PMC-EF2a
(2.04.02)

U.S. DEPARTMENT OF ENERGY
EERE PROJECT MANAGEMENT CENTER
NEPA DETERMINATION

RECIPIENT: Cedarville School District 44 **STATE:** AR

PROJECT TITLE : Recovery Act: Cedarville School District Retrofit of Heating and Cooling Systems with Geothermal Heat Pumps and Ground Source Water Loops

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DOE-FOA-0000116	DE-EE0002968	GFO-10-302	2968

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:
Description:

A9 Information gathering (including, but not limited to, literature surveys, inventories, audits), data analysis (including computer modeling), document preparation (such as conceptual design or feasibility studies, analytical energy supply and demand studies), and dissemination (including, but not limited to, document mailings, publication, and distribution; and classroom training and informational programs), but not including site characterization or environmental monitoring.

A11 Technical advice and planning assistance to international, national, state, and local organizations.

B5.1 Actions to conserve energy, demonstrate potential energy conservation, and promote energy-efficiency that do not increase the indoor concentrations of potentially harmful substances. These actions may involve financial and technical assistance to individuals (such as builders, owners, consultants, designers), organizations (such as utilities), and state and local governments. Covered actions include, but are not limited to: programmed lowering of thermostat settings, placement of timers on hot water heaters, installation of solar hot water systems, installation of efficient lighting, improvements in generator efficiency and appliance efficiency ratings, development of energy-efficient manufacturing or industrial practices, and small-scale conservation and renewable energy research and development and pilot projects. The actions could involve building renovations or new structures in commercial, residential, agricultural, or industrial sectors. These actions do not include rulemakings, standard-settings, or proposed DOE legislation.

B3.1 Onsite and offsite site characterization and environmental monitoring, including siting, construction (or modification), operation, and dismantlement or closing (abandonment) of characterization and monitoring devices and siting, construction, and associated operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis. Activities covered include, but are not limited to, site characterization and environmental monitoring under CERCLA and RCRA. Specific activities include, but are not limited to:

Rational for determination:

DOE and Cedarville School District cost share funding will be used on to improve the energy efficiency of the buildings that make up the campus of Cedarville High School, Middle School, and Elementary School through the design, installation, and monitoring of a geothermal heat pump system for heating and cooling. Following design and feasibility studies; ground-loop heat exchangers, heat pumps, a centralized energy management and control system, and all necessary piping and ductwork will be installed. Following installation, the system will be monitored and marketed to track and promote the performance of the new system. There are three phases for the proposed project.

The tasks to be performed for Phase 1 - Feasibility Study and Engineering Design, include:

Task 1: A study of existing utility distribution and cooling and heating systems will be performed to confirm and optimize the design for the geothermal system installation. The operational costs of the existing system will be measured for comparison with the newly installed system once complete. All design plans and specifications will be completed and approved for Phase II installation activities.

Task 2: The use of innovative financing approaches will be evaluated.

Task 3: The specifications of equipment to be installed during phase II will be analyzed, including; ground-loop heat transfer design, individual classroom heat pumps, reheat exchangers, UV units in ducts, controlled provision of fresh air, heat exchangers on exhaust air, and a central energy management system.

• The recipient states that test boreholes will be drilled to perform conductivity tests. They will adhere to ASHRAE recommendations and will be located on previously disturbed ground. All waste produced from the well drilling is required to be collected and disposed of in accordance with the state regulations for drilling spoils disposal.

Phase 2 – Installation and Commissioning of Equipment and Systems will consist of replacing old HVAC equipment with new equipment and construction and installation of a ground source heat pump system. The proposed ground

source heat pump system will be made up of four closed loop vertical heat exchangers/well fields and have a combined capacity of 535 tons. The well fields will have a total of 266 boreholes drilled to a depth of 400 feet. The NEPA reviewer has noted, through analysis of aerial photography, that although there are 4 separate proposed well fields, all of the existing buildings serviced occur on one contiguous, developed piece of property. The well fields will be installed in existing sports fields and gravel parking lots contained within this contiguous property. From this analysis, the reviewer determined that the 4 installations could be assessed as one unit regarding adverse impacts to the environment. Therefore, it has been concluded that the proposed activities within this project will have no adverse impacts to wetlands, floodplains, or coastal zones. The recipient states that no consultation and/or investigations were conducted regarding cultural resources and T&E species because the affected areas are already developed parts of the existing campus. An analysis of fragile Karst topography was conducted using USGS mapping of the Ozark region compared with known karst topography and the project location. It is clear from this analysis that Krast formations are not located on or near the proposed project location. These systems will use high density polyethylene pipe that is heat fused at the joints to prevent leaks and minimize the risk of refrigerant contamination of ground water. The proposed system will employ an environmentally approved mixture of potable water and propylene glycol as the refrigerant further minimizing impacts in the event of system leak. All boreholes will be grouted with thermally enhanced grout to prevent contamination of ground water by surface water runoff entering the ground through the borehole. The recipient is requiring a state certified or licensed driller that will follow IGSHPA guidelines. The recipient states that permits will be acquired per the standard rules in Arkansas administered by the Arkansas Water Well Commission. Standard practice using typical erosion control will be used. This may include silt fences and berms or trenched channels to a dry-out pit. The recipient states that the contractor will collect non-hazardous municipal waste onsite and dispose of offsite in established landfills.

Phases 1 and 3 of the project involves information gathering, document preparation and system design only, and does not present any significant impact to human health and/or environment; therefore it is categorically excluded under CX A9 "information gathering" and CX A11 "technical advice" from further NEPA review. Drilling of test boreholes is determined to have no significant impact to human health and/or the environment, therefore it is categorically excluded under B3.1 "Environmental Monitoring and Site Characterization". After a thorough review, Phase 2 - Installation and Commissioning of Equipment and Systems has been determined to present no significant impact to human health and/or environment; therefore it is categorically excluded under CX B5.1 from further NEPA review.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

None Given.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 4/1/10

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

☐ Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

☐ Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.

☐ Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____

Field Office Manager