IS APPRECIATED.

SINCERELY,

  
RICHARD WISSLER  
DEPUTY DIRECTOR

ENCLOSURE

000088

#1311  
AUG 28 1985



# Permit to Install Terms and Conditions

Application No. 14-762

APS Premise No. 1431110128

Permit Fee: \$200.00

Name of Facility: U.S. Dept. of Energy  
Feed Materials Production Center  
Person to Contact: Ms. Margaret Wilson

Address: P.O. Box E  
Oak Ridge, Tennessee 37831

Location of proposed source(s): 7400 Willey Road  
Plant #5, Casting Area  
Fernald, Ohio

Description of proposed source(s): Graphite Band Saw Controlled with a  
Dust Collector

Date of Issuance: July 10, 1985

Effective Date: July 10, 1985

The above named entity is hereby granted a permit to install for the above described source(s) pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the above described source(s) of environmental pollutants will operate in compliance with applicable State and Federal laws and regulations, and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans and specifications, the above described source(s) of pollutants will be granted the necessary permits to operate (air) or NPDES permits as applicable.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

Director

000089



Department of Energy

Oak Ridge Operations  
P. O. Box E  
Oak Ridge, Tennessee 37831

6201

July 29, 1985

Mr. R. M. Spenceley  
Manager  
NLO, Inc.  
Post Office Box 39158  
Cincinnati, Ohio 45239

Dear Mr. Spenceley:

REQUEST FOR PERMIT FEE AND PERMIT TO OPERATE (PTO) FOR PLANT 5 BAND SAW -  
FEED MATERIALS PRODUCTION CENTER (FMPC)

Reference is made to your letter to M. R. Theisen, dated December 12, 1984,  
subject "Applications for Ohio Permit to Install."

For your convenience, a copy of the referenced letter is enclosed. Also  
enclosed is a copy of the Permit to Install and a letter from the local  
agency requesting a PTO submittal.

Please send the requested \$200 permit fee to the DOE/ORO Environmental  
Protection Branch and route the PTO to me as normal.

If you have any questions, please contact Margaret Wilson of our Environ-  
mental Protection Branch at (FTS) 626-8528.

Sincerely,

*James A. Reafsnyder*  
James A. Reafsnyder  
Site Manager

SE-331:Wilson

Enclosures:

1. Ltr dtd 12/12/84
2. Ltr dtd 7/10/85, w/encl.
3. Ltr dtd 7/18/85, w/encl.

cc w/encls:

M. Wilson, SE-331.

cc w/o encls:

N. R. Leist, NLO  
D. E. Diehl, NLO  
R. B. Weidner, NLO

000090



# County of Hamilton

## SOUTHWESTERN OHIO AIR POLLUTION CONTROL AGENCY

### BOARD OF COMMISSIONERS

JOSEPH M. DeCOURCY  
NORMAN A. MURDOCK  
ROBERT A. TAFT II

### MAIN OFFICE

2400 Beekman Street  
Cincinnati, Ohio 45214  
Phone: (513) 251-8777

### LABORATORY

1675 Gest Street  
Cincinnati, Ohio 45204  
Phone: (513) 251-8863

MICHAEL J. MALONEY

Administrator

CHARLES E. SCHUMANN

Director

July 18, 1985

U.S. Dept. of Energy  
Feed Materials Production Center  
P. O. Box E  
Oak Ridge, Tennessee 37831

Attn: Margaret Wilson

Dear Sir:

On 7/10/85 Ohio EPA issued your final permit to install. At this time you are required to apply for a permit to operate the following air contaminant source(s):

Graphite Band Saw Controlled with a Dust Collector (PTI 14-762) located at 7400 Willey Road, Plant #5, Casting Area, Fernald, Ohio

Enclosed are the necessary forms required for such permit.

Please be advised that a fifteen (15.00) dollar application review fee is required according to section 3745.11 (G) of the Ohio Revised Code for each application submitted.

Send completed forms and check(s), made payable to "The Treasurer of the State of Ohio," to our main office.

Sincerely,

Charles E. Schumann,  
Director

000091

#2744

JUL 22 1985

OHIO ENVIRONMENTAL PROTECTION AGENCY  
APPLICATION FOR A PERMIT TO OPERATE  
AN AIR CONTAMINANT SOURCE

6201-4

FOR OHIO EPA USE ONLY

APS APPL NO \_\_\_\_\_  
DATE RECEIVED \_\_\_\_\_

Facility Name \_\_\_\_\_

Person to Contact \_\_\_\_\_

Facility Address \_\_\_\_\_

Mailing Address \_\_\_\_\_

City \_\_\_\_\_ County \_\_\_\_\_ Zip \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone \_\_\_\_\_ Area \_\_\_\_\_ Number \_\_\_\_\_

Telephone \_\_\_\_\_ Area \_\_\_\_\_ Number \_\_\_\_\_

(Application No., if this is a renewal application) \_\_\_\_\_ Standard Industrial Classification Code \_\_\_\_\_

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

- \_\_\_\_ Appendix A, Process
- \_\_\_\_ Appendix B, Fuel-Burning Equipment
- \_\_\_\_ Appendix C, Incinerator
- \_\_\_\_ Appendix D, Surface Coating or Printing Operation
- \_\_\_\_ Appendix E, Storage Tank
- \_\_\_\_ Appendix H, Gasoline Dispensing Facility
- \_\_\_\_ Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal
- \_\_\_\_ Appendix K, Surface Coating Line or Printing Line

- \_\_\_\_ Appendix L, Solvent Metal Cleaning
- \_\_\_\_ Appendix M, Fugitive Dust Emission Sources
- \_\_\_\_ (Specify Appendix No.)
- \_\_\_\_ Appendix N, Rubber Tire Manufacturing
- \_\_\_\_ Appendix O, Dry Cleaning Facility
- \_\_\_\_ Appendix P, Synthesized Pharmaceutical Manufacturing
- \_\_\_\_ Other Appendix \_\_\_\_\_
- \_\_\_\_ Compliance Time Schedule \_\_\_\_\_

2. Description of Source (same as used on appendix): \_\_\_\_\_

3. Your identification for Source (same as used on appendix): \_\_\_\_\_

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

Authorized Signature\* \_\_\_\_\_

Title \_\_\_\_\_

Date \_\_\_\_\_

\*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited pursuant to 3704.03 Ohio Revised Code.

Instructions for Completion of a Permit to Operate or Variance Application

These instructions concern the completion of application materials for a Permit to Operate or a Variance for air contaminant sources. An application cannot be considered unless the application form is completed and signed and any required supplemental information is submitted. Pursuant to Section 3745.11(G) of the Ohio Revised Code (ORC), any person applying for a permit to operate, permit to install, or variance must pay a non-refundable application fee \$15.00. This fee must be submitted at the time of application. Make checks payable to the Treasurer of the State of Ohio. Unless otherwise provided for by rule, a separate application must be filed for each air contaminant source. Therefore, only one (1) appendix may accompany this form. Applicants are advised that they will be required to pay a fee upon approval of their application for a Permit to Operate or Variance as provided for in Section 3745.11(B) of the ORC.

An appendix is a technical information form to be completed by the applicant. From the following description of the appendices, determine which should accompany your application.

- Appendix A - Process: for sources not included in the other appendices.
- Appendix B - Fuel-Burning Equipment: for any furnace, boiler, apparatus, and all appurtenances thereto, used in the process of burning fuel with the primary purpose of producing heat or power by indirect heat transfer.
- Appendix C - Incinerator: for any equipment, machine, device, article, contrivance, structure or part of a structure used to burn refuse or to process refuse material by burning other than by open burning.
- Appendix D - Surface Coating or Printing Operation: for a surface coating operation not included under Appendix K or for a printing operation.
- Appendix E - Storage Tank: a storage tank for petroleum liquids.
- Appendix H - Gasoline Dispensing Facility: any site where gasoline is dispensed to motor vehicle gasoline tanks from stationary storage tanks.
- Appendix J - Loading Rack at a Bulk Gasoline Plant or Terminal: an operation for transferring gasoline to a delivery vessel.
- Appendix K - Surface Coating Line: a coating line consists of one or more coating applicators, flash-off areas or ovens to be used for the following: an automobile or light-duty truck assembly plant; can manufacturing; coil-coating; fabric coating; large appliance coating; magnet wire coating; metal furniture coating; paper coating; vinyl coating.
- Appendix L - Solvent Metal Cleaning: an operation employing solvent for cleaning metal surfaces; wipe-cleaning is excluded.

General:

- M1-1 - Plant Roadways and Parking Areas
- M1-2 - Aggregate Storage Piles
- M1-3 - Material Handling
- M1-4 - Mineral Extraction
- M13 - Cement Manufacturing and Blending Plants
- M14 - Ferroalloy Production
- M15 - Metal Salvage Operations
- M16 - Pulp and Paper Mills
- M17 - Woodworking Operations
- M18 - Aggregate Processing Plants
- M19 - Coal Processing Plants
- M20 - Brick and Related Clay Product Manufacturing Plants
- M21 - Asphaltic Concrete Plants
- M22 - Concrete Batching Plants
- M23 - Sandblasting Operations
- M24 - Petroleum Refineries
- M25 - Agricultural Chemical Manufacturing Plants
- M26 - Bulk Gasoline Terminals and Plants
- M27 - Carbon Black Plants
- M28 - Municipal Incineration
- M30 - Salt Processing Operations

Iron and Steel Mills:

- M2-1 - Coke Manufacturing
- M2-2 - Iron Production
- M2-3 - Steel Manufacture
- M3 - Lime Plants
- M4 - Power Plants
- M5 - Grain Terminals
- M6 - Country Grain Elevators
- M7 - Gray Iron Foundries
- M8 - Steel Foundries
- M9 - Glass Manufacturing Plants
- M10 - Fiberglass Manufacturing
- M11 - Secondary Aluminum Processing Plants
- M12 - Fertilizer Mixing/Blending Plants

**OhioEPA**

6201

Re: Permit to Install  
Hamilton County  
Application No. 14-762

July 10, 1985

U.S. Dept. of Energy  
Feed Materials Production Center  
P.O. Box E  
Oak Ridge, Tennessee 37831

Attention: Ms. Margaret Wilson

CERTIFIED MAIL

488665

Dear Sir:

Enclosed please find an Ohio EPA Permit to Install which will allow you to install the described source(s) in a manner indicated in the permit. Because this permit contains several conditions and restrictions I urge you to read it carefully.

You are hereby notified that this action by the Director is final and may be appealed to the Environmental Board of Review pursuant to Chapter 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Board of Review within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency and the Environmental Law Division of the Office of the Attorney General within three (3) days of filing with the Board. An appeal may be filed with the Environmental Board of Review at the following address:

Environmental Board of Review  
250 East Town Street, Room 101  
Columbus, Ohio 43215

Very truly yours,

*Patricia P. Walling*

Patricia P. Walling, Manager  
Authorization & Compliance Section  
Division of Air Pollution Control

cc: US EPA  
Southwestern Ohio Air Pollution Control Agency

\* 2631  
7-15-85

**Ohio EPA**

Re: Permit to Install  
Hamilton County  
Application No. 14-762

May 15, 1985

U.S. Dept. of Energy  
Feed Materials Production Center  
P.O. Box E  
Oak Ridge, Tennessee 37831

Attention: Ms. Margaret Wilson

Dear Sir:

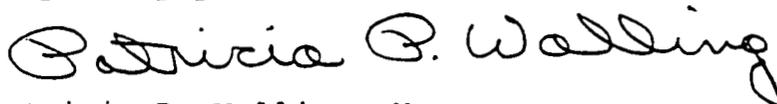
You are hereby notified that the Ohio Environmental Protection Agency has made a preliminary determination recommending that the Director issue a Permit to Install for the source(s) shown on the enclosed draft permit. This preliminary determination is not an authorization to begin construction or modification of your source(s). The purpose of this draft is to solicit public comments on the proposed installation. A public notice concerning the draft permit will appear in the Ohio EPA Weekly Review and the newspaper in the county where the source(s) will be located. Public comments will be accepted by the field office within 30 days of the date of publication in the newspaper.

A permit to install may be issued in proposed or final form based on the preliminary determination, any written public comments received within 30 days of the public notice, or record of a public meeting if one is held. You will be notified in writing of a scheduled public meeting.

When the final permit to install is issued a fee of \$200.00 will be due. Please do not submit any payment now.

If you have any questions about this draft permit, please contact the field office where you submitted your application.

Very truly yours,



Patricia P. Walling, Manager  
Authorization & Compliance Section  
Division of Air Pollution Control

PPW/gs

cc: US EPA  
Southwestern Ohio Air Pollution Control Agency  
Ohio-Kentucky-Indiana Regional  
Indiana Air Pollution Control Division  
Kentucky Division of Air Pollution Control

1854

MAY 20 1985

## Permit to Install Terms and Conditions

Application No. 14-762

APS Premise No. 1431110128

Permit Fee: \_\_\_\_\_

Name of Facility: U.S. Dept. of Energy  
Feed Materials Production Center  
Person to Contact: Ms. Margaret Wilson

Address: P.O. Box E  
Oak Ridge, Tennessee 37831

Location of proposed source(s): 7400 Willey Road  
Plant #5, Casting Area  
Fernald, Ohio

Description of proposed source(s): Graphite Band Saw Controlled with a  
Dust Collector

Date of Issuance:

Effective Date:

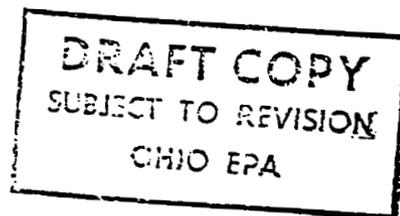
The above named entity is hereby granted a permit to install for the above described source(s) pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the above described source(s) of environmental pollutants will operate in compliance with applicable State and Federal laws and regulations, and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans and specifications, the above described source(s) of pollutants will be granted the necessary permits to operate (air) or NPDES permits as applicable.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

Director

000096



Substantial construction for installation must take place within eighteen months of the effective date of this permit. This deadline may be extended by up to twelve months, if application is made to the Director no less than sixty days before the expiration of this permit and the party shows good cause for any such extension.

The Director of the Ohio Environmental Protection Agency, or his authorized representatives, may enter upon the premises of the above-named applicant during construction and operation at any reasonable time for the purpose of making inspections, conducting tests, examining records or reports pertaining to the construction, modification or installation of the above described source of environmental pollutants.

The proposed source shall be constructed in strict accordance with the plans and application submitted for this permit to the Director of the Ohio Environmental Protection Agency. There may be no deviation from the approved plans without the express, written approval of the Agency. Any deviations from the approved plans or the above conditions may lead to such sanctions and penalties as provided under Ohio law. Approval of these plans does not constitute an assurance that the proposed facilities will operate in compliance with all Ohio laws and regulations. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed sources are inadequate or cannot meet applicable standards.

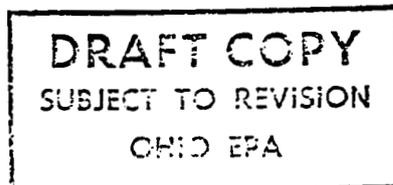
The specified permit fee must be remitted within 15 days of the effective date of this permit to install.

This permit shall apply only to the source(s) shown on the application approved by the Ohio Environmental Protection Agency.

The proposed graphite band saw will utilize Best Available Technology with the usage of a high efficiency dust collector (greater than 99.0% efficiency) to control particulate emissions.

The following rules of the Ohio Administrative Code establishes the applicable emission limitations and/or control requirements for this source:

<u>Source</u>	<u>Regulations</u> (OAC 3745-)
Graphite Band Saw	17-07, 17-11, 15-06, 15-07



The Graphite Band Saw and all other sources located at the U.S. D.O.E. Feed Materials Production Center which emit or have the potential to emit radio-nuclides to the ambient air shall comply with the requirements specified in 40 CFR Part 61 subpart H effective February 6, 1985.

**DRAFT COPY**  
SUBJECT TO REVISION  
CHIC EPA



**Department of Energy**

Oak Ridge Operations

P. O. Box E

Oak Ridge, Tennessee 37831

January 11, 1985

Mr. James E. Sadelfeld  
Southwestern Ohio Air Pollution  
Control Agency  
2400 Beekman Street  
Cincinnati, Ohio 45214

Dear Mr. Sadelfeld:

PERMIT TO INSTALL APPLICATIONS - FEED MATERIALS PRODUCTION CENTER (FMPC)  
SOURCES: PLANTS 5 AND 9

Enclosed are the completed Ohio EPA Permit to Install (PTI) Applications for the Plant 5 Platen Grinder and Graphite Band Saw and the Plant 9 Ingot O.D. Lathe. Also, enclosed are three (3) checks in the amount of \$15.00 each to cover the Ohio EPA permit application fees.

If you have any questions or require additional information, please contact Margaret Wilson of our Environmental Protection Branch at (615) 576-8528.

Sincerely,

*M. R. Theisen*

M. R. Theisen, Director  
Weapons Division

SE-331:Wilson

Enclosures:

1. Three PTI Applications
2. Check No. 46477
3. Check No. 46479
4. Check No. 46482

cc w/o encls:

S. M. Hines, SOAPCA

Don Diehl, NLO

D. J. Carr, NLO

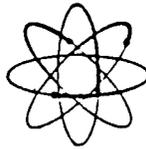
→ M. Wilson, SE-331

000089

# NLO, Inc.

6201 - EP

A SUBSIDIARY OF NL INDUSTRIES, INC.



P. O. BOX 39158

CINCINNATI, OHIO 45239

PHONE: AREA CODE: 513-738-6200

DEC 14 1984

Mr. M. R. Theisen, Director  
Weapons Division  
Department of Energy  
Oak Ridge Operations  
P. O. Box E  
Oak Ridge, TN 37831

Dear Mr. Theisen:

## APPLICATIONS FOR OHIO PERMIT TO INSTALL

- References:
- <sup>1</sup>NLO CP 83-28
  - <sup>2</sup>NLO CP 84-09
  - <sup>3</sup>NLO CP 83-36
  - <sup>4</sup>Ohio Administrative Code 3745-35-02

Enclosed are the completed Ohio EPA Permit to Install applications for the Plant 5 Platen Grinder and Graphite Band Saw and the Plant 9 Ingot O.D. Lathe. Also enclosed are three (3) checks (Nos. 46477, 46479 and 46482) in the amount of \$15 each to cover the Ohio EPA permit application fees.

Please note the applications require the signature of an authorized ORO representative before submission to the Southwestern Ohio Air Pollution Control Agency, 2400 Beekman Street, Cincinnati, Ohio 45214.

Sincerely yours,

R. M. Spenceley  
Manager

DJC/lar

- Enc. 1) Applications  
2) Check Nos. 46477, 46479 and 46482

- cc: M. W. Boback - w/enc.1  
B. J. Davis - M. Wilson - w/enc.1  
D. E. Diehl - D. J. Carr - w/enc.1  
N. R. Leist - w/enc.1  
M. R. Theisen  
R. C. Worsley - w/enc.1

*(Checks with the original only; this is a copy.)*

*0415.5*

000160

6205  
#3778  
DEC 14 1984

For Office Use Only  
Check Appropriate Box(es)

- Air Discharge
- Water Discharge to New Source Treatment Works
- Solid Waste Disposal Facility
- Hazardous Waste Disposal Facility

For Office Use Only 1.

PTI Application No. \_\_\_\_\_

Date Received \_\_\_\_\_

Premise No. \_\_\_\_\_

OHIO ENVIRONMENTAL PROTECTION AGENCY  
Application for Permit to Install

U. S. Department of Energy  
Applicant's Name

P. O. Box E  
Mailing Address

Oak Ridge	TN	37831	
City	County	State	Zip Code Telephone Number

Ms. Margaret Wilson, Engineer, Safety & Environmental Control Div. 615/576-0845  
Person to contact (Name and Title and Telephone Number)

The facility will be located within the production area of the  
Location of Proposed Facility (State the location as completely and precisely as possible)\*

DOE Feed Materials Production Center @ 7400 Willey Road		
Fernald	Hamilton	45030
City or Township	County	Zip Code

Directions: A Permit to Install is required for new or modified sources of pollution under the provisions of OAC Rule 3745-31. An application cannot be considered complete unless all applicable questions are answered and the required information has been submitted. This application must be signed in accordance with OAC Rule 3745-31-04(B) or it cannot be accepted.

Applicants for permits involving air emissions or wastewater treatment facilities will be required to pay a permit to install fee as shown in Section 3745.11(B) and (C) of the Ohio Revised Code. This fee is payable fifteen days after the date of final issuance of the permit.

Name of new or modified source or facility: Graphite Band Saw ; PLANT 5

Product of new or modified source/facility: Machine Graphite Molds

Will the proposed source/facility involve any of the following: Check all that apply.

- A.  Air Discharge
- B.  Wastewater Treatment Works
- C.  Solid Waste Disposal Facility
- D.  Hazardous Waste Disposal Facility

000161

\*Example: "The source will be constructed on a 20 Acre plot to be located on Franklin Township Road No. 17, approximately 1 1/4 miles north of the intersection of State Route 89 and Franklin Township Road No. 17 "

6201-4

The following information must be submitted on a separate piece of paper and attached to this application.

FOR ALL PERMITS TO INSTALL

1. Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.
2. List the name and quantity of all materials and chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.
3. State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shutdown for \_\_\_\_\_ years? (State number of years)
4. Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.
5. Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U.S. EPA?

FOR AIR POLLUTION SOURCES

6. State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.
7. Are the proposed sources required to comply with the following federal requirements?
  - i. New Source Performance Standards (NSPS)
  - ii. National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - iii. Prevention of Significant Deterioration (PSD)
  - iv. Appendix "S" - Emission Offset Policy
8. Will the proposed sources employ best available technology?
9. Will the proposed sources cause the significant degradation of air quality?
10. Will the proposed sources interfere with the attainment and maintenance of the ambient air quality standards?
11. Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.
12. Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?
13. Complete and attach an anticipated construction schedule for each proposed source. (See attached).
14. Please include the estimated cost of any air pollution control equipment to be installed on the proposed sources.
15. An appendix for each air contaminant source must accompany this application. From the following description of the appendices, determine which should accompany your application.

000162

FOR ALL PERMITS TO INSTALL

1. The Feed Materials Production Center (FMPC) is a contract operated federally owned facility for the production of uranium metal for the United States Department of Energy (DOE). NLO, Inc. (under prime contract with the DOE) operates the FMPC. Modifications are planned for the FMPC Metals Production Plant (Plant 5) to meet future production delivery schedules. A new graphite band saw is proposed for the casting area of Plant 5. The band saw will be used to saw cut block graphite to dimensions suitable for machining into graphite casting molds. The new band saw will operate strictly on a batch-type basis. The new band saw will be ventilated by an existing Day Company, Inc. Plant 5 dust collector (G5-262). Potential emissions from the systems are limited to a small quantity of graphite particulates. Emissions are anticipated to be minimal due to the usage of a 30 to 1 water-to-oil recirculated quench during cutting operation.
2. The proposed band saw will saw cut block graphite into dimensions suitable for further machining into casting molds. The machine will be utilized on an as-needed basis.
3. This project involves the installation of a new graphite band saw which will be ventilated to an existing dust collector.
4. No previous Ohio EPA application or plan submission has been filed for the proposed graphite band saw.
5. The proposed band saw will comply with all rules, regulations and laws of the Ohio EPA and U.S. EPA.
6. The maximum estimated particulate emissions attributable to the graphite band saw are approximately 80 pounds per hour for short time spans (<10 minutes) during peak operations. The estimated annual emission of particulates from the band saw are approximately 700 pounds per year (0.35 tons per year) based upon average operating conditions.

The existing Plant 5 dust collector (G5-262) displays an estimated operating efficiency of approximately 99 percent. Based upon this collector removal efficiency, the exhaust stack (EP5-17) is expected to emit less than 10 pounds per year of particulates (at average conditions) which are attributable to the new band saw.

7. The proposed source is not affected by these federal requirements.
8. The proposed graphite band saw will utilize best available technology with the usage of a high efficiency dust collector to control particulate emissions.
9. The proposed source will not cause significant degradation of air quality.

PERMIT TO INSTALL  
Graphite Band Saw

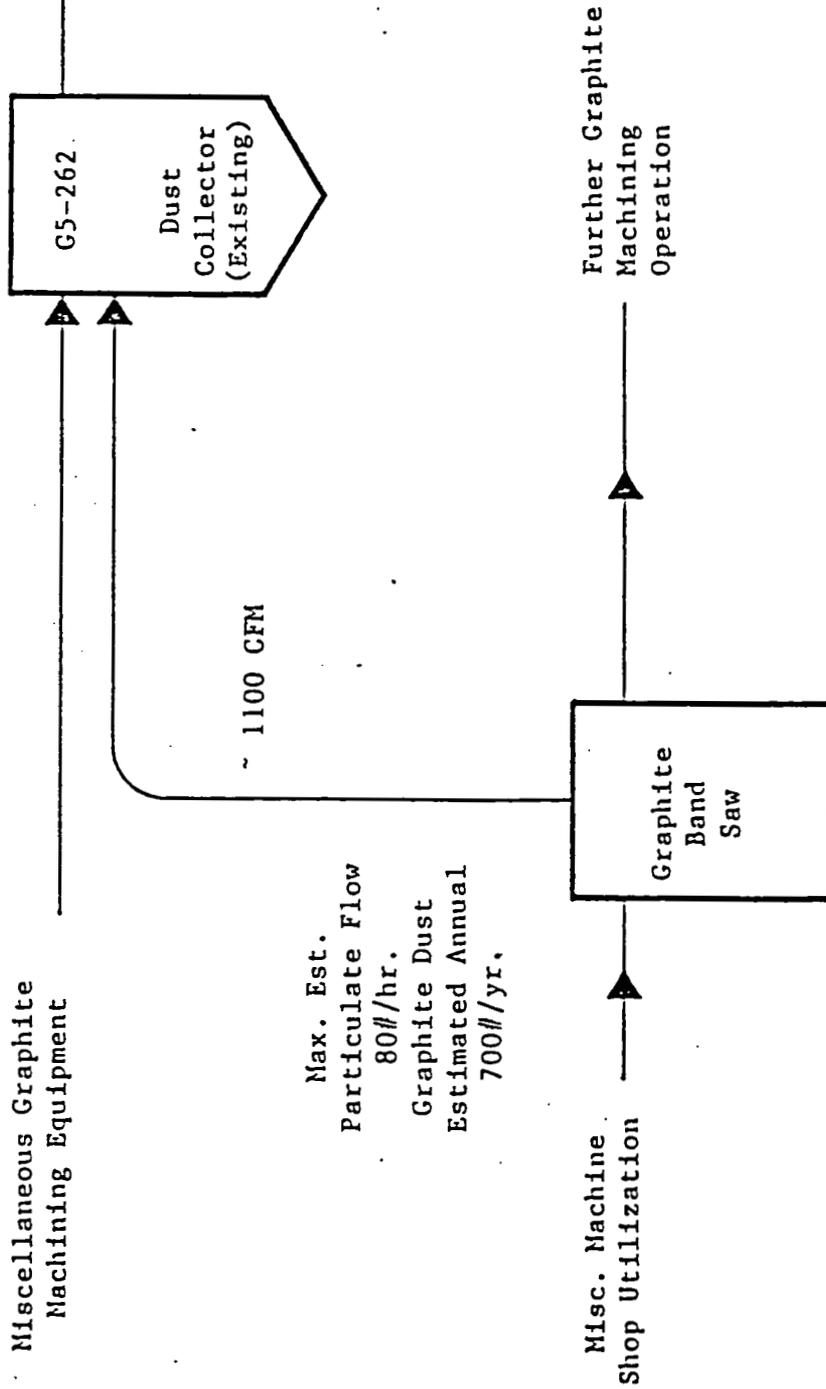
6201.4

FOR ALL PERMITS TO INSTALL (cont'd)

10. The proposed graphite band saw will not interfere with the attainment or maintenance of the ambient air quality standards.
11. No monitoring equipment will be installed.
12. No.
13. See attached.
14. Not applicable.

