



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

FILE NAME 331 Bldg.
RCHA
CERCLA

November 12, 1997

NMWMP - Hanford

NOV 25 1997

Mr. James E. Rasmussen, Director
Environmental Assurance, Permits,
Policy Division
Department of Energy
P.O. Box 550
Richland, WA 99352

Kennewick

Dear Mr. Rasmussen:

RE: Notice of Construction (NOC) Approval Order for Life Sciences
Laboratory Building 331 Modifications.

Your Notice of Construction (NOC) application for Life Sciences Laboratory Building 331 Modifications was received by the Department of Ecology's Nuclear Waste Program on July 28, 1997. The Department of Ecology notified Energy of minor deficiencies of the NOC on July 31, 1997. Energy resubmitted the NOC on October 23, 1997.

After reviewing and processing your application, a copy of the draft Approval Order was sent to Mr. Hector Rodriguez and Mr. Joe Nickel for their review and comments on November 5, 1997. Mr. Nickels discussed the draft Approval Order with Mr. Marcel Szyszkowski on November 10, 1997.

The approval of this application is enclosed for your use. Failure to meet the approval conditions may result in the revocation of this permit, the issuance of Notices of Violation, the imposition of civil penalties, and other civil or criminal actions as provided for in Chapter 70.94 RCW.

If you or your staff have any questions regarding this permit, please call Mr. Marcel Szyszkowski at (360) 407-7147.

Sincerely,

Michael A. Wilson, Manager
Nuclear Waste Program

MAW:djb
Enclosure

cc: Hector Rodriguez, USDOE
Al Conklin, WDOH



DEPARTMENT OF ECOLOGY

IN THE MATTER OF APPROVING A NONRADIO-)
ACTIVE AIR EMISSIONS NOTICE OF)
CONSTRUCTION FOR LIFE SCIENCES LABORATORY) APPROVAL ORDER
BUILDING 331 MODIFICATIONS FOR THE)
DEPARTMENT OF ENERGY, RICHLAND) No. 97NM-147

To: Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

On July 28, 1997, a Notice of Construction (NOC) was submitted by the U.S. Department of Energy (Energy), Richland, for Life Sciences Laboratory I Building 331 Modifications. The Department of Ecology (the Department) notified Energy of minor deficiencies of the NOC on July 31, 1997. Energy resubmitted the NOC on October 23, 1997.

In relation to the above, the Department of Ecology, State of Washington, pursuant to RCW 70.94.152, makes the following determination:

1. The proposed action will be in accordance with applicable rules and regulations, as set forth in chapter 173-400 WAC and 173-460 WAC, and the operation thereof, at the location proposed, will not result in ambient air quality standards being exceeded.
2. The proposed action will not have a significant adverse impact upon the environment.

THEREFORE, IT IS ORDERED that the project as described in said Notice of Construction is approved for construction and operation provided the following conditions are met:

1.0 TYPE OF PROPOSED ACTION

The Notice of Construction application addresses modifications to the Life Sciences Laboratory I (331 Building), which include removal and relocation of existing fume hoods and installation of new fume hoods. Demolition and renovation activities are being completed to accommodate relocation of existing research organizations located in other buildings. Once the modifications are completed, the research work relocated to the 331 Building will require a larger chemical inventory and potentially result in an increase of toxic air pollutants.

2.0 BACKGROUND INFORMATION

2.1 FUNCTION OF FACILITY

The function of the 331 Building is to provide research capabilities to study the health effects of chemicals and radiation and the uptake and transformation effects using radionuclides in soils, plants, and microorganisms and solutions. Current projects are being conducted to examine these effects in whole animals (rodents) and in cells grown in culture. Much of this work focuses on molecular

level changes and uses very small amounts of radioactive materials for tracing biological molecules.

