



Department of Energy

Argonne Site Office
9800 South Cass Avenue
Argonne, Illinois 60439

JUL 08 2013

Dr. Eric Isaacs
Director, Argonne National Laboratory
President, UChicago Argonne, LLC
9700 South Cass Avenue
Argonne, IL 60439

Dear Dr. Isaacs:

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

The Argonne Site Office (ASO) has approved the following as a categorical exclusion (CX) under the category of B 5.14: Combined heat and power or cogeneration systems.

- Argonne ESPC-IV Combined Heat and Power Plant (ASO-CX-295)

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

Please note that Argonne is required to obtain an Illinois EPA Air Emissions Source Construction Permit (already obtained), as well as an Illinois State Historic Preservation Officer concurrence for potential impact on archaeologically significant materials from the high pressure gas pipeline excavation (Section 106 Review).

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

Sincerely,

Joanna M. Livengood
Manager

Enclosure:
As Stated

cc: J. Stauber, ANL, w/encl.
M. Finder, ANL, w/encl.
J. Budd, ANL, w/encl.
S. Heston, ASO, w/encl.
K. Burnett, ASO, w/encl.
K. Joshi, ASO,
M. McKown, SC-CH, w/encl.
P. Siebach, SC-CH, w/encl.

Environmental Review Form for Argonne National Laboratory

Click on the question mark for instructions, contacts, and additional information on specific line items (?)

Project/Activity Title: ESPC-IV Combined Heat and Power Plant


ASO NEPA Tracking No. ASO CX-295 Type of Funding: ESPC

B&R Code _____

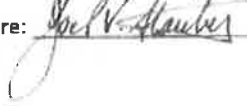
Identifying number: ERF #01211 WFO proposal # _____ CRADA proposal # _____

Work Project # 03582-00-506 ANL accounting # (item 3a in Field Work Proposal) _____

Other (explain) NEPA LOG #1482

Project Manager: J. Budd Signature:  Date: 9-7-12

NEPA Owner: P. Rash / M. FINDER Signature:  Date: 9-10-12

ANL NEPA Reviewer: Joel Stauber Signature:  Date: 2/11/13

I. Description of Proposed Action:

The Combined Heat and Power Plant (CHP) is the first phase of the Steam Plant Modernization Program. The CHP consists of a Solar Taurus 65 gas combustion turbine, 5-8 MW generation of electrical power and Heat Recovery Steam Generator (HRSG) and a building to house the units that will be connected to the existing Building 108 boiler House. The location of the CHP will be adjacent to the existing Steam Plant in a separate structure with a footprint of 110'L x 50'W x 35'H – the by-pass stack from the turbine and exhaust stack from the HRSG will be 100' above grade, refer to Figure 1. The new structure is accessed from the Main Steam Plant where Balance of Plant (BOP) auxiliary equipment (feed water pumps, air compressors and water treatment) resides by an enclosed walkway and stair tower. The new building will be constructed in a similar style to the existing plant: structural steel, masonry superstructures. The construction of the facility will require the excavation and removal of asphalt, dirt and gravel, placement of concrete foundations, and drain lines. Piping tie-ins may require some minimal encounters with asbestos, but would have to be surveyed and analyzed before construction. Figure 1 shows the conceptual model of the CHP and where it connects to the north-east side of the existing steam plant.