000164

EP5-17



PLANT 5 - GRAPHITE BAND SAW

Premise No.         
 Source No.         
 Application No.       

APPENDIX A, PROCESS

PROCESS DATA

**6201**

1. Name of process Graphite Machining
2. End product of this process Machined Graphite Molds and Accessories
3. Primary process equipment Graphite Band Molds  
 Your identification Graphite Band Saw #2 Year Installed 1985
4. Manufacturer Tannewitz Make or model GVTNE
5. Capacity of equipment (lbs./hr): Rated N/A Max. N/A
6. Method of exhaust ventilation:  Stack  Window fan  Roof vent  
 Other, describe \_\_\_\_\_  
 Are there multiple exhausts?  Yes  No

OPERATING DATA

7. Normal operating schedule: 24 hrs./day, 5 days/wk., 50 wks./year.
8. Percent annual production (finished units) by season:  
 Winter 25 Spring 25 Summer 25 Fall 25
9. Hourly production rates (lbs.): Average N/A Maximum N/A
10. Annual production (indicate units) N/A  
 Projected percent annual increase in production N/A
11. Type of operation:  Continuous  Batch
12. If batch, indicate Minutes per cycle N/A Minutes between cycles N/A
13. Materials used in process:

List of Raw Materials	Principal Use	Amount (lbs./hr.)
Block Graphite	Casting Mold & Accessories	N/A

14. A PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit points of all raw materials, intermediate products, by-products and finished products, Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment.

CONTROL EQUIPMENT

Control Equipment Code:

- |                                |                          |                             |
|--------------------------------|--------------------------|-----------------------------|
| (A) Settling chamber           | (G) Cyclonic scrubber    | (M) Adsorber                |
| (B) Cyclone                    | (H) Impingement scrubber | (N) Condenser               |
| (C) Multiple cyclone           | (I) Orifice scrubber     | (O) Afterburner - catalytic |
| (D) Electrostatic precipitator | (J) Venturi scrubber     | (P) Afterburner - thermal   |
| (E) Fabric filter              | (K) Plate or tray tower  | (Q) Other, describe _____   |
| (F) Spray chamber              | (L) Packed tower         |                             |

15. Control Equipment data:

Item	Primary Collector	Secondary Collector
(a) Type (See above code)	E	
(b) Manufacturer	Dav Company	
(c) Model No.	84AC12N	
(d) Year installed	1952	
(e) Your identification	G5-262 (EP5-17)	
(f) Pollutant Controlled	Graphite Particulates	
(g) Controlled pollutant emission rate (if known)	Graphite - NK	
(h) Pressure drop	1" - 4"	
(i) Design efficiency	NK	
(j) Operating efficiency	>99%	

STACK DATA

5. Your stack identification EP5-17
17. Are other sources vented to this stack?  Yes  No  
If yes, identify sources Miscellaneous Graphite Maching Equipment
18. Type:  Round, top inside diameter dimension 23"  
 Rectangular, top inside dimensions (L) \_\_\_\_\_ x (W) \_\_\_\_\_
19. Height: Above roof 17 ft., above ground 57 ft.
20. Exit gas: Temp. 100 °F, Volume NK ACFM, Velocity NK ft./min.
21. Continuous monitoring equipment:  Yes  No  
If yes, indicate: Type \_\_\_\_\_, Manufacturer \_\_\_\_\_  
Make or Model \_\_\_\_\_, Pollutant(s) monitored \_\_\_\_\_
22. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
If yes, check method:  Stack Test  Emission factor  Material balance

Completed by D. J. Carr, Date 11/21/84

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Under OAC 3745-31-04, These signatures shall constitute personal affirmation that all statements or assertions of fact made in the application are true and complete, comply fully with applicable state requirements, and shall subject the signatory to liability under applicable state laws forbidding false or misleading statements.

MR Theisen 01-14-85  
 Authorized Signature (for facility) Date  
 M. R. Theisen  
 Director, Weapons Division  
 Title  
 U.S. Department of Energy  
 P. O. Box E  
 Oak Ridge, TN 37831  
 Address

For Wastewater Treatment Plants:

Signature of General Contractor or Agent Date  
 Performing installation, if selected.

Company  
 Address

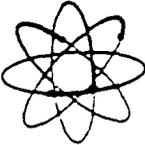
NLO, INC., CINCINNATI, OHIO 45239

THE ACCOMPANYING CHECK IS IN SETTLEMENT OF THE ITEMS STATED BELOW IF NOT CORRECT RETURN AT ONCE

INVOICE DATE	REFERENCE	AMOUNT OF INVOICE	DEDUCTIONS	AMOUNT
11/26/84	PERMIT APPLICAT FEE FOR GRAPHITE BAND SAW - CF 83-28	\$15.00	\$0.00	\$15.00

PLEASE TEAR THIS MEMORANDUM OFF BEFORE DEPOSITING CHECK

NLO-AC-1091 (REV 5-1-84)



NLO, Inc.  
CINCINNATI, OHIO 45239

CHECK NUMBER 46482

PAYABLE THROUGH  
THE FIRST NATIONAL BANK  
OF CINCINNATI  
MILFORD OFFICE  
CINCINNATI, OHIO 45202

DECEMBER 5, 1984

PAY EXACTLY **15.00**

\$15.00

PAY TO THE ORDER OF

VOID 90 DAYS FROM DATE

THE TREASURER OF THE STATE OF OHIO

NLO, INC  
GENERAL ACCOUNT

*George K. Porter*  
*D. F. Gutzwiller*

⑈046482⑈ ⑈042201948⑈

⑈950 1263⑈

000169

ENCLOSURE 9  
W. MOLD RECONDITIONING BOOTH  
PLANT 5  
FMPC #5-080

EMISSIONS ESTIMATE FOR PLANT 5 W-MOLD RECONDITIONING BOOTH, FMPC #5-080

ASSUMPTIONS:

- (1) Cyclone separator, cartridge filter, and HEPA filter collection efficiency -- 99.999% efficient.\*
- (2) Dust loading -- Based on an estimated maximum loss of 2 pounds of material per mold during reconditioning, total particulate emissions to the intake of G5A-100 will be 35,000 pounds per year.
- (3) Assumed uranium content is 10 weight percent.
- (4) Uranium emissions:

$$3.5 \times 10^4 \frac{\text{lbs}}{\text{yr}} \times 1 \times 10^{-5} \text{ filter penetration factor} \times 1 \times 10^{-1} \\ \text{fraction of uranium} = 0.035 \frac{\text{lbs}}{\text{yr}} \text{ of uranium}$$

\* PTI submitted in 1985 does not indicate the additional control equipment to be installed, i.e., new cyclone separator, cartridge filter, and HEPA filter.

Plant 5 - W. Mold Reconditioning Booth, FMPC #5-080

Estimated uranium emissions from FMPC #5-080 (see calculations) are 0.035 pounds (16 g) per year or  $1.1 \times 10^{-5}$  Ci/yr of uranium plus associated fission products, radium, thorium, neptunium, and plutonium. Quantity of non-uranium radionuclides may be calculated from 1986 Plant 5 source term by multiplying the total quantity of a given radionuclide emitted by Plant 5 by the ratio of uranium emitted by FMPC #5-080 to total 1986 Plant 5 uranium emissions, i.e.

$$\text{Ra-226} = \frac{1.6 \times 10^1 \text{ g}}{4.991 \times 10^3 \text{ g}} \times 7 \times 10^{-6} \text{ Ci} = 2.2 \times 10^{-8} \text{ Ci}$$

Effective committed dose equivalent --  $5.9 \times 10^{-4}$  mrem  
 Lung committed dose equivalent --  $3.6 \times 10^{-3}$  mrem  
 Endosteal committed dose equivalent --  $3.5 \times 10^{-3}$  mrem

Check Appropriate Box(es)

Air Discharge

Water Discharge to New Source Treatment Works

Solid Waste Disposal Facility

Hazardous Waste Disposal Facility

PTI Application No. \_\_\_\_\_

Date Received \_\_\_\_\_

Premise No. \_\_\_\_\_

OHIO ENVIRONMENTAL PROTECTION AGENCY  
Application for Permit to Install

U. S. Department of Energy, Feed Materials Production Center  
Applicant's Name

Post Office Box E  
Mailing Address

Oak Ridge TN 37831 (615) 576-0845  
City County State Zip Code Telephone Number

Margaret Wilson, Env. Engineer, Environmental Protection Division  
Person to contact (Name and Title and Telephone Number)

The facility will be located within the production area of the Feed Materials Prod. Center  
Location of Proposed Facility (State the location as completely and precisely as possible)\*

Feed Materials Production Center, 7400 Willey Road

Fernald Hamilton 45030  
City or Township County Zip Code

Standard Industrial Classification Code

Directions: A Permit to Install is required for new or modified source of pollution under the provisions of OAC Rule 3745-31. An application cannot be considered complete unless all applicable questions are answered and the required information has been submitted. This application must be signed in accordance with OAC Rule 3745-31-04(B) or it cannot be accepted.

Applicants for permits involving air emissions or wastewater treatment facilities will be required to pay a permit to install fee as shown in Section 3745.11(B) and (C) of the Ohio Revised Code. This fee is payable fifteen days after the date of final issuance of the permit.

Name of new or modified source or facility: Plant 5 - Mold Reconditioning Booth (5-080)

Product of new or modified source/facility: Cleaned Graphite Molds

Will the proposed source/facility involve any of the following: Check all that apply.

- A.  Air Discharge
- B.  Wastewater Treatment Works
- C.  Solid Waste Disposal Facility
- D.  Hazardous Waste Disposal Facility

\*Example: "The source will be constructed on a 20 Acre plot to be located on Franklin Township Road No. 17, approximately 1 1/2 miles north of the intersection of State Route 99 and Franklin Township Road No. 17."

6201-4

Under OAC 3745-31-04, These signatures shall constitute personal affirmation that all statements or assertions of fact made in the application are true and complete, comply fully with applicable state requirements, and shall subject the signatory to liability under applicable state laws forbidding false or misleading statements.

*James A. Reafsnyder*

12/13/81  
Date

Authorized Signature (for facility)  
James A. Reafsnyder  
Site Manager

Title  
U.S. Department of Energy  
P. O. Box 39158  
Cincinnati, OH 45239  
Address

For Wastewater  
Treatment Plants:

Signature of General Contractor or Agent  
Performing installation, if selected. Date

Company

Address

APPENDIX A, PROCESS

PROCESS DATA

Premise No.         
 Source No.         
 Application No.       

- Name of process Mold Reconditioning Station - Plant 5
- End product of this process Cleaned Graphite Molds
- Primary process equipment Mold Reconditioning Station
- Your identification 5-080 Year Installed 1986
- Manufacturer Custom Fabricated Make or model N/A
- Capacity of equipment (lbs./hr): Rated 167 (50 molds/day) Max. 167 (50 molds/day)
- Method of exhaust ventilation:  Stack  Window fan  Roof vent  
 Other, describe \_\_\_\_\_
- Are there multiple exhausts?  Yes  No

OPERATING DATA

- Normal operating schedule: 24 hrs./day, 7 days/wk., 50 wks./year.
- Percent annual production (finished units) by season:  
 Winter 25 Spring 25 Summer 25 Fall 25
- Hourly production rates (lbs.): Average 167 (50 molds/day) Maximum 167 (50 molds/day)
- Annual production (indicate units) 17500 molds (700 tons)  
 projected percent annual increase in production \_\_\_\_\_
- Type of operation:  Continuous  Batch
- If batch, indicate Minutes per cycle 25 Minutes between cycles 5
- Materials used in process:

List of Raw Materials	Principal Use	Amount (lbs./hr.)
Graphite Mold	Casting Operations	167 lbs/hr
Terrapaint	(Mold Coating)	8.4 lbs/hr

4. A PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit points of all raw materials, intermediate products, by-products and finished products, Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment.

CONTROL EQUIPMENT

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Control Equipment Code:

- |                                |                          |                           |
|--------------------------------|--------------------------|---------------------------|
| (A) Settling chamber           | (G) Cyclonic scrubber    | (M) Adsorber              |
| (B) Cyclone                    | (H) Impingement scrubber | (N) Condenser             |
| (C) Multiple cyclone           | (I) Orifice scrubber     | (O) Afterburner - catalyt |
| (D) Electrostatic precipitator | (J) Venturi scrubber     | (P) Afterburner - thermal |
| (E) Fabric filter              | (K) Plate or tray tower  | (Q) Other, describe _____ |
| (F) Spray chamber              | (L) Packed tower         |                           |

15. Control Equipment data:

Item	Primary Collector	Secondary Collector
(a) Type (See above code)	E	
(b) Manufacturer	W. W. Sly Mfg.	
(c) Model No.	112	
(d) Year installed	1960	
(e) Your identification	G5A-100	
(f) Pollutant Controlled	Particulates	
(g) Controlled pollutant emission rate (if known)	Particulates - Not known	
(h) Pressure drop	1" - 4"	
(i) Design efficiency	Not known	
(j) Operating efficiency	>99%	

STACK DATA

16. Your stack identification EP5-15
17. Are other sources vented to this stack?  Yes  No  
 If yes, identify sources 5-054 - 5-056; Proposed Grit Blasting; Proposed Separation Booth
18. Type:  Round, top inside diameter dimension 30"  
 Rectangular, top inside dimensions (L) \_\_\_\_\_ x (W) \_\_\_\_\_
19. Height: Above roof 13 ft., above ground 57 ft.
20. Exit gas: Temp. 80 °F, Volume 12890 ACFM, Velocity 2630 ft./min.
21. Continuous monitoring equipment:  Yes  No  
 If yes, indicate: Type Continuous Sampler, Manufacturer NLO Developed  
 Make or Model N/A, Pollutant(s) monitored Particulates
22. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
 If yes, check method:  Stack Test  Emission factor  Material balance

Completed by D. J. Carr, Date 11/7/85

Form No. \_\_\_/\_\_\_/\_\_\_  
Source No. \_\_\_/\_\_\_  
Application No. \_\_\_/\_\_\_

APPENDIX D  
\*

SURFACE COATING OR PRINTING OPERATION

1. This appendix is submitted for a:

Surface coating operation (check one below):

- Paint spray booth
- Dip tank
- Spray Coating (Other than paint spray booth)
- Other surface coating operation, describe \_\_\_\_\_
- Flow coating
- Roller coating

Printing or lithographic operation.

Name of operation Mold Reconditioning - Mold Coating; Your identification \_\_\_\_\_  
Year Installed 1986

Is this operation succeeded by a heated drying or baking operation?  Yes  No  
If yes, indicate operating temperature of oven \_\_\_\_\_ °F.

Normal operating schedule: 24 hours/day, 7 days/wk., 50 wks./year.

PAINT SPRAY BOOTH

Type of spray booth:  Enclosed  Conveyor  Downdraft  
 Other, describe \_\_\_\_\_

Booth manufacturer \_\_\_\_\_ Make or Model No. \_\_\_\_\_

Type of spraying:  Air gun  Airless  Electrostatic  
 Other, describe \_\_\_\_\_

Spraying operation is:  Manual  Automatic

Fan manufacturer \_\_\_\_\_ Make or Model No. \_\_\_\_\_

Booth's exhaust is equipped with:  Water wash (Complete item 11)  
 Exhaust filters (Complete item 12)  
 Baffles  
 Other, describe \_\_\_\_\_  
 None

Water wash: (a) Is water recirculated?  Yes  No  
(b) Is a chemical added to the water?  Yes  No  
(c) Is material reclaimed from wash water.  Yes  No  
(d) Describe method for disposal of waste materials: \_\_\_\_\_

Does not include metal plating

(a) Type of material:  Fiberglass  Aluminum **6201 - 1**  
 Other, describe \_\_\_\_\_

(b) Filter size (inches): Length \_\_\_\_\_ Width \_\_\_\_\_ Thickness \_\_\_\_\_  
 No. of filters: \_\_\_\_\_ No. of filter changes: \_\_\_\_\_ times per year

Describe material painted \_\_\_\_\_

ALL OPERATIONS (Except paint spray booth)

Describe type of operation coating of interior surfaces of graphite casting molds

Describe method of coating or printing Custom Fabricated Spray Coating Booth

Identify and describe type(s) of material coated or printed Graphite Casting Molds -  
 Approximately 80 lbs. in weight before coating

ALL OPERATIONS

Complete the following information for each general type of surface coating or printing material. Report on the material as it is employed after the addition of any pigments, solvents, etc. If there are more than three types of materials, furnish the same data for the additional materials on a separate sheet or another appendix form.

1) Material employed Terrapaint Density 16 lbs./gallon  
 Solids content N/A % by volume or N/A % by weight  
 Solvent content N/A % by volume; Solvent density N/A lbs./gallon  
 Normal application schedule 24 hrs./day, 5 days/wk., 50 wks./year.  
 Quantity used (gallons/hour): Normal 1 Maximum 1.5  
 (gallons/year): 5000

Complete the solvent composition by identifying each solvent component and its respective % by volume of the total solvent. (The % by volume should total to 100%).

Solvent Composition		
Solvent	% by Volume	*

Solvent Composition		
Solvent	% by Volume	*

\* If solvent is photochemically reactive enter "Y", if not photochemically reactive enter "N", if unknown enter "U".

Is the material photochemically reactive?  Yes  No  Do not know

000118

(b) Material employed N/A Density \_\_\_\_\_ lbs./gallon  
 Solids content \_\_\_\_\_ % by volume or \_\_\_\_\_ % by weight  
 Solvent content \_\_\_\_\_ % by volume Solvent density \_\_\_\_\_ lbs./gallon  
 Normal application schedule: \_\_\_\_\_ hrs./day, \_\_\_\_\_ days/wk., \_\_\_\_\_ wks./year.  
 Quantity used (gallons/hour): Normal \_\_\_\_\_ Maximum \_\_\_\_\_  
 (gallons/year): \_\_\_\_\_

Complete the solvent composition by identifying each solvent component and its respective % by volume of the total solvent. (The % by volume should total to 100%).

Solvent Composition		
Solvent	% by Volume	*

Solvent Composition		
Solvent	% by Volume	*

\* If solvent is photochemically reactive enter "Y", if not photochemically reactive enter "N", if unknown enter "U".

Is the material photochemically reactive?  Yes  No  Do not know

(c) Material employed N/A Density \_\_\_\_\_ lbs./gallon  
 Solids content \_\_\_\_\_ % by volume or \_\_\_\_\_ % by weight  
 Solvent content \_\_\_\_\_ % by volume Solvent density \_\_\_\_\_ lbs./gallon  
 Normal application schedule: \_\_\_\_\_ hrs./day, \_\_\_\_\_ days/wk., \_\_\_\_\_ wks./year.  
 Quantity used (gallons/hour): Normal \_\_\_\_\_ Maximum \_\_\_\_\_  
 (gallons/year): \_\_\_\_\_

• Complete the solvent composition by identifying each solvent component and its respective % by volume of the total solvent. (The % by volume should total to 100%).

Solvent Composition		
Solvent	% by Volume	*

Solvent Composition		
Solvent	% by Volume	*

\* If solvent is photochemically reactive enter "Y", if not photochemically reactive enter "N", if unknown enter "U".

Is the material photochemically reactive?  Yes  No  Do not know

Identify all liquid organic cleanup materials for this process and indicate the amount used per average operating day and per year.

Cleanup Material	*	Gallons Used	
		Daily	Yearly
N/A			

If material is photochemically reactive enter "Y", if not photochemically reactive enter "N", if unknown enter "U".

000119

points of all materials and finished products. Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment.

6201 - 4

CONTROL EQUIPMENT

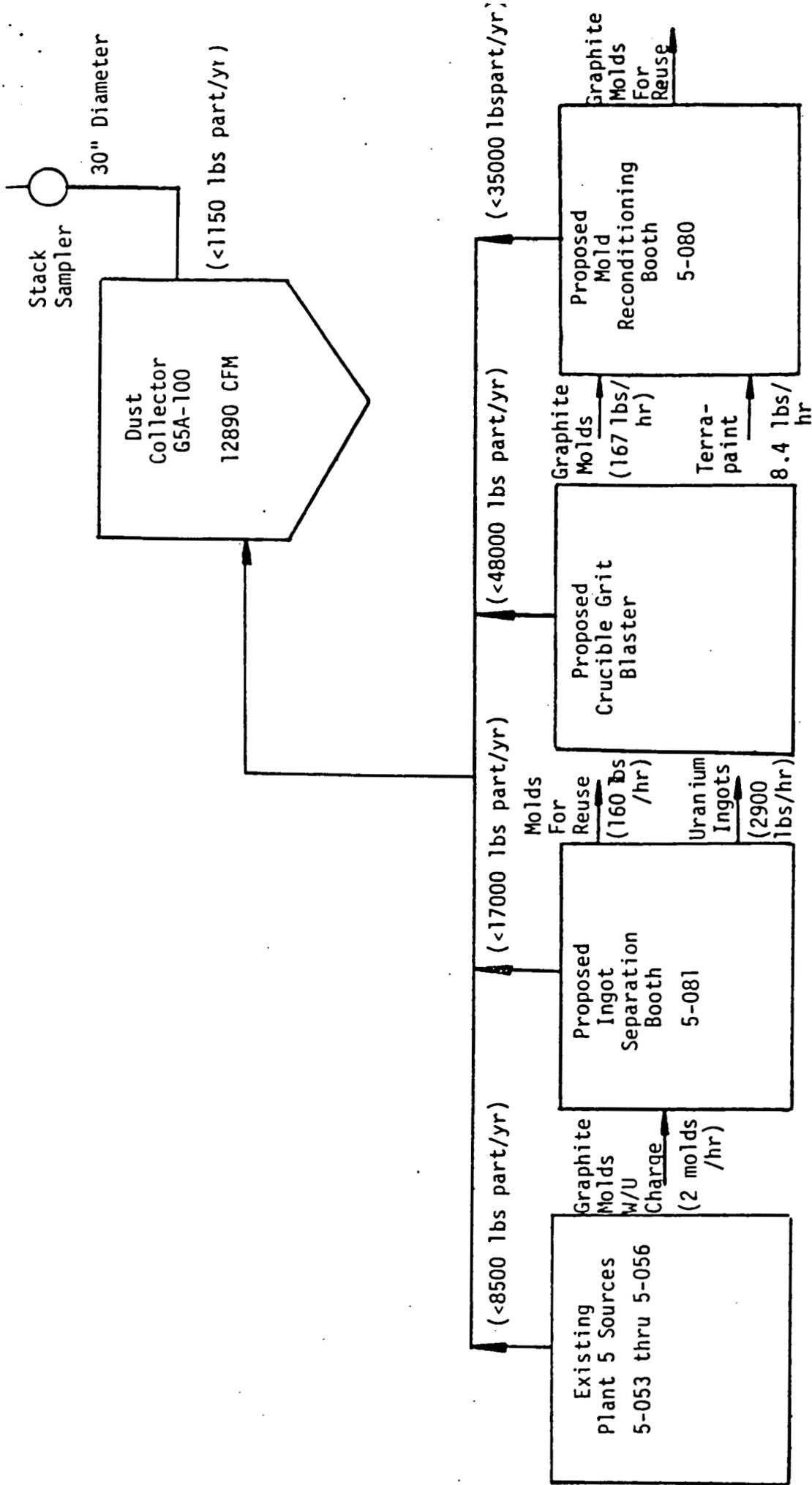
1. Type of control equipment:  None  
 Incinerator, Temp. \_\_\_\_\_ °F, Thermal/Catalytic (Circle one)  
 Adsorption, describe \_\_\_\_\_  
 Condensation, describe \_\_\_\_\_  
 Other, describe Fabric filter dust collector
2. Manufacturer W.W. Sly Manufacturing Model No. 112 Year Installed 1960
3. Percent collection or removal efficiency: Design Not known % Operating 99
4. For non-incineration method identify specific pollutant controlled Particulates

STACK DATA

1. Your stack identification EP5-15
2. Are other sources vented to this stack?  Yes  No  
If yes, identify sources \_\_\_\_\_
3. Type:  Round, top inside diameter dimension 30"  
 Rectangular, top inside dimensions (L) \_\_\_\_\_ x (W) \_\_\_\_\_
4. Height: Above roof 13 ft., above ground 57 ft.
5. Exit gas: Temp. 80 °F, Volume 12890 ACFM, Velocity 2630 ft./min.
6. Continuous monitoring equipment:  Yes  No  
If yes, indicate Type Continuous Sampler, Manufacturer NLO Developed  
Make or Model N/A, Pollutant(s) monitored Particulates
7. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
If yes, check method:  Stack Test  Emission factor  Material balance

Completed by D. J. Carr, Date 10/29

000120



METALS PRODUCTION PLANT - DUST COLLECTOR G5A-100

The following information must be submitted on a separate piece of paper and attached to this application.

6201 -

FOR ALL PERMITS TO INSTALL

1. Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.
2. List the name and quantity of all materials and chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.
3. State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shutdown for \_\_\_\_ years? (State number of years)
4. Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.
5. Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U.S. EPA?

FOR AIR POLLUTION SOURCES

6. State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.
7. Are the proposed sources required to comply with the following federal requirements?
  - i. New Source Performance Standards (NSPS)
  - ii. National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - iii. Prevention of Significant Deterioration (PSD)
  - iv. Appendix "S" - Emission Offset Policy
8. Will the proposed sources employ best available technology?
9. Will the proposed sources cause the significant degradation of air quality?
10. Will the proposed sources interfere with the attainment and maintenance of the ambient air quality standards?
11. Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.
12. Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?
13. Complete and attach an anticipated construction schedule for each proposed source. (See attached).
14. Please include the estimated cost of any air pollution control equipment to be installed on the proposed sources.
15. An appendix for each air contaminant source must accompany this application. From the following description of the appendices, determine which should accompany your application.

