Department of Energy
Fermi Site Office
Post Office Box 2000
Batavia, Illinois 60510

JUL 15 2014

Ms. Martha E. Michels
Assistant Director for ESH&Q
Fermilab
P.O. Box 500
Batavia, IL 60510

Dear Ms. Michels:

SUBJECT: NATIONAL ENVIRONMENTAL POLICY ACT DETERMINATION AT FERMI NATIONAL ACCELERATOR LABORATORY – C-ZERO DETECTOR HALL AND NEUTRINO TARGET SERVICE FACILITY RENOVATION TO PROVIDE FOR A RADIOACTIVE MATERIALS STORAGE FACILITY

Reference: Letter, from M. Michels to M. Weis, dated July 9, 2014, Subject: National Environmental Policy Act Environmental Evaluation Notification Form for the C-Zero Detector Hall and Neutrino Target Service Facility Renovation to provide for a Radioactive Materials Storage Facility

I have reviewed the National Environmental Policy Act (NEPA) Environmental Evaluation Notification Form (EENF) for the C-Zero Detector Hall and Neutrino Target Service Facility Renovation to provide for a Radioactive Materials Storage Facility. Based on the information provided in the EENF, I have approved the following categorical exclusion (CX):

Project Name	Approved	CX
C-Zero Detector Hall and Neutrino Target Service Facility Renovation to provide for a Radioactive Materials Storage Facility	7/10/2014	B1.10, B1.15, B1.23

I am returning a signed copy of the EENF for your records. No further NEPA review is required. This project falls under categorical exclusions provided in 10 *CFR* 1021, as amended in November 2011.

Sincerely,

Michael J. Weis
Site Manager

Enclosure:
As Stated

cc: N. Lockyer, w/o encl.
T. Meyer, w/o encl.
A. Kenney, w/o encl.
T. Dykhuis, w/encl.

FERMILAB ENVIRONMENTAL EVALUATION NOTIFICATION FORM (EENF) for documenting compliance with the National Environmental Policy Act (NEPA), DOE NEPA Implementing Regulations, and the DOE NEPA Compliance Program of DOE Order 451.1B

Project/Activity Title: C-Zero (C-0) Detector Hall and Neutrino Target Service Facility (NTSF) Renovation to Provide for a Radioactive Materials Storage Facility
ES&H Tracking Number: 01127

I hereby verify, via my signature, the accuracy of information in the area of my contribution for this document and that every effort would be made throughout this action to comply with the commitments made in this document and to pursue cost-effective pollution prevention opportunities. Pollution prevention (source reduction and other practices that eliminate or reduce the creation of pollutants) is recognized as a good business practice which would enhance site operations thereby enabling Fermilab to accomplish its mission, achieve environmental compliance, reduce risks to health and the environment, and prevent or minimize future Department of Energy (DOE) legacy wastes.

Fermilab Action Owner: Ryan Schultz (X6571)
Signature and Date 7/3/14

Fermilab ES&H Officer: Sylvia Wilson (X4489)
Signature and Date 7/7/14

I. Description of the Proposed Action and Need

Purpose and Need:
In general, when a component fails in a target hall facility, it is placed locally in a temporary storage location (referred to as a 'morgue'). The Neutrinos at the Main Injector (NuMI) target hall morgue, for example has a capacity of no more than three components. Once the morgue is at full capacity, components must be moved to another facility to make room for the next failed component. During 2009-2012 C-0 Remote Handling Facility (C-0 RHF) was constructed to enable repair and processing of these radioactive components. It is outfitted with a 'hot cell' where a component can be remotely worked on via 'master-slave manipulators.' It also has three shielded storage bays to locally store these components. Presently, these three storage bays at C-0 RHF, as well as the NuMI target hall morgue, are at capacity and cannot accept any more components.

The purpose of the proposed action is to renovate the C-0 Detector Hall (C0 DH) Building and to upgrade the Neutrino Target Service Facility (NTSF) in order to provide needed storage space for radioactive components.

The two buildings are related because NTSF is currently the only building on site for long term storage of radioactive components. C-0 DH is therefore proposed as a second building that would become the primary location for long term storage of highly radioactive components. NTSF would still be used in the long term plan for radioactive component storage at Fermilab which requires both C-0 DH and NTSF to be utilized for at least the next decade. Larger components with higher radioactivity would be stored at C-0 DH, while smaller components with lower radioactivity would be stored at NTSF.