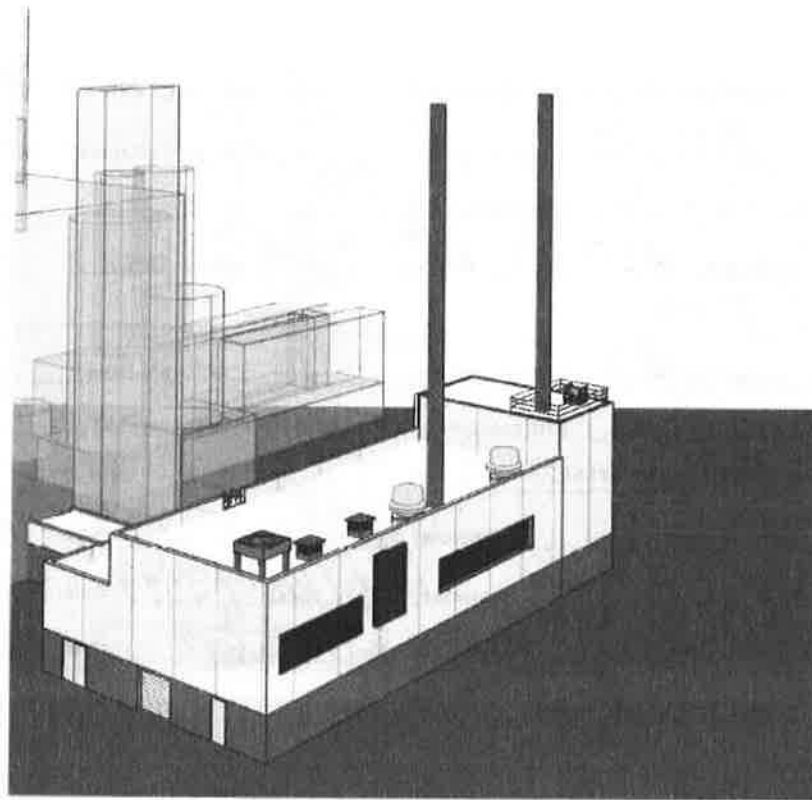


Figure 1. Combined Heat and Power Plant Conceptual Model

The CHP will provide an efficiency of 90%, which provides an 8% improvement over the conventional steam boilers. The gas combustion turbine will operate 8,592 hours per year providing a thermal base load output of 32,000 lbs per hour of steam along with a connected 6MW generator of electrical power. The duct burner when dispatched provides an additional steam load of 78,000 lbs per hour to equate to the maximum rated HRSG steam load of 110,000 lbs per hour. If the gas combustion turbine is offline, the duct burner has the capability to maintain the HRSG at 110,000 lbs per hour. The system can not exceed 110,000 lbs per hour regardless of operational mode.

After construction of the CHP, gas fired units #3 and/or #4 will be shut down and cut off from ever re-starting depending on final permit requirements and associated limits. Figure 2 shows the location of the proposed CHP.