000122

1. The Feed Materials Production Center (FMPC) is a contract-operated federal facility for the production of uranium metal for the United States Department of Energy (DOE). NLO, Inc. operates the FMPC under prime contract with the DOE. Plant 5 of the FMPC is the Metals Production Plant where uranium metal is produced from  $UF_4$  (Green Salt) in a thermite-type reaction with magnesium. The reduction reaction takes place in a closed steel reduction vessel which is lined with packed  $MgF_2$  slag (5-001 thru 5-011, Jolters) to protect the vessel from the intense heat of the reaction.  $UF_4$  and magnesium granules, totaling about 500 pounds are blended and charged into the slag-lined vessels (5-012 thru 5-015, "F" Machines). The vessel is capped with slag, fitted with a steel cover (5-016 and 5-017, Capping Station) and heated in a resistance furnace at a temperature range of 1200-1500<sup>o</sup>F for 3-4 hours, until the contents react spontaneously. At this point, the internal temperature of the pot may reach up to 3000<sup>o</sup>F. About five minutes after this reaction takes place, the vessel is removed from the furnace and stored in an air cooling tank for one hour and then to a water cooling tank for several hours. After cooling, the contents are removed and the uranium mass, called a derby, is separated and cleaned by slag chipping hammers (5-018 thru 5-021, Break-out Station). Standard depleted production derbies weigh about 167 Kg U. Normal or slightly enriched derbies weigh about 152 Kg U. The  $MgF_2$  slag resulting from the thermite reaction is milled for reuse as liner material (5-067 - 5-079).

In the casting process, cleaned derbies together with uranium recycle materials are charged into a graphite crucible. The loaded crucible is placed in a vacuum induction furnace (5-022 thru 5-049, Casting Furnaces) and heated for about 95 minutes at 130 Kw input to approximately 2700<sup>o</sup>F, at which temperature it is ready to pour. A shear plug on the bottom of the crucible is severed to permit the molten metal to flow into a heated graphite mold. After cooling the mold is separated from the ingot, cleaned and prepared for reuse (5-052 - 5-054). Crucibles are flame treated to oxidize any residual uranium (5-050 and 5-051).

As cast ingots are cropped by sawing about two inches from the top section to remove shrinkage cavities and impurities that rise to the top of the melt during solidification (5-055 - 5-057).

Ingot dimensions range from 23 to 40 inches in length. The longer ingots are sawed in half, producing two billets for the extrusion step. After sampling, the cropped ingots are transferred to the Special Products Plant for center-drilling and surface machining. Machined ingots undergo heat treating in the Metals Fabrication Plant before off-site extrusion operations.

The Plant 5 Mold Reconditioning Station removes residual material from graphite molds resultant from the casting operation after separation, and recoats the inner surfaces of the mold for reuse. Approximately 2 graphite molds are cleaned and recoated per hour in the Reconditioning Station at average operating

conditions. An estimated 4 pounds of terrapaint is applied to the surfaces of the molds to facilitate proper casting operations.

The proposed Mold Reconditioning Station will be ventilated by an existing 12890 CFM Sly fabric filter dust collector (G5A-100).

2. Approximately 2 molds will be cleaned and recoated in the proposed Mold Reconditioning Station per hour of operation at normal conditions. Approximately 4 pounds of terrapaint will be applied to the inner surfaces of the casting molds.
3. The source is a proposed facility at the FMPC which has potential to emit air particulates to the atmosphere.
4. No previous Ohio EPA application or plan submission has been filed for this source.
5. The proposed source will comply with all rules, laws, and regulations of Ohio EPA and the United States EPA>
6. Based upon an estimated maximum loss of 2 pounds of material per mold during reconditioning, the total particulates emissions to the intake of G5A-100 will be 35,000 pounds per year. New dust collector system will utilize cyclone separators, cartridge and HEPA for overall removal efficiency of 99.999%.
7. The source will be required to comply with the requirements for radionuclide emissions of the NESHAPS.
8. The source will utilize best available technology with the usage of an existing high efficiency dust collection system.
9. The source will not cause the significant degradation of air quality.
10. The source will not interfere with the attainment or maintenance of the ambient air quality standards.
11. The existing dust collector is equipped with NLO, Inc. developed continuous flow stack sampler. The sampler draws a continuous sample at an isokinetic rate from a fixed point within the exhaust stack. Collected samples are analyzed to determine both particulate ( as needed) and radionuclide emission rates from the facility exhaust.
12. No
13. N/A
14. N/A

OHIO ENVIRONMENTAL PROTECTION AGENCY

INSTALLATION SCHEDULE

TO ACCOMPANY APPLICATION FOR PERMIT TO INSTALL

THIS FORM CONSTITUTES PART OF THE APPLICATION OF:

FACILITY NAME: Feed Materials Production Center

ADDRESS: 7400 Willey Road, Fernald, Ohio 45030

FOR A PERMIT TO INSTALL THE FOLLOWING AIR CONTAMINANT SOURCE:

IDENTIFICATION: Mold Reconditioning Booth 5-080

DESCRIPTION: Facility to surface clean and recoat graphite molds for reuse

THE INSTALLATION OF THE ABOVE AIR CONTAMINANT SOURCE IS PLANNED TO FOLLOW THE TIME SCHEDULE DESCRIBED BELOW:

	<u>DATE</u>
1. EQUIPMENT ORDERED - - - - -	<u>June, 1985</u>
2. COMMENCE CONSTRUCTION - - - - -	<u>1st Quarter, 1986</u>
3. STARTUP - - - - -	<u>June, 1986</u>
4. PERFORMANCE TESTING - - - - -	<u></u>

000125

ENCLOSURE 10

W. REMELT CRUCIBLE LID CLEANER

PLANT 5

FMPC #5-083

EMISSIONS ESTIMATE FOR PLANT 5 W. REMELT CRUCIBLE LID CLEANER  
FMPC #5-083

ASSUMPTION:

- (1) Cyclone separator, cartridge filter, and HEPA filter collection efficiency -- 99.999% efficient.\*
- (2) Dust loading -- Based on an engineering estimated loss of 1 pound of particulate per crucible and the processing of 50 crucibles per day, the total particulate emissions to the intake of the filter system will be 50 pounds per day.
- (3) Assumed uranium content is 10 weight percent.
- (4) Uranium emissions

(a) Average uranium emissions per year:

$$5 \times 10^1 \frac{\text{pounds}}{\text{day}} \times 1 \times 10^{-5} \text{ filter penetration factor} \times 1 \times 10^{-1} \text{ fraction of particulate due to U} \times 5 \frac{\text{days}}{\text{week}} \times 50 \frac{\text{weeks}}{\text{yr}} =$$
$$1.25 \times 10^{-2} \frac{\text{pounds of uranium}}{\text{yr}}$$

(5) Maximum uranium emissions per year:

$$5 \times 10^1 \frac{\text{pounds}}{\text{day}} \times 1 \times 10^{-5} \text{ filter penetration factor} \times 1 \times 10^{-1} \text{ fraction of particulate due to U} \times 7 \frac{\text{days}}{\text{week}} \times 50 \frac{\text{weeks}}{\text{yr}} =$$
$$1.75 \times 10^{-2} \frac{\text{pounds of uranium}}{\text{yr}}$$

\* Previously submitted PTI does not indicate the additional control equipment to be installed, i.e., new cyclone separator, cartridge filter, and HEPA filter.

Plant 5 - W. Remelt Crucible Lid Cleaner, FMPC #5-083

Estimated uranium emissions from FMPC #5-083 (see calculations) are 0.018 pounds (8.2 g) per year or  $5.4 \times 10^{-6}$  Ci plus associated fission products, radium, thorium, neptunium, and plutonium. Quantity of non-uranium radionuclides may be calculated from 1986 Plant 5 source term by multiplying the total quantity of a given radionuclide emitted by Plant 5 by the ratio of uranium emitted by FMPC #5-083 to total 1986 Plant 5 uranium emissions, i.e.

$$\text{Ra-226} = \frac{8.2 \text{ g}}{4.991 \times 10^3 \text{ g}} \times 7 \times 10^{-6} \text{ Ci} = 1.1 \times 10^{-8} \text{ Ci, etc.}$$

Effective committed dose equivalent --  $3.0 \times 10^{-4}$  mrem

Lung committed dose equivalent --  $1.9 \times 10^{-3}$  mrem

Endosteal bone committed dose equivalent --  $1.8 \times 10^{-3}$  mrem



Department of Energy

Oak Ridge Operations  
P. O. Box E  
Oak Ridge, Tennessee 37831

*BVIN*

February 4, 1988  
DOE 456-88

Mr. S. Mark Hines  
Southwestern Ohio Air Pollution  
Control Agency  
2400 Beekman Street  
Cincinnati, OH 45214

*FMPC  
5-083*

Dear Mr. Hines:

RESUBMITTANCE OF NESHAPS RELATED PERMIT-TO-OPERATE (PTO) AND PERMIT-TO-INSTALL (PTI) APPLICATIONS, AND OF OTHER REQUESTED PERMIT APPLICATIONS - FEED MATERIALS PRODUCTION CENTER (FMPC)

Enclosed are fourteen (14) Permit-To-Operate (PTO) applications and four (4) Permit-To-Install applications which we previously submitted to you for review, and which were subsequently returned to us until resolution of the NESHAPS issues. We are currently resubmitting them per your request and indication that these are sufficiently complete for review. We are also enclosing ten (10) permit applications which you have reviewed, and have requested that we resubmit to make your files complete. The enclosed NESHAPS related applications are identified by the following Source I.D. Numbers:

PTOs: 2-020; 2-021; 2-043; 2-073; 2-075; 2-077; 2-163; 5-061; 6-004; 6-017; 6-018; 6-040; 6-041; 9-011

PTIs: 1-011; 5-080; 5-083; East/West Derby Breakout System

*PTI was not sent in w/lt. Swar will send separate*

The enclosed permit applications which we are resubmitting for completion of your files are identified by the following Source I.D. Numbers:

4-014; 4-015; 4-016; 4-017; 4-018; 4-019; 5-059; 5-066; 8-012; 9-005

000129

*[Handwritten signature]*  
FEB 24 1988

6201-1

If you have any questions or require additional information concerning these applications, please contact Barbara Wojtowicz of our Environmental Protection Division at (615) 576-1181.

Sincerely,

  
James A. Reafsnyder  
Site Manager

SE-31:Wojtowicz

Enclosures:  
As stated

cc:

L. C. Bogar, WMCO  
L. C. Dolan, WMCO  
V. A. Barto, WMCO  
D. E. Faris, WMCO

000130

Check Appropriate Box(es)

- Air Discharge
- Water Discharge to New Source Treatment Works
- Solid Waste Disposal Facility
- Hazardous Waste Disposal Facility

OFFICE USE ONLY

PTI Application No. \_\_\_\_\_

Date Received \_\_\_\_\_

Premise No. \_\_\_\_\_

OHIO ENVIRONMENTAL PROTECTION AGENCY  
Application for Permit to Install

U. S. Department of Energy, Feed Materials Production Center  
Applicant's Name

P. O. Box E  
Mailing Address

<u>Oak Ridge</u>	<u>TN</u>	<u>37831</u>	<u>615/576-0845</u>
City	County	State	Zip Code Telephone Number

Ms. Margaret Wilson, Environ. Engineer, Environmental Protection Division 615/576-08  
Person to contact (Name and Title and Telephone Number)

The facility will be located within the production area of the DOE.  
Location of Proposed Facility (State the location as completely and precisely as possible)\*

Feed Materials Production Center, 7400 Willey Road

<u>Fernald</u>	<u>Hamilton</u>	<u>45030</u>
City or Township	County	Zip Code

Directions: A Permit to Install is required for new or modified sources of pollution under the provisions of OAC Rule 3745-31. An application cannot be considered complete unless all applicable questions are answered and the required information has been submitted. This application must be signed in accordance with OAC Rule 3745-31-04(B) or it cannot be accepted.

Applicants for permits involving air emissions or wastewater treatment facilities will be required to pay a permit to install fee as shown in Section 3745.11(B) and (C) of the Ohio Revised Code. This fee is payable fifteen days after the date of final issuance of the permit.

Name of new or modified source or facility: Plant 5 - Crucible Lid Cleaner (5-083)

Product of new or modified source/facility: Cleaned Graphite Crucible Lids

Will the proposed source/facility involve any of the following: Check all that apply.

- A.  Air Discharge
- B.  Wastewater Treatment Works
- C.  Solid Waste Disposal Facility
- D.  Hazardous Waste Disposal Facility

000131

\*Example: "The source will be constructed on a 20 Acre plot to be located on Franklin Township Road No. 17, approximately 1 1/4 miles north of the intersection of State Route 99 and Franklin Township Road No. 17 "

Under OAC 3745-31-04, these signatures shall constitute personal affirmation that all statements or assertions of fact made in the application are true and complete, comply fully with applicable state requirements, and shall subject the signatory to liability under applicable state laws forbidding false or misleading statements.

---

Authorized Signature (for facility)	Date
-------------------------------------	------

James A. Reafsnyder (DOE)	
Site Manager	
Title	

U. S. Department of Energy	
Oak Ridge Operations Office	
P. O. Box E	
Oak Ridge, Tennessee 37831	
Address	

The following information must be submitted on a separate piece of paper and attached to this application.

FOR ALL PERMITS TO INSTALL

1. Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.
2. List the name and quantity of all materials and chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.
3. State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shutdown for \_\_\_\_\_ years? (State number of years)
4. Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.
5. Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U.S. EPA?

FOR AIR POLLUTION SOURCES

6. State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.
7. Are the proposed sources required to comply with the following federal requirements?
  - i. New Source Performance Standards (NSPS)
  - ii. National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - iii. Prevention of Significant Deterioration (PSD)
  - iv. Appendix "S" - Emission Offset Policy
8. Will the proposed sources employ best available technology?
9. Will the proposed sources cause the significant degradation of air quality?
10. Will the proposed sources interfere with the attainment and maintenance of the ambient air quality standards?
11. Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.
12. Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?
13. Complete and attach an anticipated construction schedule for each proposed source. (See attached).
14. Please include the estimated cost of any air pollution control equipment to be installed on the proposed sources.
15. An appendix for each air contaminant source must accompany this application. From the following description of the appendices, determine which should accompany your application.

FOR WASTEWATER DISCHARGES

16. State the anticipated quality of all types of environmental pollutants to be discharged by the facility.
17. State in detail the method for disposal for all environmental pollutants listed in the question above. This should include a complete description of any control equipment to be employed.
18. If wastewater is to be discharged to a surface water, state the anticipated concentration (mg/l) and loading (lbs/day) in the discharge, and the effect this discharge will have on the surface water under critical conditions.
19. If wastewater is to be discharged to the groundwater, state the anticipated concentration (mg/l) and loading (lbs/day) in the wastewater, and the effect this wastewater will have on the groundwater.
20. If wastewater is to be discharged to a sewerage system, what will be the effect on the sewerage system and wastewater treatment system.
21. Describe any monitoring equipment to be installed at the facility.
22. Will the proposed source conform with area-wide waste management plans for wastewater treatment?
23. General plans for approval of the proposed source should be submitted to demonstrate compliance with OAC Rule 3745-31-05.
24. The following information should be included with the application (if applicable).
  - i. Appendix G. Extended Aeration Wastewater Treatment Facility Data Sheet
  - ii. Pump Station Data Sheet
  - iii. Sanitary Sewer Data Sheet
  - iv. Application for Approval of Plans for collection, treatment, and disposal of wastewater.

FOR SOLID WASTE DISPOSAL FACILITIES

25. State the anticipated quality of all types of environmental pollutants to be discharged by the facility.
26. State in detail the method for disposal for all environmental pollutants listed in the question above. This should include a complete description of any control equipment to be employed.
27. Describe any groundwater or surface stream monitoring systems to be installed at the facility.
28. State the local zoning requirements.
29. Will the proposed source conform with area-wide waste management plans for solid waste?
30. An Appendix F - Solid Wastes Disposal Facility must be included with this application.

1. The Feed Materials Production Center (FMPC) is a contract-operated federal facility for the production of uranium metal for the United States Department of Energy (DOE). NLO, Inc. operates the FMPC under prime contract with the DOE. Plant 5 of the FMPC is the Metals Production Plant where uranium metal is produced from  $UF_4$  (Green Salt) in a thermite-type reaction with magnesium. The reduction reaction takes place in a closed steel reduction vessel which is lined with packed  $MgF_2$  slag (5-001 thru 5-011, Jollers) to protect the vessel from the intense heat of the reaction.  $UF_4$  and magnesium granules, totaling about 500 pounds are blended and charged into the slag-lined vessels (5-012 thru 5-015, "F" Machines). The vessel is capped with slag, fitted with a steel cover (5-016 and 5-017, Capping Station) and heated in a resistance furnace at a temperature range of 1200-1500<sup>o</sup>F for 3-4 hours, until the contents react spontaneously. At this point, the internal temperature of the pot may reach up to 3000<sup>o</sup>F. About five minutes after this reaction takes place, the vessel is removed from the furnace and stored in an air cooling tank for one hour and then to a water cooling tank for several hours. After cooling, the contents are removed and the uranium mass, called a derby, is separated and cleaned by slag chipping hammers (5-018 thru 5-021, Break-out Station). Standard depleted production derbies weigh about 167 Kg U. Normal or slightly enriched derbies weigh about 152 Kg U. The  $MgF_2$  slag resulting from the thermite reaction is milled for reuse as liner material (5-067 - 5-079).

In the casting process, cleaned derbies together with uranium recycle materials are charged into a graphite crucible. The loaded crucible is placed in a vacuum induction furnace (5-022 thru 5-049, Casting Furnaces) and heated for about 95 minutes at 130 Kw input to approximately 2700<sup>o</sup>F, at which temperature it is ready to pour. A shear plug on the bottom of the crucible is severed to permit the molten metal to flow into a heated graphite mold. After cooling the mold is separated from the ingot, cleaned and prepared for reuse (5-052 - 5-054). Crucibles are flame treated to oxidize any residual uranium (5-050 and 5-051).

As cast ingots are cropped by sawing about two inches from the top section to remove shrinkage cavities and impurities that rise to the top of the melt during solidification (5-055 - 5-057).

Ingot dimensions range from 23 to 40 inches in length. The longer ingots are sawed in half, producing two billets for the extrusion step. After sampling, the cropped ingots are transferred to the Special Products Plant for center-drilling and surface machining. Machined ingots undergo heat treating in the Metals Fabrication Plant before off-site extrusion operations.

NLO Engineering Project 05-83501, Restoration of Special Materials Processing Facilities, involves the replacement of 14 Plant 5 casting furnaces and the installation of a crucible cleaner, a crucible lid cleaner and a mold reconditioning booth.

The proposed crucible lid cleaner will brush clean the inside of graphite remelt crucible lids for reuse. The crucible lid cleaner will be a custom fabricated unit designed to handle fifty-75 pound graphite crucible per 24 hour day. The crucible cleaner will be ventilated to existing Pulverizing Machinery Collector Number G5-259.

2. The proposed crucible lid cleaner will be designed to handle approximately fifty-75 pound graphite crucibles per 24 hour day.
3. The crucible lid cleaner is a new installation at the FMPC.
4. No previous Ohio EPA application or plan submission has been filed for the proposed crucible lid cleaner.
5. The crucible lid cleaner will comply with all rules, laws and regulations of Ohio EPA and U.S. EPA.
6. The crucible lid cleaner is a new facility at the FMPC and thus no representative emission data exists for the source. Based upon a best engineering estimate of the process involved, the maximum anticipated emission from the source to the intake of the collector is expected to be 1 pound of particulates per graphite crucible cleaned. Based upon 50 crucibles per day, the expected discharge to the collector intake is 50 pounds of particulates per day or 3 pounds per hour. Utilizing a 99 percent collector removal efficiency, the total expected emissions from G5-259 due to the proposed crucible cleaner is one pound per day of particulates or 0.03 pounds per hour.
7. The proposed source will be required to comply with the requirements of the NESHAP's standard for radionuclide emissions.
8. The proposed source will utilize best available technology with the usage of a high efficiency dust collector for particulate removal.
9. The proposed source will not cause the significant degradation of air quality.
10. The proposed source will not interfere with the attainment and maintenance of the ambient air quality standard.
11. The existing dust collector is equipped with a NLO developed continuous flow stack sampler. The sampler draws a continuous sample at an isokinetic rate from a fixed point within the exhaust stack. Collected samples are analyzed to determine both particulate (as needed) and radionuclide emission rates from the facility exhaust.
12. No
13. See Attached
14. N/A



CONTROL EQUIPMENT

Control Equipment Code:

**6201** = 4

- (A) Settling chamber
- (B) Cyclone
- (C) Multiple cyclone
- (D) Electrostatic precipitator
- (E) Fabric filter
- (F) Spray chamber
- (G) Cyclonic scrubber
- (H) Impingement scrubber
- (I) Orifice scrubber
- (J) Venturi scrubber
- (K) Plate or tray tower
- (L) Packed tower
- (M) Adsorber
- (N) Condenser
- (O) Afterburner - catalytic
- (P) Afterburner - thermal
- (Q) Other, describe \_\_\_\_\_

15. Control Equipment data:

Item	Primary Collector	Secondary Collector
(a) Type (See above code)	E	
(b) Manufacturer	Pulverizing Machinery	
(c) Model No.	18-32-130R	
(d) Year installed	1952	
(e) Your identification	G5-259	
(f) Pollutant Controlled	Particulates	
(g) Controlled pollutant emission rate (if known)	Particulates - <25 lbs/yr	
(h) Pressure drop	1" - 4"	
(i) Design efficiency	99.5%	
(j) Operating efficiency	<99%	

STACK DATA

16. Your stack identification EP5-12

17. Are other sources vented to this stack?  Yes  No  
If yes, identify sources 5-051; Proposed Crucible Cleaner

18. Type:  Round, top inside diameter dimension 30"  
 Rectangular, top inside dimensions (L) \_\_\_\_\_ x (W) \_\_\_\_\_

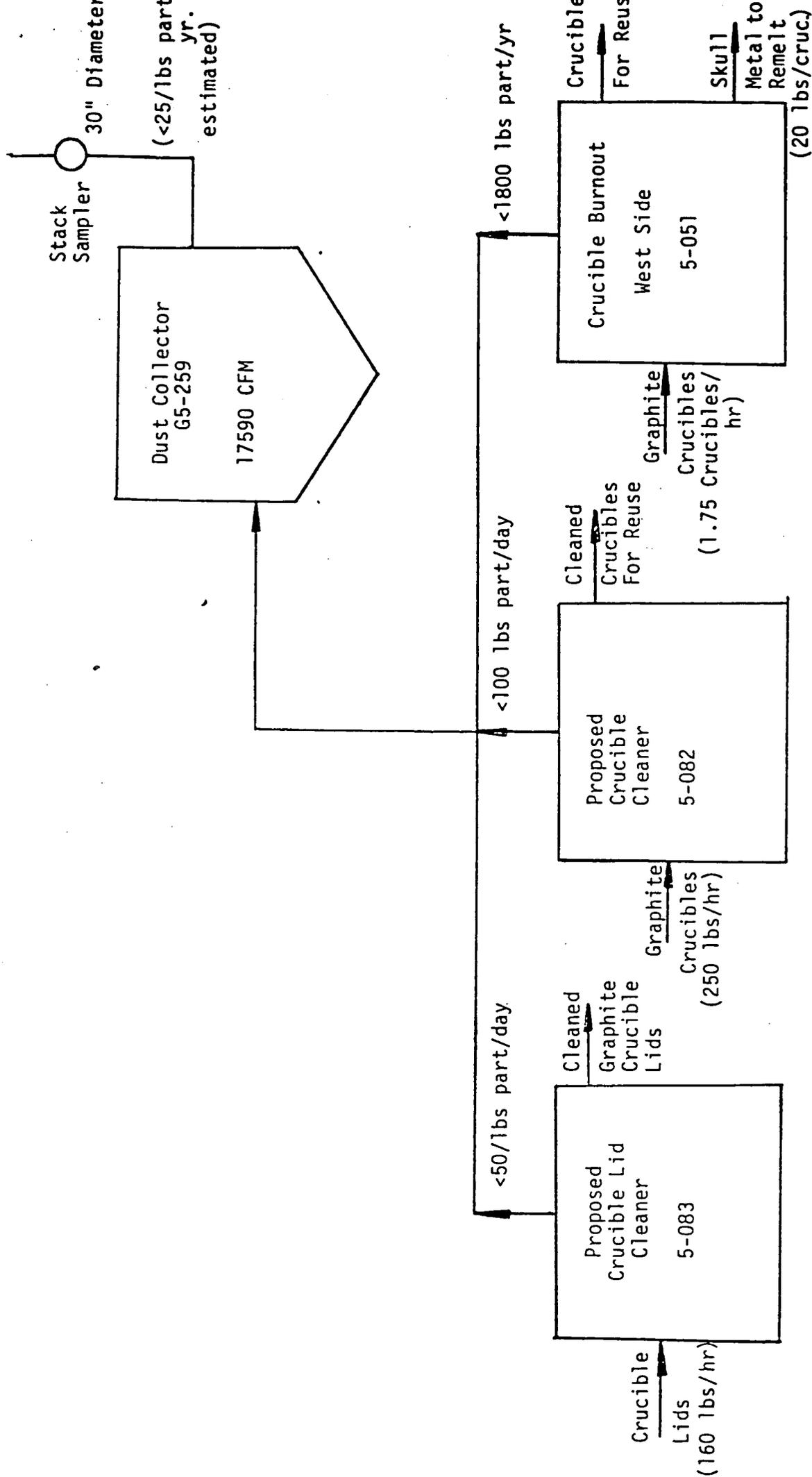
19. Height: Above roof 17 ft., above ground 57 ft.

20. Exit gas: Temp. 100 °F, Volume 17590 ACFM, Velocity 3580 ft./min.

21. Continuous monitoring equipment:  Yes  No  
If yes, indicate: Type Continuous Sampler, Manufacturer NLO Developed  
Make or Model N/A, Pollutant(s) monitored Particulates

22. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
If yes, check method:  Stack Test  Emission factor  Material balance

Completed by Vincent A. Barto, Date 4/16/87



METALS PRODUCTION PLANT - DUST COLLECTOR G5A-100

INSTALLATION SCHEDULE

TO ACCOMPANY APPLICATION FOR PERMIT TO INSTALL

THIS FORM CONSTITUTES PART OF THE APPLICATION OF:

FACILITY NAME: Feed Materials Production Center

ADDRESS: 7400 Willey Road

FOR A PERMIT TO INSTALL THE FOLLOWING AIR CONTAMINANT SOURCE:

IDENTIFICATION: Plant 5 - Crucible Lid Cleaner (5-083)

DESCRIPTION: Facility for Surface Cleaning Graphite Crucible Lids for Reuse  
in Remelt Operations

THE INSTALLATION OF THE ABOVE AIR CONTAMINANT SOURCE IS PLANNED TO FOLLOW THE TIME SCHEDULE DESCRIBED BELOW:

	<u>DATE</u>
1. EQUIPMENT ORDERED - - - - -	<u>June, 1985</u>
2. COMMENCE CONSTRUCTION - - - - -	<u>1st Quarter, 1986</u>
3. STARTUP - - - - -	<u>June, 1987</u>
4. PERFORMANCE TESTING - - - - -	<u></u>

6201-1

ENCLOSURE 11  
FLAT INGOT MODEL 4 MILLING MACHINE  
PLANT 6  
FMPC #6-064

000141

EMISSION CALCULATIONS FOR PLANT 6

FMPC # 6-001, 6-002, 6-060, 6-061, 6-062, 6-063, and 6-064

ASSUMPTION:

The following emission analysis is based on raw stack sampler data for FMPC emission point EP6-3 compiled over 763 operational days. Currently eight sources vent to the American Air Filter dust collector EP6-3. They are five horizontal Cincinnati Milling Machines (6-001, 6-002, 6-060, 6-061 and 6-064), two Kearney & Tricker vertical milling machines (6-062 and 6-063), and one cross transomatic finish core milling machine (6-003). FMPC #6-064 only operated a small time during the period stack sample data were collected. It is not considered to have contributed any emissions to the measured quantities.