2.2 LOCATION OF FACILITY

The 331 Building is located in the 300 Area within DOE's Hanford Site, approximately 4 km (2.2 miles) north of Richland, Washington, and 0.1 km (0.06 miles) west of the Columbia River, as shown in Figure 1 of the NOC. The site is bounded by the controlled-area fence of the 300 Area.

Address:

U.S. Department of Energy,
Richland Operations Office
P.O.Box 550
Richland, Washington 99352

Contact:

James E. Rasmussen, Director
Environmental Assurance, Permits
& Policy Division
(509) 376-5441

2.3 DESCRIPTION OF FACILITY

The approximate area of the 331 Building is 10,892 m² (117,240 ft²). The primary element is a three-story, reinforced concrete structure consisting of two laboratory floors with a mechanical-electrical services floor in between. Ventilation supply, exhaust equipment, and mechanical and electrical services are located on the second floor. Figures 2 and 3 of the NOC illustrate the first and third floor plans and highlight the areas of proposed modification, respectively.

2.4 OPERATION DESCRIPTION

The design and physical configuration of the 331 Building requires consideration of several research functional requirements that are unique to the operation of this facility. The organizations that will occupy the 331 Building include Environmental Microbiology, Thermodynamic and Molecular Geochemistry, Bioelectro Magnetics, Macromolecular Structure and Dynamics, Interfacial Geochemistry, Dosimetry, Molecular and Structural Biology Research Program, and Medical Isotope/Radioisotopes Program.

2.5 OPERATING MODE

Normal operations of the 331 Building occur during an 8-hour period of the day shift. The 331 Building has the potential to operate twenty-four hours per day.

3.0 PROJECT INFORMATION

3.1 DESCRIPTION OF THE MODIFICATION

Modifications to the 331 Building will include removal and relocation of existing fume hoods and installation of new fume hoods. The first floor inhalation suite (Room 170) will be modified into a single laboratory to meet the needs of the Environmental Microbiology Group. The modifications will involve construction of one large lab consisting of one glovebox, six chambers, and four 5-foot hoods. Three of the original laboratories 11 high efficiency particulate air (HEPA) filters will be removed, and the remaining existing

exhaust and HEPA filtration system will be used to support the new work. Rooms 109, 110, 112, and the metabolism rooms will also be modified to support the Actinide and Trace Metal Geochemistry Group.

The existing single-filtered exhaust system, which currently serves two fume hoods, will be reused to support the new labs' three 6-foot hoods. Rooms 101, 103, 107, 150, 152, and 156 will be modified to support the Actinide and Trace Metal Geochemistry Group.

The third-floor animal rooms (rooms 313 through 376) will be modified into eight general purpose chemistry labs to support the Molecular Biosciences Group. The existing animal and support spaces will be demolished to provide shell space for modification into new labs. Each new lab will have one 5-foot and one 6-foot fume hood, for a total of 16 hoods. The hoods will contain HEPA filtration and will be exhausted into the main building exhaust system. Nonradiological research will be performed in these general purpose chemistry labs.

These modifications will consist of a net increase of approximately 25 fume hoods, chambers, and gloveboxes. The overall airflow from the building will not change significantly, as only an increase of 4.25 m³/min (150 ft³/min) is expected.

3.2 VENTILATION AND EMISSIONS CONTROL SYSTEM DESCRIPTION

3.2.1 DESCRIPTION OF VENTILATION SYSTEM AND EMISSION ESTIMATION

Heating, ventilating, and air conditioning requirements within the laboratory areas of the 331 Building vary depending on the specific equipment and laboratory functional requirements. System design considers environmental conditions and cooling loads necessary to accommodate the research. The proposed modifications will not require establishment of a new emission point; however, the new fume hoods will be tied into the existing ventilation system. Figure 4 of the NOC illustrates in general terms the air flow from the laboratories, through the control equipment, and to the stack.

The 331 Building stack rises 17.8 m (58.8 ft) above the ground, and is 2.0 m (78 in.) in inside diameter.

