Department of Energy
Argonne Site Office
9800 South Cass Avenue
Argonne, Illinois 60439

MAR 1 1 2015

Dr. Peter B. Littlewood
Director, Argonne National Laboratory
President, UChicago Argonne, LLC
9700 South Cass Avenue
Argonne, IL 60439

Dear Dr. Littlewood:

SUBJECT: NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) DETERMINATION FOR ARGONNE NATIONAL LABORATORY (ARGONNE)

The Argonne Site Office (ASO) approves the following as a categorical exclusion (CX) under Appendix B (to 10 CFR Part 1021, Subpart D, Integrated DOE NEPA Implementing Procedures, December 1996), Category B 3.6 "Siting/construction/operation/decommissioning of facilities for bench-scale research, conventional laboratory operations, small-scale research and development and pilot projects."

- Scale up of Lithium Ion Battery Material Recycling, Building 369, ASO-CX-312

Therefore, no further NEPA review is required. However, if any modification or an expansion of the scope is made to the above project, additional NEPA review will be necessary.

Enclosed please find a copy of the approved Environmental Review Form (ERF) for the project. If you have any questions, please contact Kaushik Joshi of my staff at (630) 252-4226.

Sincerely,

Joanna M. Livengood

Joanna M. Livengood
Manager

Enclosure:
As Stated

cc: J. Stauber, ANL, w/encl.
J. Spangenberger, ANL, w/encl.
W. Brocker, ANL, w/encl.
K. Joshi, ASO, 201, w/encl.
M. McKown, SC-CH, w/encl.
P. Siebach, SC-CH, w/encl.

Argonne NATIONAL LABORATORY

Environmental Review Form for Argonne National Laboratory

Project/Activity Title: Scale up of Lithium Ion Battery Material Recycling

ASO NEPA Tracking No. ASO- CX- 312 **Type of Funding**: _____

B&R Code _____

Identifying number: C1500601 WFO proposal # _____ CRADA proposal # C1500601

Work Project # _____ ANL accounting # (item 3a in Field Work Proposal) _____

Other (explain) _____

Project Manager: Jeffrey Spangenberger Signature: _____ Date: 2/17/15

NEPA Owner: William A. Brocker Signature: _____ Date: 02/17/2015

ANL NEPA Reviewer: Joel Stauber Signature: _____ Date: 2/17/15

I. **Description of Proposed Action:** The proposed action is to design, build and test a 100 gallon sized system to separate and recover materials from lithium ion battery manufacturing scrap; specifically, the trimmings of anodes and cathodes from LiFePO4 and LiMnO2 battery manufacture that are supplied by our research partners. Testing will include up to 10 separate runs by the conclusion of this work. The anode consists of a copper foil coated with graphite while the cathode is an aluminum foil coated with the particular active cathode material. To separate the coating from the foil the trimmings are placed in a tank and either nitric or sulfuric acid is pumped into the tank at or near room temperature. The mixture is agitated for several minutes. The acid causes the coating to detach from the foil and the agitation helps to remove the coating from the foil and to become suspended in the acid solution. Once the coatings are removed the acid solution is pumped from the agitating tank to a storage tank. Water is then pumped into the agitation tank and briefly agitated to rinse any remaining acid off of the foil. The water is then pumped back to its storage tank and, if needed, neutralized. The acid solution is pumped through a filter to recover the coating material. The agitating tank is opened and the foil is removed. The acids and rinse water are reused. Previous testing has shown small amounts of NO2 and SO2 gas evolution during the acid agitation phase of the process. Part of this work is to determine the amount of these gases that are generated. The system will be kept under negative pressure and will be routed through a Bionomic Industries Scrubpac Ventclean model 2LC to remove any NO2 or SO2 that may be given off. Heat may be generated during the agitation phase of the operation. A chiller with heat exchanger will be used to remove any heat generated.

