

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Microwave Readout Techniques for Very Large Arrays of Nuclear Sensors – University of Colorado

SECTION B. Project Description

The University of Colorado, in collaboration with the National Institute for Standards & Technology (NIST), proposes to develop an inexpensive yet powerful readout technique based on microwave transmission and reflection that will enable very large arrays of diverse sensor types for nuclear materials quantification and tracking. Reconfigurable Open Architecture Computing Hardware (ROACH) boards will be used.

SECTION C. Environmental Aspects / Potential Sources of Impact

Radioactive Material Use – Testing of gamma-ray sensors will likely be performed using a 10 microCurie sealed ¹⁵³Gd radioisotope source available at the nearby NIST site.

Chemical Use/Storage / Chemical Waste Disposal – Fabrication of thin-film circuits and the preparation of cryostat components sometimes requires the use of solvents (acetone, ethanol, methanol). Proper storage and disposal facilities are available and will be used.

Water/Well Use – Cryostats based on mechanical cryocoolers that operate on a sealed charge of helium gas will be used. The Cryomech CP2800 compressors for these cryocoolers are water cooled and sometimes draw water from the building supply. Typical flow rates are one gallon per minute.

Discharge of Wastewater – In some configurations, compressor cooling water is drawn from building supply and discharged to the building drain after one pass through the compressor. The used cooling water is clean, and its discharge complies with all applicable regulations.

SECTION D. Determine the Level of Environmental Review (or Documentation) and Reference(s): Identify the applicable categorical exclusion from 10 CFR 1021, Appendix B, give the appropriate justification, and the approval date.

Note: For Categorical Exclusions (CXs) the proposed action must not: 1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, including requirements of DOE orders; 2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment 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; 4) adversely affect environmentally sensitive resources. In addition, no extraordinary circumstances related to the proposal exist which would affect the significance of the action, and the action is not “connected” nor “related” (40 CFR 1508.25(a)(1) and (2), respectively) to other actions with potentially or cumulatively significant impacts.

References: B3.6 Siting, construction, modification, operation, and decommissioning of facilities for small-scale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial development.

Justification: The activity consists of developing very large arrays of sensors for research purposes.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jason Sturm, DOE-ID Deputy NEPA Compliance Officer on 11/25/2013