



## Fermilab Environmental Review Form Ver. 09/20/2006

*The purpose of providing this information is to establish the appropriate level of environmental review for the project/activity. The information below includes both construction and operation phases of the project/activity if applicable. Please consider any known regulatory permits that may be required for each phase.*

### Project Information

**Date:** 09/15/2022

**Project Activity/Title:** E1039/SpinQuest Experiment in NM4/KTeV facility

**Project Number/Identifier:** 2022-21451

**Project Enter Date:** 09/09/2022

**Project Owner:** 12680N - Rick Tesarek

### **Purpose & Need:**

E1039/SpinQuest Experiment to probe the spin structure of the proton using 120 GeV protons from the Fermilab Main Injector incident on a spin polarized target of solid ammonia. The reaction products of muon pairs are detected and analyzed using an existing magnetic spectrometer used previously by the E906/SeaQuest experiment.

### **Alternative Analysis:**

No. The intent is to leverage the use of the existing E906/SeaQuest spectrometer and beamline. Other facilities would be prohibitively expensive.

### **Project/Activity Description:**

SpinQuest/E1039 experiment re-uses the existing SeaQuest/E906 spectrometer, beamline and beam dump. New/improved shielding is installed along with a new helium liquefaction plant to support the new superconducting magnet and new solid ammonia target. Construction also includes minor reconfiguration of the experimental hall electrical distribution and low conductivity water piping to provide electrical power and cooling water for the above equipment .

The experiment re-uses the previous experiment SeaQuest/E906 (EENF-01083 signed 21 May 2010) New items specific to the SpinQuest/E1039 experiment are cataloged below.

### **Impacted Groups:**

AD

CCD

CD

PPD

# Potential Environmental Effects

## Air Emissions

*(Systems containing any refrigerants, regardless of volume, portable or permanent electrical generators, boilers or other sources of gaseous emissions, such as any internal combustion engines)*

*Systems that contain refrigerants, regardless of volume - Yes*

*Other Air Emission Sources - Yes*

Possible new air emission sources:

Ammonia gas

Helium gas

Existing air emission sources:

Argon-methane-carbon-hexafluoride gas mixture

Nitrogen gas

## Waste

*(Indicate whether C and D waste will be disposed of in a landfill or recycled, either by Fermilab or a commercial recycling vendor)*

*Will any waste materials be generated by this project? - Yes*

*Will this project generate any hazardous, radioactive, Illinois Special, mixed or otherwise regulated waste? (All regulated waste must be manifested through the ESH&Q Section Hazard Control Technology Team (HCTT). Contact HCTT at extension 4498 for information.) - Yes*

*Will the waste materials contain any amount of metal? - Yes*

Ammonia

Misc. materials including metals, plastics, concrete, oil.

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## Metal Removal

I Don't Know

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## Clearing and/or Excavation (est. area, vol., disposition)

*(Estimate the area to be affected, volume of spoils, expected, disposition of spoils, and soil erosion control measures.)*

## Asbestos

*(Indicate how any asbestos will be remediated)*

## PCBs

*(processing, transport, disposal, or removal)*

## Chemical use or storage

*(Has the affected area ever been used as a chemical dispensing area, waste or product storage area, or been the site of any chemical spills?)*

*Does the area involve a solid waste management Unit?)*

*List and characterize any chemicals to be used in this action. - Yes*

Ammonia

Ethanol

Isopropanol

Epoxies

## Radiation

*Is any worker, Fermilab employee or member of the public likely to be exposed to radiation during the construction, operation or eventual demolition of this project? - Yes*

Experimenters and Fermilab personnel will have limited exposure to beam activated equipment and shielding. We practice As Low As Reasonably Achievable (ALARA) for all radiation exposures to personnel.

### **Liquid Effluent**

*(including sanitary sewer, soil, or surface water)*

### **Oil Use/Storage**

2. Will the project involve the use of any oil filled equipment? - Yes

a) Will it be a new source? - Yes

Several new vacuum pumps will contain a combined total of approximately 10 gallons of oil.

### **Project Site**

Deplete any non-renewable resources? - Yes

Some helium (non-renewable resource) will be lost to the atmosphere.

### **Other**

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## **Disposition by Fermilab Environmental Reviewer**

Appendix A Action: NO

Actions Included in Previous NEPA: YES

Generic CX: NO

CX Number: N/A

Date of Review: 09/15/2022

DOE Determination Required: NO

Date Sent to ES&H: N/A

Comments: This activity is approved via the SeaQuest CX approval.

Fermilab Environmental Reviewer:12482N - Teri Dykhuis

*No attachments found for this project.*