II. **Description of Affected Environment:** The installation of this system will take place in building 369. No building modifications are necessary. Existing utilities will be used for this work. All

tanks will be in secondary containment. At the conclusion of this work used nitric acid, sulfuric acid, scrubber solution and rinse water solution will need to be disposed. This work will involve 100 gallons of dilute nitric acid, 100 gallons of dilute sulfuric acid, 50 gallons of scrubber solution and 200 gallons of rinse water. All anode and cathode materials will be returned to the supplier.

III. **Potential Environmental Effects:** (Attach explanation for each "yes" response. **See Instructions for Completing Environmental Review Form**)

A. Complete Section A for all projects.

1. Project evaluated for Pollution Prevention and Waste Minimization opportunities and details provided under items 2, 4, 6, 7, 8, 16, and 20 below, as applicable — Yes X No ____

   The proposed project has been evaluated for minimization of pollution and waste generation based on experience from earlier work. Only the minimum amount of chemicals needed will be ordered.

2. Air Pollutant Emissions — Yes X No ____

   NO2 and SO2 may be generated. These substances will be routed through a Bionomic Industries Scrubpac Ventclean model 2LC scrubber for removal. Output of the scrubber will be exhausted outside of building 369 through a dedicated exhaust system. Monitoring by IH will be conducted as necessary. FMS-SEP will be contacted to make sure that this activity falls within Argonne's Title V permit.

3. Noise — Yes ____ No X

4. Chemical/Oil Storage/Use — Yes X No ____

   Each test will process an estimated 20 lbs. of anode or cathode battery material. (This work does not include processing any sealed batteries or any electrolyte materials). Up to 10 tests will be performed. Dilute nitric and sulfuric acid will be used, and stored while not in use, for this work. Dilute acid solutions will be made from a more concentrated acid. All acid solutions, in use or storage, will be located on secondary containment. Approximately 100 gallons of dilute nitric acid, 100 gallons of dilute sulfuric acid, 50 gallons of used scrubber solution and 200 gallons of rinse water will be needed, in total, to perform this work. Large samples anode/cathode materials processed in the high-bay area will be returned to the supplier after processing. Materials that will not be returned will be disposed of as per Argonne's Laboratory Management System (LMS).

5. Pesticide Use — Yes ____ No X

6. Polychlorinated Biphenyls (PCBs) — Yes ____ No X

7. Biohazards — Yes ____ No X

8. Effluent/Wastewater (If yes, see question #12 and contact Gregg Kulma (FMS-SEP) at 2-9147 or gkulma@anl.gov — Yes X No ____

   The laboratory drains are connected to the Laboratory waste water treatment plant for which the effluent is subject to a NPDES permit issued by the IEPA. We will consult with FMS-SEP to assure conformance with all environmental protection permits and ANL site requirements.

9. Waste Management

   a) Construction or Demolition Waste — Yes ____ No X

   b) Hazardous Waste — Yes X No ____

   At Argonne, all RCRA hazardous waste will be accumulated (in a Satellite Accumulation Area) by personnel qualified by Argonne-specific training. Requisitions for transfer of accumulated hazardous waste to a central on-site facility will be completed by Argonne-certified personnel. The research personnel will conform to the requirements in LMS-PROC-103. All on-site handling, storage, and disposal will be performed in accordance with the RCRA Part B permit issued by the IEPA. The accumulated hazardous waste will be disposed in accordance with Argonne's Part B permit, and in accordance with the requirement in LMS-PROC-103.

   c) Radioactive Mixed Waste — Yes ____ No X

   d) Radioactive Waste — Yes ____ No X

   e) PCB or Asbestos Waste — Yes ____ No X

   f) Biological Waste — Yes ____ No X

   g) No Path to Disposal Waste — Yes ____ No X

   h) Nano-material Waste — Yes ____ No X

10. Radiation — Yes ____ No X

11. Threatened Violation of ES&H Regulations or Permit Requirements — Yes ____ No X

12. New or Modified Federal or State Permits — Yes ____ No X

13. Siting, Construction, or Major Modification of Facility to Recover, Treat, Store, or Dispose of Waste — Yes ____ No X