- 1) Emissions attributable to each milling machine vented to EP6-3 are proportional to feed rate (pounds per hour of metal to be cut) to each source. This assumption yields to the following apportionment of emissions among the milling machines vented to EP6-3 over the period the stack sampler data were collected:

6-001 -	7%
6-002 -	7%
6-003 -	58%
6-060 -	7%
6-061 -	7%
6-062 -	7%
6-063 -	7%
6-064 -	0%*
	<u>100%</u>

\* 6-064 operated only a brief time and was shutdown. Therefore, it was considered to have had no contribution to the measured emissions. However, had it operated, it is estimated its emissions would have been the same as the other milling machines except 6-003.

- 2) Average and maximum hourly emission rates are equal since the milling machines are operated at maximum throughput when operating.

URANIUM EMISSIONS

From raw stack sampler data for FMPC emission point EP6-3 (June 15, 1985 through July 18, 1987), the annual uranium emission rate was equal to 0.11 kg, FMPC #6-003 contributed approximately 58% and FMPC #6-064 contributed 0% to EP6-3 emissions. A further breakdown indicates FMPC #6-001, 6-002, 6-060, 6-061, 6-062, 6-063) each contributed an estimated 7%.

$$0.11 \frac{\text{kg}}{\text{yr}} \times 7 \times 10^{-2} \text{ fraction emitted per machine} = 7.7 \times 10^{-3} \frac{\text{kg}}{\text{yr}} =$$

$$1.7 \times 10^{-2} \frac{\text{lb}}{\text{yr}} \text{ for each machine}$$

$$1.7 \times 10^{-2} \frac{\text{lb}}{\text{yr}} \times \frac{1 \text{ day}}{24 \text{ hrs}} \times \frac{1 \text{ wk}}{5 \text{ days}} \times \frac{1 \text{ yr}}{50 \text{ wk}} = 2.8 \times 10^{-6} \frac{\text{lb}}{\text{hr}}$$

Average Annual Emission Rate

$$2.8 \times 10^{-6} \frac{\text{lb}}{\text{hr}} \times 24 \frac{\text{hr}}{\text{day}} \times 5 \frac{\text{day}}{\text{wk}} \times 50 \frac{\text{wk}}{\text{yr}} = 1.7 \times 10^{-2} \frac{\text{lb}}{\text{yr}}$$

Maximum Annual Emission Rate

$$2.8 \times 10^{-6} \frac{\text{lb}}{\text{hr}} \times 8.760 \times 10^3 \frac{\text{hr}}{\text{yr}} = 2.4 \times 10^{-2} \frac{\text{lb}}{\text{yr}} \text{ per milling machine}$$

Plant 6 - Flat Ingot Cutting Milling Machine Model 4, FMPC #6-064

Estimated uranium emissions from Flat Ingot Cutting Model 4, FMPC #6-064 (see emission calculations) are estimated to be 0.024 pounds (10.9 g) per year or  $1.16 \times 10^{-5}$  Ci plus associated fission products, radium, thorium, neptunium, and plutonium. Quantity of non-uranium radionuclides may be calculated from 1986 site source term by multiplying the total quantity of a given radionuclide emitted by the site by the ratio of uranium emitted by FMPC #6-064 to total 1986 FMPC site uranium emissions, i.e.

$$\text{Ra-226} = \frac{1.09 \times 10^1 \text{ g}}{2.94 \times 10^4 \text{ g}} \times 4.10 \times 10^{-5} \text{ Ci} = 1.52 \times 10^{-8} \text{ Ci, etc.}$$

Effective committed dose equivalent --  $4.4 \times 10^{-4}$  mrem  
Lung committed dose equivalent --  $2.7 \times 10^{-3}$  mrem  
Endosteal bone committed dose equivalent --  $2.6 \times 10^{-3}$  mrem

Check Appropriate Box(es)

- Air Discharge
- Water Discharge to New Source Treatment Works
- Solid Waste Disposal Facility
- Hazardous Waste Disposal Facility

6201-4  
PTI Application No. \_\_\_\_\_

Date Received \_\_\_\_\_

Premise No. \_\_\_\_\_

OHIO ENVIRONMENTAL PROTECTION AGENCY  
Application for Permit to Install

US DEPT. OF ENERGY FEED MATERIALS PRODUCTION CENTER

Applicant's Name \_\_\_\_\_

PO BOX 39158  
Mailing Address \_\_\_\_\_

CINCINNATI,	HAMILTON,	OHIO	45239	
City	County	State	Zip Code	Telephone Number

MARGARET WILSON, DOE PROJECT OFFICER, OAK RIDGE, TENNESSEE (615) 576-0845  
Person to contact (Name and Title and Telephone Number) \_\_\_\_\_

EMPC IS LOCATED NEAR FERNALD, OHIO at 7400 Willey Road  
Location of Proposed Facility (State the location as completely and precisely as possible) \_\_\_\_\_

Fernald	Hamilton	45030
City or Township	County	Zip Code

Directions: A Permit to Install is required for new or modified sources of pollution under the provisions of OAC Rule 3745-31. An application cannot be considered complete unless all applicable questions are answered and the required information has been submitted. This application must be signed in accordance with OAC Rule 3745-31-04(B) or it cannot be accepted.

Applicants for permits involving air emissions or wastewater treatment facilities will be required to pay a permit to install fee as shown in Section 3745.11(B) and (C) of the Ohio Revised Code. This fee is payable fifteen days after the date of final issuance of the permit.

Name of new or modified source or facility: Plant 6 - Flat Ingot Cutting - Cinn. Milling  
Machine Model No. 4

Product of new or modified source/facility: Uranium Billets (6-064)

Will the proposed source/facility involve any of the following: Check all that apply.

- A.  Air Discharge
- B.  Wastewater Treatment Works
- C.  Solid Waste Disposal Facility
- D.  Hazardous Waste Disposal Facility

000145

\*Example: \*The source will be constructed on a 20 Acre plot to be located on Franklin Township Road No. 17, approximately 1 1/4 miles north of the intersection of State Route 88 and Franklin Township Road No. 17.  
EPA 3150 2/8/83

Source No.             
 Identification No.           

PROCESS DATA

Name of process Flat Ingot Cutting - Plant 6

Product of this process Uranium Billets for Off-site Rolling

Primary process equipment Cincinnati Milling Machine - Model No. 4

Your identification Cincinnati Milling Machine - Model No. 4 Year Installed 1986  
(6-064)

Manufacturer Cincinnati Milling Machine Make or model No. 4

Capacity of equipment (lbs./hr): Rated 930 (10 cuts/8 hrs) Max. 1200 (12 cuts/8 hrs)

Method of exhaust ventilation:  Stack  Window fan  Roof vent  
 Other, describe \_\_\_\_\_  
 Are there multiple exhausts?  Yes  No

OPERATING DATA

Normal operating schedule: 24 hrs./day, 7 days/wk., 50 wks./year.

Percent annual production (finished units) by season:  
 Winter 25 Spring 25 Summer 25 Fall 25

Hourly production rates (lbs.): Average 930 Maximum 1200

Annual production (indicate units) 2,790 tons (7,500 ingots)  
 Projected percent annual increase in production 10%

Type of operation:  Continuous  Batch

If batch, indicate Minutes per cycle 30 Minutes between cycles 18

Materials used in process:

List of Raw Materials	Principal Use	Amount (lbs./hr.)
Flat Uranium Ingots	Billets for Rolling	930

A PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit points of all raw materials, intermediate products, by-products and finished products. Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment. See Flow Diagram attached (Page A-2.1)

Control Equipment Code:

6201

- |                            |                          |                             |
|----------------------------|--------------------------|-----------------------------|
| (A) Settling chamber       | (G) Cyclonic scrubber    | (M) Adsorber                |
| (B) Cyclone                | (H) Impingement scrubber | (N) Condenser               |
| (C) Multiple cyclone       | (I) Orifice scrubber     | (O) Afterburner - catalytic |
| Electrostatic precipitator | (J) Venturi scrubber     | (P) Afterburner - thermal   |
| (E) Fabric filter          | (K) Plate or tray tower  | (Q) Other, describe _____   |
| (F) Spray chamber          | (L) Packed tower         |                             |

Control Equipment data:

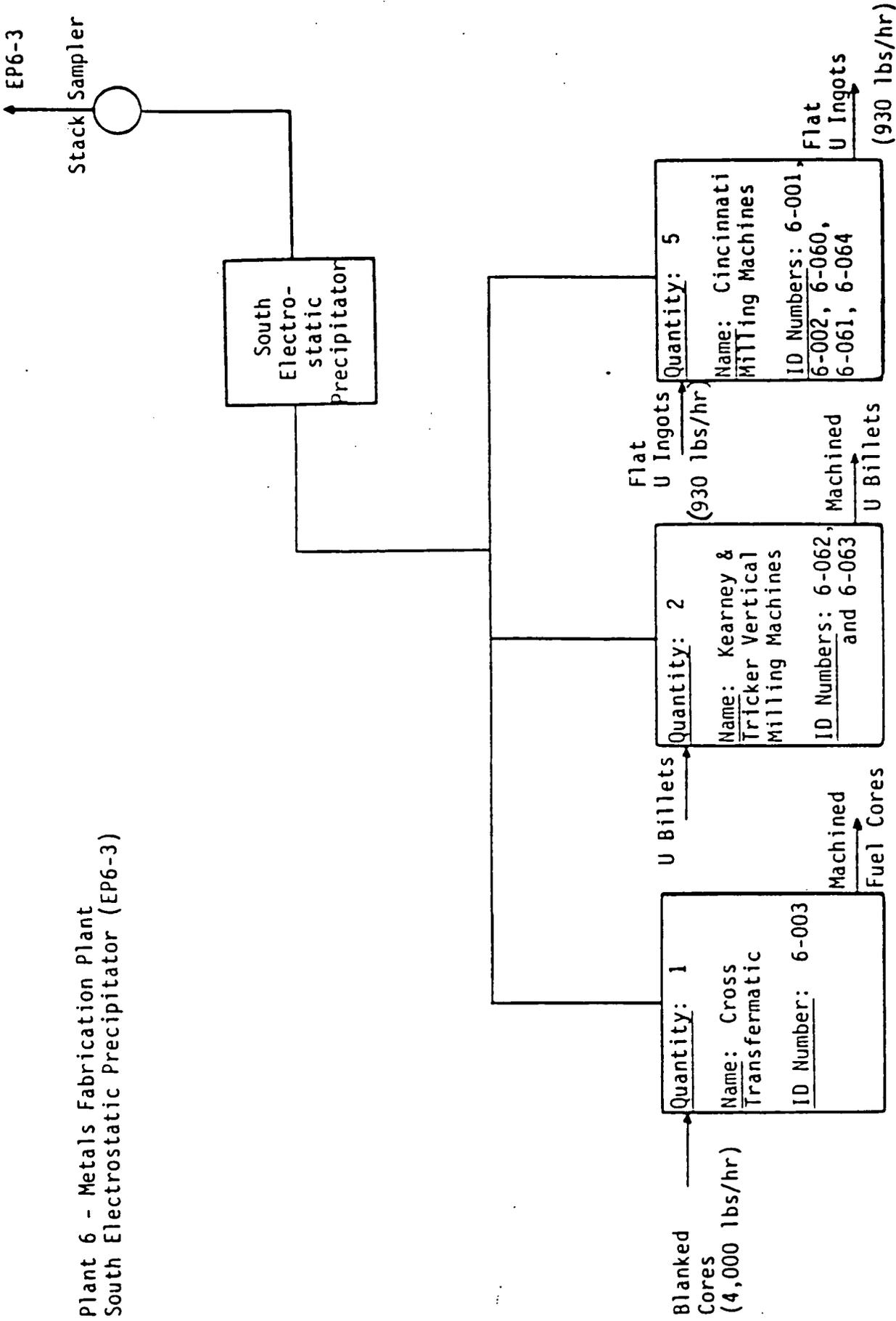
Item	Primary Collector	Secondary Collector
(a) Type (See above code)	D	
(b) Manufacturer	American Air Filter	
(c) Model No.	E-2 Electromatic	
(d) Year installed	1960	
(e) Your identification	South ESP (EP6-3)	
(f) Pollutant Controlled	Particulates	
(g) Controlled pollutant emission rate (if known)	Below detectable limits	
(h) Pressure drop	Not known	
(i) Design efficiency	90%	
(j) Operating efficiency	>99%	

STACK DATA

6. Your stack identification EP6-3
7. Are other sources vented to this stack?  Yes  No  
 If yes, identify sources 6-001, 6-002, 6-003, 6-060, 6-061, 6-062, 6-063
8. Type:  Round, top inside diameter dimension 47"  
 Rectangular, top inside dimensions (L) \_\_\_\_\_ x (W) \_\_\_\_\_
9. Height: Above roof 10 ft., above ground 25 ft.
10. Exit gas: Temp. 80 °F, Volume 14,200 ACFM, Velocity 1,200 ft./min.
11. Continuous monitoring equipment:  Yes  No  
 If yes, indicate: Type Continuous Sampler, Manufacturer Custom Developed  
 Make or Model N/A, Pollutant(s) monitored Particulates
12. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
 If yes, check method:  Stack Test  Emission factor  Material balance

Completed by Westinghouse Mat'ls. Company of Ohio Date 4/13/87

Plant 6 - Metals Fabrication Plant  
 South Electrostatic Precipitator (EP6-3)



The following information must be submitted on a separate piece of paper and attached to this application.

FOR ALL PERMITS TO INSTALL

6201

1. Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.
2. List the name and quantity of all materials and chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.
3. State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shutdown for \_\_\_\_\_ years? (State number of years)
4. Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.
5. Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U.S. EPA?

FOR AIR POLLUTION SOURCES

6. State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.
7. Are the proposed sources required to comply with the following federal requirements?
  - i. New Source Performance Standards (NSPS)
  - ii. National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - iii. Prevention of Significant Deterioration (PSD)
  - iv. Appendix "S" - Emission Offset Policy
8. Will the proposed sources employ best available technology?
9. Will the proposed sources cause the significant degradation of air quality?
10. Will the proposed sources interfere with the attainment and maintenance of the ambient air quality standards?
11. Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.
12. Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?
13. Complete and attach an anticipated construction schedule for each proposed source. (See attached).
14. Please include the estimated cost of any air pollution control equipment to be installed on the proposed sources.
15. An appendix for each air contaminant source must accompany this application. From the following description of the appendices, determine which should accompany your application.

000149

## CINCINNATI MILLING MACHINE - MODEL NO. 4

1. The Feed Materials Production Center (FMPC) is a government owned facility for the production of highly pure uranium metal. Westinghouse Materials Company of Ohio (WMCO) manages the FMPC under contract to the U.S. Department of Energy Oak Ridge Operations Office (DOE-ORO). The Metals Fabrication Plant - Plant 6 at the FMPC is a large scale production facility for the heat treating, acid pickling and finish machining of uranium metal to produce finished fuel cores for off-site shipment. Plant 6 Flat Ingot Cutting is performed on Cincinnati Milling Machine cut-off lathes. Flat uranium metal ingots are supplied to the lathes at a rate of approximately 930 pounds per hour (each). The flat ingots are cut to dimensions suitable for an off-site rolling operation. The lathes utilize a 30 to 1 water to soluble oil cutting fluid to assist in machining operations and reduce particulate and smoke emissions. The Cutoff lathes are ventilated to an existing 14200 CFM American Air Filter Electrostatic Precipitator (South ESP) with a rated removal efficiency greater than 90 percent.
2. Flat uranium metal ingots are supplied to the lathes at a rate of approximately 930 pounds per hour per machine.
3. The source is a facility at the FMPC which has a potential to emit air contaminants to the atmosphere. The facility does not currently have a valid permit to install on file with the Ohio EPA.
4. No previous Ohio EPA application or plan submission have been filed for this source.
5. The source complies with all rules, laws and regulations of Ohio EPA and U.S. EPA.
6. Based upon available information, the source discharges approximately 750 pounds of particulate matter to the intake side of the ESP per year at average operating conditions. Approximately 1800 pounds per year would be discharged to the intake side of the ESP at maximum conditions. Based upon stack sampler data, the ESP discharges less than 10 pounds per year of particulates and less than 1 pound per year radionuclides to the atmosphere.
7.
  - i) No
  - ii) The source will be required to comply with the NESHAP guidelines for radionuclide emissions.

In order to demonstrate compliance with the NESHAP standard for radionuclides, an AIRDOS/DARTAB computer run was performed for this source (6-064). 6-064 is designed to vent to the south electrostatic precipitator (S-ESP) located in Plant 6, along with seven (7) other sources, of which four (4) are flat ingot cutting machines very similar to 6-064.

6201-

## CINCINNATI MILLING MACHINE - MODEL NO. 4 (continued)

The S-ESP is equipped with a continuous flow stack sampler. Stack emissions data from calendar year 1986 indicates that radionuclide emissions from EP6-3 were below detectable limits.

For the AIRDOS run, sources were grouped by control equipment emission point. Hence, all of the sources vented to EP6-3 were evaluated in one AIRDOS run. Based on best engineering judgment, a radionuclide emission level from EP6-3 of one kilogram per year of operations was used as a conservative estimate for the AIRDOS run.

See Addendum.

iii) No

iv) No

8. The source utilizes best available technology with the usage of a high efficiency electrostatic precipitator for control of particulate emissions.
9. The source does not cause significant degradation of air quality.
10. The source does not interfere with the attainment and maintenance of the ambient air quality standard.
11. The ESP is equipped with a continuous flow stack sampler. The sampler draws a continuous sample at an isokinetic rate from a fixed point within the exhaust stack. Collected samples are analyzed to determine both particulate (as needed) and radionuclide emission rates from the facility exhaust.
12. No
13. N/A
14. N/A

Under OAC 3745-31-04, these signatures shall constitute personal affirmation that all statements or assertions of fact made in the application are true and complete, comply fully with applicable state requirements, and shall subject the signatory to liability under applicable state laws forbidding false or misleading statements.

---

Authorized Signature (for facility) Date

James A. Reafsnyder (DOE)  
Site Manager

---

Title

U. S. Department of Energy  
Oak Ridge Operations Office  
P. O. Box E  
Oak Ridge, Tennessee 37831

---

Address

**6201**

ENCLOSURE 12  
FLAT INGOT MODEL 4A MILLING MACHINE  
PLANT 6  
FMPC #6-001

**000153**

Plant 6 - Flat Ingot Cutting A Milling Machine, FMPC #6-001

See FMPC #6-064 since emission and dose calculations are the same.

FOR OFFICE USE ONLY  
Check Appropriate Box(es)

- Air Discharge
- Water Discharge to New Source Treatment Works
- Solid Waste Disposal Facility
- Hazardous Waste Disposal Facility

PTI Application No. 6201

Date Received \_\_\_\_\_

Premise No. \_\_\_\_\_

OHIO ENVIRONMENTAL PROTECTION AGENCY  
Application for Permit to Install

US DEPT. OF ENERGY FEED MATERIALS PRODUCTION CENTER

Applicant's Name \_\_\_\_\_

PO BOX 39158

Mailing Address \_\_\_\_\_

CINCINNATI,	HAMILTON,	OHIO	45239	
City	County	State	Zip Code	Telephone Number

Person to contact (Name and Title and Telephone Number) MARGARET WILSON, DOE PROJECT OFFICER, OAK RIDGE, TENNESSEE (615) 576-0845

Location of Proposed Facility (State the location as completely and precisely as possible)\*

FMPC IS LOCATED NEAR FERNALD, OHIO at 7400 Willey Road

Feed Materials Production Center, 7400 Willey Road

Fernald	Hamilton	45030
City or Township	County	Zip Code

Directions: A Permit to Install is required for new or modified sources of pollution under the provisions of OAC Rule 3745-31. An application cannot be considered complete unless all applicable questions are answered and the required information has been submitted. This application must be signed in accordance with OAC Rule 3745-31-04(B) or it cannot be accepted.

Applicants for permits involving air emissions or wastewater treatment facilities will be required to pay a permit to install fee as shown in Section 3745.11(B) and (C) of the Ohio Revised Code. This fee is payable fifteen days after the date of final issuance of the permit.

Name of new or modified source or facility: Flat Ingot Cutting - Cinti. No. 4A - Plant 6

Product of new or modified source/facility: Uranium Billets for Offsite Rolling (6-001)

Will the proposed source/facility involve any of the following: Check all that apply.

- A.  Air Discharge
- B.  Wastewater Treatment Works
- C.  Solid Waste Disposal Facility
- D.  Hazardous Waste Disposal Facility

000155

\*Example: "The source will be constructed on a 20 Acre plot to be located on Franklin Township Road No. 17, approximately 1 1/4 miles north of the intersection of State Route 44 and Franklin Township Road No. 17."

Under OAC 3745-31-04, these signatures shall constitute personal affirmation that all statements or assertions of fact made in the application are true and complete, comply fully with applicable state requirements, and shall subject the signatory to liability under applicable state laws forbidding false or misleading statements.

---

Authorized Signature (for facility)	Date
-------------------------------------	------

James A. Reafsnyder (DOE)	
Site Manager	
Title	

---

U. S. Department of Energy	
Oak Ridge Operations Office	
P. O. Box E	
Oak Ridge, Tennessee 37831	
Address	

APPENDIX A, PROCESS

**6201**

PROCESS DATA

1. Name of process Flat Ingot Cutting - Plant 6
2. End product of this process Uranium Billets for Offsite Rolling
3. Primary process equipment Cincinnati Milling Machine No. 4A  
Your identification 6-001 Year Installed 1983
4. Manufacturer Cincinnati Milling Machine Make or Model No. 4A
5. Capacity of equipment (lbs./hr): Rated 930(10 cuts/8 hours) Max. 1200 (12 cuts/8 hours)
6. Method of exhaust ventilation:  Stack  Window fan  Roof vent  
 Other, describe \_\_\_\_\_  
Are there multiple exhausts?  Yes  No

OPERATING DATA

7. Normal operating schedule: 8 hrs./day, 5 days/wk., 50 wks./year.
8. Percent annual production (finished units) by season:  
Winter 25 Spring 25 Summer 25 Fall 25
- Hourly production rates (lbs.): Average 930 Maximum 1200
10. Annual production (indicate units) 930 tons (2500 cuts)  
Projected percent annual increase in production 10%
11. Type of operation:  Continuous  Batch
12. If batch, indicate Minutes per cycle 30 Minutes between cycles 18
13. Materials used in process:

List of Raw Materials	Principal Use	Amount (lbs./hr.)
Flat Uranium Ingots	Billets for Rolling	930

14. A PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit points of all raw materials, intermediate products, by-products and finished products. Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment.

(continued on reverse side)

CONTROL EQUIPMENT

Control Equipment Code:

- |                                |                          |                           |
|--------------------------------|--------------------------|---------------------------|
| (A) Settling chamber           | (G) Cyclonic scrubber    | (M) Adsorber              |
| (B) Cyclone                    | (H) Impingement scrubber | (N) Condenser             |
| (C) Multiple cyclone           | (I) Orifice scrubber     | (O) Afterburner - catal.  |
| (D) Electrostatic precipitator | (J) Venturi scrubber     | (P) Afterburner - therm.  |
| (E) Fabric filter              | (K) Plate or tray tower  | (Q) Other, describe _____ |
| (F) Spray chamber              | (L) Packed tower         |                           |

15. Control Equipment data:

Item	Primary Collector	Secondary Collector
(a) Type (See above code)	D	
(b) Manufacturer	American Air Filter	
(c) Model No.	E-2 Electromatic	
(d) Year installed	1960	
(e) Your identification	South ESP (EP6-3)	
(f) Pollutant Controlled	Particulates	
(g) Controlled pollutant emission rate (if known)	Particulates <10 lbs/yr.	
(h) Pressure drop	Not known	
(i) Design efficiency	90%	
(j) Operating efficiency	90%	

STACK DATA

16. Your stack identification EP6-3
17. Are other sources vented to this stack?  Yes  No  
If yes, identify sources 6-002, 6-003
18. Type:  Round, top inside diameter dimension 47"  
 Rectangular, top inside dimensions (L) \_\_\_\_\_ x (W) \_\_\_\_\_
19. Height: Above roof 10 ft., above ground 25 ft.
20. Exit gas: Temp. 80 °F, Volume 14200 ACFM, Velocity 1200 ft./min.
21. Continuous monitoring equipment:  Yes  No  
If yes, indicate: Type Continuous Sampler, Manufacturer NLO developed  
Make or Model N/A, Pollutant(s) monitored Particulates
22. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
If yes, check method:  Stack Test  Emission factor  Material bala

Completed by D.J. Carr/J. Welborn, Date 4/16/87

The following information must be submitted on a separate piece of paper and attached to this application.

6201

FOR ALL PERMITS TO INSTALL

1. Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.
2. List the name and quantity of all materials and chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.
3. State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shutdown for \_\_\_\_ years? (State number of years)
4. Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.
5. Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U.S. EPA?

