

SUPPLEMENT ANALYSIS TO THE ENVIRONMENTAL ASSESSMENT OF “OREGON INSTITUTE OF TECHNOLOGY (OIT) DEEP GEOTHERMAL WELL AND POWER PLANT PROJECT” DOE/EA-1621

1. BACKGROUND

This Supplement Analysis (SA) has been prepared to determine if the Environmental Assessment (EA), *Oregon Institute of Technology (OIT) Deep Geothermal Well and Power Plant Project* (DOE/EA-1621, September 23, 2008) prepared by the Department of Energy (DOE) adequately addresses the environmental impacts of OIT's newly proposed geothermal action or if the EA needs to be supplemented. The DOE/EA-1621 is available for viewing at http://www.eere.energy.gov/golden/Reading_Room.aspx.

As set forth in the EA, DOE proposed to fund OIT's drilling and testing of a geothermal production well, and the potential construction and operation of a geothermal power plant, as described below.

OIT proposed to install a small-scale, high-temperature geothermal power plant on the OIT campus, powered by fluid from the proposed geothermal production well connected to the power plant by a proposed geothermal fluid pipeline. The power plant would be approximately 1.2 megawatts (MW) gross in generating capacity and would be a binary (organic Rankine cycle) type. This plant would use high-temperature geothermal water/steam (estimated to be around 300°F) from the proposed deep geothermal well of up to 6,000 feet. The power plant and cooling tower would be located on a pad 80 feet by 50 feet adjacent to the existing heat exchange building on the southeast corner of campus (see Figure 1). Cooling water would be supplied to the cooling tower from nearby coldwater wells by a proposed coldwater pipeline that would run from the existing heat exchange building.

2. DESCRIPTION OF NEWLY PROPOSED GEOTHERMAL ACTION

Subsequent to the completion of DOE/EA-1621, OIT proposed additional scope of work associated with its geothermal development; this new scope of work was not directly analyzed in the EA. Once the geothermal well analyzed in the EA was drilled it was determined that a higher flow rate was needed to compensate for lower than expected temperatures; therefore a new injection well would be needed to handle the higher flow rate and a pipeline with supporting equipment would be needed to connect the new injection well with the existing OIT geothermal system.

The newly proposed geothermal action would occur on land owned by OIT and would consist of the excavation of trenching for the installation of a 12-inch insulated fiberglass geothermal fluid pipeline, a 6-inch and 8-inch return pipeline, a 4-inch waterline, a 6-inch sanitary sewer line that would run from the future power generation facility, two 5-inch electrical conduits, and two 2-inch data conduits with pull boxes. The total area of this proposed disturbance is approximately

