# Categorical Exclusion for U.S. Customs and Border Protection Non-Intrusive Inspection Tests, Pacific Northwest National Laboratory, Richland, Washington

## Proposed Action

To support U.S. Department of Homeland Security's Customs and Border Protection, the U.S. Department of Energy (DOE) Pacific Northwest Site Office (PNSO) proposes to perform testing of radiation detection equipment using a portable linear accelerator (LINAC) at the Pacific Northwest National Laboratory (PNNL) site. This portable accelerator has primary beam energy of 6 million electron volts (MeV) and maximum beam power of less than 25 kilowatts (kW).

## Location of Action

The Physical Sciences Facility (PSF) at the PNNL site.

## Description of the Proposed Action

PNNL proposes to test the effectiveness of radiation detection equipment designed to operate in the presence of a pulsed source of gamma radiation (e.g., LINAC). Radiation detection systems are deployed at U.S. ports of entry (POE) to detect elevated radiation in cargo. In addition to these radiation detection systems, second-generation, LINAC-based high-energy radiography systems are also beginning to be deployed to image selected shipments. However, the radiography systems' output can be detected by the radiation portal monitor, resulting in an alarm or interferences that decrease radiation detection sensitivity. Thus, improved radiation detection hardware and software solutions (e.g., blanking solutions) have been developed to alleviate interference. PNNL would acquire temporary services for a LINAC to represent the presence of a high-energy radiography system as found at POEs.

The radiation detection equipment would be placed, temporarily, at PNNL's Large Detector Facility located adjacent to the 3440 Building. This area is commonly referred to as the test track. For the majority of tests, the portable LINAC would be mounted in a truck and located approximately 50 to 75 yards west of the existing pavement, within a previously disturbed field that is part of the original facility footprint. For other parts of the test, the LINAC may be situated elsewhere within the facility boundary.

PNNL would use a LINAC system owned by Hesco, a Division of PTSE, Inc. of San Leandro, California. The LINAC was manufactured by Varian and has been modified to suit Hesco's needs for a portable radiography system. It generates a 6 MeV x-ray beam. Hesco typically uses this LINAC for high-energy x-ray field inspection. Hesco's field service projects include bridges, power plants, oil refineries, buildings, marine structures, rockets, and satellites. Prior Hesco clients include Babcock and Wilcox, the California Department Of Transportation, Edwards Air Force Base, the Federal Highway Administration, Honeywell Engines and Systems, Idaho State University, Pratt and Whitney Aerojet Propulsion, Pratt and Whitney Space Propulsion, the Tennessee Valley Authority, Titan Pulse Systems, Westinghouse Savannah River Company, Lockheed Martin, and the National Aeronautics and Space Administration.

Testing would occur over a two-week period; however, the LINAC would be in use only the second week. Testing is targeted to begin the last week of May 2012 and run through June 8, 2012. Figure 1 shows the location of the test track and Figure 2 depicts the approximate location of the LINAC during the testing.