The upgrades to NTSF are necessary for better remote handling of these highly radioactive components. Reduced radiological exposure to workers is the primary motivation for the upgraded crane, remote cameras and lighting upgrades.

Proposed Action:
The required C-0 DH renovation would include dismantling and removing a 350-ton shield plug wall; removing Tevatron beamline components that are currently located in the room; re-routing various utilities such as heating ventilating and air conditioning, fire protection and low conductivity water piping; installing

a remotely operable 20-ton crane; constructing new walls; and installing additional lights. Many of the upgrades to the C-0 RHF, such as the redundant sump pumps and generators, would be utilized or extended into the new C-0 DH storage areas. All work in the C-0 DH would be interior, which is 3000 square feet.

The work would also include upgrading the NTSF, which would involve modernizing the bridge crane, adding remote handling cameras, and upgrades to lighting.

Alternatives Considered:
No other facilities at Fermilab would be suitable for this need in terms of space and infrastructure; other locations considered would require much more extensive upgrading with no offsetting environmental benefit. The proposed storage operations at C-0 DH would coincide and complement the current uses for the C-0 RHF. The C-0 DH was identified as the optimal location for a long term radioactive storage facility due to its existing infrastructure and close proximity to C-0 RHF. The 'no action' alternative would not meet the purpose and need.

II. Description of the Affected Environment

See section III and IV for further information.

III. Potential Environmental Effects (If the answer to the questions below is "yes", provide comments for each checked item and where clarification is necessary.)

A. Sensitive Resources: Would the proposed action result in changes and/or disturbances to any of the following resources?

- ☐ Threatened or endangered species
- ☐ Other protected species
- ☐ Wetland/Floodplains
- ☐ Archaeological or historical resources
- ☐ Non-attainment areas

B. Regulated Substances/Activities: Would the proposed action involve any of the following regulated substances or activities?

- ☐ Clearing or Excavation
- ☒ Demolition or decommissioning
- ☐ Asbestos removal
- ☐ PCBs
- ☐ Chemical use or storage
- ☐ Pesticides
- ☐ Air emissions
- ☐ Liquid effluents
- ☐ Underground storage tanks
- ☒ Hazardous or other regulated waste (including radioactive or mixed)
- ☒ Radioactive exposures or radioactive emissions
- ☐ Radioactivation of soil or groundwater

C. Other Relevant Disclosures: Would the proposed action involve any of the following actions/disclosures?

- ☐ Threatened violation of ES&H permit requirements
- ☐ Siting/construction/major modification of waste recovery or TSD facilities
- ☐ Disturbance of pre-existing contamination
- ☐ New or modified permits
- ☐ Public controversy

☐ Action/involvement of another federal agency
☐ Public utilities/services
☐ Depletion of a non-renewable resource

IV. Comments on checked items in section III.

Demolition or Decommissioning
Removal of the 350 ton plug wall that separates C-0 RHF from C-0 DH would be a substantial operation. The wall would be moved into the C-0 RHF and cut apart by a contractor who specializes in concrete demolition. The contractor would employ different methods to minimize dust during demolition. One such method is to use water to create a liquid effluent that captures the dust from cutting, another is to fracture the concrete instead of cutting it.

Disposition of Construction & Debris (C&D) waste would be coordinated by the Facility Engineering and Services Section Radiation Safety Officer. If possible, the subcontractor would dispose of all C&D waste with a recycling vendor and obtain a report, for submittal to Fermilab, on the amounts of material recycled.

Hazardous or other Regulated Waste
Depending on the results of the radioactive surveys, some demolition materials may be radioactive. Disposition of these materials would be coordinated by the Facility Engineering and Services Section Radiation Safety Officer. If the demolition material is radioactive, it would be stored at the Boneyard until it decays.

Although, unlikely, the debris from demolition of the shield plug wall may have radioactive contamination (from Tevatron operations). If so, it would be managed via the Environment, Safety, Health and Quality Section.