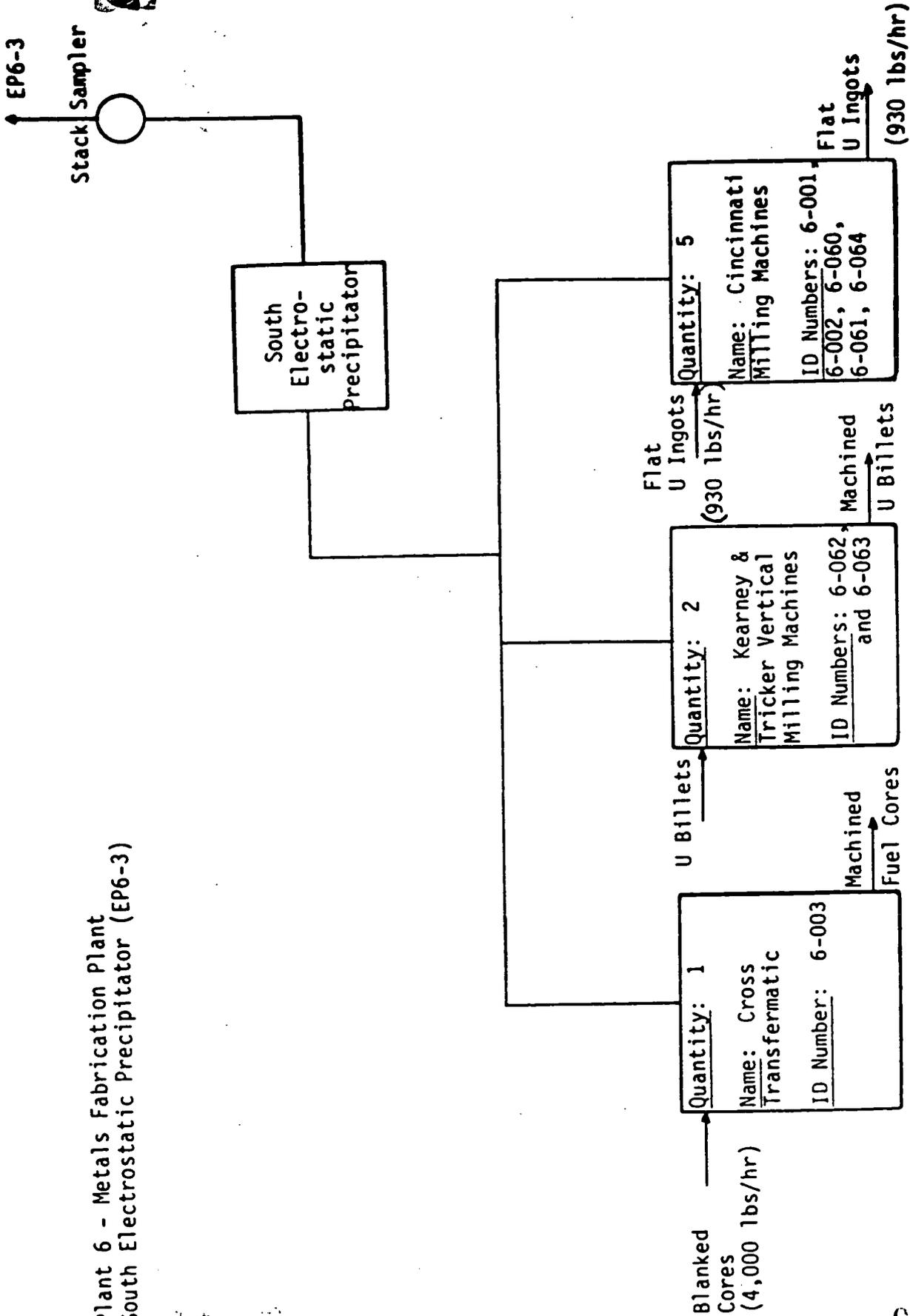
FOR AIR POLLUTION SOURCES

6. State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.
7. Are the proposed sources required to comply with the following federal requirements?
  - i. New Source Performance Standards (NSPS)
  - ii. National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - iii. Prevention of Significant Deterioration (PSD)
  - iv. Appendix "S" - Emission Offset Policy
8. Will the proposed sources employ best available technology?
9. Will the proposed sources cause the significant degradation of air quality?
10. Will the proposed sources interfere with the attainment and maintenance of the ambient air quality standards?
11. Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.
12. Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?
13. Complete and attach an anticipated construction schedule for each proposed source. (See attached).
14. Please include the estimated cost of any air pollution control equipment to be installed on the proposed sources.
15. An appendix for each air contaminant source must accompany this application. From the following description of the appendices, determine which should accompany your application.

000159

1. The Feed Materials Production Center (FMPC) is a government owned facility for the production of highly pure uranium metal. NLO, Inc. operates the FMPC under contract to the U.S. Department of Energy Oak Ridge Operations Office (DOE-ORO). The Metals Fabrication Plant - Plant 6 at the FMPC is a large scale production facility for the heat treating, acid pickling and finish machining of uranium metal to produce finished fuel cores for offsite shipment. Plant 6 Flat Ingot Cutting is performed on two existing Cincinnati Milling Machine cut-off lathes. Flat uranium metal ingots are supplied to the lathes at a rate of approximately 930 pounds per hour (each). The flat ingots are cut to dimensions suitable for an offsite rolling operation. The lathes utilize a 30 to 1 water to soluble oil cutting fluid to assist in machining operations and reduce particulate and smoke emissions. The Cutoff lathes are ventilated to an existing 14200 CFM American Air Filter Electrostatic Precipitator (South ESP) with a rated removal efficiency greater than 90 percent.
2. Flat uranium metal ingots are supplied to the lathes at a rate of approximately 930 pounds per hour per machine.
3. The source is an existing facility at the FMPC which has a potential to emit air contaminants to the atmosphere. The facility is not currently operating under a valid permit to operate.
4. No previous Ohio EPA application or plan submission have been filed for this source.
5. The source complies with all rules, laws and regulations of Ohio EPA and U.S. EPA.
6. Based upon available information the source discharges approximately 250 pounds of particulate matter to the intake side of the ESP per year at average operating conditions. Approximately 600 pounds per year would be discharged to the intake side of the ESP at maximum conditions. Based upon stack sampler data, the ESP discharges less than 10 pounds per year of particulates to the atmosphere.
7. The source will be required to comply with the NESHAP guidelines for radionuclide emissions following final promulgation of the federal standard. See Addendum.
8. The source utilizes best available technology with the usage of a high efficiency electrostatic precipitator for control of particulate emissions.
9. The source does not cause the significant degradation of air quality.
10. The source does not interfere with the attainment and maintenance of the ambient air quality standard.
11. The ESP is equipped with a NLO, Inc. developed continuous flow stack sampler. The sampler draws a continuous sample at an isokinetic rate from a fixed point within the exhaust stack. Collected samples are analyzed to determine both particulate (as needed) and radionuclide emission rates from the facility exhaust.
2. No
13. N/A
14. N/A

Plant 6 - Metals Fabrication Plant  
 South Electrostatic Precipitator (EP6-3)



PROCESS FLOW DIAGRAM

**ADDENDUM  
NESHAP SUBPART H  
NEW SOURCE COMPLIANCE DOCUMENTATION  
FLAT INGOT CUTTING - CINCINNATI NO. 4 A  
SOURCE 6-001 (EP6-3)**

General

Particulate emission estimates presented on page A-2 of the application for the Plant 6 Flat Ingot Cutting 4A Source 6-001 was made based on design efficiencies of control equipment and upon best engineering judgment. These are; however, extremely conservative estimates made for comparison with total particulate limits, which are for less stringent than the radionuclide limits.

For this reason, the particulate emission estimate in the PTI application was not used to estimate radioactive emissions, since the resulting dose estimate would be unrealistically high. For the dose modeling, estimates of radionuclide emissions from the new source was based upon existing actual emissions data from emission point EP6-3 during the past two calendar years (1985 & 1986).

Measured emissions during 1985 and 86 from emission point EP6-3 are 0.0 kg U/year. This total was comprised of contributions from seven existing sources, including six new sources 6-001, 6-002, 6-060, 6-061, 6-062, and 6-063 and one pre-1983 source 6-003.

Therefore, for emission point EP3-3 a 0.0 kg U/year valve was used in the 1986 site-wide AIRDOS calculation for the six new sources and one Pre-1983 existing source 6-003.

Radiological Analysis For Entire Site

A. Description of Data Bases Used

Potential radiation doses to the nearest resident off-site individual and to the population within 80 km of the plant were calculated for all radionuclide emissions during calendar year 1986. The calculations were made using computerized dispersion modeling techniques developed under the sponsorship of the EPA(Ref.1-3). In assessing radiation dose commitments from atmospheric releases of radionuclides, three computer codes were used in calculating doses and risks. The first of these codes is PREPAR(Ref. 1), a FORTRAN program designed to simplify the preparation of the input file for the AIRDOS-EPA computer code(Ref. 2). Default values for all variables are available in PREPAR, so that the user need only to enter the data for which the defaults should be changed. In the case of the DOE facilities, only the variables for which site-specific data was available were changed (i.e., local population distribution, meteorology, location of nearest off-site individual, source terms, stack data). PREPAR utilizes two other programs EXTRAC and RADLST, which create and write the input radionuclide file for PREPAR. PREPAR writes a data file which is read by AIRDOS-EPA and writes a report of those data values.

The second code in the series is AIRDOS-EPA(Ref. 2), a FORTRAN program for estimating radionuclide concentrations in air; rates of deposition on ground

surfaces; ground surface concentrations; intake rates via inhalation of air and ingestion of meat, milk, and fresh vegetables; and radiation doses to man from airborne releases of radionuclides. A modified Gaussian plume equation is used to estimate both horizontal and vertical dispersion of as many as 36 radionuclides released from stacks or area sources. Radionuclide concentrations in meat, milk, and fresh produce consumed by man are estimated by coupling the output of the atmospheric models with the U.S. Nuclear Regulatory Commission, Regulatory Guide 1.109 terrestrial food chain models. Exposure modes include immersion in contaminated air, exposure to contaminated ground surfaces (through deposition), immersion in contaminated water, inhalation of radionuclides in air, and ingestion of food produced in the area. Doses can be calculated for individuals as well as a collective group (i.e., population), and was intended for use as a routine assessment tool (i.e., not for accidental releases).

The third code is DARTAB(Ref. 3), a computer code which combines radionuclide environmental exposure data (from AIRDOS-EPA output) with dosimetric and health effects data to generate tabulations of the predicted impact of radioactive airborne effluents. The dose factors used by DARTAB originated from the U.S. EPA Clean Air Act Amendment tapes of codes and dose factors. Their dose factors are based on Reference 4.

The source terms for the computer codes was based on actual stack emission data from FMPC during 1986. Since site specific meteorological data were not available until late in 1986, meteorological data from the Greater Cincinnati airport was selected as being representative of the FMPC site and need in the computer models. Dose conversion factors were based on the International Commission on Radiological Protection (ICRP). Organ weighting factors used in estimating effective 50-year dose commitments are based on ICRP recommendation and are also those used by the EPA(Ref. 4). A whole-body dose equivalent was estimated for comparison with the NESHAP regulatory limit of 25 mrem/year, whole-body dose. The whole-body dose equivalent resulting from radionuclides that are not deposited throughout the body is zero for internal exposure. thus, the whole-body dose equivalent from all radionuclide releases at FMPC results from external exposure only (i.e., ground deposition and immersion in air), with the exception of Cs-137 which is considered a whole-body seeker.

## B. Assumptions and Results

For the model calculations for emissions from the entire FMPC site, total emissions from the plant were assumed to be released from a single point located in the center of the production area. Source terms are included in Table 1. The radionuclides are released from a theoretical height of 16.1 m (stack diameter of .46 m and effluent velocity of 54 m/sec). The nearest off-site resident is 1128 m in the north direction. For population dose calculations, persons within a 50-mile radius of the facility are considered (based on 1980 census data). In this assessment, a particle size of 1 micron is assumed. Sixty percent of the source term is assumed to be moderately soluble in the lung (W-solubility) while 40% is considered insoluble (Y-solubility). Fifty-year dose commitments are calculated for inhalation and ingestion pathways. Ingestion doses were calculated assuming that one-third of the consumed food was grown locally while two-thirds was imported from outside the 80-km region (i.e., uncontaminated). A gastrointestinal absorption fraction of 5% was used for the W-solubility calculations while the fraction was 0.2% for Y-solubility.

Doses from the release of uranium only were compared with those from the release of a few fission products (i.e., Sr, Tc, Ru, Cs) and transuranics (i.e., Np and Pu). The whole-body dose equivalents are included in Table 2. The total whole-body dose from uranium only is estimated to be  $2.1 \times 10^{-4}$  mrem (well below the 25 mrem limit). This dose is from external exposure only since uranium does not deposit throughout the whole body. Including the other radionuclides in the source term increases the dose to only  $2.2 \times 10^{-4}$  mrem. This dose is from external exposure from all of the nuclides except Cs-137 which deposits throughout the whole body.

Also included in Table 2 are the effective 50-year dose commitments and various organ doses which result from both internal and external exposure. Ingestion doses were calculated assuming that, for the nearest resident located 1128 m in the north direction, one-third of his food was grown in his own backyard while two-thirds was imported from outside the 80-km region (i.e., uncontaminated). The total effective 50-year dose commitment from uranium only is estimated to be 0.34 mrem. Inclusion of the other radionuclides increases this dose to only 0.37 mrem. The primary pathway of exposure is inhalation. The radionuclides contributing to the dose are primarily  $^{234}\text{U}$  and  $^{238}\text{U}$ .

For population doses, it was again assumed that one-third of the food consumed was grown locally while two-thirds was imported. The total whole-body dose equivalent to the population within 80-km was estimated to be  $6.2 \times 10^{-3}$  person-rem from the other nuclides are included. The total effective 50-year dose commitment to the population is 8.9 person-rem for uranium only and 9.6 person-rem with the other radionuclides included (Table 3).

#### Radiological Analysis For The Plant 6 Source (6-001)

An AIRDOS-EPA/DARTAB run for the Plant 6 Source (6-001) was not performed since its emission contribution (0.0 kg/year) was included in the 1986 site-wide dose calculations. The computer codes and assumptions were utilized as for the entire site analysis was discussed in Section A.

**6201**

ENCLOSURE 13  
FLAT INGOT MODEL 4B MILLING MACHINE  
PLANT 6  
FMPC #6-002

000165

Plant 6 - Flat Ingot Cutting B Milling Machine, FMPC #6-002

See FMPC #6-064 since emission and dose calculations are the same.

000166

FOR OFFICE USE ONLY  
Check Appropriate Box(es)

- Air Discharge
- Water Discharge to New Source Treatment Works
- Solid Waste Disposal Facility
- Hazardous Waste Disposal Facility

0201

PTI Application No. \_\_\_\_\_

Date Received \_\_\_\_\_

Premise No. \_\_\_\_\_

OHIO ENVIRONMENTAL PROTECTION AGENCY  
Application for Permit to Install

US DEPT. OF ENERGY FEED MATERIALS PRODUCTION CENTER

Applicant's Name \_\_\_\_\_

PO BOX 39158

Mailing Address \_\_\_\_\_

CINCINNATI,	HAMILTON,	OHIO	45239	
City	County	State	Zip Code	Telephone Number

MARGARET WILSON, DOE PROJECT OFFICER, OAK RIDGE, TENNESSEE	(615) 576-0845
Person to contact (Name and Title and Telephone Number)	

EMPC IS LOCATED NEAR FERNALD, OHIO at 7400 Willey Road  
Location of Proposed Facility (State the location as completely and precisely as possible)

Feed Materials Production Center, 7400 Willey Road

Fernald	Hamilton	45030
City or Township	County	Zip Code

Directions: A Permit to Install is required for new or modified sources of pollution under the provisions of OAC Rule 3745-31. An application cannot be considered complete unless all applicable questions are answered and the required information has been submitted. This application must be signed in accordance with OAC Rule 3745-31-04(B) or it cannot be accepted.

Applicants for permits involving air emissions or wastewater treatment facilities will be required to pay a permit to install fee as shown in Section 3745.11(B) and (C) of the Ohio Revised Code. This fee is payable fifteen days after the date of final issuance of the permit.

Name of new or modified source or facility: FLAT INGOT CUTTING- CINTI No.4B- PLANT 6 (6-00

Product of new or modified source/facility: URANIUM BILLETS FOR OFFSITE ROLLING

Will the proposed source/facility involve any of the following: Check all that apply.

- A.  Air Discharge
- B.  Wastewater Treatment Works
- C.  Solid Waste Disposal Facility
- D.  Hazardous Waste Disposal Facility

000167

Example: \*The source will be constructed on a 20 Acre plot to be located on Franklin Township Road No. 17, approximately 1 1/4 miles north of the intersection of State Route 44 and Franklin Township Road No. 17.  
EPA 3150  
K/R/A

Under OAC 3745-31-04, these signatures shall constitute personal affirmation that all statements or assertions of fact made in the application are true and complete, comply fully with applicable state requirements, and shall subject the signatory to liability under applicable state laws forbidding false or misleading statements.

---

Authorized Signature (for facility)	Date
-------------------------------------	------

James A. Reafsnyder (DOE)

Site Manager

---

Title

U. S. Department of Energy

Oak Ridge Operations Office

P. O. Box E

Oak Ridge, Tennessee 37831

---

Address

APPENDIX A. PROCESS

**6201**

PROCESS DATA

- 1. Name of process Flat Ingot Cutting - Plant 6
- 2. End product of this process Uranium Billets for Offsite Rolling
- 3. Primary process equipment Cincinnati Milling Machine No. 4B  
Your identification 6-002 Year Installed 1984
- 4. Manufacturer Cincinnati Milling Machine Make or Model No. 4B
- 5. Capacity of equipment (lbs./hr): Rated 930(10 cuts/8 hours) Max. 1200(12 cuts/8 hours)
- 6. Method of exhaust ventilation:  Stack  Window fan  Roof vent  
 Other, describe \_\_\_\_\_  
Are there multiple exhausts?  Yes  No

OPERATING DATA

- 7. Normal operating schedule: 8 hrs./day, 5 days/wk., 50 wks./year.
- 8. Percent annual production (finished units) by season:  
Winter 25 Spring 25 Summer 25 Fall 25
- Hourly production rates (lbs.): Average 930 Maximum 1200
- 10. Annual production: (indicate units) 930 tons (2500 cuts)  
Projected percent annual increase in production 10%
- 11. Type of operation:  Continuous  Batch
- 12. If batch, indicate Minutes per cycle 30 Minutes between cycles 18
- 13. Materials used in process:

List of Raw Materials	Principal Use	Amount (lbs./hr.)
Flat Uranium Ingots	Billets for Rolling	930

14. A PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit point of all raw materials, intermediate products, by-products and finished products. Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment.

(continued on reverse side)

000169

CONTROL EQUIPMENT

Control Equipment Code:

- |                                |                          |                           |
|--------------------------------|--------------------------|---------------------------|
| (A) Settling chamber           | (G) Cyclonic scrubber    | (M) Adsorber              |
| (B) Cyclone                    | (H) Impingement scrubber | (N) Condenser             |
| (C) Multiple cyclone           | (I) Orifice scrubber     | (O) Afterburner - cataly  |
| (D) Electrostatic precipitator | (J) Venturi scrubber     | (P) Afterburner - therma  |
| (E) Fabric filter              | (K) Plate or tray tower  | (Q) Other, describe _____ |
| (F) Spray chamber              | (L) Packed tower         |                           |

15. Control Equipment data:

Item	Primary Collector	Secondary Collector
(a) Type (See above code)	D	
(b) Manufacturer	American Air Filter	
(c) Model No.	E-2 Electromatic	
(d) Year installed	1960	
(e) Your identification	South ESP (EP6-3)	
(f) Pollutant Controlled	Particulates	
(g) Controlled pollutant emission rate (if known)	Particulates <10 lbs/yr.	
(h) Pressure drop	Not Known	
(i) Design efficiency	90%	
(j) Operating efficiency	90%	

STACK DATA

16. Your stack identification EP6-3

17. Are other sources vented to this stack?  Yes  No  
 If yes, identify sources 6-001, 6-003

18. Type:  Round, top inside diameter dimension 47"  
 Rectangular, top inside dimensions (L) \_\_\_\_\_ x (W) \_\_\_\_\_

19. Height: Above roof 10 ft., above ground 25 ft.

20. Exit gas: Temp. 80 °F, Volume 14200 ACFM, Velocity 1200 ft./min.

21. Continuous monitoring equipment:  Yes  No  
 If yes, indicate: Type Continuous Sampler, Manufacturer NLO developed  
 Make or Model N/A, Pollutant(s) monitored Particulates

22. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
 If yes, check method:  Stack Test  Emission factor  Material balance

Completed by D. J. Carr, Date 4/16/87

The following information must be submitted on a separate piece of paper and attached to this application.

6201

FOR ALL PERMITS TO INSTALL

1. Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.
2. List the name and quantity of all materials and chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.
3. State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shutdown for \_\_\_\_ years? (State number of years)
4. Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.
5. Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U.S. EPA?

FOR AIR POLLUTION SOURCES

6. State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.
7. Are the proposed sources required to comply with the following federal requirements?
  - i. New Source Performance Standards (NSPS)
  - ii. National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - iii. Prevention of Significant Deterioration (PSD)
  - iv. Appendix "S" - Emission Offset Policy
8. Will the proposed sources employ best available technology?
9. Will the proposed sources cause the significant degradation of air quality?
10. Will the proposed sources interfere with the attainment and maintenance of the ambient air quality standards?
11. Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.
12. Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?
13. Complete and attach an anticipated construction schedule for each proposed source. (See attached).
14. Please include the estimated cost of any air pollution control equipment to be installed on the proposed sources.
15. An appendix for each air contaminant source must accompany this application. From the following description of the appendices, determine which should accompany your application.

000171

1. The Feed Materials Production Center (FMPC) is a government owned facility for the production of highly pure uranium metal. NLO, Inc. operates the FMPC under contract to the U.S. Department of Energy Oak Ridge Operations Office (DOE-ORO). The Metals Fabrication Plant - Plant 6 at the FMPC is a large scale production facility for the heat treating, acid pickling and finish machining of uranium metal to produce finished fuel cores for offsite shipment. Plant 6 Flat Ingot Cutting is performed on two existing Cincinnati Milling Machine cut-off lathes. Flat uranium metal ingots are supplied to the lathes at a rate of approximately 930 pounds per hour (each). The flat ingots are cut to dimensions suitable for an offsite rolling operation. The lathes utilize a 30 to 1 water to soluble oil cutting fluid to assist in machining operations and reduce particulate and smoke emissions. The Cutoff lathes are ventilated to an existing 14200 CFM American Air Filter Electrostatic Precipitator (South ESP) with a rated removal efficiency greater than 90 percent.
2. Flat uranium metal ingots are supplied to the lathes at a rate of approximately 930 pounds per hour per machine.
3. The source is an existing facility at the FMPC which has a potential to emit air contaminants to the atmosphere. The facility is not currently operating under a valid permit to operate.
4. No previous Ohio EPA application or plan submission have been filed for this source.
5. The source complies with all rules, laws and regulations of Ohio EPA and U.S. EPA.
6. Based upon available information the source discharges approximately 250 pounds of particulate matter to the intake side of the ESP per year at average operating conditions. Approximately 600 pounds per year would be discharged to the intake side of the ESP at maximum conditions. Based upon stack sampler data, the ESP discharges less than 10 pounds per year of particulates to the atmosphere.
7. The source will be required to comply with the NESHAP guidelines for radionuclide emissions following final promulgation of the federal standard. See addendum
8. The source utilizes best available technology with the usage of a high efficiency electrostatic precipitator for control of particulate emissions.
9. The source does not cause the significant degradation of air quality.
10. The source does not interfere with the attainment and maintenance of the ambient air quality standard.
11. The ESP is equipped with a NLO, Inc. developed continuous flow stack sampler. The sampler draws a continuous sample at an isokinetic rate from a fixed point within the exhaust stack. Collected samples are analyzed to determine both particulate (as needed) and radionuclide emission rates from the facility exhaust.
2. No
13. N/A
14. N/A

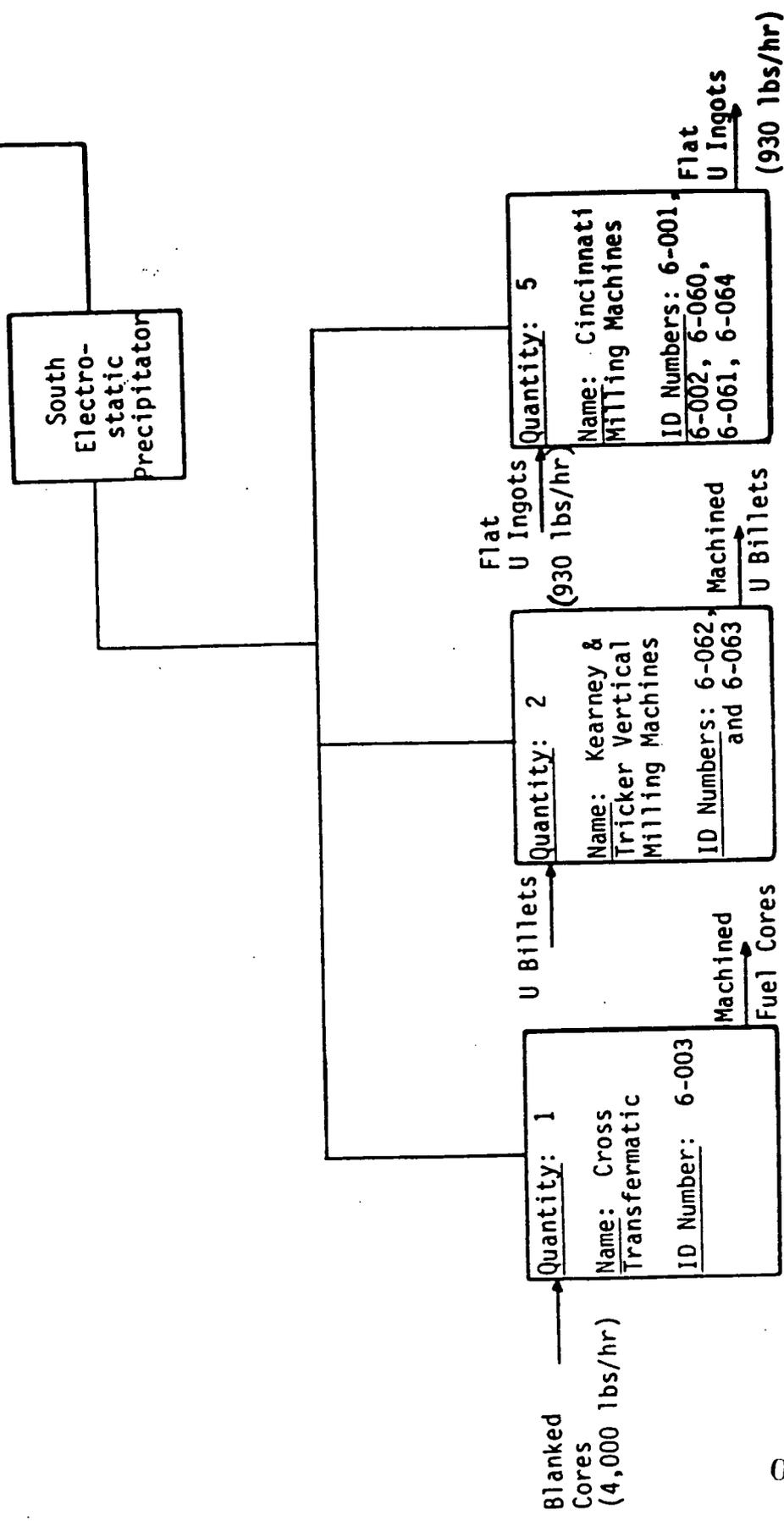
000172

Plant 6 - Metals Fabrication Plant  
 South Electrostatic Precipitator (EP6-3)

EP6-3

Stack Sampler

6201



PROCESS FLOW DIAGRAM

000173

**ADDENDUM  
NESHAP SUBPART H  
NEW SOURCE COMPLIANCE DOCUMENTATION  
FLAT INGOT CUTTING - CINCINNATI NO. 4 B  
SOURCE 6-002 (EP6-3)**

General

Particulate emission estimates presented on page A-2 of the application for the Plant 6 Flat Ingot Cutting 4B Source 6-002 was made based on design efficiencies of control equipment and upon best engineering judgment. These are; however, extremely conservative estimates made for comparison with total particulate limits, which are for less stringent than the radionuclide limits.

For this reason, the particulate emission estimate in the PTI application was not used to estimate radioactive emissions, since the resulting dose estimate would be unrealistically high. For the dose modeling, estimates of radionuclide emissions from the new source was based upon existing actual emissions data from emission point EP6-3 during the past two calendar years (1985 & 1986).

Measured emissions during 1985 and 86 from emission point EP6-3 are 0.0 kg U/year. This total was comprised of contributions from seven existing sources, including six new sources 6-001, 6-002, 6-060, 6-061, 6-062, and 6-063 and one pre-1983 source 6-003.