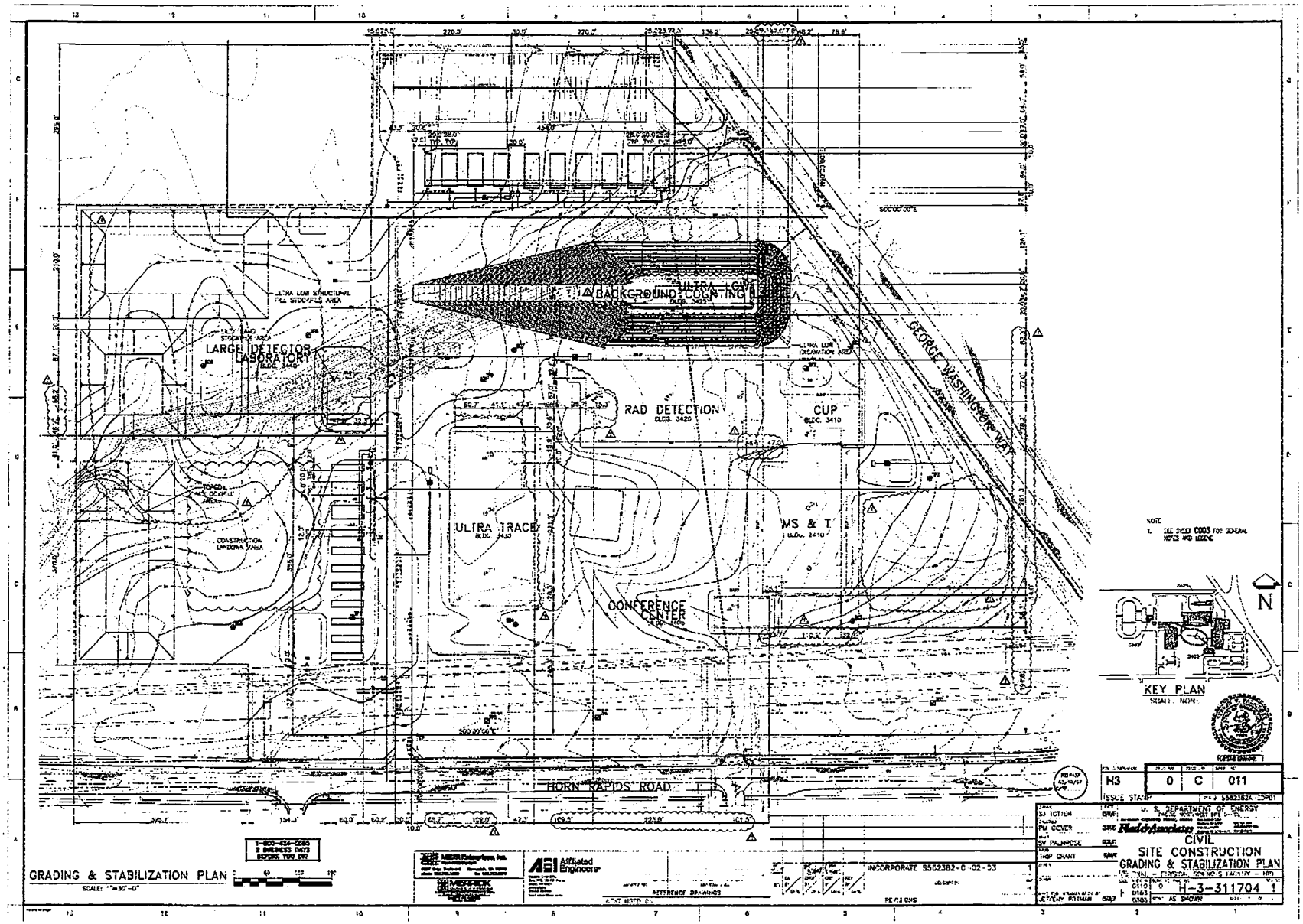


**Figure 1.** Location of the Large Detector Test Laboratory PSF

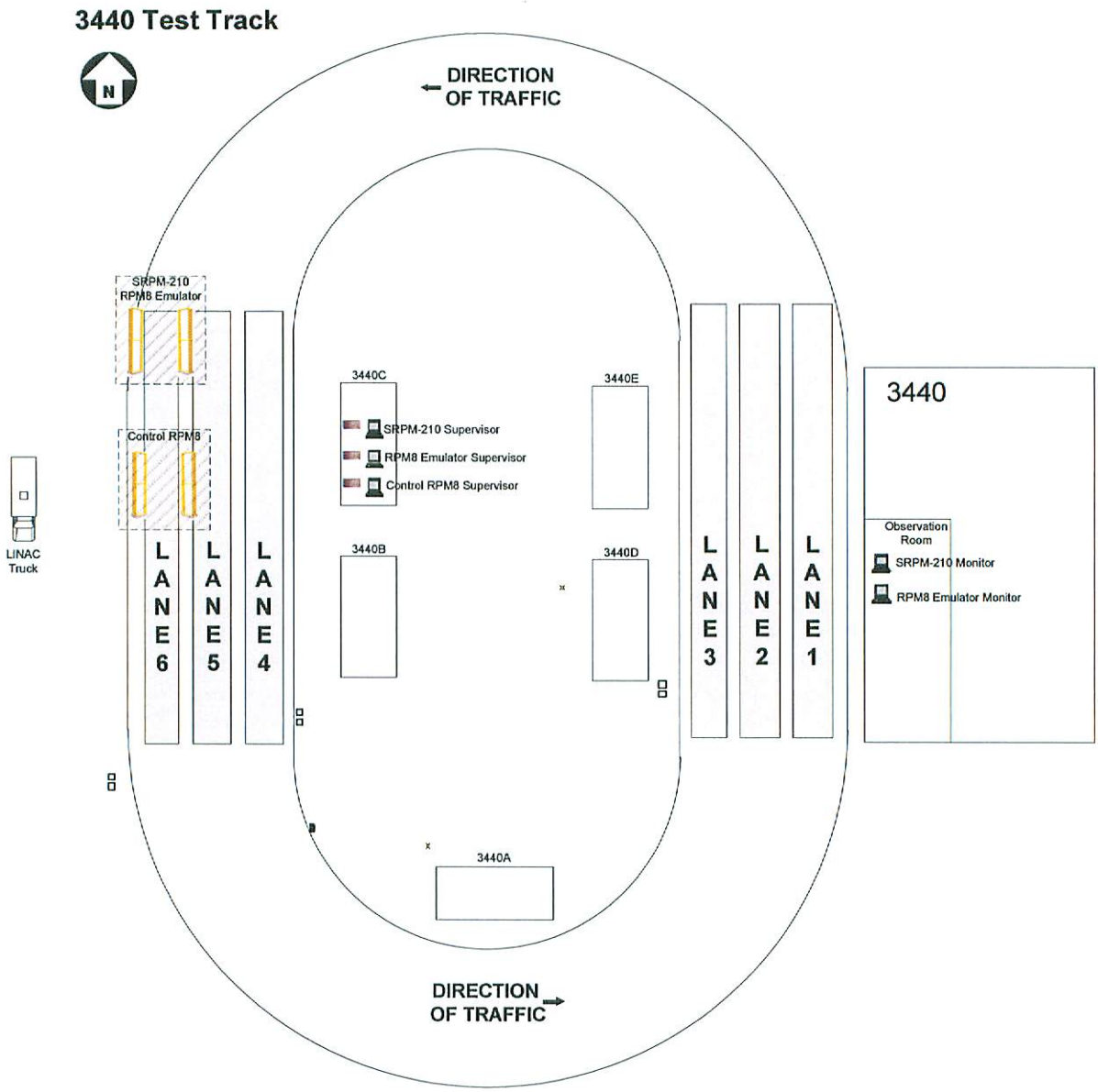


**Figure 2.** Test Location Within PNNL's Large Detector Facility

## Biological and Cultural Resources

Testing the LINAC at PSF would not likely result in adverse impacts to sensitive biological or cultural resources. However, biological and cultural resource reviews would be conducted to assure that impacts to sensitive resources are avoided and minimized.

The biological resource review would identify the occurrence of federal- and state-protected species in the project area (e.g., avian species protected under the Migratory Bird Treaty Act; plant and animal species protected under the Endangered Species Act, including candidates for such protection; and species listed as threatened or endangered by the State of Washington). Resource review recommendations would be followed to assure there are no adverse impacts to sensitive species and resources.

The cultural resource review would assure that impacts to sensitive cultural resources are avoided. If consultation with the State Historic Preservation Office and/or affected tribes is deemed necessary, it would be initiated before project implementation.

## Categorical Exclusion to Be Applied

As the proposed action is to test a particle accelerator at the PSF facility, the following categorical exclusions (CXs), as listed in the DOE National Environmental Policy Act (NEPA) implementing procedures, Title 10 of the Code of Federal Regulations (CFR) Part 1021, would apply:

B3.10 Siting, construction, modification, operation, and decommissioning of particle accelerators, including electron beam accelerators, with primary beam energy less than approximately 100 million electron volts (MeV) and average beam power less than approximately 250 kilowatts (kW), and