

ENVIRONMENTAL EVALUATION NOTIFICATION FORM

Grantee/Contractor Laboratory: Princeton University/Princeton Plasma Physics Laboratory (PPPL)

Project/Activity Title: Tritium System Demolition & Disposal (revised 11/2020)

CH NEPA Tracking No.: _____ Type of Funding SC

B&R Code: _____ Total Estimated Cost: \$ 33.4 million

DOE Cognizant Secretarial Officer (CSO): Marc Jones

Contractor Project Manager: _____ Signature: _____

Date: _____

Contractor NEPA Reviewer: Dorothy M. Strauss Signature: _____

Date: _____

I. Description of Proposed Action:

The tritium processing systems and neutral beam injection equipment used during the 1990's Deuterium-Tritium (D-T) experiments for the Tokamak Fusion Test Reactor (TFTR) are aging, contain about 15,000 Curies of residual tritium in components, and are not planned for future use. This project would remove and dispose of the components of these tritium systems, including glove boxes, fume hoods, gas holding tanks, tritium purification system (TPS) process piping, (all located in the tritium area in the D-Site basement), one neutral beam box (of three located in the TFTR test cell), contaminated HVAC ductwork (from both locations), and control room components (located separately in the D-Site basement). Excepting the control room components, which would be recycled or disposed of as domestic waste, these components bear low levels of tritium contamination and would be disposed of as low-level radioactive waste at a DOE-approved disposal site. The two remaining neutral beam boxes would be moved out of the TFTR Test Cell and exhausted to the existing monitored D-Site stack. Parts from these retained neutral beam boxes would remain stored within the boxes. Removal activities are anticipated to result in airborne tritium releases to the existing monitored stack that are expected to be less than 100 Curies/year, and tritium releases of less than 1 Curie/year in liquid form through the existing PPPL liquid effluent collection tank (LECT) system to the municipal sanitary sewer system. These releases would result in a peak annual dose to the maximum exposed individual (MEI) of <0.1 mrem/year. A theoretical release of the entire tritium inventory of 15,000 Curies would result in a peak dose to the maximum exposed individual of 24 mrem. These doses are small fractions of the average annual background dose of 600 mrem/year from all radiation sources.

This project would result in a savings of approximately \$350,000/year in operational costs for radiological monitoring, compliance, and oversight while making available approximately 5,000 GSF of high value research space. This work would be conducted by subcontracted industry experts subject to PPPL oversight.

II. Description of Affected Environment: D-Site, TFTR Test Cell and Basement (see attached maps and figures).

PPPL is located on Princeton University's James Forrestal Campus in Plainsboro Township, Middlesex County (central New Jersey), adjacent to the municipalities of

Princeton, Kingston, East and West Windsor, and Cranbury, NJ. It occupies approximately 90.83 acres in the areas known as “C- and D-Sites.” PPPL has operated on the current site since 1959. The closest urban centers are New Brunswick, 14 miles (22.5 km) to the northeast, and Trenton, 12 miles (19 km) to the southwest. Within a 50-mile (80 km) radius are the major urban centers of New York City, Philadelphia, and Newark. Princeton University’s main campus is approximately three miles west of the site, primarily located within the borough of Princeton.

The estimated resident population within 10 miles (16 km) of PPPL is approximately 500,000. The total estimated population within a 50-mile radius (80km) of PPPL is approximately 17,735,164.

Surrounding the site are lands of preserved and undisturbed areas including upland forest, wetlands, open grassy areas, and a minor stream, Bee Brook, which flows along PPPL’s eastern boundary. These areas are designated as open space in the James Forrestal Campus (JFC) site development plan.

The climate of central New Jersey is classified as mid-latitude, rainy climate with mild winters, hot summers, and no dry season. Temperatures may range from below zero to above 100 degrees Fahrenheit (°F) (-17.8° Celsius (C) to 37.8° C); extreme temperatures typically occur once every five years. Approximately half the year, from late April until mid-October, the days are freeze-free. Normally the climate is moderately humid with a total average precipitation of about 46 inches (116 cm) evenly distributed throughout the year.

III. **Potential Environmental Effects:** (Attach explanation for each "yes" response, and "no" responses if additional information is available and could be significant in the decision-making process.)