The 331 Building structure is 15 m (49 ft) in height, 130 m (427 ft) wide, and 139 m (456 ft) long.

The annual average stack temperature is estimated to be 25°C (78°F). The annual average ambient air temperature is 12°C (53°F).

Nominal volumetric flow rate for stack (EP-331-01-S): 73,900 cfm (34.9 m³/s).

3.2.2 EXISTING CONTROLS

The 331 Building contains HEPA filter banks designed to collect radioactive particulate matter. The total particulate matter removal efficiency is >99.97%. The stack diameter inside is 2.0 m (78 in.). The release height above grade is 17.8 m (58.8 ft). The exit velocity is 11.3 m/s (37.1 ft/s). The stack temperature is 25°C (78°F) (yearly average).

4.0 DETERMINATION

Since the emissions from this modification are substantially below the ASILs and the lowest costs associated with any control is \$176,000/per ton of pollutant removed, the existing controls described in Section 3.2.2 are considered T-BACT.

5.0 APPROVAL CONDITIONS

1. Any activities permitted under this Approval Order are in conformance with the description of the project contained in the Notice of Construction submitted for Ecology approval and the generally applicable requirements of the State Implementation Plan.
2. A new Notice of Construction shall be filed if emissions of toxic air pollutants exceed the pounds per year Small Quantity Emission Rates (SQER) of WAC 173-460-080(2)(e), or it shall be on file at the 331 Building that T-SCREEN was run and that emissions were less than the Acceptable Source Impact Level (ASIL), in accordance with 173-460-080 (2) and (3). Results shall be on file at PNNL for inspection.
3. A new Notice of Construction shall be filed if emissions of criteria pollutants exceed the thresholds of Table 1.

TABLE 1. Threshold Pollutant Level for the 331 Building.

Pollutant	Tons/year
Carbon monoxide	20
Nitrogen oxides	8
Sulfur dioxide	8
Volatile organic compounds	8
Particulate matter	5
PM-10	3
Lead	0.12

All plans, specifications and other information submitted to the Department relative to this project and further documents and any further authorizations or approvals or denials in relation thereto shall be kept at the Nuclear Waste Program of the Department in the "Air Permitting" files and by such action shall be incorporated herein and made a part thereof.

Nothing in this approval shall be construed as obviating compliance with any requirements of law other than those imposed pursuant to the Washington Clean Air Act and rules and regulations thereunder. Authorization may be modified, suspended or revoked in whole or in part for cause including, but not limited to, the following:

1. Violation of any terms or conditions of this authorization;
2. Obtaining this authorization by misrepresentation or failure to disclose fully all relevant facts.

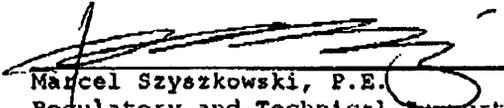
The provisions of this authorization are severable and, if any provision of this authorization, or application of any provision of this authorization to any circumstance, is held invalid, the application to any circumstance, is held invalid, the application of such provision to their circumstances, and the remainder of this authorization, shall not be affected thereby.

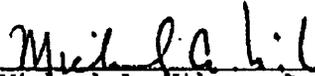
Any person feeling aggrieved by this Order may obtain review thereof by application, within 30 days of receipt of this Order to the Washington Pollution Control Hearings Board, P. O. Box 40903, Olympia, Washington 98504-0903. Concurrently, a copy of the application must be sent to the Department of Ecology, P.O. Box 98504-7600, Olympia, WA 98504-7600. These procedures are consistent with the provisions of Chapter 43.21B RCW and the rules and regulations adopted thereunder.

Dated at Lacey, Washington this 10th day of November, 1997.

PREPARED BY:

APPROVED BY:


Marcel Szyszkowski, P.E.
Regulatory and Technical Support Section
Nuclear Waste Program
Department of Ecology


Michael A. Wilson, Program Manager
Nuclear Waste Program
Department of Ecology