associated beamlines, storage rings, colliders, and detectors, for research and medical purposes (such as proton therapy), and isotope production, within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible), or internal modification of any accelerator facility regardless of energy, that does not increase primary beam energy or current. In cases where the beam energy exceeds 100 MeV, the average beam power must be less than 250 kW, so as not to exceed an average current of 2.5 milliamperes (mA).

B3.11 Outdoor tests and experiments for the development, quality assurance, or reliability of materials and equipment (including, but not limited to, weapon system components), under controlled conditions. Covered actions may include, but are not limited to, burn tests (such as tests of electric cable fire resistance or the combustion characteristics of fuels), impact tests (such as pneumatic ejector tests using earthen embankments or concrete slabs designated and routinely used for that purpose), or drop, puncture, water-immersion, or thermal tests. Covered actions would not involve source, special nuclear, or byproduct materials, except encapsulated sources manufactured to applicable standards that contain source, special detector/sensor development and testing and first responder field training.

## Eligibility Criteria

The proposed action meets the eligibility criteria of 10 CFR 1021.410(b) because the proposed action does not have any extraordinary circumstances that might affect the significance of the environmental effects, is not connected to other actions with potentially significant impacts [40 CFR 1508.25(a)(1)], is not related to other actions with individually insignificant but cumulatively significant impacts [40 CFR 1508.27(b)(7)], and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during environmental impact statement preparation.