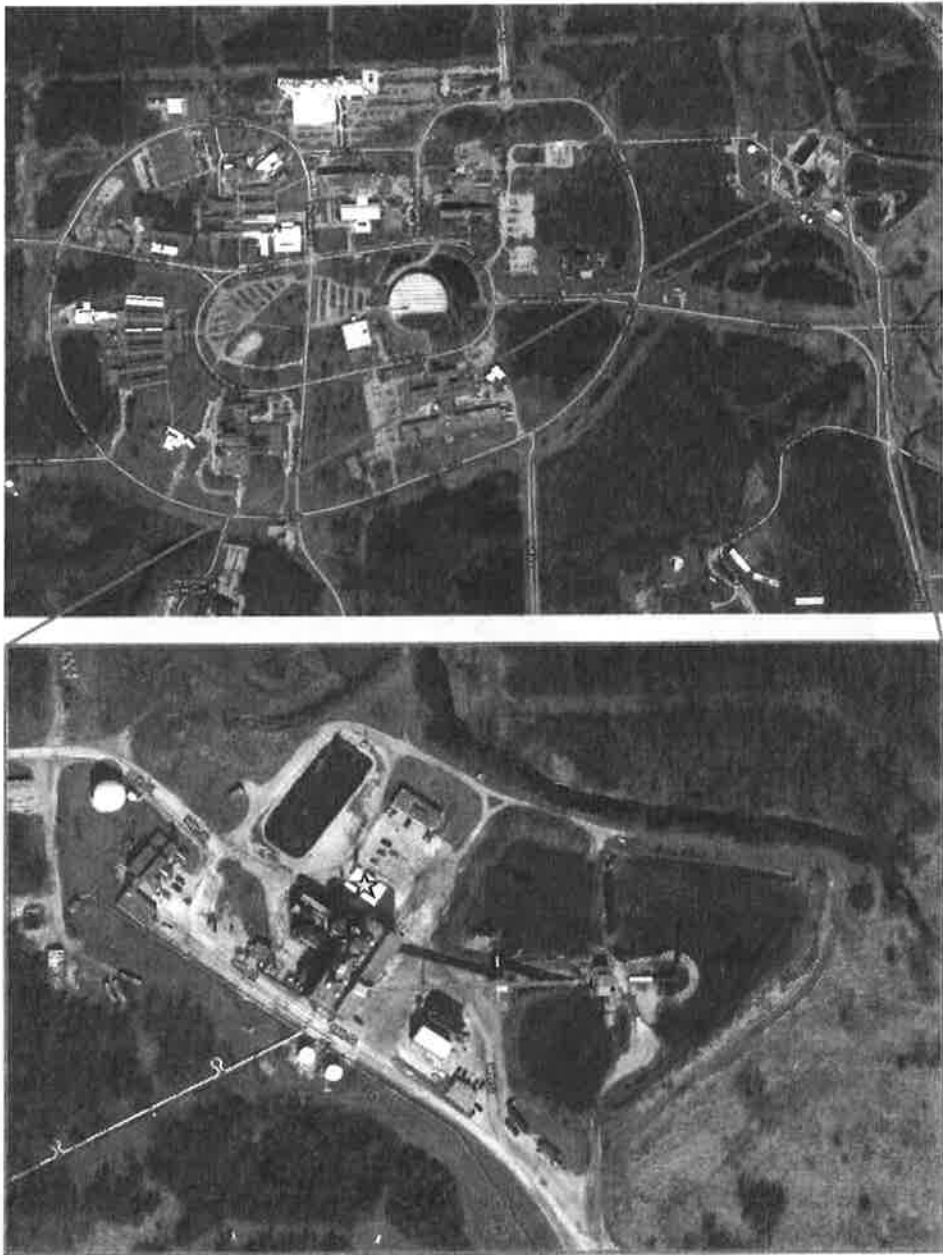


Figure 2. Project Location for Combined Heat and Power Plant

II. **Description of Affected Environment:**

Construction will occur in a previously disturbed area, which is the surrounding area of the present Steam Plant, see Figure 2. CHP will be operating at an efficiency of 90% in comparison to 82% efficiency of the existing boilers. In addition - the installation of the CHP, which provides increased efficiency and reliability, which allows at least one boiler to be decommissioned. The CHP electrical generation aspect of 5-8 MW will reduce power generation off the "grid" representing approximately 15-20% of Argonne's annual electrical load or an estimated 55 tons of CO₂e if generated with coal. The exhaust from the gas turbine is used to produce steam for the Argonne site thus using the same energy source twice to produce both electricity and steam for Argonne site reducing the volume of non-renewable energy sources needed to operate the facility.

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 Yes No
opportunities and details provided under items 2, 4, 6, 7, 8, 16, and 20 below, as applicable

2. Air Pollutant Emissions Yes No

Natural gas as a fuel will provide cleaner fuel and the new CHP will increase the fuel efficiency of the plant by approximately 8% and permit the decommissioning of at least one existing coal fired boiler. This action will reduce actual emissions but per permit rules emissions will technically increase due to the potential capacities of the existing plant verses added CHP plant. Noresco and the Laboratory will review the PSD and NSR rules to determine the final expected future levels of discharge from the revised plant.

3. Noise Yes No

During construction of the new facility, standard construction noises from excavation, cranes, earth moving and other construction equipment will occur. General noise levels will be well below 85 dba. Certain specific noises will exceed the maximum levels and temporary protection will be put in place. As applied to the operations of the facility, the gas combustion turbine and generator are enclosed for sound attenuation. SOLAR has noted 85 dba as an average at 3 feet from the package at a height of 5 feet.

4. Chemical Storage/Use Yes No

During the construction of the facility, standard construction chemicals and materials requiring MSDS sheets will be stored and used. Chemicals for water treating are a Point of

Feed (POF) within the existing Steam Plant. They will be stored and used during the operations of the facility.

This facility will not be adding any oil filled transformers or other oil filled equipment without specific containment systems.

5. Pesticide Use Yes No

6. Polychlorinated Biphenyls (PCBs) Yes No

Some modifications to the existing plant will be made that might remove light fixtures. These fixtures are not expected to have PCB containing parts. However, during design these items will be verified.

7. Biohazards Yes No

8. Liquid Effluent (wastewater) Yes No

Boiler blow down will be piped to the existing laboratory sewer collection system in the existing boiler house. This water is collected in the existing Boiler House equalization pond and discharged to the Laboratory's site laboratory wastewater treatment plant and to the Du Page Sanitary system as allowed by contract. The new boiler blow down created by the new CHP will be offset by the decommissioning of one or more existing boilers resulting in a zero net increase. The new CHP plant will not create a sanitary sewer waste stream. Storm water will be discharged to the nearby storm water collection system in the parking area northeast of the new plant. Some modifications to the laboratory and storm water collection systems will be made during the construction of the facility.