Therefore, for emission point EP3-3 a 0.0 kg U/year valve was used in the 1986 site-wide AIRDOS calculation for the six new sources and one Pre-1983 existing source 6-003.

Radiological Analysis For Entire Site

A. Description of Data Bases Used

Potential radiation doses to the nearest resident off-site individual and to the population within 80 km of the plant were calculated for all radionuclide emissions during calendar year 1986. The calculations were made using computerized dispersion modeling techniques developed under the sponsorship of the EPA<sup>(Ref.1-3)</sup>. In assessing radiation dose commitments from atmospheric releases of radionuclides, three computer codes were used in calculating doses and risks. The first of these codes is PREPAR<sup>(Ref. 1)</sup>, a FORTRAN program designed to simplify the preparation of the input file for the AIRDOS-EPA computer code<sup>(Ref. 2)</sup>. Default values for all variables are available in PREPAR, so that the user need only to enter the data for which the defaults should be changed. In the case of the DOE facilities, only the variables for which site-specific data was available were changed (i.e., local population distribution, meteorology, location of nearest off-site individual, source terms, stack data). PREPAR utilizes two other programs EXTRAC and RADLST, which create and write the input radionuclide file for PREPAR. PREPAR writes a data file which is read by AIRDOS-EPA and writes a report of those data values.

The second code in the series is AIRDOS-EPA<sup>(Ref. 2)</sup>, a FORTRAN program for estimating radionuclide concentrations in air; rates of deposition on ground

surfaces; ground surface concentrations; intake rates via inhalation of air and ingestion of meat, milk, and fresh vegetables; and radiation doses to man from airborne releases of radionuclides. A modified Gaussian plume equation is used to estimate both horizontal and vertical dispersion of as many as 36 radionuclides released from stacks or area sources. Radionuclide concentrations in meat, milk, and fresh produce consumed by man are estimated by coupling the output of the atmospheric models with the U.S. Nuclear Regulatory Commission, Regulatory Guide 1.109 terrestrial food chain models. Exposure modes include immersion in contaminated air, exposure to contaminated ground surfaces (through deposition), immersion in contaminated water, inhalation of radionuclides in air, and ingestion of food produced in the area. Doses can be calculated for individuals as well as a collective group (i.e., population), and was intended for use as a routine assessment tool (i.e., not for accidental releases).

The third code is DARTAB(Ref. 3), a computer code which combines radionuclide environmental exposure data (from AIRDOS-EPA output) with dosimetric and health effects data to generate tabulations of the predicted impact of radioactive airborne effluents. The dose factors used by DARTAB originated from the U.S. EPA Clean Air Act Amendment tapes of codes and dose factors. Their dose factors are based on Reference 4.

The source terms for the computer codes was based on actual stack emission data from FMPC during 1986. Since site specific meteorological data were not available until late in 1986, meteorological data from the Greater Cincinnati airport was selected as being representative of the FMPC site and used in the computer models. Dose conversion factors were based on the International Commission on Radiological Protection (ICRP). Organ weighting factors used in estimating effective 50-year dose commitments are based on ICRP recommendation and are also those used by the EPA(Ref. 4). A whole-body dose equivalent was estimated for comparison with the NESHAP regulatory limit of 25 mrem/year, whole-body dose. The whole-body dose equivalent resulting from radionuclides that are not deposited throughout the body is zero for internal exposure. Thus, the whole-body dose equivalent from all radionuclide releases at FMPC results from external exposure only (i.e., ground deposition and immersion in air), with the exception of Cs-137 which is considered a whole-body seeker.

## B. Assumptions and Results

For the model calculations for emissions from the entire FMPC site, total emissions from the plant were assumed to be released from a single point located in the center of the production area. Source terms are included in Table 1. The radionuclides are released from a theoretical height of 16.1 m (stack diameter of .46 m and effluent velocity of 54 m/sec). The nearest off-site resident is 1128 m in the north direction. For population dose calculations, persons within a 50-mile radius of the facility are considered (based on 1980 census data). In this assessment, a particle size of 1 micron is assumed. Sixty percent of the source term is assumed to be moderately soluble in the lung (W-solubility) while 40% is considered insoluble (Y-solubility). Fifty-year dose commitments are calculated for inhalation and ingestion pathways. Ingestion doses were calculated assuming that one-third of the consumed food was grown locally while two-thirds was imported from outside the 80-km region (i.e., uncontaminated). A gastrointestinal absorption fraction of 5% was used for the W-solubility calculations while the fraction was 0.2% for Y-solubility.

Doses from the release of uranium only were compared with those from the release of a few fission products (i.e., Sr, Tc, Ru, Cs) and transuranics (i.e., Np and Pu). The whole-body dose equivalents are included in Table 2. The total whole-body dose from uranium only is estimated to be  $2.1 \times 10^{-4}$  mrem (well below the 25 mrem limit). This dose is from external exposure only since uranium does not deposit throughout the whole body. Including the other radionuclides in the source term increases the dose to only  $2.2 \times 10^{-4}$  mrem. This dose is from external exposure from all of the nuclides except Cs-137 which deposits throughout the whole body.

Also included in Table 2 are the effective 50-year dose commitments and various organ doses which result from both internal and external exposure. Ingestion doses were calculated assuming that, for the nearest resident located 1128 m in the north direction, one-third of his food was grown in his own backyard while two-thirds was imported from outside the 80-km region (i.e., uncontaminated). The total effective 50-year dose commitment from uranium only is estimated to be 0.34 mrem. Inclusion of the other radionuclides increases this dose to only 0.37 mrem. The primary pathway of exposure is inhalation. The radionuclides contributing to the dose are primarily  $^{234}\text{U}$  and  $^{238}\text{U}$ .

For population doses, it was again assumed that one-third of the food consumed was grown locally while two-thirds was imported. The total whole-body dose equivalent to the population within 80-km was estimated to be  $6.2 \times 10^{-3}$  person-rem from the other nuclides are included. The total effective 50-year dose commitment to the population is 8.9 person-rem for uranium only and 9.6 person-rem with the other radionuclides included (Table 3).

#### Radiological Analysis For The Plant 6 Source (6-002)

An AIRDOS-EPA/DARTAB run for the Plant 6 Source (6-002) was not performed since its emission contribution (0.0 kg/year) was included in the 1986 site-wide dose calculations. The computer codes and assumptions were utilized as for the entire site analysis was discussed in Section A.

6201

ENCLOSURE 14  
FLAT INGOT 425-20 MILLING MACHINE  
PLANT 6  
FMPC #6-060

000177

Plant 6 - Flat Ingot Cutting 425-20 Milling Machine, FMPC #6-060

See FMPC #6-064 since emission and dose calculations are the same.

000178

Check Appropriate Box(es)

- Air Discharge
- Water Discharge to New Source Treatment Works
- Solid Waste Disposal Facility
- Hazardous Waste Disposal Facility

**6201**

PTI Application No. \_\_\_\_\_

Date Received \_\_\_\_\_

Premise No. \_\_\_\_\_

**OHIO ENVIRONMENTAL PROTECTION AGENCY**  
Application for Permit to Install

U. S. Department of Energy, Feed Materials Production Center  
Applicant's Name

P. O. Box E  
Mailing Address

<u>Oak Ridge</u>	<u>TN</u>	<u>37831</u>	<u>615/576-0845</u>
City	County	State	Zip Code
			Telephone Number

Ms. Margaret Wilson, Environ. Engineer, Environmental Protection Division 615/576-08.  
Person to contact (Name and Title and Telephone Number)

The facility will be located within the production area of the DOE.  
Location of Proposed Facility (State the location as completely and precisely as possible)\*

Feed Materials Production Center, 7400 Willey Road

<u>Fernald</u>	<u>Hamilton</u>	<u>45030</u>
City or Township	County	Zip Code

Directions: A Permit to Install is required for new or modified sources of pollution under the provisions of OAC Rule 3745-31. An application cannot be considered complete unless all applicable questions are answered and the required information has been submitted. This application must be signed in accordance with OAC Rule 3745-31-04(B) or it cannot be accepted.

Applicants for permits involving air emissions or wastewater treatment facilities will be required to pay a permit to install fee as shown in Section 3745.11(B) and (C) of the Ohio Revised Code. This fee is payable fifteen days after the date of final issuance of the permit.

Name of new or modified source or facility: Plant 6 - Flat Ingot Cutting - Cincinnati 425-  
6-060

Product of new or modified source/facility: Uranium Billets

Will the proposed source/facility involve any of the following: Check all that apply.

- A.  Air Discharge
- B.  Wastewater Treatment Works
- C.  Solid Waste Disposal Facility
- D.  Hazardous Waste Disposal Facility

000179

\*Example: "The source will be constructed on a 20 Acre plot to be located on Franklin Township Road No. 17, approximately 1 1/4 miles north of the intersection of State Route 99 and Franklin Township Road No. 17 "

EPA 3150  
6/8/82



Premise No.         
 Source No.         
 Application No.       

APPENDIX A, PROCESS

PROCESS DATA

**6201**

1. Name of process Plant 6 - Flat Ingot Cutting - Cincinnati 425-20
2. End product of this process Machined Uranium Billets
3. Primary process equipment Milling Machine  
 Your identification Cincinnati No. 425-20 - Plant 6 Year Installed 1985
4. Manufacturer Cincinnati Milling Machine Make or model Hyproverci 425-20
5. Capacity of equipment (lbs./hr): Rated 930 (10 Ingots/8hr) Max. 1200 (12 Ingots/8 hrs)
6. Method of exhaust ventilation:  Stack  Window fan  Roof vent  
 Other, describe \_\_\_\_\_  
 Are there multiple exhausts?  Yes  No

OPERATING DATA

7. Normal operating schedule: 24 hrs./day, 5 days/wk., 50 wks./year.
8. Percent annual production (finished units) by season:  
 Winter 25 Spring 25 Summer 25 Fall 25
9. Hourly production rates (lbs.): Average 930 Maximum 1200
10. Annual production (indicate units) 2790 tons (7500 Ingots)  
 Projected percent annual increase in production 10%
1. Type of operation:  Continuous  Batch
2. If batch, indicate Minutes per cycle 30 Minutes between cycles 18
3. Materials used in process:

List of Raw Materials	Principal Use	Amount (lbs./hr.)
Flat Uranium Ingots	Billets for Rolling	930

4. A PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit points of all raw materials, intermediate products, by-products and finished products, Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment.

CONTROL EQUIPMENT

Control Equipment Code:

- |                                |                          |                           |
|--------------------------------|--------------------------|---------------------------|
| (A) Settling chamber           | (G) Cyclonic scrubber    | (M) Adsorber              |
| (B) Cyclone                    | (H) Impingement scrubber | (N) Condenser             |
| (C) Multiple cyclone           | (I) Orifice scrubber     | (O) Afterburner - catalyt |
| (D) Electrostatic precipitator | (J) Venturi scrubber     | (P) Afterburner - thermal |
| (E) Fabric filter              | (K) Plate or tray tower  | (Q) Other, describe _____ |
| (F) Spray chamber              | (L) Packed tower         |                           |

15. Control Equipment data:

Item	Primary Collector	Secondary Collector
(a) Type (See above code)	D	
(b) Manufacturer	American Air Filter	
(c) Model No.	E-2 Electromatic	
(d) Year installed	1960	
(e) Your identification	South ESP (EP6-3)	
(f) Pollutant Controlled	Particulates	
(g) Controlled pollutant emission rate (if known)	Particulates < 10 lbs/yr.	
(h) Pressure drop	Not known	
(i) Design efficiency	90%	
(j) Operating efficiency	90%	

STACK DATA

16. Your stack identification EP6-3
17. Are other sources vented to this stack?  Yes  No  
 If yes, identify sources 6-001, 6-002, 6-003, CMM No. 6, K&T A, and K&T B
18. Type:  Round, top inside diameter dimension 47"  
 Rectangular, top inside dimensions (L) \_\_\_\_\_ x (W) \_\_\_\_\_
19. Height: Above roof 10 ft., above ground 25 ft.
20. Exit gas: Temp. 80 °F, Volume 14200 ACFM, Velocity 1200 ft./min.
21. Continuous monitoring equipment:  Yes  No  
 If yes, indicate: Type Continuous Sampler, Manufacturer NLO developed  
 Make or Model N/A, Pollutant(s) monitored Particulates
22. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
 If yes, check method:  Stack Test  Emission factor  Material balance

Completed by D.J. Carr, Date 4/16/87

The following information must be submitted on a separate piece of paper and attached to this application.

6201

FOR ALL PERMITS TO INSTALL

1. Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.
2. List the name and quantity of all materials and chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.
3. State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shutdown for \_\_\_\_ years? (State number of years)
4. Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.
5. Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U.S. EPA?

FOR AIR POLLUTION SOURCES

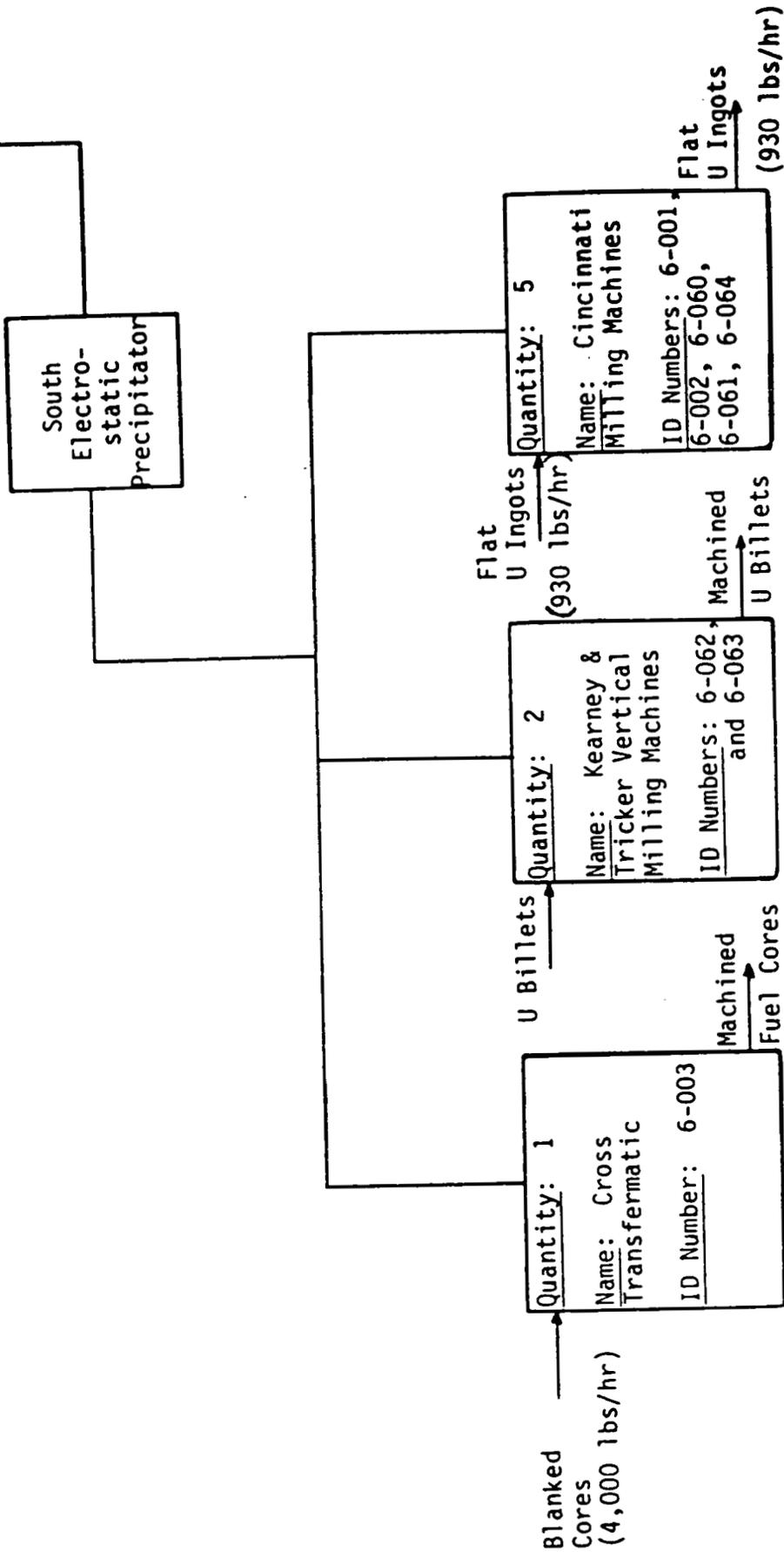
6. State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.
7. Are the proposed sources required to comply with the following federal requirements
  - i. New Source Performance Standards (NSPS)
  - ii. National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - iii. Prevention of Significant Deterioration (PSD)
  - iv. Appendix "S" - Emission Offset Policy
8. Will the proposed sources employ best available technology?
9. Will the proposed sources cause the significant degradation of air quality?
10. Will the proposed sources interfere with the attainment and maintenance of the ambient air quality standards?
11. Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.
12. Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?
13. Complete and attach an anticipated construction schedule for each proposed source. (See attached).
14. Please include the estimated cost of any air pollution control equipment to be installed on the proposed sources.
15. An appendix for each air contaminant source must accompany this application. From the following description of the appendices, determine which should accompany your application.

000183

1. The Feed Materials Production Center (FMPC) is government owned facility for the production of high pure uranium metal. NLO, Inc. operates the FMPC under contract to the U.S. Department of Energy Oak Ridge Operations Office (DOE-ORO). The Metals Fabrication Plant - Plant 6 at the FMPC is a large scale production facility for the heat treating, acid pickling and finish machining of uranium metal to produce finished fuel cores for offsite shipment. Additional capacity for cutting flat ingots is required in Plant 6. Two Cincinnati Milling Machine Cutoff Lathes are proposed to be installed in the plant. Flat uranium metal ingots will be supplied to the lathes at a rate of approximately 930 pounds per hour (each). The flat ingots will be cut to dimensions suitable for an offsite rolling operation. The lathes utilize a 30 to 1 water to soluble oil cutting fluid to assist in machining operations and reduce particulate and smoke emissions. The Cutoff lathes will be ventilated by an existing 14200 CFM American Air Filter Electrostatic Precipitator (South ESP) with a rated removal efficiency greater than 90 percent.
2. Flat uranium metal ingots will be supplied to the lathes at a rate of approximately 930 pounds per hour per machine.
3. The source is a proposed facility at the FMPC which has a potential to emit air contaminants to the atmosphere. The facility does not currently have a valid permit to install on file with the Ohio EPA.
4. No previous Ohio EPA application or plan submission has been filed for this source.
5. The source complies with all rules, laws and regulations of Ohio EPA and U.S. EPA.
6. Based upon estimates of smoke emissions from the existing Plant 6 Cutoff lathes (6-001 and 6-002) it is anticipated that the proposed Cincinnati Mill will emit less than one pound of particulate to the intake of the South EPA per 8 hour shift. Increases on emissions from the South ESP due to the addition of the four mills (K&T 550 TF20, Cincinnati Mill Machine No. 6 and 425-20) is expected to be negligible.
7. The source will be required to comply with the NESHAP guidelines for radionuclide emissions following final promulgation of the federal standard. See attached addendum.
8. The source will utilize best available technology with the usage of a high efficiency electrostatic precipitator for control of particulate emissions.
9. The source does not cause the significant degradation of air quality.
10. The source does not interfere with the attainment and maintenance of the ambient air quality standard.
11. The ESP is equipped with an NLO, Inc. developed continuous flow stack sampler. The sampler draws a continuous sample at an isokinetic rate from a fixed point within the exhaust stack. Collected samples are analyzed to determine both particulate (as needed) and radionuclide emission rates from the facility exhaust.
12. No
13. N/A
14. N/A

Plant 6 - Metals Fabrication Plant  
 South Electrostatic Precipitator (EP6-3)

EP6-3  
 Stack Sampler  
 6201



PROCESS FLOW DIAGRAM

## ADDENDUM

### NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS SUBPART H NEW SOURCE COMPLIANCE DOCUMENTATION

Plant 6 - Flat Ingot Cutting , Cincinnati 425-20  
Source No. 6-060

#### General

Particulate emission estimates presented on Page A-2 of this applications for the Plant 6 - Flat Ingot Cutting - Cincinnati 425-20 (Source 6-060) was made based on design efficiencies of control equipment and upon best engineering judgment. These are, however, extremely conservative estimates made for comparison with total particulate limits, which are for less stringent than the radionuclide limits.

For this reason, the particulate emission estimate in the PTI application was not used to estimate radioactive emissions, since the resulting dose estimate would be unrealistically high. For the dose modeling, estimates of radionuclide emissions from the new source was based upon existing actual emissions data from emission point EP6-3 during the past two calendar years (1985 & 1986).

Measured emissions during 1985 and 86 from emission point EP6-3 are 0.0 kg U/year. This total was comprised of contributions from seven existing sources, including six new sources 6-001, 6-002, 6-060, 6-062 and 6-063 and one pre-1983 source 6-003.

Therefore, for emission point EP6-3 a 0.0 kg U/year value was used in the 1986 site-wide AIRDOS calculation for the six new sources and one Pre-1983 existing source 6-003.

#### Radiological Analysis For Entire Site

##### A. Description of Data Bases Used

Potential radiation doses to the nearest resident off-site individual and to the population within 80 km of the plant were calculated for all radionuclide emissions during calendar year 1986. The calculations were made using computerized dispersion modeling techniques developed under the sponsorship of the EPA (Ref. 1-3). In assessing radiation dose commitments from atmospheric releases of radionuclides, three computer codes were used in calculating doses and risks. The first of these codes is PREPAR (Ref. 1), a FORTRAN program designed to simplify the preparation of the input file for the AIRDOS-EPA computer code (Ref. 2). Default values for all variables are available in PREPAR so that the user need only to enter the data for which the defaults should be changed. In the case of the DOE facilities, only the variables for which site-specific data was available were changed (i.e., local population distribution, meteorology, location of nearest off-site individual, source terms, stack data). PREPAR utilizes two other programs, EXTRAC and RADLST, which

create and write the input radionuclide file for PREPAR. PREPAR writes a data file which is read by AIRDOS-EPA and writes a report of those data values.

The second code in the series is AIRDOS-EPA (Ref. 2), a FORTRAN program for estimating radionuclide concentrations in air; rates of deposition on ground surfaces; ground surface concentrations; intake rates via inhalation of air and ingestion of meat, milk and fresh vegetables; and radiation doses to man from airborne releases of radionuclides. A modified Gaussian plume equation is used to estimate both horizontal and vertical dispersion of as many as 36 radionuclides released from stacks or area sources. Radionuclide concentrations in meat, milk and fresh vegetables consumed by man are estimated by coupling the output of the atmospheric models with the U. S. Nuclear Regulatory Commission, Regulatory Guide 1.109 terrestrial food chain models. Exposure modes include immersion in contaminated air, exposure to contaminated ground surfaces (through deposition), immersion in contaminated water, inhalation of radionuclides in air and ingestion of food produced in the area. Doses can be calculated for individuals as well as a collective group (i.e., population) and was intended for use as a routine assessment tool (i.e., not for accidental releases).

The third code is DARTAB (Ref. 3), a computer code which combines radionuclide environmental exposure data (from AIRDOS-EPA output) with dosimetric and health effects data to generate tabulations of the predicted impact of radioactive airborne effluents. The dose factors used by DARTAB originated from the U. S. EPA Clean Air Act Amendment tapes of codes and dose factors. Their dose factors are based on Reference 4.

The source terms for the computer codes was based on actual stack emission data from FMPC during 1986. Since site specific meteorological data were not available until late in 1986, meteorological data from the Greater Cincinnati Airport was selected as being representative of the FMPC site and need in the computer models. Dose conversion factors were based on the International Commission on Radiological Protection (ICRP). Organ weighting factors used in estimating effective 50-year dose commitments are based on ICRP recommendation and are also those used by the EPA (Ref. 4). A whole-body dose equivalent was estimated for comparison with the NESHAP regulatory limit of 25 mrem/year, whole-body dose. The whole-body dose equivalent resulting from radionuclides that are not deposited throughout the body is zero for internal exposure. Thus, the whole-body dose equivalent from all radionuclide releases at FMPC results from external exposure only (i.e., ground deposition and immersion in air), with the exception of Cs-137 which is considered a whole-body seeker.

## B. Assumptions and Results

For the model calculations for emissions from the entire FMPC site, total emissions from the plant were assumed to be released from a single point located in the center of the production area. Source terms are included in Table 1. The radionuclides are released from a theoretical height of 16.1 m (stack diameter of .46 m and effluent velocity of 54 m/sec). The nearest off-site resident is 1128 m in the north direction. For population dose calculations, persons within a 50-mile radius of the facility are considered (based on 1980 census data). In this assessment, a particle size of 1 micron is assumed. Sixty percent of the source term

is assumed to be moderately soluble in the lung (W-solubility) while 40% is considered insoluble (Y-solubility). Fifty-year dose commitments are calculated for inhalation and ingestion pathways. Ingestion doses were calculated assuming that one-third of the consumed food was grown locally while two-thirds was imported from outside the 80-km region (i.e., uncontaminated). A gastrointestinal absorption fraction of 5% was used for the W-solubility calculations while the fraction was 0.2% for Y-solubility.

Doses from the release of uranium only were compared with those from the release of a few fission products (i.e., Sr, Tc, Ru, Cs) and transuranics (i.e., Np and Pu). The whole-body dose equivalents are included in Table 2. The total whole-body dose from uranium only is estimated to be  $2.1 \times 10^{-4}$  mrem radionuclides in the source term increases the dose to only  $2.2 \times 10^{-4}$  mrem. This dose is from external exposure from all of the nuclides except Cs-137 which deposits throughout the whole body.

Also included in Table 2 are the effective 50-year dose commitments and various organ doses which result from both internal and external exposure. Ingestion doses were calculated assuming that, for the nearest resident located 1128 m in the north direction, one-third of his food was grown in his own backyard while two-thirds was imported from outside the 80-km region (i.e., uncontaminated). The total effective 50-year dose commitment from uranium only is estimated to be 0.34 mrem. Inclusion of the other radionuclides increases this dose to only 0.37 mrem. The primary pathway of exposure is inhalation. The radionuclides contributing to the dose are primarily  $^{234}\text{U}$  and  $^{238}\text{U}$ .

For population doses, it was again assumed that one-third of the food consumed was grown locally while two-thirds was imported. The total whole-body dose equivalent to the population within 80-km was estimated to be  $6.2 \times 10^3$  person-rem from the other nuclides is 8.9 person-rem for uranium only and 9.6 person-rem with the other radionuclides included (Table 3).

### C. Radiological Analysis for The Plant 6 6-060 Source

An AIRDOS-EPA/DARTAB run for the Plant 6 Source (6-061) was not performed since its emission contribution (0.0 kg/year) was included in the 1986 site-wide dose calculations. The same computer codes and assumptions utilized for the entire site analysis was discussed in Section A.

Potential doses to the nearest resident as calculated by the models are shown in Table 2.