OIT Geothermal System Project Elements

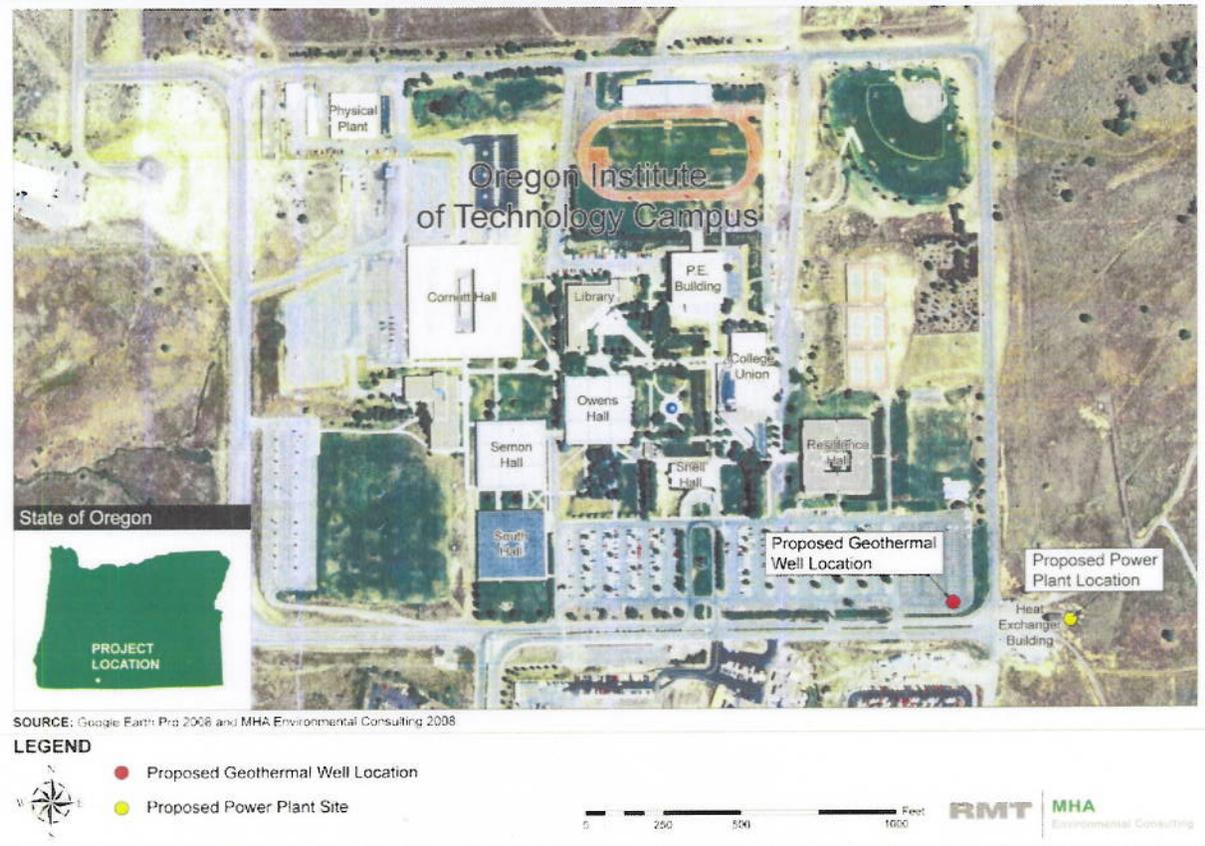


Figure 1: EA Project Elements

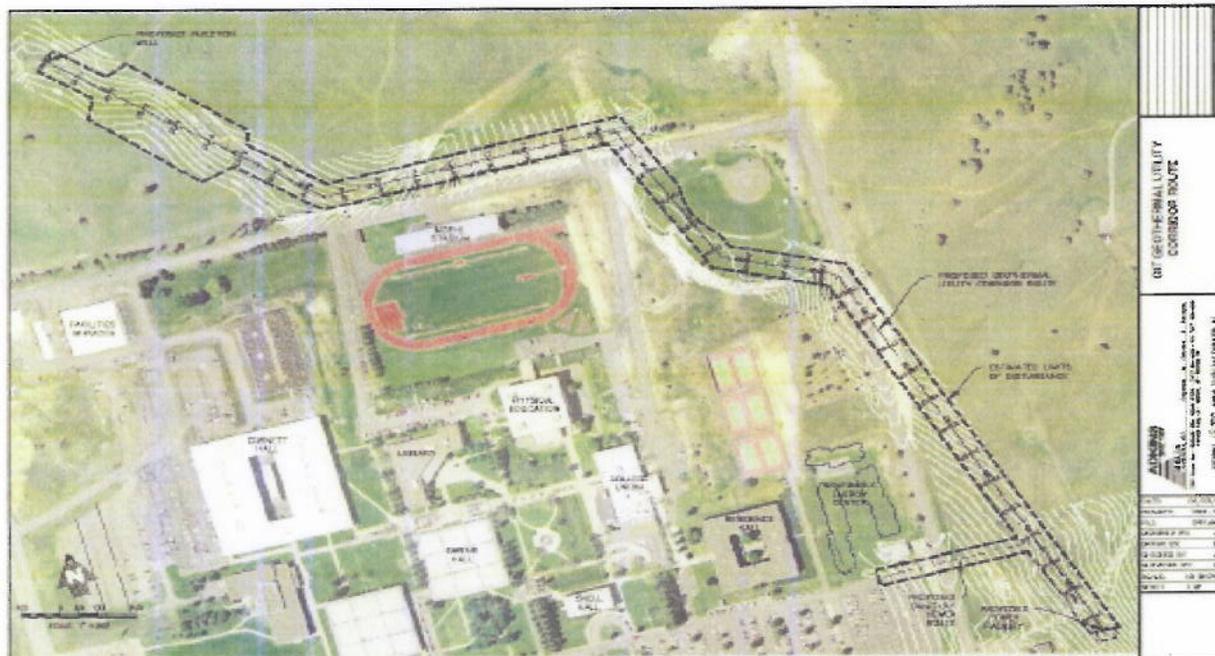


Figure 2: Newly proposed geothermal action

eight acres with a working area for trenching of 3,800 feet long by 75 feet wide for geothermal piping, 400 feet long by 50 feet wide for the sanitary sewer line, and an additional area requiring fill material (see Figure 2). Drilling of a new geothermal injection well would occur along an existing dirt road.

OIT would backfill disturbed areas after installation, return those areas to appropriate contours, and reseed with an appropriate seed mix to prevent erosion.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The EA analyzed an area that included the OIT campus bounded by College Way to the north, Campus Drive to the south, Industrial Park Drive to the west, and Bryant Williams Drive to the east as well as a small area adjacent to the campus to the southeast. All lands analyzed in the EA were previously disturbed areas. The newly proposed geothermal action would occur within 200 meters of the area analyzed in the EA with approximately half of the work occurring in areas that have already been analyzed in the EA (see Figures 1 & 2).

With the exception of Cultural and Historical Resources, the resource areas analyzed in Chapter 3 of the EA and the effects to those resource areas due to the newly proposed geothermal action were adequately addressed in the EA because of the close proximity and similar natures of the proposed actions analyzed in the EA and the newly proposed geothermal action analyzed in this supplement.

3.1 Cultural and Historical Resources

3.1.1 Affected Environment

Refer to the above referenced EA for a discussion of the Cultural and Historical Resources introduction and setting for the project area.

Cultural and Historical Resources