A. Sensitive Resources: Will the proposed action result in changes and/or disturbances to any of the following resources?

	<u>Yes/No</u>
1. Threatened/Endangered Species and/or Critical Habitats	1. No
2. Other Protected Species (e.g. Burros, Migratory Birds)	2. No
3. Wetlands	3. No
4. Archaeological/Historic Resources	4. No
5. Prime, Unique or Important Farmland	5. No
6. Non-Attainment Areas	6. No
7. Class I Air Quality Control Region	7. No
8. Special Sources of Groundwater (e.g. Sole Source Aquifer)	8. No
9. Navigable Air Space	9. No
10. Coastal Zones	10. No
11. Areas w/ Special National Designation (e.g. National Forests, Parks, Trails)	11. No
12. Floodplain	12. No

B. Regulated Substances/Activities: Will the proposed action involve any of the following regulated substances or activities?

	<u>Yes/No</u>
13. Clearing or Excavation (indicate if greater than 1 acre [43,560 sq. ft.]; if more than 5,000 sq. ft., a Soil Erosion / Sediment Control Permit may be required from Freehold Soil Conservation District.) <i>Note: Soil disturbance includes clearing, grading, excavation, storage, and filling. Soil erosion and sediment control permits required if $\geq 5,000$ sq. ft.</i> <i>Note: Excavations expected to encounter ground water may require a permit.</i>	13. No
14. Dredge or Fill (under Clean Water Act section 404; indicate if greater than 1 acre)	14. No
15. Noise (in excess of regulations)	15. No
16. Asbestos Removal <i>Asbestos-containing materials including approx. 1.1 tons of floor tiles from the tritium area would be removed and disposed of by an asbestos-certified contractor.</i>	16. Yes
17. PCBs	17. No
18. Import, Manufacture or Processing of Toxic Substances	18. No
19. Chemical Storage/Use <i>Standard chemicals (alcohol, lubricating oils to support cutting equipment, etc.) would be used with SDSs provided to Industrial Hygiene at least 24 hours prior to first use.</i>	19. Yes
20. Pesticide Use	20. No
21. Hazardous, Toxic, or Criteria Pollutant Air Emissions <i>Anticipated releases to the monitored stack are expected to be ~ 10-100 Curies/year.</i>	21. Yes
22. Liquid Effluent <i>Liquid effluent collection tank (LECT) releases to the municipal sanitary sewer system would be controlled to remain at less than 1 Curie/year, which is less than allowable limits of the NJ Dept. of Environmental Protection.</i>	22. Yes
23. Underground Injection	23. No
24. Hazardous Waste <i>In addition to the floor tiles noted above, installed batteries, oil, and other components removed from the tritium system may be disposed of as hazardous waste according to current procedure.</i>	24. Yes
25. Underground Storage Tanks	25. No
26. Radioactive (AEA) Mixed Waste	26. No
27. Radioactive Waste <i>Approximately 99.5 tons of tritium system components and piping, 80 tons of material from the neutral beam boxes, and .5 tons of galvanized sheet metal ductwork would be disposed of according to current procedure as low-level radioactive waste at a DOE-approved disposal site.</i>	27. Yes
28. Radiation Exposures <i>Tritium contamination is present in the tritium system components and piping. The total amount of tritium on-site is estimated to be ~ 15,000 Curies. Work in the TFTR test cell may expose workers to low levels of tritium or contamination. Workers would adhere to provisions in the approved Radiation Protection Program and PPPL Health Physics personnel would provide monitoring and oversight. Radiation exposures would be managed well below the PPPL Administrative Control Level of 1,000 mrem per calendar year per person and 600 mrem per calendar quarter.</i>	28. Yes