## C. REFERENCES

1. Sjoreen, A. L. and C. W. Miller, PREPAR - A User-Friendly Preprocessor to Create AIRDOS-EPA Input Data Sets, Oak Ridge National Laboratory, ORNL-5952 (August, 1984).
2. Moore, R. E., et al., AIRDOS-EPA: A Computerized Methodology for Estimating Environmental Concentrations and Dose to Man from Airborne Releases of Radionuclides, EPA 520/1-79-009. (December, 1979).
3. Begovich, C. L., et al., DARTAB: A Program to Combine Airborne Radionuclide Environmental Exposure Data with Dosimetric and Health Effects Data to Generate Tabulations of Predicted Health Impacts, Oak Ridge National Laboratory, ORNL-5692 (August, 1981).
4. U.S. Environmental Protection Agency, Radionuclides: Background Information Document for Final Rules, Volume 1, EPA 520/1-84-022-1, 1984.

Table 1 Summary of emissions for FMPC<sup>a</sup>

		Emissions (Ci/yr) <sup>b</sup>									
U-234	U-235	U-238	Sr-90	Tc-99	Ru-106	Cs-137	Np-237	Pu-238	Pu-239	Pu-240	
9.1E-3	4.5E-4	9.7E-3	3.2E-4	1.2E-3	3.5E-4	1.9E-4	2.1E-5	1.5E-5	1.1E-4	1.1E-4	

<sup>a</sup> Comparison of doses between releases of uranium only and release of uranium plus other radionuclides listed.

<sup>b</sup> Uranium is assumed to be 60% W-solubility (moderately soluble in the lung) and 40% Y-solubility (insoluble).

Table 2 Doses and risks to the nearest resident at FMPC<sup>a</sup>

Nuclides <sup>b</sup>	Dose (millirem/year)				Lifetime fatal cancer risk <sup>f</sup>
	Whole-body <sup>c</sup>	Effective <sup>d</sup>	Bone <sup>e</sup>	Lung	
U only	2.1E-4	3.4E-1	9.0E-2	2.8E0	4.1E-6
U and others	2.2E-4	3.7E-1	3.9E-1	2.9E0	4.3E-6

<sup>a</sup> Nearest resident is 1128 m north. Effective and organ doses are 50-year dose commitments.

<sup>b</sup> 'Other' radionuclides includes Sr-90, Tc-99, Ru-106, Cs-137, Np-237, Pu-238, Pu-239, and Pu-240.

<sup>c</sup> Whole-body doses for uranium are from external pathways only, since uranium is not deposited throughout the whole-body. The whole-body dose from adding the other radionuclides includes internal doses from Cs-137 since it is considered a whole-body seeker.

<sup>d</sup> Based on ICRP organ weighting factors.

<sup>e</sup> Endosteal cells of the bone.

<sup>f</sup> This value is the probability of the nearest resident dying of cancer from this exposure.

Table 3 Doses and risks to the population<sup>a</sup>

Nuclides <sup>b</sup>	Dose (person-rem)			
	Whole-body <sup>c</sup>	Effective <sup>d</sup>	Bone <sup>e</sup>	Lung
U only	6.2E-3	8.9E0	2.4E0	7.3E1
U and others	6.6E-3	9.6E0	1.0E1	7.5E1

<sup>a</sup> Population within 80-km. Effective and organ doses are 50-year dose commitments.

<sup>b</sup> 'Other' radionuclides includes Sr-90, Tc-99, Ru-106, Cs-137, Np-237, Pu-238, Pu-239, and Pu-240.

<sup>c</sup> Whole-body doses for uranium are from external pathways only, since uranium is not deposited throughout the whole-body. The whole-body dose from adding the other radionuclides includes internal doses from Cs-137 since it is considered a whole-body seeker.

<sup>d</sup> Based on ICRP organ weighting factors.

<sup>e</sup> Endosteal cells of the bone.

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ENCLOSURE 15  
FLAT INGOT NO. 6 MILLING MACHINE  
PLANT 6  
FMPC #6-061

0001S3

Plant 6 - Flat Ingot Cutting No. 6 Milling Machine FMPC #6-061

See FMPC #6-064 since emission and dose calculations are the same.

Check Appropriate Box(es)

- Air Discharge
- Water Discharge to New Source Treatment Works
- Solid Waste Disposal Facility
- Hazardous Waste Disposal Facility

6201

PTI Application No. \_\_\_\_\_

Date Received \_\_\_\_\_

Premise No. \_\_\_\_\_

OHIO ENVIRONMENTAL PROTECTION AGENCY  
Application for Permit to Install

U. S. Department of Energy, Feed Materials Production Center  
Applicant's Name

P. O. Box E  
Mailing Address

<u>Oak Ridge</u>	<u>TN</u>	<u>37831</u>	<u>615/576-0845</u>
City	County	State	Zip Code Telephone Number

Ms. Margaret Wilson, Environ. Engineer, Environmental Protection Division 615/576-08  
Person to contact (Name and Title and Telephone Number)

The facility will be located within the production area of the DOE.  
Location of Proposed Facility (State the location as completely and precisely as possible)\*

Feed Materials Production Center, 7400 Willey Road

<u>Fernald</u>	<u>Hamilton</u>	<u>45030</u>
City or Township	County	Zip Code

Directions: A Permit to Install is required for new or modified sources of pollution under the provisions of OAC Rule 3745-31. An application cannot be considered complete unless all applicable questions are answered and the required information has been submitted. This application must be signed in accordance with OAC Rule 3745-31-04(B) or it cannot be accepted.

Applicants for permits involving air emissions or wastewater treatment facilities will be required to pay a permit to install fee as shown in Section 3745.11(B) and (C) of the Ohio Revised Code. This fee is payable fifteen days after the date of final issuance of the permit.

Name of new or modified source or facility: Plant 6 - Flat Ingot Cutting, Cinti. No. 6  
6-061

Product of new or modified source/facility: Uranium Billets

Will the proposed source/facility involve any of the following: Check all that apply.

- A.  Air Discharge
- B.  Wastewater Treatment Works
- C.  Solid Waste Disposal Facility
- D.  Hazardous Waste Disposal Facility

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\*Example: "The source will be constructed on a 20 Acre plot to be located on Franklin Township Road No. 17, approximately 1 1/4 miles north of the intersection of State Route 99 and Franklin Township Road No. 17"



Premise No.         
 Source No.         
 Application No.       

APPENDIX A, PROCESS

A-

PROCESS DATA

**6201**

1. Name of process Plant 6 - Flat Ingot Cutting - Cincinnati No. 6
2. End product of this process Machined Uranium Billets
3. Primary process equipment Milling Machine  
 Your identification Cincinnati No. 6 - Plant 6 Year Installed 1985
4. Manufacturer Cincinnati Milling Machine Make or model No. 6
5. Capacity of equipment (lbs./hr): Rated 930 (10 Ingots/8hrs) Max. 1200 (12 Ingots/8 hrs)
6. Method of exhaust ventilation:  Stack  Window fan  Roof vent  
 Other, describe \_\_\_\_\_  
 Are there multiple exhausts?  Yes  No

OPERATING DATA

7. Normal operating schedule: 24 hrs./day, 5 days/wk., 50 wks./year.
8. Percent annual production (finished units) by season:  
 Winter 25 Spring 25 Summer 25 Fall 25
9. Hourly production rates (lbs.): Average 930 Maximum 1200
10. Annual production (indicate units) 2790 tons (7500 Ingots)  
 Projected percent annual increase in production 10%
1. Type of operation:  Continuous  Batch
2. If batch, indicate Minutes per cycle 30 Minutes between cycles 18
3. Materials used in process:

List of Raw Materials	Principal Use	Amount (lbs./hr.)
Flat Uranium Ingots	Billets for Rolling	930

A PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit points of all raw materials, intermediate products, by-products and finished products. Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment.

CONTROL EQUIPMENT

Control Equipment Code:

- (A) Settling chamber
- (B) Cyclone
- (C) Multiple cyclone
- (D) Electrostatic precipitator
- (E) Fabric filter
- (F) Spray chamber
- (G) Cyclonic scrubber
- (H) Impingement scrubber
- (I) Orifice scrubber
- (J) Venturi scrubber
- (K) Plate or tray tower
- (L) Packed tower
- (M) Adsorber
- (N) Condenser
- (O) Afterburner - catalytic
- (P) Afterburner - thermal
- (Q) Other, describe \_\_\_\_\_

15. Control Equipment data:

Item	Primary Collector	Secondary Collector
(a) Type (See above code)	D	
(b) Manufacturer	American Air Filter	
(c) Model No.	E-2 Electromatic	
(d) Year installed	1960	
(e) Your identification	South ESP (EP6-3)	
(f) Pollutant Controlled	Particulates	
(g) Controlled pollutant emission rate (if known)	Particulates <10 lbs/yr.	
(h) Pressure drop	Not Known	
(i) Design efficiency	90%	
(j) Operating efficiency	90%	

STACK DATA

16. Your stack identification EP6-3
17. Are other sources vented to this stack?  Yes  No  
 If yes, identify sources 6-001, 6-002, 6-003, CMM 425-20, K&T A and K&T B
18. Type:  Round, top inside diameter dimension 47"  
 Rectangular, top inside dimensions (L) \_\_\_\_\_ x (W) \_\_\_\_\_
19. Height: Above roof 10 ft., above ground 25 ft.
20. Exit gas: Temp. 80 °F, Volume 14200 ACFM, Velocity 1200 ft./min.
21. Continuous monitoring equipment:  Yes  No  
 If yes, indicate: Type Continuous Sampler, Manufacturer NLO developed  
 Make or Model N/A, Pollutant(s) monitored Particulates
22. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
 If yes, check method:  Stack Test  Emission factor  Material balance

Completed by D.J. Carr, Date 4/16/87

The following information must be submitted on a separate piece of paper and attached to this application.

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FOR ALL PERMITS TO INSTALL

1. Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.
2. List the name and quantity of all materials and chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.
3. State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shutdown for \_\_\_\_\_ years? (State number of years)
4. Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.
5. Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U.S. EPA?

FOR AIR POLLUTION SOURCES

6. State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.
7. Are the proposed sources required to comply with the following federal requirements?
  - i. New Source Performance Standards (NSPS)
  - ii. National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - iii. Prevention of Significant Deterioration (PSD)
  - iv. Appendix "S" - Emission Offset Policy
8. Will the proposed sources employ best available technology?
9. Will the proposed sources cause the significant degradation of air quality?
10. Will the proposed sources interfere with the attainment and maintenance of the ambient air quality standards?
11. Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.
12. Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?
13. Complete and attach an anticipated construction schedule for each proposed source. (See attached).
14. Please include the estimated cost of any air pollution control equipment to be installed on the proposed sources.
15. An appendix for each air contaminant source must accompany this application. From the following description of the appendices, determine which should accompany your application.

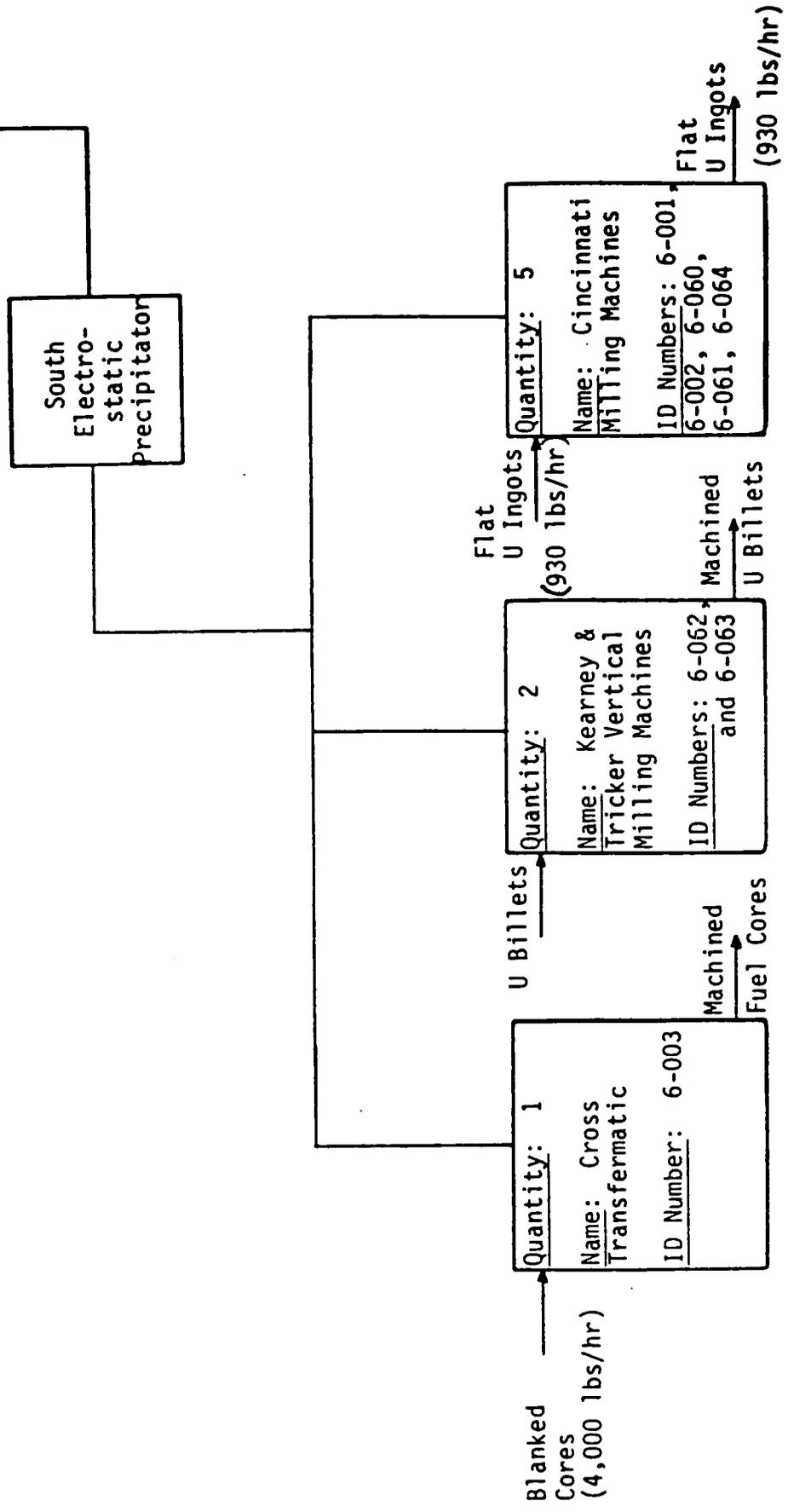
000199

1. The Feed Materials Production Center (FMPC) is government owned facility for the production of high pure uranium metal. NLO, Inc. operates the FMPC under contract to the U.S. Department of Energy Oak Ridge Operations Office (DOE-ORO). The Metals Fabrication Plant - Plant 6 at the FMPC is a large scale production facility for the heat treating, acid pickling and finish machining of uranium metal to produce finished fuel cores for offsite shipment. Additional capacity for cutting flat ingots is required in Plant 6. Two Cincinnati Milling Machine Cutoff Lathes are proposed to be installed in the plant. Flat uranium metal ingots will be supplied to the lathes at a rate of approximately 930 pounds per hour (each). The flat ingots will be cut to dimensions suitable for an offsite rolling operation. The lathes utilize a 30 to 1 water to soluble oil cutting fluid to assist in machining operations and reduce particulate and smoke emissions. The Cutoff lathes will be ventilated by an existing 14200 CFM American Air Filter Electrostatic Precipitator (South ESP) with a rated removal efficiency greater than 90 percent.
2. Flat uranium metal ingots will be supplied to the lathes at a rate of approximately 930 pounds per hour per machine.
3. The source is a proposed facility at the FMPC which has a potential to emit air contaminants to the atmosphere. The facility does not currently have a valid permit to install on file with the Ohio EPA.
4. No previous Ohio EPA application or plan submission has been filed for this source.
5. The source complies with all rules, laws and regulations of Ohio EPA and U.S. EPA.
6. Based upon estimates of smoke emissions from the existing Plant 6 Cutoff lathes (6-001 and 6-002) it is anticipated that the proposed Cincinnati Mill will emit less than one pound of particulate to the intake of the South EPA per 8 hour shift. <sup>Increases</sup> on emissions from the South ESP due to the addition of the four mills (K&T 550 TF20, Cincinnati Mill Machine No. 6 and 425-20) is expected to be negligible.
7. The source will be required to comply with the NESHAP guidelines for radionuclide emissions following final promulgation of the federal standard. See attached addendum.
8. The source will utilize best available technology with the usage of a high efficiency electrostatic precipitator for control of particulate emissions.
9. The source does not cause the significant degradation of air quality.
10. The source does not interfere with the attainment and maintenance of the ambient air quality standard.
11. The ESP is equipped with an NLO, Inc. developed continuous flow stack sampler. The sampler draws a continuous sample at an isokinetic rate from a fixed point within the exhaust stack. Collected samples are analyzed to determine both particulate (as needed) and radionuclide emission rates from the facility exhaust.
12. No
13. N/A
14. N/A

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EP6-3  
Stack Sampler

Plant 6 - Metals Fabrication Plant  
South Electrostatic Precipitator (EP6-3)



PROCESS FLOW DIAGRAM

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## ADDENDUM

### NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS SUBPART H NEW SOURCE COMPLIANCE DOCUMENTATION

Plant 6 - Flat Ingot Cutting , Cint. No. 6  
Source No. 6-061

#### General

Particulate emission estimates presented on Page A-2 of this application for the Plant 6 - Flat Ingot Cutting - Cincinnati No. 6 (Source 6-061) was made based on design efficiencies of control equipment and upon best engineering judgment. These are, however, extremely conservative estimates made for comparison with total particulate limits, which are for less stringent than the radionuclide limits.

For this reason, the particulate emission estimate in the PTI application was not used to estimate radioactive emissions, since the resulting dose estimate would be unrealistically high. For the dose modeling, the estimate of radionuclide emission from the source was based upon existing actual emissions data from emission point EP6-3 during the past two calendar years (1985 & 1986).

Measured emissions during 1985 and 86 from emission point EP6-3 are 0.0 kg U/year. This total was comprised of contributions from seven existing sources, including six new sources 6-001, 6-002, 6-060, 6-062 and 6-063 and one pre-1983 source 6-003.

Therefore, for emission point EP6-3 a 0.0 kg U/year value was used in the 1986 site-wide AIRDOS calculation for the six new sources and one Pre-1983 existing source 6-003.

#### Radiological Analysis For Entire Site

##### A. Description of Data Bases Used

Potential radiation doses to the nearest resident off-site individual and to the population within 80 km of the plant were calculated for all radionuclide emissions during calendar year 1986. The calculations were made using computerized dispersion modeling techniques developed under the sponsorship of the EPA (Ref. 1-3). In assessing radiation dose commitments from atmospheric releases of radionuclides, three computer codes were used in calculating doses and risks. The first of these codes is PREPAR (Ref. 1), a FORTRAN program designed to simplify the preparation of the input file for the AIRDOS-EPA computer code (Ref. 2). Default values for all variables are available in PREPAR so that the user need only to enter the data for which the defaults should be changed. In the case of the DOE facilities, only the variables for which site-specific data was available were changed (i.e., local population distribution, meteorology, location of nearest off-site individual, source terms, stack data). PREPAR utilizes two other programs, EXTRAC and RADLST, which

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create and write the input radionuclide file for PREPAR. PREPAR writes a data file which is read by AIRDOS-EPA and writes a report of those data values.

The second code in the series is AIRDOS-EPA (Ref. 2), a FORTRAN program for estimating radionuclide concentrations in air; rates of deposition on ground surfaces; ground surface concentrations; intake rates via inhalation of air and ingestion of meat, milk and fresh vegetables; and radiation doses to man from airborne releases of radionuclides. A modified Gaussian plume equation is used to estimate both horizontal and vertical dispersion of as many as 36 radionuclides released from stacks or area sources. Radionuclide concentrations in meat, milk and fresh vegetables consumed by man are estimated by coupling the output of the atmospheric models with the U. S. Nuclear Regulatory Commission, Regulatory Guide 1.109 terrestrial food chain models. Exposure modes include immersion in contaminated air, exposure to contaminated ground surfaces (through deposition), immersion in contaminated water, inhalation of radionuclides in air and ingestion of food produced in the area. Doses can be calculated for individuals as well as a collective group (i.e., population) and was intended for use as a routine assessment to (i.e., not for accidental releases).

The third code is DARTAB (Ref. 3), a computer code which combines radionuclide environmental exposure data (from AIRDOS-EPA output) with dosimetric and health effects data to generate tabulations of the predicted impact of radioactive airborne effluents. The dose factors used by DARTAB originated from the U. S. EPA Clean Air Act Amendment tapes of codes and dose factors. Their dose factors are based on Reference 4.

The source terms for the computer codes was based on actual stack emission data from FMPC during 1986. Since site specific meteorological data were not available until late in 1986, meteorological data from the Greater Cincinnati Airport was selected as being representative of the FMPC site and need in the computer models. Dose conversion factors were based on the International Commission on Radiological Protection (ICRP). Organ weighting factors used in estimating effective 50-year dose commitments are based on ICRP recommendation and are also those used by the EPA (Ref. 4). A whole-body dose equivalent was estimated for comparison with the NESHAP regulatory limit of 25 mrem/year, whole-body dose. The whole-body dose equivalent resulting from radionuclides that are not deposited throughout the body is zero for internal exposure. Thus, the whole-body dose equivalent from all radionuclide releases at FMPC results from external exposure only (i.e., ground deposition and immersion in air), with the exception of Cs-137 which is considered a whole-body seeker.

## B. Assumptions and Results

For the model calculations for emissions from the entire FMPC site, total emissions from the plant were assumed to be released from a single point located in the center of the production area. Source terms are included in Table 1. The radionuclides are released from a theoretical height of 16.1 m (stack diameter of .46 m and effluent velocity of 54 m/sec). The nearest off-site resident is 1128 m in the north direction. For population dose calculations, persons within a 50-mile radius of the facility are considered (based on 1980 census data). In this assessment, a particle size of 1 micron is assumed. Sixty percent of the source term

is assumed to be moderately soluble in the lung (W-solubility) while 40% is considered insoluble (Y-solubility). Fifty-year dose commitments are calculated for inhalation and ingestion pathways. Ingestion doses were calculated assuming that one-third of the consumed food was grown locally while two-thirds was imported from outside the 80-km region (i.e., uncontaminated). A gastrointestinal absorption fraction of 5% was used for the W-solubility calculations while the fraction was 0.2% for Y-solubility.

Doses from the release of uranium only were compared with those from the release of a few fission products (i.e., Sr, Tc, Ru, Cs) and transuranics (i.e., Np and Pu). The whole-body dose equivalents are included in Table 2. The total whole-body dose from uranium only is estimated to be  $2.1 \times 10^{-4}$  mrem radionuclides in the source term increases the dose to only  $2.2 \times 10^{-4}$  mrem. This dose is from external exposure from all of the nuclides except Cs-137 which deposits throughout the whole body.

Also included in Table 2 are the effective 50-year dose commitments and various organ doses which result from both internal and external exposure. Ingestion doses were calculated assuming that, for the nearest resident located 1128 m in the north direction, one-third of his food was grown in his own backyard while two-thirds was imported from outside the 80-km region (i.e., uncontaminated). The total effective 50-year dose commitment from uranium only is estimated to be 0.34 mrem. Inclusion of the other radionuclides increases this dose to only 0.37 mrem. The primary pathway of exposure is inhalation. The radionuclides contributing to the dose are primarily  $^{234}\text{U}$  and  $^{238}\text{U}$ .

For population doses, it was again assumed that one-third of the food consumed was grown locally while two-thirds was imported. The total whole-body dose equivalent to the population within 80-km was estimated to be  $6.2 \times 10^3$  person-rem from the other nuclides is 8.9 person-rem for uranium only and 9.6 person-rem with the other radionuclides included (Table 3).

### C. Radiological Analysis for The Plant 6 6-061 Source

An AIRDOS-EPA/DARTAB run for the Plant 6 Source (6-061) was not performed since its emission contribution (0.0 kg/year) was included in the 1986 site-wide dose calculations. The same computer codes and assumptions utilized for the entire site analysis was discussed in Section A.

Potential doses to the nearest resident as calculated by the models are shown in Table 2.

## C. REFERENCES

1. Sjoreen, A. L. and C. W. Miller, PREPAR - A User-Friendly Preprocessor to Create AIRDOS-EPA Input Data Sets, Oak Ridge National Laboratory, ORNL-5952 (August, 1984).
2. Moore, R. E., et al., AIRDOS-EPA: A Computerized Methodology for Estimating Environmental Concentrations and Dose to Man from Airborne Releases of Radionuclides, EPA 520/1-79-009. (December, 1979).
3. Begovich, C. L., et al., DARTAB: A Program to Combine Airborne Radionuclide Environmental Exposure Data with Dosimetric and Health Effects Data to Generate Tabulations of Predicted Health Impacts, Oak Ridge National Laboratory, ORNL-5692 (August, 1981).
4. U.S. Environmental Protection Agency, Radionuclides: Background Information Document for Final Rules, Volume 1, EPA 520/1-84-022-1, 1984.

Table 1 Summary of emissions for FMPC<sup>a</sup>

		Emissions (Ci/yr) <sup>b</sup>										
		U-234	U-235	U-238	Sr-90	Tc-99	Ru-106	Cs-137	Np-237	Pu-238	Pu-239	Pu-240
		9.1E-3	4.5E-4	9.7E-3	3.2E-4	1.2E-3	3.5E-4	1.9E-4	2.1E-5	1.5E-5	1.1E-4	1.1E-4

<sup>a</sup> Comparison of doses between releases of uranium only and release of uranium plus other radionuclides listed.

<sup>b</sup> Uranium is assumed to be 60% M-solubility (moderately soluble in the lung) and 40% Y-solubility (insoluble).

Table 2 Doses and risks to the nearest resident at FMPC<sup>a</sup>

Nuclides <sup>b</sup>	Dose (millirem/year)				Lifetime fatal cancer risk <sup>f</sup>
	Whole-body <sup>c</sup>	Effective <sup>d</sup>	Bone <sup>e</sup>	Lung	
U only	2.1E-4	3.4E-1	9.0E-2	2.8E0	4.1E-6
U and others	2.2E-4	3.7E-1	3.9E-1	2.9E0	4.3E-6

<sup>a</sup> Nearest resident is 1128 m north. Effective and organ doses are 50-year dose commitments.

<sup>b</sup> 'Other' radionuclides includes Sr-90, Tc-99, Ru-106, Cs-137, Np-237, Pu-238, Pu-239, and Pu-240.

<sup>c</sup> Whole-body doses for uranium are from external pathways only, since uranium is not deposited throughout the whole-body. The whole-body dose from adding the other radionuclides includes internal doses from Cs-137 since it is considered a whole-body seeker.

<sup>d</sup> Based on ICRP organ weighting factors.

<sup>e</sup> Endosteal cells of the bone.

<sup>f</sup> This value is the probability of the nearest resident dying of cancer from this exposure.

Table 3 Doses and risks to the population<sup>a</sup>

Nuclides <sup>b</sup>	Dose (person-rem)			
	Whole-body <sup>c</sup>	Effective <sup>d</sup>	Bone <sup>e</sup>	Lung
U only	6.2E-3	8.9E0	2.4E0	7.3E1
U and others	6.6E-3	9.6E0	1.0E1	7.5E1

<sup>a</sup> Population within 80-km. Effective and organ doses are 50-year dose commitments.

