

**U.S. Department of Energy
Finding of No Significant Impact and
Floodplain Statement of Findings**

**Environmental Assessment for the Construction and Operation of the Proton
Improvement Plan Project at Fermilab, Batavia, Illinois
(DOE/EA-2072)**

AGENCY: U.S. Department of Energy

ACTIONS: Finding of No Significant Impact and Floodplain Statement of Findings

SUMMARY

The Proton Improvement Plan-II (PIP-II) Project would help to advance our understanding of the basic physics of elementary particles called neutrinos. PIP-II is an essential upgrade to the existing particle accelerator complex at Fermi National Accelerator Laboratory (Fermilab) in Batavia, Illinois. The upgrade will enable Fermilab's accelerators to generate an unprecedented stream of neutrinos – subtle, subatomic particles that could hold the key to understanding the universe's evolution – by creating the world's most intense high-energy neutrino beams.

The Proposed Action is not located within a 100-year or 500-year floodplain. The U.S. Army Corps of Engineers (USACE) has determined that wetlands located in the Proposed Action are non-jurisdictional and no wetlands permit is required. The Environmental Assessment (EA) incorporates a Floodplain/Wetlands Assessment and the Department of Energy's (DOE's) floodplain findings pursuant to Title 10, *Code of Federal Regulations*, Part 1022 (10 CFR Part 1022), "Compliance with Floodplain and Wetland Environmental Review Requirements."

Based on the analysis in the EA, DOE has determined that the Proposed Action does not constitute a major federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act (NEPA). Therefore, the preparation of an environmental impact statement is not required and DOE is issuing this Finding of No Significant Impact (FONSI). The analysis is consistent with the analysis completed in the EA for the Long Baseline Neutrino Facility/Deep Underground Neutrino Experiment (LBNF/DUNE) Project conducted in 2015.

PUBLIC AVAILABILITY AND CONTACT INFORMATION

The FONSI and Final EA (DOE/EA-2072) are available on-line at:
<http://pip2.fnal.gov/env-assessment/>

For questions about this FONSI, the EA, or for further information regarding the PIP-II NEPA process or the DOE NEPA process in general, contact:

Rick Hersemann
U.S. Department of Energy
Fermi Site Office
P.O. Box 2000
Batavia, IL 60510-0500
Telephone: (630) 840-4122
E-Mail: rick.hersemann@science.doe.gov

DESCRIPTION OF THE PROPOSED ACTION

Proposed Action: Under the Proposed Action, Fermilab would construct facilities that would enhance the capabilities of Fermilab's existing particle accelerator to generate a proton beam with increased intensity. The increased beam power would reduce the time for existing and planned experiments to achieve world-class results as well as sustain high reliability operation of the Fermilab accelerator complex. The components of the Proposed Action would be constructed within the infield of Fermilab's Main Ring. The primary structures would include a Linac Tunnel, Linac Gallery, Beam Transfer Line, Utility Plant Building, Cryogenic Plant Building, High Bay Building, Utility Corridor, and Roadway and Parking Areas. Most of these facilities would be constructed underground to shield the surrounding environment from beamline radiation. The facilities and work areas would be housed in a series of underground tunnels and aboveground service buildings.

The Proposed Action would upgrade the neutrino beam production capabilities of Fermilab's accelerator complex to support a world-leading neutrino program, while maintaining high-reliability operations through the rejuvenation of aging systems within this complex and providing a platform for future enhancements. The Proposed Action would support the long-term development of a broad multi-megawatt neutrino program at Fermilab as future resources become available.

The Proposed Action would include implementation of Standard Environmental Protection Measures (SEPMs), such as post-construction re-vegetation, erosion control, and traffic control, as well as Best Management Practices (BMPs) and occupational health and safety and radiation safety programs.

The facilities would be designed for an expected lifetime of approximately 40 years. Since ultimate decommissioning, including potential repurposing, dismantling and disposal of radioactive and non-radioactive components would not occur for many years, it would be too speculative to evaluate future decommissioning impacts in this EA. Therefore, the environmental impacts of decommissioning would be evaluated in a future NEPA process.