C. Other Relevant Disclosures. Will the proposed action involve the following?

Yes/No

- | | | |
|-----|--|--------|
| 29. | A threatened violation of ES&H regulations/permit requirements
<i>The requirements of 10CFR851 (as implemented under the DOE-approved PPPL Worker Safety and Health Program) would be applied to work at PPPL under this proposed action. The subcontractor would be required to provide a Health and Safety Plan and Waste Management Plan for PPPL review and approval.</i> | 29. No |
| 30. | Siting/Construction/Major Modification of Waste Recovery, or TSD Facilities | 30. No |
| 31. | Disturbance of Pre-existing Contamination
<i>Note: Excavations that encounter contaminated ground water require a permit.</i> | 31. No |
| 32. | New or Modified Federal/State Permits | 32. No |
| 33. | Public controversy | 33. No |
| 34. | Action/involvement of Another Federal Agency (e.g. license, funding, approval) | 34. No |
| 35. | Action of a State Agency in a State with NEPA-type law.
(Does the State Environmental Quality Review Act Apply?) | 35. No |
| 36. | Public Utilities/Services | 36. No |
| 37. | Depletion of a Non-Renewable Resource | 37. No |

IV. **Section D Determination:** Is the project/activity appropriate for a determination under Subpart D of the DOE NEPA Regulations for compliance with NEPA?

DOE-PSO NEPA Compliance Officer (NCO) Review:

Concurrence with Proposed Class of Action Recommended

CX EA EIS

Categories: B1.23 (Demolition and disposal of buildings), B1.16 (Asbestos removal)

For Categorical Exclusions (CXs):

A. The proposed action fits within a class of actions that is listed in Appendix A or B to Subpart D.

For classes of actions listed in Appendix B, the following conditions are integral elements; i.e., to fit within a class, the proposal must not:

- 1) Threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, including DOE and/or Executive Orders;
- 2) Require siting, construction, or major expansion of waste storage, disposal, recovery, or treatment facilities, but may include such categorically excluded facilities;
- 3) Disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; or
- 4) Adversely affect environmentally sensitive resources.
- 5) Involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those of the Department of Agriculture, the Environmental

Protection Agency, and the National Institutes of Health.

B. There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal; and

C. The proposal is not "connected" to other actions with potentially significant impacts, is not related to other proposed actions with cumulatively significant impacts, and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211.

V. **DOE Recommendation Approval:**

TRACY ESTES

Digitally signed by TRACY ESTES
Date: 2021.02.08 09:00:52 -05'00'

