

**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 Policy 451.1**

Project/Activity Title: Nevis Blocks Removal

ES&H Tracking Number: 01151

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: Bartosz Lipinski (x2524)

Signature and Date _____

I. Description of the Proposed Action and Need

Purpose and Need:

The Nevis Shielding Blocks ("Nevis blocks"), consisting mostly of concrete with various quantities of solid pieces of lead and other metals, were originally brought to Fermilab from the Nevis Laboratories in Irvington, New York in 1980 for experiment shielding. Over the years around 400 of the blocks, most notably in the Meson Detector Building and Kaons at the Tevatron Experiment Building, have been used for this purpose. The remaining blocks are in various states of weathering and radioactive decay and are being stored in the Nevis pole barn at the Railhead (see Section VII).

The purpose of the action is to dispose of the Nevis blocks, and this is needed because the longer the shielding blocks remain in storage, the greater the risk of the spread of contamination to the outside of the barn. Additionally, allowing rubble to continue to build up increases safety concerns regarding both access risks and possibly putting pressure on the barn walls which could result in a barn wall breach.

Proposed Action:

The scope of this project would be to dispose several of the blocks stored at the Nevis pole barn. Disposal of the blocks would be prioritized based on most hazardous to least hazardous characteristics. Nevis blocks stored at the Railhead inside of the Nevis Barn are in a progressive state of deterioration. Based on information gained from disassembly, characterization, and disposal efforts by Fermilab in 2003 through 2005, the major components of the blocks consist of lead, zinc, steel, and concrete. There are a little more than 200 blocks, about a third of which are reported to be radioactive. Over years of storage the shielding blocks have been deteriorating and, as a result, "block rubble" is being released from the shielding blocks. The rubble that has fallen onto the ground inside the barn and has accumulated to a point where access is extremely difficult and dangerous. Falling rubble has also created potential environmental issues, mixing with the gravel area both inside the barn and potentially surrounding area outside.

FNAL has approximately 205 Nevis Shielding Blocks (Nevis Blocks) that require waste characterization and disposal. The goal of the project would be to dispose of the Nevis Block inventory properly and safely with the blocks deemed most hazardous being prioritized for disposal.

The following services are required for the proposal from a subcontractor:

- Radiological and chemical characterization of wastes, including preparation of sampling and analysis plans, researching and compiling process knowledge review of data for regulatory classification. Ensure compliance with waste acceptance criteria.
- Define waste packaging requirements and packaging waste for transportation of waste.

- Coordinate transportation and transport the waste from Fermilab site to treatment site and/or waste disposal facility.
- Treatment and disposal of waste.

Additionally, the following elements shall be considered:

- The subcontractor would need to provide third party radiation safety, internal dosimetry, dosimetry and sampling (refer to attached Radiological ES&H Requirements).
- The subcontractor would need to provide third party industrial hygiene, occupational exposure sampling (refer to Industrial Hygiene Requirements).
- The subcontractor would also assess the NEVIS Barn surface for contamination and create a plan to abate.

Alternatives Considered:

Various preliminary disposal processes for the Nevis blocks have been considered and reviewed by the Integrated Project Team for the following factors:

- Health and Safety. For everyone's safety, it is best that the Nevis blocks are characterized and removed from the site with minimal to no intrusive methods used that could potentially disperse hazardous or radioactive materials leading to contamination of nearby areas and exposure to workers.
- Risk Management. Minimize the number of risk factors for the successful completion of the project.
- Practicality. What disposal process makes most sense to fulfill the project needs?
- Feasibility. How viable is the disposal process? Can all project requirements be met?
- Cost. What option is most cost effective?

Disposal process and material characterization requirements are to be designed by an Architectural and Engineering (A/E) consultant and the Nevis block disposal is to be performed by a subcontractor (refer to Section 3.3). Three alternatives were considered:

- Alternative 1 – Remove and dispose of the Nevis blocks as-is (without breaking them apart). Perform characterization of the Nevis blocks to meet the requirements and acceptance criteria of the end waste storage company. Package and ship the Nevis blocks to the end waste storage company.
- Alternative 2 – Break down the Nevis blocks into constituent components for characterization of materials similar to how five shielding blocks were disposed by Fermilab in 2003-2005. Depending on characterization findings, dispose of the materials as construction, hazardous, radioactive, or mixed waste. Package and ship the Nevis blocks to the end waste storage company.
- Alternative 3 – Continue to store Nevis blocks on site and maintain the Nevis pole barn storage facility.
- Alternative 4 – Offer the Nevis blocks to other laboratories for their shielding needs.

The first alternative would involve characterization of the Nevis block materials to meet disposal requirements including radioactivity, identifying radionuclides, and materials composition of the blocks by use of non-destructive testing or other least intrusive methods. The A/E consultant would identify the technical requirements necessary for safe disposal of the Nevis blocks and prepare the disposal process for the project. Five blocks had been characterized by Fermilab in 2003-2005 and the supporting documentation can be relied on for limited characterization of the block population. Depending on the designed disposal process, the blocks could be characterized into construction, hazardous, mixed waste, or some combination thereof if segregation of materials becomes possible. A sampling program may be developed by the A/E to characterize a statistically significant sample size of blocks to satisfy characterization requirements of the end waste storage company accepting and storing the blocks. After blocks are characterized, they would be packaged and shipped to the end waste storage company.