Purpose and Need: The purpose of the PIP-II Project is to upgrade the existing proton beam power at the Fermilab accelerator complex to meet two main capability gap and mission need goals of DOE and Fermilab. The increased beam power would reduce the time for existing and planned experiments to achieve world-class results as well as sustain high reliability operation of the Fermilab accelerator complex. The need for higher proton beam power comes at a time when many components of the existing Fermilab accelerator complex are approaching 50 years in age.

The PIP-II Project would increase the production rates of neutrinos and reduce the time for the LBNF/DUNE Project to achieve world class results. Future experiments would also use the intense proton beam provided by the PIP-II Project to provide additional opportunities for basic research in other areas of physics. The PIP-II Project and ancillary experiments would further our understanding of neutrinos and their role in shaping our Universe.

Alternatives: As required by Council on Environmental Quality (CEQ) regulations, the PIP-II EA evaluates a No Action Alternative to serve as a basis for comparison with the action alternatives. Under the No Action Alternative, PIP-II would not be constructed and operated and the enhanced opportunities for neutrino research would not be pursued.

ENVIRONMENTAL IMPACTS

Land Use and Recreation

PIP-II is consistent with current Fermilab land use and its science mission. The Proposed Action facilities would not be visible from off-site locations, the Illinois Prairie Path, or the interpretive trail. Thus construction and operation of the Proposed Action would have very low impacts on existing or future onsite land uses at Fermilab or on the character or use of land in the surrounding community. Public access to Fermilab's open space and the recreational use of the Illinois Prairie Path on the Fermilab site would not change.

Biological Resources/Wetlands and Floodplains

The wetlands located on the proposed construction site have been determined to be non-jurisdictional by the USACE and do not require a permit. The proposed construction site is not located within a 100-year or 500-year floodplain. Operations would occur within the area previously disturbed by construction and would be designed to minimize exposure of biota to activated materials. With implementation of SEPMS and U.S. Fish and Wildlife Service requirements, biological resource impacts would be low during construction and operations. Temporary impacts on plants and animals would be minimized. There would be very low impacts on Federal or State protected species.

Cultural Resources

There are no known historic properties or paleontological resources in the proposed construction area. DOE has completed consultations with the Illinois State Historic Preservation Agency (IHPA) pursuant to Section 106 of the National Historic Preservation Act (NHPA). Fermilab maintains a Cultural Resource Management Plan

(CRMP). IHPA concurred with the findings of the CRMP. During construction, CRMP procedures would be implemented if cultural or paleontological resources are encountered during ground disturbance or excavation activities. During operation, activities would not typically require ground disturbance or excavation; therefore, operation of the Proposed Action would have very low impact on cultural or paleontological resources.

Health and Safety

During construction of the Proposed Action, the primary health and safety risk would be worker accidents and injuries. To minimize worker accidents and injuries and to protect the public and environment, construction activities would comply with Fermilab Integrated Safety Management System, the Fermilab Environment, Safety and Health Manual, relevant federal and state regulations, and pertinent building codes. There would be no new occupational or radiological health or safety impacts on worker or the public. Impacts would be similar to those from current activities. Operations would result in radiation exposure of less than the DOE standard to a limited number of workers and people authorized to enter the facility. Current Fermilab administrative annual dose goals would be observed. Work would be managed by existing policies that limit exposure to as low as reasonably achievable.

Hydrology and Water Quality

During construction of the Proposed Action, potential impacts on surface water hydrology and water quality may occur as the result of ground disturbances and associated stormwater runoff. The Proposed Action is not located within the 100-year or 500-year floodplain; therefore, construction and operation activities would have low impacts on flooding in the vicinity of the Proposed Action. Permits for managing stormwater would be obtained from the Illinois Environmental Protection Agency (IEPA). SEPMS would be implemented to manage surface water and groundwater and would be consistent with current operations and limited by permit conditions. Impacts to surface water and groundwater quality would be low.

Noise and Vibration

During construction, noise levels would temporarily increase but would diminish rapidly with distance. No blasting would be required; therefore, construction activities would not result in excess vibration and are not anticipated to increase noise levels above existing ambient conditions. Operational noise impacts would be low and limited to chillers and air handling equipment.

