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

3/28/13

MAR 28 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 FOR THE GEOTECHNICAL INVESTIGATION OF THE LONG BASELINE NEUTRINO EXPERIMENT (LBNE) DETECTOR SITE IN SOUTH DAKOTA

Reference: Letter, from J. Anderson to M. Weis, dated March 21, 2013, Subject: NEPA Environmental Evaluation Notification Form (EENF) for the Geotechnical Investigation of the LBNE Detector Site in South Dakota

I have reviewed the EENF for the Geotechnical Investigation of the LBNE Detector Site in South Dakota. Based on the information provided in the EENF, I have approved the following categorical exclusion (CX):

Project Name	Approved	CX
Geotechnical Investigation of the LBNE Detector Site in South Dakota	3/27/2013	B3.1

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.

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: Geotechnical Investigation of LBNE Detector Site in South Dakota

ES&H Tracking Number: 01104

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 Project Owner: Elaine McCluskey (X2193)
Signature and Date Elaine McCluskey 3/20/2013

Fermilab ES&H Officer: Michael Andrews (X8472)
Signature and Date 3/20/2013

I. Description of the Proposed Action and Need

Purpose and Need:

The purpose of this project is to provide geotechnical monitoring information for the proposed Long Baseline Neutrino Experiment (LBNE) surface detector in Lead, SD. The project data would provide engineers with a geotechnical, hydrologic, and geochemical basis to design and construct a safe and dependable detector. The geochemical data would be used to analyze the potential for environmental impacts that would result from water coming into contact with rock excavated during the LBNE detector construction.

Proposed Action:

The proposed action would consist of a geotechnical investigation comprised of drilling up to 20 boreholes with an outside diameter of 6 inches within an area of approximately 10 acres (see attached map in Appendix A for the area location). The area subsurface is unconsolidated alluvium composed mainly of disturbed soils and lithics underlain by bedrock. Holes would be augered until failure, and as necessary, diamond drilled into bedrock to a depth of up to 200 feet; the diameter of the drilled holes in bedrock would be reduced to 3.75 inches. The activity would disturb an area of less than 2 acres. The study area has been disturbed repeatedly by mining activity, over the past 125 years, associated with the former Homestake mine. The proposed disturbance area is currently characterized by High Plain forest dominated by immature Ponderosa Pines, low density cover, thin soil horizons and mined rock. The work would require the creation of drill pads and drill cutting pits, the creation and improvement of two track roads, and minor trenching and test pitting. Drill holes, pad creation and roadwork would be performed by a bulldozer and backhoe. Some minor excavation may be necessary to provide adequate access to boring sites. The drillhole and cutting pits would be managed according to South Dakota regulations found at http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:11:08.

In addition, all drill fluids would be contained within pits. Surface water would be diverted around pits. Shallow capture moats (cupping) would be constructed around drill pads to collect runoff. All topsoil

would be removed from areas prior to disturbance, stockpiled and protected from storm water runon/runoff. All drill pads, pits, trenches, non-access roads would be stabilized within two weeks of work completion. Access roads and other un-reclaimed disturbance would fall under Sanford Laboratory's Storm Water Permit (Industrial SWD Permit SDR00507B) and the associated Storm Water Pollution Prevention Plan (SWPPP) Best Management Practices. Some drill holes may be completed for piezometer installation depending on depth to groundwater. These holes would be surveyed in and reported to the State of South Dakota.

Alternatives Considered:

This project would examine the general area proposed for the surface-based LBNE detector. This site was selected after considerations of science requirements and hydrologic, geologic and geochemical attributes to provide for safety, constructability, and minimal environmental impact. A No Action alternative would not fulfill the need, and would leave designers with inadequate data to either prepare a safe design, or understand potential impacts to water resources.

II. Description of the Affected Environment

This investigation would take place over a total area of approximately 10 acres; however, the total impacted area is less than 2 acres. It is a routine drilling operation, requiring some minor excavation to construct drill pads, access roads, etc. Boreholes would be up to 200 feet in depth, including into bedrock. There is no planned effluent. All materials would be contained at the site.

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.

Clearing or Excavation
Minor excavation would be required within the 2 acre project area to construct drill holes, cutting pits, drilling pads and access roads. Excavated material would be stockpiled, protected from run-off and used for restoration of the area after project completion.

Air Emissions
There may be possible minor internal combustion emissions from truck mounted drill rigs.

Hazardous or other regulated waste
Due to the nature of the past disturbance (mining), it is possible that hazardous materials may be encountered in the course of this project. In the event of encountering such a material all work would stop and competent and qualified person would be called upon to assess the nature of the hazard and possible cleanup requirements. Any encounter with a hazardous material impacting the environment would be immediately reported to the state of South Dakota, DOE and the NRC (if exceeding the RQ). Cleanup of a hazardous material would be performed in conjunction with the state of South Dakota and the approval of the DOE.

New or modified permits
This work could result in a storm water permit if it is determined that over two acres would be impacted (by South Dakota regulation). The projects source water would come from either Whitewood Creek or be trucked to the site from the city of Lead. Whitewood Creek source water would require a water rights permit to be obtained from the South Dakota Water Rights Division. There is no drilling permit required for this project from the state of South Dakota. This has been confirmed in writing.

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 B3.1 which states:

B3.1 Site characterization and environmental monitoring, (including but not limited to siting, construction, modification, operation, and dismantlement and removal or otherwise proper closure (such as of a well) of characterization and monitoring devices, and siting, construction, and associated operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis). Such activities would be designed in conformance with applicable requirements and use best management practices to limit the potential effects of any resultant ground disturbance. Covered activities include, but are not limited to, site characterization and environmental monitoring under CERCLA and RCRA. (This class of actions excludes activities in aquatic environments. See B3.16 of this appendix for such activities.) Specific activities include, but are not limited to: (a) Geological, geophysical (such as gravity, magnetic, electrical, seismic, radar, and temperature gradient), geochemical, and engineering surveys and mapping, and the establishment of survey marks. Seismic techniques would not include large-scale reflection or refraction testing; (b) Installation and operation of field instruments (such as stream-gauging stations or flow-measuring devices, telemetry systems, geochemical monitoring tools, and geophysical exploration tools); (c) Drilling of wells for sampling or monitoring of groundwater or the vadose (unsaturated) zone, well logging, and installation of water-level recording devices in wells; (d) Aquifer and underground reservoir response testing; (e) Installation and operation of ambient air monitoring equipment; (f) Sampling and characterization of water, soil, rock, or contaminants (such as drilling using

truck- or mobile-scale equipment, and modification, use, and plugging or boreholes); (g) Sampling and characterization of water effluents, air emissions, or solid waste streams; (h) Installation and operation of meteorological towers and associated activities (such as assessment of potential wind energy resources); (i) Sampling of flora or fauna; and (j) Archeological, historic, and cultural resource identification in compliance with 36 CFR part 800 and 43 CFR part 7.

Fermilab NEPA Program Manager: Teri L. Dykhuis
Signature and Date Teri L. Dykhuis 3/22/2013

VI. DOE/FSO NEPA Coordinator Review

Concurrence with the recommendation for determination:

Fermi Site Office (FSO) Manager: Michael J. Weis
Signature and Date 3/28/2013

FSO NEPA Coordinator: Rick Hersemann
Signature and Date Rick Hersemann 3/27/2013

Appendix A

The green polygon indicates the approximate area of the geotechnical investigations. The blue line is the boundary of the land owned by the South Dakota Science and Technology Authority.