The second alternative consists of a subcontractor breaking down/disassembling the Nevis blocks into constituent components and packaging the material in DOT approved containers for disposal. The A/E

consultant would identify the technical requirements necessary for safe disposal of the Nevis blocks and prepare the disposal process for the project. Characterization of the materials would be conducted by a subcontractor during disassembly. Depending on the characterizations of the materials, they would be disposed of accordingly as construction, hazardous, or mixed waste. A similar method was used in 2003-2005 for the disposal of five shield blocks.

This second alternative is not preferred for several reasons, including:

- Risk to health and safety.
- Risk of contamination of the site.
- More complex disposal and packaging.
- Material is unlikely to be recyclable.
- High level of oversight required.
- High labor cost for disassembling the blocks.

The third alternative is to continue to store the Nevis block on site and maintain the Nevis pole barn storage facility. This third alternative is not preferred for several reasons, including:

- The blocks are over 40 years old and in various stages of deterioration.
- Some of the blocks contain radioactive and/or hazardous materials which, combined with the deterioration, can lead to site contamination.
- Cost escalation due to storage of the blocks, maintenance of the storage facility, and ultimate future disposal.

The fourth alternative is to poll other laboratories to determine if some of the Nevis blocks can be utilized by them. Some characterization of the blocks is going to be required in this approach and the extent would depend on the requirements of receiving laboratories. The number of unknowns with the blocks, such as radiation levels and composition, and the non-uniformity in the shape and size of the blocks, may complicate selection of blocks that are good candidates for shielding activities. This alternative can be investigated in tandem with the other alternatives.

Ultimately, the first alternative is preferred for many reasons, including:

- It maintains the integrity of the Nevis block materials, to the greatest extent possible, thus minimizing potential health and safety concerns that might be caused by intrusive work resulting in dispersible radioactive or hazardous waste materials.
- It is the least complex in terms of material handling requirements needed to package and safely transport the materials.
- It is the most cost-effective option.

Alternative 4 can be investigated in tandem and any blocks that are identified as good candidates for shielding activities at other laboratories can be shipped to those labs rather than being disposed of.

The 'No Action' alternative would not meet the purpose and need for this proposed activity.

II. Description of the Affected Environment

Specific environmental effects are presented in Section III.

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
- Noise that Exceeds Allowable Limits
- 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.

Chemical use or storage

The Nevis Barn is currently used to store lead and Class 1 Radioactive materials along with the Nevis Shielding Blocks.

Air Emissions

Depending on disposal process, generators at the Nevis Barn may be required. Transportation to the disposal facility by truck (or other) would be required for the Nevis Blocks.

Noise that Exceeds Allowable Limits

Depending on disposal process, equipment that exceeds acceptable noise levels may be used. If this occurs then measures would be taken to mitigate the noise, protect workers, and notify the Lab's neighbors.

Hazardous or other regulated waste (including radioactive or mixed)

The project would consist of disposal of the existing shielding blocks being stored at the Nevis Barn. Some of the blocks are radioactive, contain lead, and other metals. The materials have not been characterized as waste to date but would be as part of the project.

Radioactive exposures or radioactive emissions

Radioactive materials are stored within the Nevis Barn and disposal of the blocks would require characterization of the blocks, packaging, and transport.

V. NEPA Recommendation

Fermilab staff has evaluated the proposed action and believe that the following Categorical Exclusion applies. It is believed that the proposed action meets the description found in DOE's NEPA Implementation Procedures, 10 CFR 1021, Subpart D, Appendix B, as follows.

B1.10 Onsite Storage of Activated Material

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

B1.30 Transfer Actions

Transfer actions, in which the predominant activity is transportation, provided that (1) the receipt and storage capacity and management capability for the amount and type of materials, equipment, or waste to be moved already exists at the receiving site and (2) all necessary facilities and operations at the receiving site are already permitted, licensed, or approved, as appropriate. Such transfers are not regularly scheduled as part of ongoing routine operations.

Fermilab NEPA Program Manager: Teri L. Dykhuis

Signature and Date _____

VI. DOE/Fermi Site Office (FSO) NEPA Review

Based upon my review of information conveyed to me and in my possession concerning the proposed action, as NEPA Compliance Officer (as authorized under DOE Policy 451.1), I have determined that the proposed action fits within the specified class of actions, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

FSO NEPA Compliance Officer: Rick Hersemann

Signature and Date _____

VII. Diagram and Photos

Nevis Shielding Blocks



Existing Conditions at the Nevis Storage Barn



Example of Deteriorating Condition of a Nevis Shielding Block



GIS Representation of the Railhead; Building #849 is the Nevis Barn