PSO Staff: Tracy Estes

Signature: _____

Date: _____

SC GLD: Michael M. McCann

Signature: Michael McCann

Date: 2/5/2021

VI. **NEPA Compliance Officer Subpart D CX Determination and Approval:**

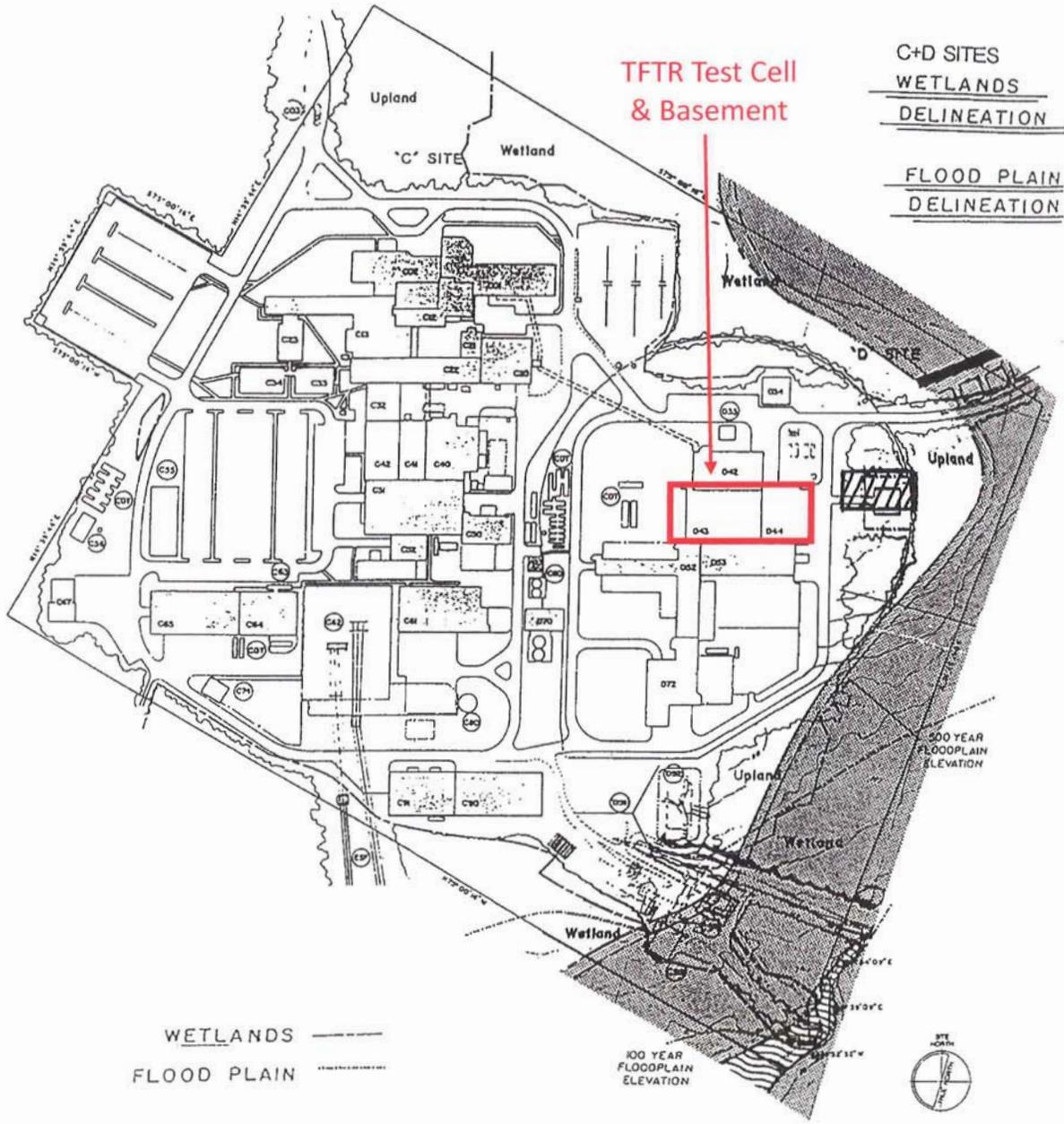
Based on my review of information conveyed to me and in my possession (or attached) concerning the proposed action, as NEPA Compliance Officer, I have determined that the proposed action fits within the specified class of actions, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

PSO NCO: Peter R. Siebach

Signature: _____

Date: _____

TCR-ESH-014,R5-001



SHADE INDICATES STREAM PROTECTION CORRIDOR PER PRINCETON FORRESTAL CENTER STORMWATER MANAGEMENT PLAN, 1980

0 100 300 600 FT.
SITE PLAN
PRINCETON UNIVERSITY
PLASMA PHYSICS LABORATORY

Tritium System Demolition and Disposal

TFTR Test Cell



NO.	REVISION	BY	CH	SUP	APPROVED	DATE
1	REVISED SQ. FT. PER EGN-5542	JN	JS		EJ	03/21/08
2	UPDATE AD-300 DRAWINGS TO REFLECT ACTUAL CONDITIONS PER EGN-7424	TK	DS	LM	MV	07/22/15
3	ADDD FIRE BARRIERS PER EGN-7876	TK	SD	LM	MD	01/04/17

PRINCETON PLASMA PHYSICS LABORATORY
PRINCETON UNIVERSITY

C & D SITES
BUILDING FLOOR PLANS
EXPERIMENTAL AREA, 1st FLOOR, D4.3

DW: P.M. & E. DATE: 01/14/2002 D000 FILE: 359A0305E.DWG
 ENG: C. POTENSKY APPROVED:
 DWN: J. SIEBEL
 CHK: S. FLHR CHK: SUPY SHEET 56 REV 3

TEST CELL AREA: 1050 SQ FT

NSTX TEST CELL: 690 SQ FT

GENERAL DRY: 1,860 SQ FT

COMMON: 2,856 SQ FT

HALLS/WALLS: 3,566 SQ FT

TOTAL: 32,821 SQ FT

SCALE: 1/4" = 1'-0"

EXPERIMENTAL AREA, 1st FLOOR, D4.3

Figure 1

Tritium System Demolition and Disposal

LEGEND:

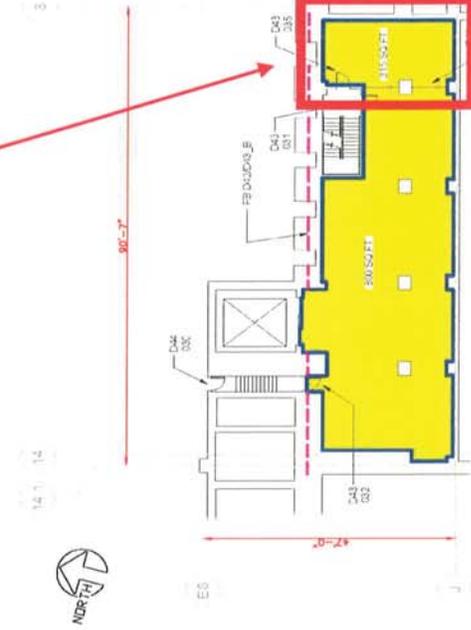
- HIGH BAY: 24,539 SQ. FT.
- GENERAL DRY: 1,860 SQ. FT.
- COMMON: 2,856 SQ. FT.
- HALLS/WALLS: 3,566 SQ. FT.
- TOTAL: 32,821 SQ. FT.

EXPERIMENTAL AREA, 1st FLOOR

GSE	32,821	NSE	29,255	USE	26,359
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NO.	REVISION	BY	CH	SUP	APPROVED	DATE
1	REVISED SQ. FT. PER ECN-5342	JUN	JS		EJ	03/21/08
2	UPDATE AD-300 DRAWINGS TO REFLECT ACTUAL CONDITIONS PER ECN-7424	TK	DS	LM	WV	08/03/15
3	ADDED FIRE BARRIERS(S) PER ECN-7876	TK	SD	LM	MD	01/04/17

Tritium Area Control Room

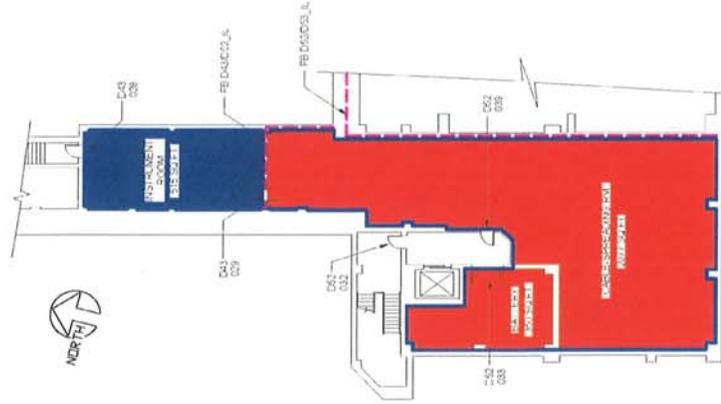


L DUDEK

DATA ACQUISITION LEVEL, D43

SCALE: 1/4" = 1'-0"

GENERAL DRY WALLS	STORAGE	P.I. WALLS
1,115 SQ. FT.	515 SQ. FT.	2,427 SQ. FT.
3,142 SQ. FT.		1,567 SQ. FT.
4,257 SQ. FT.		4,509 SQ. FT.
GSSF 4,257		
NSE 1,115		
USE 1,115		
GSSF 4,509		
NSE 2,942		
USE 2,942		



INTERMEDIATE LEVEL, D43

SCALE: 1/4" = 1'-0"



DATA ACQUISITION LEVEL

INTERMEDIATE LEVEL

USE

NSE

USE

GSSF

PRINCETON PLASMA PHYSICS LABORATORY
PRINCETON UNIVERSITY

C & D SITES
BUILDING FLOOR PLANS
DATA ACQUISITION & INTERMEDIATE FLOOR PLANS, D43

DN: P.J. & E.	DATE: 10/10/2002	DAO FILE: 39A03059.DWG
ENG: C. POTENSKY	APPROVED:	
DN: J. SEBEL		B-AD-300
CHK: S. FLOHR	CHK: SRY CP SF	SHEET 59
		REV 3

RELEASED FOR
FACILITY MAINTENANCE
PROJECTS ONLY

Tritium System Demolition and Disposal
Figure 3