The "Integral Elements" of 10 CFR 1021 are satisfied as discussed in Table 1.

Table 2 summarizes environmental impacts considered when preparing this CX determination. Answers to relevant questions are explained in detail in the text following Table 2.

**Table 1.** Integral Elements, 10 CFR 1021, Subpart D, Appendix B (1)-(5)

| Would The Proposed Action: | Evaluation: |
|---|---|
| Threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health? | The proposed action would not threaten a violation of regulations or DOE or executive orders. |
| Require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities? | No waste management facilities would be constructed under this CX. Any generated waste would be managed in accordance with applicable regulations in existing facilities. Waste disposal pathways would be identified prior to generating waste and waste generation would be minimized. |
| Disturb hazardous substances, pollutants, or contaminants that preexist in the environment such that there would be uncontrolled or unpermitted releases? | No preexisting hazardous substances, pollutants, or contaminants would be disturbed in a manner that results in uncontrolled or unpermitted releases. |
| Have the potential to cause significant impacts on environmentally sensitive resources., including, but not limited, to:<br>• protected historic/archaeological resources<br>• protected biological resources and habitat<br>• jurisdictional wetlands, 100-year floodplains | No environmentally sensitive resources would be adversely affected. Resource reviews would be conducted for special circumstances. Refer to the Biological and Cultural Resources section for details regarding the application of cultural and biological resource reviews. |
| • federal- or state-designated parks and wildlife refuges, wilderness areas, wild and scenic rivers, national monuments, marine sanctuaries, national natural landmarks, and scenic areas. | The proposed action would not adversely affect floodplains, wetlands regulated under the Clean Water Act, national monuments, or other specially designated areas, prime agricultural lands, or special sources of water. |
| Involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species? | The proposed action would not involve the use of genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed action 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. |

**Table 2.** Summary of Environmental Impacts Considered During Preparation of the CX

| Would the Proposed Action: | | Yes | No |
|---|---|---|---|
| 1 | Result in more than minimal air impacts? | | X |
| 2 | Increase offsite radiation dose measurably? | | X |
| 3 | Require a radiological work permit? | | X |
| 4 | Cause more than a minor or temporary increase in noise level? | | X |
| 5 | Discharge any liquids to the environment? | | X |
| 6 | Require a Spill Prevention Control and Countermeasures plan? | | X |
| 7 | Require an excavation permit (e.g., for test pits, wells, utility installation)? | | X |
| 8 | Disturb an undeveloped area? | | X |
| 9 | Use carcinogens, hazardous, or toxic chemicals/materials? | X | |
| 10 | Involve hazardous, radioactive, polychlorinated biphenyl, or asbestos waste? | X | |
| 11 | Require environmental permits? | | X |

## Explanations

9. The proposed action would use small quantities of carcinogens, hazardous, and/or toxic chemicals and materials. For example, equipment or machinery might contain or require the use of chemicals such as antifreeze, hydraulic fluids, or fuel. In addition, project decontamination and closeout activities might require the use of cleaning materials such as cleaning solutions and solvents. Project inventories would be maintained at the lowest practicable levels, and chemical wastes would be recycled, neutralized, or regenerated if possible. The LINAC head would be shielded using lead. This lead would not be exposed to the environment and would be kept inside the truck or wrapped. Product substitution (use of less toxic chemicals in place of more toxic chemicals) would be considered where reasonable.
10. The proposed action would not generate radioactive or mixed wastes because the project would rely upon sealed sources for testing and the LINAC generates high-energy photons without a radioactive source material. In addition, proposed activities might generate hazardous wastes. If unrecyclable, such wastes would be managed by Hesco or characterized, handled, packaged, transported, treated, stored, and/or disposed of in existing Hanford Site or offsite treatment, storage, and disposal facilities in accordance with applicable local, state, and federal regulations, DOE orders and PNNL guidelines.

## Compliance Action

I have determined that the proposed action satisfies the DOE NEPA eligibility criteria and integral elements, does not pose extraordinary circumstances, and meets the requirements for the CX referenced above. Therefore, using the authority delegated to me by DOE Order 451.1B, Change 2, I have determined that the proposed action may be categorically excluded from further NEPA review and documentation.

**Signature:** _____ **Date:** 5/18/12

Theresa L. Aldridge
PNSO NEPA Compliance Officer

cc: JA Stegen, PNNL