There are no known archaeological resources present within the area of the newly proposed geothermal action. Project work would occur partially on previously disturbed ground and partially on undisturbed ground.

The OIT campus has a recent history and was moved to its current location in 1963 in order to utilize the geothermal resources to heat the campus. There are no historic resources or buildings in the vicinity of the newly proposed geothermal action.

Native American Values

There are several Federal laws and policy that are applicable to the consideration of Native American values. Of particular importance are:

- American Indian Religious Freedom Act of 1978 (AIRFA): Requires federal agencies to take into account the effect of their actions on Native American traditional religious practices prior to actions being authorized.
- Native American Graves Protection and Repatriation Act of 1990 (NAGPRA): The intent of this legislation is to ensure that disposition of Native American human remains and associated funerary objects shall be controlled by individuals or groups determined to be most closely associated with the materials.
- Traditional Cultural Properties (TCP): National Register (US Department of the Interior) Bulletin 38 discusses properties that can be determined to be eligible for inclusion on the National Register of Historic Places because of their association with beliefs of cultural practices of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community.

The Native American tribes in the project area include the Modoc, Klamath, and Yahooskin tribes. The nearest reservation to the proposed project site is the XL Ranch, located in California about 75 miles southeast of the proposed project site (NPS 1996). There are no areas of known traditional cultural properties, traditional uses, or sacred sites within the area of the newly proposed geothermal action.