<sup>b</sup> 'Other' radionuclides includes Sr-90, Tc-99, Ru-106, Cs-137, Np-237, Pu-238, Pu-239, and Pu-240.

<sup>c</sup> Whole-body doses for uranium are from external pathways only, since uranium is not deposited throughout the whole-body. The whole-body dose from adding the other radionuclides includes internal doses from Cs-137 since it is considered a whole-body seeker.

<sup>d</sup> Based on ICRP organ weighting factors.

<sup>e</sup> Endosteal cells of the bone.

6201

ENCLOSURE 16  
FLAT. INGOT K&T A MILLING MACHINE  
PLANT 6  
FMPC # 6-062

000269

Plant 6 - Flat Ingot K&T A Vertical Milling Machine, FMPC #6-062

See FMPC #6-064 since emission and dose calculations are the same.

000210

Check appropriate Box(es)

- Air Discharge
- Water Discharge to New Source Treatment Works
- Solid Waste Disposal Facility
- Hazardous Waste Disposal Facility

6201

PTI Application No. \_\_\_\_\_

Date Received \_\_\_\_\_

Premise No. \_\_\_\_\_

OHIO ENVIRONMENTAL PROTECTION AGENCY  
Application for Permit to Install

U. S. Department of Energy, Feed Materials Production Center  
Applicant's Name

P. O. Box E  
Mailing Address

Oak Ridge	TN	37831	615/576-0845
City	County	State	Zip Code Telephone Number

Ms. Margaret Wilson, Environ. Engineer, Environmental Protection Division 615/576-08  
Person to contact (Name and Title and Telephone Number)

The facility will be located within the production area of the DOE.  
Location of Proposed Facility (State the location as completely and precisely as possible)\*

Feed Materials Production Center, 7400 Willey Road

Fernald	Hamilton	45030
City or Township	County	Zip Code

Directions: A Permit to Install is required for new or modified sources of pollution under the provisions of OAC Rule 3745-31. An application cannot be considered complete unless all applicable questions are answered and the required information has been submitted. This application must be signed in accordance with OAC Rule 3745-31-04(B) or it cannot be accepted.

Applicants for permits involving air emissions or wastewater treatment facilities will be required to pay a permit to install fee as shown in Section 3745.11(B) and (C) of the Ohio Revised Code. This fee is payable fifteen days after the date of final issuance of the permit.

Name of new or modified source or facility: Plant 6 - Flat Ingot Machining - K & T B  
6-063

Product of new or modified source/facility: Uranium Billets

Will the proposed source/facility involve any of the following: Check all that apply.

- A.  Air Discharge
- B.  Wastewater Treatment Works
- C.  Solid Waste Disposal Facility
- D.  Hazardous Waste Disposal Facility

000211

\*Example: "The source will be constructed on a 20 Acre plot to be located on Franklin Township Road No. 17, approximately 1 1/4 miles north of the intersection of State Route 99 and Franklin Township Road No. 17."

Premise No.             
 Source No.             
 Application No.           

APPENDIX A, PROCESS

PROCESS DATA

1. Name of process Plant 6 - Flat Ingot Machining - Kearney & Tricker B
2. End product of this process Machined Uranium Billets
3. Primary process equipment Vertical Milling Machine  
 Your identification K & T Vertical Mill B - Plant 6 Year Installed 1985
4. Manufacturer Kearney & Tricker Make or model 550 TF20
5. Capacity of equipment (lbs./hr): Rated 930 (10 Ingots/8hrs) Max. 1200 (12 Ingots/8hrs)
6. Method of exhaust ventilation:  Stack  Window fan  Roof vent  
 Other, describe \_\_\_\_\_  
 Are there multiple exhausts?  Yes  No

OPERATING DATA

7. Normal operating schedule: 24 hrs./day, 5 days/wk., 50 wks./year.
8. Percent annual production (finished units) by season:  
 Winter 25 Spring 25 Summer 25 Fall 25
9. Hourly production rates (lbs.): Average 930 Maximum 1200
0. Annual production (indicate units) 2790 tons (7500 Ingots)  
 Projected percent annual increase in production 10%
1. Type of operation:  Continuous  Batch
2. If batch, indicate Minutes per cycle 30 Minutes between cycles 18
3. Materials used in process:

List of Raw Materials	Principal Use	Amount (lbs./hr.)
Flat Uranium Ingots	Billets for Rolling	930

4. A PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit points of all raw materials, intermediate products, by-products and finished products, Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment.

CONTROL EQUIPMENT

6201

Control Equipment Code:

- (A) Settling chamber
- (B) Cyclone
- (C) Multiple cyclone
- (D) Electrostatic precipitator
- (E) Fabric filter
- (F) Spray chamber
- (G) Cyclonic scrubber
- (H) Impingement scrubber
- (I) Orifice scrubber
- (J) Venturi scrubber
- (K) Plate or tray tower
- (L) Packed tower
- (M) Adsorber
- (N) Condenser
- (O) Afterburner - catalytic
- (P) Afterburner - thermal
- (Q) Other, describe \_\_\_\_\_

15. Control Equipment data:

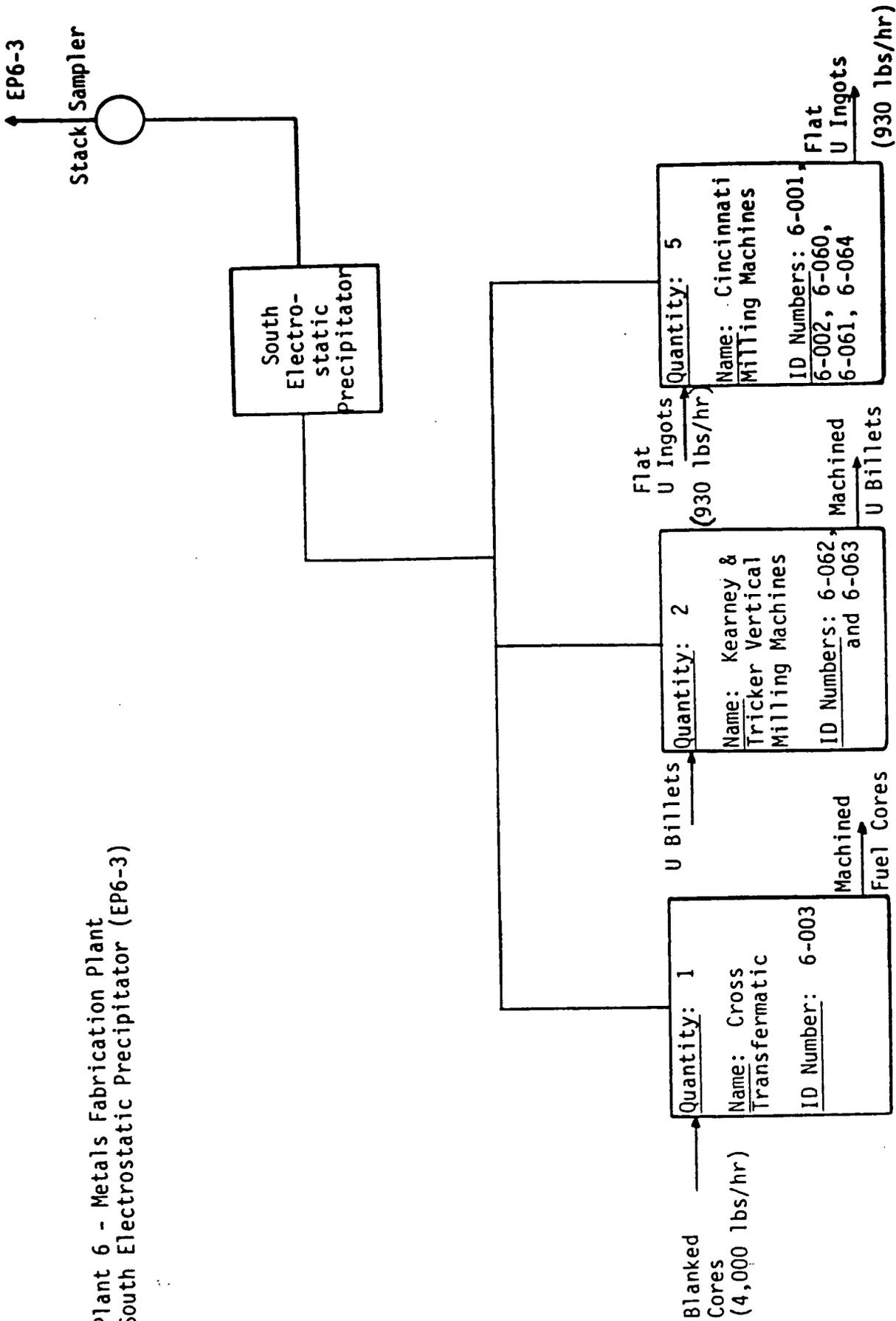
Item	Primary Collector	Secondary Collector
(a) Type (See above code)	D	
(b) Manufacturer	American Air Filter	
(c) Model No.	E-2 Electromatic	
(d) Year installed	1960	
(e) Your identification	South ESP (EP6-3)	
(f) Pollutant Controlled	Particulates	
(g) Controlled pollutant emission rate (if known)	Particulates <10 lbs/yr	
(h) Pressure drop	Not known	
(i) Design efficiency	90%	
(j) Operating efficiency	90%	

STACK DATA

16. Your stack identification EP6-3
17. Are other sources vented to this stack?  Yes  No  
 If yes, identify sources 6-001, 6-002, 6-003, CMM No. 6, CMM 425-20, K & T A
18. Type:  Round, top inside diameter dimension 47  
 Rectangular, top inside dimensions (L) \_\_\_\_\_ x (W) \_\_\_\_\_
19. Height: Above roof 10 ft., above ground 25 ft.
20. Exit gas: Temp. 80 °F, Volume 14200 ACFM, Velocity 1200 ft./min.
21. Continuous monitoring equipment:  Yes  No  
 If yes, indicate: Type Continuous Sampler, Manufacturer NLO developed  
 Make or Model N/A, Pollutant(s) monitored Particulates
22. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
 If yes, check method:  Stack Test  Emission factor  Material balance

Completed by D.J. Carr, Date 4/16/87

Plant 6 - Metals Fabrication Plant  
 South Electrostatic Precipitator (EP6-3)



PROCESS FLOW DIAGRAM

The following information must be submitted on a separate piece of paper and attached to this application.

FOR ALL PERMITS TO INSTALL

6201

1. Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.
2. List the name and quantity of all materials and chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.
3. State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shutdown for \_\_\_\_\_ years? (State number of years)
4. Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.
5. Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U.S. EPA?

FOR AIR POLLUTION SOURCES

6. State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.
7. Are the proposed sources required to comply with the following federal requirements:
  - i. New Source Performance Standards (NSPS)
  - ii. National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - iii. Prevention of Significant Deterioration (PSD)
  - iv. Appendix "S" - Emission Offset Policy
8. Will the proposed sources employ best available technology?
9. Will the proposed sources cause the significant degradation of air quality?
10. Will the proposed sources interfere with the attainment and maintenance of the ambient air quality standards?
11. Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.
12. Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?
13. Complete and attach an anticipated construction schedule for each proposed source. (See attached).
14. Please include the estimated cost of any air pollution control equipment to be installed on the proposed sources.
15. An appendix for each air contaminant source must accompany this application. From the following description of the appendices, determine which should accompany your application.

000215

1. The Feed Materials Production Center (FMPC) is a government owned facility for the production of high pure uranium metal. NLO, Inc. operates the FMPC under contract to the U.S. Department of Energy Oak Ridge Operations Office (DOE-ORO). The Metals Fabrication Plant - Plant 6 at the FMPC is a large scale production facility for the heat treating, acid pickling and finish machining of uranium metal to produce finished fuel cores for offsite shipment. Two Kearney and Trickler Model 550 TF20 Vertical Milling Machines are proposed to be installed in Plant 6. The Milling Machine will clean/plane the outer surfaces of flat uranium ingots. Flat ingots will be supplied to each mill at a rate of approximately 930 pounds per hour. The lathes utilize a 30 to 1 water soluble oil cutting fluid to assist in machining operations and reduce particulate and smoke emissions. The Cutoff lathes will be ventilated to an existing 14200 CFM American Air Filter Electrostatic Precipitator (South ESP) with a rated removal efficiency greater than 90 percent.
2. Flat uranium metal ingots will be supplied to the lathes at a rate of approximately 930 pounds per hour per machine.
3. The source is a proposed facility at the FMPC which has a potential to emit air contaminants to the atmosphere. The facility does not currently have a valid permit to install on file with the Ohio EPA.
4. No previous Ohio EPA application or plan submission has been filed for this source.
5. The source complies with all rules, laws and regulations of Ohio EPA and U.S. EPA.
6. Based upon estimates of smoke emissions from the existing Plant 6 Cutoff lathes (6-001 and 6-002) it is anticipated that the proposed Kearney and Tricker Mill will emit less than one pound of particulate to the intake of the South EPA per 8 hour shift.  
Increases on emissions from the South ESP due to the addition of the four mills (K&T 550 TF20, Cincinnati Mill Machine No. 6 and 425-20) is expected to be negligible.
7. The source will be required to comply with the NESHAP guidelines for radionuclide emissions following final promulgation of the federal standard. See attached addendum.
8. The source will utilize best available technology with the usage of a high efficiency electrostatic precipitator for control of particulate emissions.
9. The source does not cause the significant degradation of air quality.
10. The source does not interfere with the attainment and maintenance of the ambient air quality standard.
11. The ESP is equipped with an NLO, Inc. developed continuous flow stack sampler. The sampler draws a continuous sample at an isokinetic rate from a fixed point within the exhaust stack. Collected samples are analyzed to determine both particulate (as needed) and radionuclide emission rates from the facility exhaust.
12. No
13. N/A
14. N/A



**6201**

ENCLOSURE 17

FLAT INGOT K&T B MILLING MACHINE

PLANT 6

FMPC #6-063

**000218**

Plant 6 - Flat Ingot K&T A Vertical Milling Machine, FMPC #6-063

See FMPC #6-064 since emission and dose calculations are the same.

Check Appropriate Box(es)

- Air Discharge
- Water Discharge to New Source Treatment Works
- Solid Waste Disposal Facility
- Hazardous Waste Disposal Facility

6201

PTI Application No. \_\_\_\_\_

Date Received \_\_\_\_\_

Premise No. \_\_\_\_\_

OHIO ENVIRONMENTAL PROTECTION AGENCY  
Application for Permit to Install

U. S. Department of Energy, Feed Materials Production Center  
Applicant's Name

P. O. Box E  
Mailing Address

<u>Oak Ridge</u>	<u>TN</u>	<u>37831</u>	<u>615/576-0845</u>
City	County	State	Zip Code Telephone Number

Ms. Margaret Wilson, Environ. Engineer, Environmental Protection Division 615/576-08  
Person to contact (Name and Title and Telephone Number)

The facility will be located within the production area of the DOE.  
Location of Proposed Facility (State the location as completely and precisely as possible)\*

Feed Materials Production Center, 7400 Willey Road

<u>Fernald</u>	<u>Hamilton</u>	<u>45030</u>
City or Township	County	Zip Code

Directions: A Permit to Install is required for new or modified sources of pollution under the provisions of OAC Rule 3745-31. An application cannot be considered complete unless all applicable questions are answered and the required information has been submitted. This application must be signed in accordance with OAC Rule 3745-31-04(B) or it cannot be accepted.

Applicants for permits involving air emissions or wastewater treatment facilities will be required to pay a permit to install fee as shown in Section 3745.11(B) and (C) of the Ohio Revised Code. This fee is payable fifteen days after the date of final issuance of the permit.

Name of new or modified source or facility: Plant 6 - Flat Ingot Machining - K&T A  
6-062

Product of new or modified source/facility: Uranium Billets

Will the proposed source/facility involve any of the following: Check all that apply.

- A.  Air Discharge
- B.  Wastewater Treatment Works
- C.  Solid Waste Disposal Facility
- D.  Hazardous Waste Disposal Facility

000220

\*Example: "The source will be constructed on a 20 Acre plot to be located on Franklin Township Road No. 17, approximately 1 1/4 miles north of the intersection of State Route 99 and Franklin Township Road No. 17."

Premise No.         
Source No.         
Application No.       

APPENDIX A, PROCESS

PROCESS DATA

- 1. Name of process Plant 6 - Flat Ingot Machining - Kearney & Tricker A
- 2. End product of this process Machined Uranium Billets
- 3. Primary process equipment Vertical Milling Machine  
Your identification K & T Vertical Mill A - Plant 6 Year Installed 1985
- 4. Manufacturer Kearney & Tricker Make or model 550 TF20
- 5. Capacity of equipment (lbs./hr): Rated 930 (10Ingots/8hr) Max. 1200 (12 Ingots/8 hrs)
- 6. Method of exhaust ventilation:  Stack  Window fan  Roof vent  
 Other, describe \_\_\_\_\_  
Are there multiple exhausts?  Yes  No

OPERATING DATA

- 7. Normal operating schedule: 24 hrs./day, 5 days/wk., 50 wks./year.
- 8. Percent annual production (finished units) by season:  
Winter 25 Spring 25 Summer 25 Fall 25
- 9. Hourly production rates (lbs.): Average 930 Maximum 1200
- 10. Annual production (indicate units) 2790 tons (7500 Ingots)  
Projected percent annual increase in production 10%
- 1. Type of operation:  Continuous  Batch
- 2. If batch, indicate Minutes per cycle 30 Minutes between cycles 18
- 3. Materials used in process:

List of Raw Materials	Principal Use	Amount (lbs./hr.)
Flat Uranium Ingots	Billets for Rolling	930

4. A PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit points of all raw materials, intermediate products, by-products and finished products, Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment.

CONTROL EQUIPMENT

6201

Control Equipment Code:

- |                                |                          |                           |
|--------------------------------|--------------------------|---------------------------|
| (A) Settling chamber           | (G) Cyclonic scrubber    | (M) Adsorber              |
| (B) Cyclone                    | (H) Impingement scrubber | (N) Condenser             |
| (C) Multiple cyclone           | (I) Orifice scrubber     | (O) Afterburner - catalyt |
| (D) Electrostatic precipitator | (J) Venturi scrubber     | (P) Afterburner - thermal |
| (E) Fabric filter              | (K) Plate or tray tower  | (Q) Other, describe _____ |
| (F) Spray chamber              | (L) Packed tower         |                           |

15. Control Equipment data:

Item	Primary Collector	Secondary Collector
(a) Type (See above code)	D	
(b) Manufacturer	American Air Filter	
(c) Model No.	E-2 Electromatic	
(d) Year installed	1960	
(e) Your identification	South ESP (EP6-3)	
(f) Pollutant Controlled	Particulates	
(g) Controlled pollutant emission rate (if known)	Particulates <10 lbs/yr	
(h) Pressure drop	Not known	
(i) Design efficiency	90%	
(j) Operating efficiency	90%	

STACK DATA

16. Your stack identification EP6-3
17. Are other sources vented to this stack?  Yes  No  
If yes, identify sources 6-001, 6-002, 6-003, K&T B, CMM No. 6, CMM 425-20
18. Type:  Round, top inside diameter dimension 47"  
 Rectangular, top inside dimensions (L) \_\_\_\_\_ x (W) \_\_\_\_\_
19. Height: Above roof 10 ft., above ground 25 ft.
20. Exit gas: Temp. 80 °F, Volume 14200 ACFM, Velocity 1200 ft./min.
21. Continuous monitoring equipment:  Yes  No  
If yes, indicate: Type Continuous Sampler, Manufacturer NLO developed  
Make or Model N/A, Pollutant(s) monitored Particulates
22. Emission data: Emissions from this source have been determined and such data is included with this appendix:  Yes  No  
If yes, check method:  Stack Test  Emission factor  Material balance

Completed by D.J. Carr, Date 4/16/87

000222

The following information must be submitted on a separate piece of paper and attached to this application.

FOR ALL PERMITS TO INSTALL

1. Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.
2. List the name and quantity of all materials and chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.
3. State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shutdown for \_\_\_\_\_ years? (State number of years)
4. Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.
5. Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U.S. EPA?

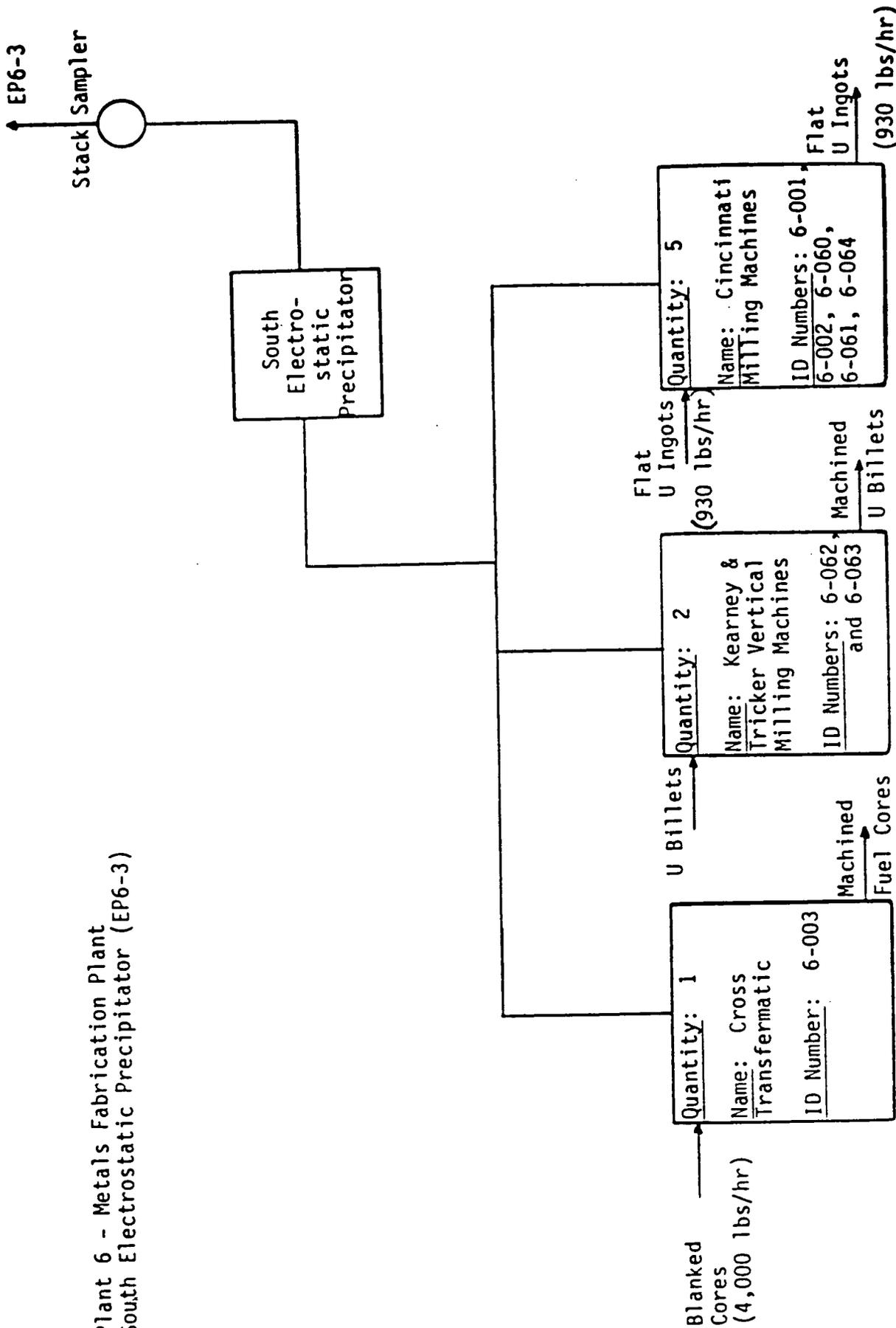
FOR AIR POLLUTION SOURCES

6. State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.
7. Are the proposed sources required to comply with the following federal requirements?
  - i. New Source Performance Standards (NSPS)
  - ii. National Emission Standards for Hazardous Air Pollutants (NESHAPS)
  - iii. Prevention of Significant Deterioration (PSD)
  - iv. Appendix "S" - Emission Offset Policy
8. Will the proposed sources employ best available technology?
9. Will the proposed sources cause the significant degradation of air quality?
10. Will the proposed sources interfere with the attainment and maintenance of the ambient air quality standards?
11. Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.
12. Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?
13. Complete and attach an anticipated construction schedule for each proposed source. (See attached).
14. Please include the estimated cost of any air pollution control equipment to be installed on the proposed sources.
15. An appendix for each air contaminant source must accompany this application. From the following description of the appendices, determine which should accompany your application.

000223

1. The Feed Materials Production Center (FMPC) is a government owned facility for the production of high pure uranium metal. NLO, Inc. operates the FMPC under contract to the U.S. Department of Energy Oak Ridge Operations Office (DOE-ORO). The Metals Fabrication Plant - Plant 6 at the FMPC is a large scale production facility for the heat treating, acid pickling and finish machining of uranium metal to produce finished fuel cores for offsite shipment. Two Kearney and Trickler Model 550 TF20 Vertical Milling Machines are proposed to be installed in Plant 6. The Milling Machine will clean/plane the outer surfaces of flat uranium ingots. Flat ingots will be supplied to each mill at a rate of approximately 930 pounds per hour. The lathes utilize a 30 to 1 water soluble oil cutting fluid to assist in machining operations and reduce particulate and smoke emissions. The Cutoff lathes will be ventilated to an existing 14200 CFM American Air Filter Electrostatic Precipitator (South ESP) with a rated removal efficiency greater than 90 percent.
2. Flat uranium metal ingots will be supplied to the lathes at a rate of approximately 930 pounds per hour per machine.
3. The source is a proposed facility at the FMPC which has a potential to emit air contaminants to the atmosphere. The facility does not currently have a valid permit to install on file with the Ohio EPA.
4. No previous Ohio EPA application or plan submission has been filed for this source.
5. The source complies with all rules, laws and regulations of Ohio EPA and U.S. EPA.
6. Based upon estimates of smoke emissions from the existing Plant 6 Cutoff lathes (6-001 and 6-002) it is anticipated that the proposed Kearney and Tricker Mill will emit less than one pound of particulate to the intake of the South EPA per 8 hour shift.  
Increases on emissions from the South ESP due to the addition of the four mills (K&T 550 TF20, Cincinnati Mill Machine No. 6 and 425-20) is expected to be negligible.
7. The source will be required to comply with the NESHAP guidelines for radionuclide emissions following final promulgation of the federal standard. See attached addendum.
8. The source will utilize best available technology with the usage of a high efficiency electrostatic precipitator for control of particulate emissions.
9. The source does not cause the significant degradation of air quality.
10. The source does not interfere with the attainment and maintenance of the ambient air quality standard.
11. The ESP is equipped with an NLO, Inc. developed continuous flow stack sampler. The sampler draws a continuous sample at an isokinetic rate from a fixed point within the exhaust stack. Collected samples are analyzed to determine both particulate (as needed) and radionuclide emission rates from the facility exhaust.
12. No
13. N/A
14. N/A

Plant 6 - Metals Fabrication Plant  
 South Electrostatic Precipitator (EP6-3)



PROCESS FLOW DIAGRAM