Transportation

Construction would result in a modest increase in the annual average daily traffic on public roadways near Fermilab. With implementation of traffic SEPMS, traffic volume and commensurate potential for accidents and injuries on public roads would be low. Operational traffic impacts would be low.

Air Quality

Air emissions from construction activities would be minimized by existing policies and would be temporary. Potential air emissions from operations, including radionuclides, would be controlled and monitored to ensure the emissions would be well below regulatory limits and Fermilab policy. Air quality impacts would be low.

Visual Resources

Construction activities would not be visible from off-site or on-site recreational areas. The aboveground buildings and facilities would be visible from Wilson Hall but would be landscaped comparable to existing buildings at Fermilab. Overall, visual impacts would be low.

Geology and Soils

During construction, up to 120,000 cubic yards (yd³) of soils would be removed and re-used or stored on site. SEPMs and a project-specific erosion control plan would be used to minimize soil erosion and stormwater runoff during construction activities. Operations would have very low impacts on soils or bedrock.

Socioeconomics and Environmental Justice

Construction and operation of the Proposed Action would have a marginally beneficial economic impact on the local construction and associated industries. The off-site communities proximate to the Proposed Action are neither low income nor disproportionately minority communities. Thus, environmental impacts would be low and borne equally by both minority and non-minority municipalities. Hence, there is no environmental justice concern.

Sustainability

Construction and operation would conform to the goals of Federal Executive Order (EO) 13834 "Efficient Federal Operations" to optimize energy and environmental performance, reduce waste, and cut costs. Fermilab's existing Site Sustainability Plan (SSP) and Environmental Management System (EMS) would implement these goals.

Utilities

Construction and operation of the Proposed Action would require additional power, water, wastewater treatment, and natural gas resources, which would be within the capacity of the local utility providers. The power required for construction followed by 40 years of operation would not exceed power or distribution system capacity of the local utility company. Thus, impacts on local utility providers would be low.

Waste Management

Construction activities would generate debris, which would largely be recycled. Operation of PIP-II would generate domestic and regulated waste that would be managed according to existing regulations and Fermilab policies. Waste minimization practices would be observed and compliance with waste management standards maintained.

Cumulative Impacts

Projects with potential cumulative impacts include those existing or planned on the Fermilab site (e.g., LBNF/DUNE) or in the immediate area. Cumulative impacts would be minimized through implementation of Fermilab's existing environmental health and safety regulatory programs, sustainability guidelines, SEPMS, BMPs, and compliance with relevant Federal, state, and local laws and requirements. Overall, the Proposed Action is anticipated to result in low cumulative impacts.

PUBLIC COMMENT ON THE DRAFT EA

In October 2018, DOE announced via letters to various stakeholders, press release, and the PIP-II project website the availability of the draft PIP-II EA for comment. The comment period on the PIP-II EA was held from October 15 to November 15, 2018.

Mechanisms for submitting formal comments included letter and e-mail. A total of five comments were received. Appendix D was added to the EA to document the comments and respond to them. Primary concerns were related to construction activities. Most of the commenters expressed support for the project and the associated science program. No edits or clarifications to the EA were required.

DETERMINATION

The PIP-II EA is hereby approved. Based on the analysis contained therein and consideration of public comments received on the draft PIP-II EA, DOE has determined that the Proposed Action would not individually or cumulatively have a significant effect on the quality of the human environment within the meaning of NEPA. Therefore, it does not constitute a major federal action within the meaning of NEPA, and an environmental impact statement is not required. DOE has determined that its 10 CFR 1021 and 1022 Floodplain and Wetland Environmental Review Requirements as well as Section 106 of the NHPA have been satisfied. With this determination, DOE may proceed with the PIP-II Proposed Action.

Authorization is contingent upon the following:

1. To avoid or minimize potential impacts during construction, site preparation work requiring the removal of trees and prairie vegetation will be conducted outside the typical nesting, foraging, and roosting season for birds, bats, and bumble bees.
2. Receipt of any other necessary regulatory authorizations or permits.
3. Compliance with the CRMP.

Issued in Batavia, Illinois, this 25th day of January 2019.



Michael J. Weis
U.S. Department of Energy, Fermi Site Office Manager