9. Waste Management

a) Construction or Demolition Waste Yes No

Standard construction debris from construction will occur. Excess concrete, mortar, asphalt, bricks, blocks, clean gravel and earth will be recycled either on site or off site. Other construction debris will be collected and segregated at the job site such as wood, metals, paper, plastic, etc. per HPSB Guiding Principles. All construction and demolition debris going to and diverted from the landfill will need to be tracked and documented.

b) Hazardous Waste Yes No

Some modifications to the existing plant will be made that might require welding, cutting, etc. of structural members and utilities that may be coated with lead based paint. However, during design, these items will be verified.

c) Radioactive Mixed Waste Yes No

d) Radioactive Waste Yes No

e) PCB or Asbestos Waste Yes No

Some modifications to the existing plant will be made that might remove light fixtures or piping insulation. These fixtures are not expected to have PCB containing parts. The piping is not expected to have asbestos insulation. However, during design these item will be checked.

f) Biological Waste Yes No

g) No Path to Disposal Waste Yes No

h) Nano-material Waste Yes No

10. Radiation Yes No

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

During design ES&H representatives will be reviewing the project to identify potential violations of regulations or required permits.

12. New or Modified Federal or State Permits Yes No

The Laboratory's Title V Operating Permit will require modification. IEPA will require a Construction Permit before actual construction or equipment can be purchased. Retirement of existing boiler(s) will have to be specified so as not to trigger Prevention of Significant Deterioration (PSD) or New Source Review (NSR). Evaluation of the expected emissions will be conducted by Noresco/Argonne during the Investment Grade Audit (IGA) to ensure Argonne meets current IEPA regulations. The entire work site is expected to be less than acre. However, if the entire work site exceeds 1 acre, a stormwater construction permit will need to be applied for and received prior to construction.

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

14. Public Controversy Yes No

CHP is an accepted EPA clean steam and electric generating technology. In a general comparison - a CHP is regarded as 82% efficient as compare to a conventional power plant at 33% efficient.

15. Historic Structures and Objects Yes No

16. Disturbance of Pre-existing Contamination Yes No

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

CHP is accepted EPA clean steam and electric generating technology. In a general comparison - a CHP is regarded as 82% efficient as compare to a conventional power plant at 33% efficient. This process in general uses the same non-renewable energy source twice instead of one to generate energy: electricity and steam. In addition, the structure itself will employ many sustainable design features such as cool roofs, recycling of construction debris, etc. Materials used for the general construction of the facility will meet the minimum standards identified in the FEMP criteria. Due to the CHP efficiency and the use of natural gas instead of a coal fired boiler, the project will result in Scope 1 greenhouse gas (GHG) emission reductions. In light of the onsite power generation of the CHP, the project will also result in Scope 2 and 3 GHG emission reductions.

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

The existing foot print is on a paved surface.

22. Navigable Air Space Yes No

A new exhaust stack will be installed to about 100 feet above grade. This smokestack will be below the existing adjacent stacks. The FFA will be contacted and notified of the planned installation.

23. Clearing or Excavation Yes No

The proposed footprint of the CHP site is 110' x 50' x 35'. Site work will include the removal of the existing asphalt surface, existing sub-base gravels and sub-grade clays to install the necessary foundations.

24. Archaeological Resources* Yes No

25. Underground Injection Yes No

26. Underground Storage Tanks Yes No

**Natural gas line locations may have potential impact on archeological resources. Project will need to comply with provisions of Section 106 cultural resources review.*

27. Public Utilities or Services Yes _____ No X

28. Depletion of a Non-Renewable Resource Yes _____ No X

Natural Gas is regarded as a fossil fuel and non-renewable resource. The CHP plants use of natural gas reduces the amount of gas used to generate steam and also provides 6 MW of electrical power and a reduction of 55 tons of CO₂e or an approximate reduction of 940 mmBtu of natural gas. The reduction of offsite power use and associated demand reduces the use of coal at offsite power plants.

B. 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. B 5.14 Combined heat and power or cogeneration systems

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.

ASO NEPA Coordinator Review: Kaushik Joshi

Signature: K Joshi Date: 7-2-2013

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: 7/2/13

Peter R. Siebach
Acting Argonne Site Office NCO

ASO NCO EA or EIS Recommendation:

Class of Action: _____

Signature: _____ Date: _____

Peter R. Siebach
Acting Argonne Site Office NCO

Concurrence with EA or EIS Recommendation:

CH GLD: _____

Signature: _____ Date: _____

ASO Manager Approval of EA or EIS Recommendation:

An ____ EA ____ EIS shall be prepared for the proposed _____ and
_____ shall serve as the document manager.

Signature: _____

Date: _____

Dr. Joanna M .Livengood
Manager

August 2012