3.1.2 Environmental Consequences

Cultural and Historical Resources

The newly proposed geothermal action would occur partially on ground that has previously been undisturbed, therefore a cultural resources survey of the areas to be disturbed was required prior to project implementation. A cultural resource survey was completed on December 17, 2010 and February 21, 2011 at ≤5 meter intervals over the entire area to be disturbed to identify the presence of archaeological resources and to evaluate the nature and extent of prior disturbance to the soils and sediments present. This survey included archival review, background research, a reconnaissance level archaeological survey, and consultation with the Oregon State Historic Preservation Office (SHPO) and the Klamath Tribes Culture and Heritage Department. The cultural survey identified no significant surficial cultural resources within the area of the newly proposed geothermal action, but "Areas where soil is intact may hold subsurface archaeological deposits and all ground disturbing activities should be monitored by a qualified archaeologist."

A cultural resource report detailing the findings of the cultural resource survey was submitted to SHPO with all required documentation. SHPO reviewed the report and concurred in a letter dated March 11, 2011, "that the project will have no effect on any known cultural resources. No further archaeological research is needed with this project."

Although no archaeological sites are known to exist within the area of the newly proposed geothermal action and none were found during the cultural resource survey, an archaeological/tribal monitor will be present during all surface disturbing activities to protect sub-surface resources that may be present but unknown at this time. If previously undocumented cultural resource sites are discovered during surface disturbing activities, OIT will halt construction in the area of the discovery and contact the DOE Project Officer to evaluate the

find. If the site is eligible for the National Register of Historic Places (NRHP), impacts will be mitigated through avoidance or an appropriate data recovery program developed among the DOE, SHPO, and OIT. In the event of an inadvertent discovery of human remains, OIT will halt work immediately and notify the proper authorities pursuant to Oregon Revised Statute 97.745 and NAGPRA. Therefore, there would be no adverse impacts to cultural resources as a result of implementation of the newly proposed geothermal action.

The OIT campus was built in 1963 and there are no historic buildings in the project vicinity. The project would have no effect on historic properties.

Native American Values

There are no known Native American TCPs or sacred sites within the proposed project area that would be affected by the newly proposed geothermal action. The proposed project would not have an adverse impact on Native American properties or values.

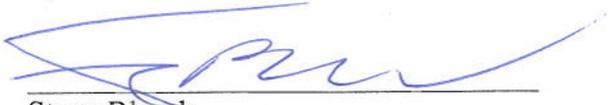
4. CONCLUSION/DETERMINATION

DOE has evaluated the potential for the newly proposed geothermal action to adversely affect the environment. Conclusions of the evaluation are summarized as follows:

- With the exception of Cultural Resources, the resource areas analyzed in Chapter 3 of the EA and the effects to those resource areas due to the newly proposed geothermal action were adequately addressed in the EA because of the close proximity and similar natures of the proposed actions analyzed in the EA and the newly proposed geothermal action analyzed in this supplement. Impacts from the newly proposed geothermal action to these resources are expected to be temporary and minimal.
- Cultural Resources – Although no archaeological sites are known to exist within the area of the newly proposed geothermal action and none were found during the cultural resource survey, an archaeological/tribal monitor will be present during all surface disturbing activities to protect sub-surface resources that may be present but unknown at this time. If previously undocumented cultural resource sites are discovered during surface disturbing activities, OIT will halt construction in the area of the discovery and contact the DOE Project Officer to evaluate the find. If the site is eligible for the National Register of Historic Places (NRHP), impacts will be mitigated through avoidance or an appropriate data recovery program developed among the DOE, SHPO, and OIT. In the event of an inadvertent discovery of human remains, OIT will halt work immediately and notify the proper authorities pursuant to Oregon Revised Statute 97.745 and NAGPRA. Therefore, there would be no adverse impacts to cultural resources as a result of implementation of the newly proposed geothermal action.

Based on the analyses of the potential impacts to cultural and historical resources of the drilling of a new geothermal injection well and the excavation of trenching for the installation of a pipeline with supporting equipment discussed in this SA, DOE concludes that the newly proposed geothermal action is not a substantial change to the proposed actions analyzed in the

EA. There are no significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. Therefore, DOE has determined that no additional NEPA review is required.



Steve Blazek
NEPA Compliance Officer
Golden Field Office

3/31/11
Date