14. Public Controversy — Yes ____ No X

15. Historic Structures and Objects — Yes ____ No X

16. Disturbance of Pre-existing Contamination — Yes ____ No X

17. Energy Efficiency, Resource Conserving, and Sustainable Design Features — Yes ____ No X

B. For projects that will occur outdoors, complete Section B as well as Section A.

18. Threatened or Endangered Species, Critical Habitats, and/or other Protected Species — Yes ____ No ____

19. Wetlands — Yes ____ No ____

20. Floodplain — Yes ____ No ____

21. Landscaping — Yes ____ No ____

22. Navigable Air Space — Yes ____ No ____

23. Clearing or Excavation — Yes ____ No ____

24. Archaeological Resources — Yes ____ No ____

25. Underground Injection — Yes ____ No ____

26. Underground Storage Tanks — Yes ____ No ____

27. Public Utilities or Services — Yes ____ No ____

28. Depletion of a Non-Renewable Resource — Yes ____ No ____

C. For projects occurring outside of ANL complete Section C as well as Sections A and B.

29. Prime, Unique, or Locally Important Farmland — Yes ____ No ____

30. Special Sources of Groundwater (such as sole source aquifer) — Yes ____ No ____

31. Coastal Zones — Yes ____ No ____

32. Areas with Special National Designations (such as National Forests, Parks, or Trails) — Yes ____ No ____

33. Action of a State Agency in a State with NEPA-type Law — Yes ____ No ____

34. Class I Air Quality Control Region — Yes ____ No ____

IV. Subpart D Determination: (to be completed by DOE/ASO)

Are there any extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal? Yes ____ No X

Is the project connected to other actions with potentially significant impacts or related to other proposed action with cumulatively significant impacts? Yes ____ No X

If yes, is a categorical exclusion determination precluded by 40 CFR 1506.1 or 10 CFR 1021.211? Yes ____ No ____

Can the project or activity be categorically excluded from preparation of an Environment Assessment or Environmental Impact Statement under Subpart D of the DOE NEPA Regulations? Yes X No ____

If yes, indicate the class or classes of action from Appendix A or B of Subpart D under which the project may be excluded. APPENDIX B, B3.6 "SITING/CONSTRUCTION/OPERATION/DECOMMISSIONING OF FACILITIES FOR BENCH-SCALE RESEARCH,

If no, indicate the NEPA recommendation and class(es) of action from Appendix C or D to Subpart D to Part 1021 of 10 CFR. CONVENTIONAL LABORATORY OPERATIONS, SMALL-SCALE RESEARCH, AND DEVELOPMENT AND PILOT PROJECTS.

ASO NEPA Coordinator Review: Kaushik Joshi

Signature: KNJoshi Date: 3-9-2015

ASO NCO Approval of CX Determination:

The preceding pages are a record of documentation that an action may be categorically excluded from further NEPA review under DOE NEPA Regulation 10 CFR Part 1021.400. I have determined that the proposed action meets the requirements for the Categorical Exclusion identified above.

Signature: Peter R Siebach Date: 3/9/2015

Peter R. Siebach
Acting Argonne Site Office NCO

P.S.

ASO NCO EA or EIS Recommendation: NOT APPLICABLE

Class of Action: _____

Signature: _____ Date: _____

Peter R. Siebach
Acting Argonne Site Office NCO

Concurrence with EA or EIS Recommendation: NOT APPLICABLE

CH GLD: _____

Signature: _____ Date: _____

ASO Manager Approval of EA or EIS Recommendation: NOT APPLICABLE

An ☐ EA ☐ EIS shall be prepared for the proposed _____ and

_____ shall serve as the document manager.

Signature: _____ Date: _____

Dr. Joanna M. Livengood
Manager