JAN 17 2013

Mr. Jack W. Anderson
Chief Operating Officer
Fermilab
P.O. Box 500
Batavia, IL 60510

Dear Mr. Anderson:

SUBJECT: NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) DETERMINATION AT FERMI NATIONAL ACCELERATOR LABORATORY (FERMILAB) – HYDROSTATIC RELIEF ACTION AT THE NEUTRINOS AT THE MAIN INJECTOR (NUMI)

Reference: Letter, from J. Anderson to M. Weis, dated January 16, 2013, Subject: NEPA Environmental Evaluation Notification Form (EENF) for the Hydrostatic Relief Action at NuMI

I have reviewed the Fermilab EENF for the Hydrostatic Relief Action at NuMI. Based on the information provided in the EENF, I have approved the following categorical exclusion (CX):

Project Name	Approved	CX
Hydrostatic Relief Action at NuMI	1/16/2013	B2.5

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: P. Oddone, w/o encl.
Y. - K. Kim, w/o encl.
N. Grossman, w/encl.
T. Dykhuis, w/encl.

bc: P. Siebach, CH-STS, w/encl.
M. McKown, CH-OCC, w/o encl.
J. Scott, FSO, w/o encl.
R. Hersemann, FSO, 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 451.1

Project/Activity Title: Hydrostatic Relief Action at NuMI (*Neutrinos at the Main Injector*, or NuMI, is a facility at Fermilab which creates an intense beam of neutrinos with the scientific goal of detecting and studying neutrino oscillations.)

ES&H Tracking Number: 01102

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 Lead: James Hylen (X2122)
Signature and Date James Hylen 1/15/2013

Fermilab ES&H Officer: Michael Andrews (X8472)
Signature and Date 1/15/13

I. Description of the Proposed Action and Need

Purpose and Need:
The purpose of the action is to relieve the hydrostatic pressure around the NuMI underground target hall and thereby decrease infiltration of water into the NuMI tunnel. The infiltration of moisture has resulted in an approximate doubling of moisture in the enclosure over the years. Infiltration of groundwater contributes to high humidity and results in increased tritium (short lived radioactive isotope of hydrogen) creation, which ultimately finds its way into the Industrial Cooling Water (ICW) system and the sanitary sewers. The high humidity interacting with the beam also results in increased acidity in the atmosphere and increased corrosion of equipment in the tunnel.

The need for this action is to decrease the humidity, and therefore, the production of tritium inside the target hall. Decreasing the level of tritium produced via this mechanism is in keeping with the Fermilab ALARA program (ALARA is an acronym for "as low as is reasonably achievable" which means making every reasonable effort to maintain exposure to ionizing radiation as far below dose limits as practical). A secondary need to protect experimental equipment from corrosion, which is accelerated by the lowered pH in the atmosphere, would also be met.

Proposed Action:
The action would involve drilling 3 shafts, each 3 inches in diameter, through the walls of the NuMI enclosure and into the water-bearing layer of fractured rock just outside the enclosure (see attached diagrams). The shafts would be slanted through this layer to increase the likelihood of intercepting adequate water flow. Each shaft would be approximately 10 feet in length and would be fitted with a valve at the enclosure wall to enable NuMI personnel to control and shut off the flow of groundwater as necessary. The water from outside the enclosure would eventually flow through the NuMI tunnel to the MINOS (*Main Injector Neutrino Oscillation Search,* or MINOS, is a particle physics experiment designed to study neutrino oscillations) experiment sump, and ultimately be pumped to the surface and injected into the ICW system. All wastes (i.e. drilling mud, cuttings, etc.) would be drummed and disposed of through the Fermilab Hazardous Waste Technology Team.

Alternatives Considered
Adopting the no action alternative would mean continuing to operate with high humidity and the resulting higher level of tritium production in the hall. A second possible alternative would be to install dehumidification equipment in the hall, but this is a much more costly alternative, and there is not adequate space available to accommodate the type of equipment that would be necessary. A third alternative would be to install much longer under drains along the length of the tunnel. This alternative would be prohibitively expensive.

II. Description of the Affected Environment

Work in the tunnel would be monitored by Accelerator Division ES&H personnel and all hearing protection measures would be implemented. All wastes generated by the action would be drummed and treated as regulated waste, as necessary. Non-regulated waste would be of very small volume (<10 cubic yards) and handled appropriately. Some of the waste (drilling mud, cuttings, etc.) may be sufficiently radioactive to be treated as radioactive waste. Such waste material would be drummed and processed through the Fermilab Hazardous Waste Technology Team. Because of the location of the action within the NuMI experimental areas, the only exposure to workers would be to those employees already trained as Radiation Workers. The sub-contracting personnel would all receive Radiation Worker training prior to their commencing the work. The work itself does not involve any additional radiation sources.

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
- ☐ Cultural resources, including 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
- ☒ Health, safety, or industrial hygiene issues

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.

Health, safety, or industrial hygiene issues
Work in the tunnel would be monitored by Accelerator Division ES&H personnel and all hearing protection measures would be implemented.

