



## Department of Energy

Fermi Area Office  
Post Office Box 2000  
Batavia, Illinois 60510

RECEIVED

OCT 2 2002

Environment,  
Safety & Health Section

SEP 30 2002

Mr. Gerald Brown, Associate  
Director for Operations Support  
Fermilab  
P.O. Box 500  
Batavia, IL 60510

SCANNED  
Posted on the ~~Web~~ *Server*  
Date 10/2/02

Dear Mr. Brown:

SUBJECT: NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) DETERMINATION AT  
FERMI NATIONAL ACCELERATOR LABORATORY - "RUN IIb D-ZERO  
DETECTOR PROJECT"

Reference: Letter, same subject, G. Brown to J. Monhart, dated 09/25/02.

I have reviewed the Fermilab Environmental Evaluation Notification Form (EENF) for the subject proposed project transmitted by your referenced letter. Based on the information provided in the EENF, I have approved the following project as a categorical exclusion (CX):

<u>Project Name</u>	<u>Approved</u>	<u>CX (s)</u>
Run IIb D-Zero Detector Project	09/27/2002	B3.10

I am returning a signed copy of the EENF for your records. No further NEPA review is required. This project falls under a categorical exclusion(s) provided in 10 CFR 1021, as amended in 1996.

Sincerely,

Jane L. Monhart  
Area Manager

Enclosure:  
Signed EENF

cc: M. Witherell, w/o encl.  
K. Stanfield, w/o encl.  
B. Chrisman, w/o encl.  
C. Trimby, w/o encl.  
J. Kotcher, PPD (MS-357), w/encl.  
B. Griffing, ESHS, w/encl.  
T. Dykhuis, ESHS, w/o encl.

## FERMILAB ENVIRONMENTAL EVALUATION NOTIFICATION FORM

**Project/Activity Title** Run IIb D-Zero Detector Project  
**ES&H Tracking Number** 01026 **Funding Source** Operating  
**Fermilab Project Manager** Jon Kotcher

**Signature** Jon Kotcher

**Date** 9/19/02

**Fermilab NEPA Reviewer** Teri L. Dykhuis

**Signature** Teri L. Dykhuis

**Date** 9/23/02

### I. Description of the Proposed Action

The Run IIb D-Zero Detector Project would involve construction of a new, more radiation-hard silicon detector for the D-Zero experiment that would replace the existing silicon detector and allow for operations at higher instantaneous and integrated luminosities. It would represent an increase in the overall scientific capabilities of the D-Zero experiment. The Project would also encompass upgrades and improvements to the existing Trigger and Data Acquisition systems. The Project does not include any building or structural modifications to the D-Zero Assembly Hall or D-Zero Experimental Hall. The Project would be carried out over the FY03-FY05 time frame.

The existing silicon vertex detector has a predicted, finite lifetime. Radiation damage arising from current operations will eventually render its inner layers inoperable. This is expected to occur following the delivery of 2-4 inverse femtobarns of integrated luminosity. If operations continue as predicted this luminosity would be reached by the beginning of FY06. Thus the existing detector should be replaced in that timeframe.

To accommodate the capabilities of this replacement detector, and the anticipated increases in the capabilities of the Tevatron accelerator complex that provides beam to the experiment, associated upgrades to the D-Zero trigger and data acquisition systems would also be essential.

The Project is necessary to enhance D-Zero's ability to produce forefront physics research, including high-priority scientific goals that include the search for the Higg's particle and physics beyond the Standard Model. The "No action" alternative would not fulfill the purpose/need of the activity. There are no other reasonable alternatives to replacing the silicon detector in order to meet the scientific goals of the experiment.

### II. Description of the Affected Environment

There are no conventional construction activities (i.e. excavation, building demolition or erection, roofing, etc.) involved with this Project. Construction and assembly of the detector would take place within existing facilities.

The existing silicon detector that would be removed and replaced as part of this project may be slightly radioactive at the time of its removal. It would be labeled, handled, and stored consistent with Laboratory and DOE requirements.

**III. Potential Environmental Effects** (Provide comments for each checked item and where clarification is necessary.)

A. Sensitive Resources: Will 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: Will the proposed action involve any of the following regulated substances or activities?

- Excavation
- Noise
- Asbestos
- PCBs
- Chemical storage or use
- Pesticides
- Hazardous, toxic or criteria air emissions
- Liquid effluents
- Underground storage tanks
- Hazardous waste
- Radioactive waste
- Radioactive exposures

C. Other relevant 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. NEPA Recommendation**

Fermilab has reviewed this proposed action and conclude that the appropriate level of NEPA determination is a Categorical Exclusion. The conclusion is based on the proposed action meeting the applicable requirements in DOE's NEPA Implementation Procedures, 10 CFR 1021, Subpart D, Appendix B3.10.

**V. DOE/CH-FRMI Group NEPA Coordinator Review**

Concurrence with the recommendation for determination:

NEPA Coordinator reviewer J. P. Cooper  
Signature Jonathan P. Cooper  
Date 9/27/02

Fermi Area Manager Jane Monhart  
Signature Jane S. Monhart  
Date 9/30/02

**VI. Comments on checked items in section III.**

**Radioactive Exposures**

Radiation exposure to workers would be kept to a minimum by use of Fermilab Radioactive Work Permits (RWP's) filled out by the PPD Radiation Safety Officer, as necessary. PPD Radiological Control personnel would monitor all work with Class 2 or higher radioactive materials. The requirements of the Fermilab Radiological Control Manual and all applicable DOE requirements would be followed.

**Radioactive Waste**

Some components of the existing silicon detector are made of beryllium, which also may be slightly radioactive upon removal from the collision hall. This would be determined by radiation surveys at the time of removal. The total quantity of beryllium in the existing detector is small. Should some of those components be radioactive, they would be labeled, handled, stored, and disposed of according to applicable Fermilab and DOE requirements.