Radioactive exposures or emissions
NTSF and C-0 are currently used to store radioactive materials. Construction workers on this project could be exposed and therefore the Fermilab Radiation Control Manual (FRCM) would be followed and buildings would be surveyed prior to initiating work.

Concrete, iron, and lead shielding would be used to minimize exposure to personnel working in the area and radiological areas would be posted in accordance with the FRCM. To further reduce the potential for personnel exposures, shielding huts that are equipped with video monitoring would be provided for crane operators. The C-0 building itself is encased with concrete walls and flooring to provide radiation shielding, along with earth shielding beyond that. Concrete blocks would also be utilized within the room to shield workers and equipment (crane electronics) from radiation.

Radiation contamination would be minimized by using steel containers to store components in the C-0 DH. Components would be placed in these containers in the C-0 RHF, then moved into the C-0 DH. These components would be kept in place within C-0 DH so that the risk of radioactive contamination would remain very low. While these steel containers would contain radioactive contamination, they would not provide shielding. The outer walls of the C-0 DH room would therefore be the primary mechanism to prevent exposure to areas outside the C-0 RH room. A shielding assessment would be performed to determine how much steel or concrete would be necessary. It should be noted that the C-0 DH is an underground structure with over 20 feet of earth shielding (part of the former Tevatron beam enclosure) and thus, dose to uncontrolled areas is negligible.

The sump system in the C-0 RHF would need to be accessed to determine if it is adequate to provide for the C-0 RHF, or if modifications are required. The existing two-basin sump system was designed so any water from the building floor drains would flow to an isolated basin to allow sampling prior to release. A 150 kilowatt diesel generator provides power for the entire building in the event of an outage, thereby powering the presently installed duplex sump system. A back-up pump that is installed in the basin, also serves the exterior perimeter drain pipes. This pump, with isolated and dedicated controls and back-up power, has the capacity to independently clear the basin of water even during heavy infiltration events. A

concrete curb was installed around the sump basin, preventing potentially contaminated water from mixing with that being pumped to the outside. Should the water level on the building floor near the top of the curb, multiple redundant sensors would signal for all pumps to shut down and this would prevent contaminated water from leaving the building in the case of a flood event.

V. NEPA Recommendation

Fermilab staff has evaluated the proposed action and believe a Categorical Exclusion is appropriate. It is believed that the proposed action meets the description found in DOE's NEPA Implementation Procedures, 10 CFR 1021, Subpart D, Appendix B1.10 – *Onsite storage of activated material*, B1.15 – *Support Buildings,* and B1.23 – *Demolition and disposal of buildings*.

B1.10 "Routine, onsite storage at an existing facility of activated equipment and material (including, but not limited to, lead) used at the facility, to allow reuse after decay of radioisotopes with short half-lives.

B1.15 "Siting, construction or modification, and operation of support buildings and support structures (including, but not limited to, trailers and prefabricated and modular buildings) within or contiguous to an already developed area (where active utilities and currently used roads are readily accessible). Covered support buildings and structures include, but are not limited to, those for office purposes; parking; cafeteria services; education and training; visitor reception; computer and data processing services; health services or recreation activities; routine maintenance activities; storage of supplies and equipment for administrative services and routine maintenance activities; security (such as security posts); fire protection; small-scale fabrication (such as machine shop activities), assembly, and testing of non-nuclear equipment or components; and similar support purposes, but exclude facilities for nuclear weapons activities and waste storage activities, such as activities covered in B1.10, B1.29, B1.35, B2.6, B6.2, B6.4, B6.5, B6.6, and B6.10 of this appendix."

B1.23 "Demolition and subsequent disposal of buildings, equipment, and support structures (including, but not limited to, smoke stacks and parking lot surfaces), provided that there would be no potential for release of substances at a level, or in a form, that could post a threat to public health or the environment."

Fermilab NEPA Program Manager: Teri L. Dykhuis
Signature and Date Teri L Dykhuis 7/8/2014

VI. DOE/FSO NEPA Coordinator Review

Concurrence with the recommendation for determination:

Fermi Site Office (FSO) Manager: Michael J. Weis
Signature and Date 7/15/2014

FSO NEPA Coordinator: Rick Hersemann
Signature and Date Rick Hersemann 7/10/2014

VII. Appendix – Location of Various Facilities