Hazardous or other regulated waste (including radioactive or mixed)
All wastes generated by the action would be drummed and treated as regulated waste, as necessary. Non-regulated waste would be of very small volume (<10 cubic yards) and handled appropriately.

Some of the waste (drilling mud, cuttings, etc.) may be sufficiently radioactive to be treated as radioactive waste. Such waste material would be drummed and processed through the Fermilab Hazardous Waste Technology Team.

Radioactive exposures or radioactive emissions
Because of the location of the action within the NuMI experimental areas, the only exposure to workers would be to those employees already trained as Radiation Workers. The sub-contracting personnel would all receive Radiation Worker training prior to their commencing the work. The work itself does not involve any additional radiation sources.

V. NEPA Recommendation

Fermilab staff have reviewed this proposed action and concluded that the appropriate level of NEPA determination is Categorical Exclusion. The conclusion is based on the proposed action meeting the description found in DOE's NEPA Implementation Procedures, 10 CFR 1021, Subpart D, Appendix B2.5 which states: "Safety and environmental improvements of a facility (including, but not limited to, replacement and upgrade of facility components) that do not result in a significant change in the expected useful life, design capacity, or function of the facility and during which operations may be suspended and then resumed. Improvements include, but are not limited to, replacement/upgrade of control valves, in-core monitoring devices, facility air filtration systems, or substation transformers or capacitors; addition of structural bracing to meet earthquake standards and/or sustain high wind loading; and replacement of aboveground or belowground tanks and related piping, provided that there is no evidence of leakage, based on testing in accordance with applicable requirements (such as 40 CFR part 265, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities" and 40 CFR part 280, "Technical Standards and Corrective Action Requirements for Owners and Operators or Underground Storage Tanks"). These actions do not include rebuilding or modifying substantial portions of a facility (such as replacing a reactor vessel)."

Fermilab NEPA Program Manager: Teri L. Dykhuis
Signature and Date Teri L. Dykhuis 1/16/2013

VI. DOE/FSO NEPA Coordinator Review

Concurrence with the recommendation for determination:

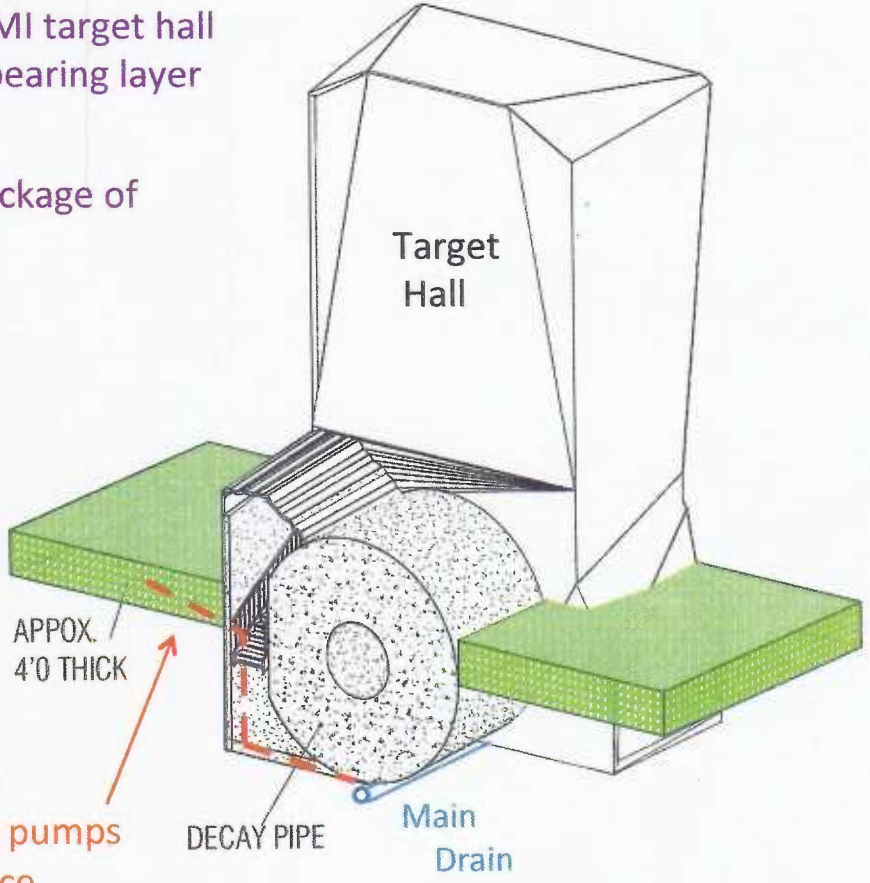
Fermi Site Office (FSO) Manager: Michael J. Weis
Signature and Date 1/17/2013

FSO NEPA Coordinator: Rick Hersemann
Signature and Date Rick Hersemann 1/16/2013

Under consideration for reducing NuMI tritium transport to sump

Reduce water pressure around NuMI target hall by giving drainage path for water-bearing layer

(crudely, compensate for some blockage of drain system)



NuMI target hall:

Vuggy Layer of high hydraulic conductivity in rock

Level that water had backed up to before the test wells were sealed

Drain gutters just worked on

Proposed drain pipe location