



U.S. Department of Energy Categorical Exclusion Determination Form

Proposed Action Title: CATEGORICAL EXCLUSION (CX) DETERMINATION FOR THE EXASCALE COMPUTING PROJECT (CX-ECP-16-001)

Program or Field Office: Office of Science – Oak Ridge National Laboratory (Project Lead)

Location(s) (City/County/State): Argonne National Laboratory, Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Oak Ridge National Laboratory (Project Lead), Sandia National Laboratories

Proposed Action Description:

The Exascale Computing Project (ECP) proposed action consists of preliminary activities performed in an attempt to develop a new, more powerful, generation of High Performance Computing –based tools that will support computing capabilities 10-100 times today’s existing petascale systems.

This action involves a partnership between six national laboratories and numerous other entities. ECP partner laboratories are Argonne National Laboratory (ANL), Lawrence Berkeley National Laboratory (LBNL), Lawrence Livermore National Laboratory (LLNL), Los Alamos National Laboratory (LANL), Oak Ridge National Laboratory (ORNL), and Sandia National Laboratories (SNL). The ECP also includes multiple subcontractors and university partners. This action does not include acquisition or deployment of a production ready system or major facility upgrades.

The action addressed here is computing, office-related, or small scale research & development conducted indoors. This Exascale Computing Project will take place in existing facilities and by its very nature is expected to have minimal impacts on the environment. Actions covered by this CX include: creating and/or enhancing the predictive capability of relevant applications through targeted development of requirements-based models, algorithms, and methods; integration of appropriate software and hardware co-design methodologies; systematic improvement of exascale system readiness and utilization; demonstration and assessment of effective software/hardware integration; developing expanded and vertically integrated software stack that includes advanced math libraries, programming environment, tools, and extreme-scale system management; utilizing vendor-based research and development for hardware development; advanced system engineering development including acquisition and support of testbeds for the application, software, and hardware activities.

Exascale computing represents only the next step in a continuum of increases in High Performance Computing. As such, a number of related NEPA reviews have been conducted at the DOE partnership sites over the last several years for computer improvement projects. The three NNSA laboratories have utilized Site-Wide Environmental Impact Statements (SWEIS) and regular updating of these documents, and the SC laboratories have utilized Environmental Assessments (EAs) and CXs to cover computer related improvements. These prior reviews have concluded that potential environmental impacts associated with computer advancements have not resulted in significant impacts. NEPA reviews will continue to be conducted to support advances in High Performance Computing, including conducting a NEPA review if it is decided to proceed forward with the deployment of a production related exascale computing system after the preliminary actions covered by this CX are completed. Also, to assure the specific actions included in the ECP are appropriately covered by this CX, awards will be contingent on finding that the specific proposed actions of the awardee are bounded by the CX. This will be accomplished via the use of Environmental Compliance Checklists describing the project components and their potential environmental impacts. If a checklist indicates a specific component of the project could lead to the need to more analysis, such as an EA, then DOE would perform an environmental critique/synopsis as stated in 10 CFR 1021.216, following the procedures therein, prior to making the award.

Categorical Exclusion(s) Applied:

- B1.7 - Electronic equipment
- B1.15 – Support buildings
- B1.24 – Property transfers
- B1.31 – Installation or relocation of machinery and equipment
- B2.2 – Building and equipment instrumentation
- B3.6 – Small-scale research and development, laboratory operations, and pilot projects

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of 10 CFR Part 1021.

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.

To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (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 listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

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

The proposal has not been segmented to meet the definition of a categorical exclusion. This proposal 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 preparation of an environmental impact statement.

The above description accurately describes the proposed action, which reflects the requirements of the CX cited above. Therefore, I recommend that the proposed action be categorically excluded from further NEPA review and documentation.

Program Point of Contact: *Daniel K. Tracy Davis* Date Determined: *12/20/2016*

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: *James T. Elmer* Date Determined: *12/20/2016*