Mount Spurr Geothermal Project

Grantees	Ormat Nevada, Inc. (Independent Power Producer), ORNI 46 LLC (Independent Power Producer)
Technology Type	GEOTHERMAL
Region	Railbelt
AEDG Project Code	10157

REF Grants Received

Round	App	Grant Title	Grant #	AEA Project #	Phase	Start Date	End Date	Status
3	477	Mount Spurr Geothermal Project	7030018	406012	Feasibility	7/1/10	6/30/12	Closed
4	652	Mount Spurr Geothermal Project 2	7040032	406012	Construction	7/1/11		Closed

Grant 7030018: Mount Spurr Geothermal Project

Project Scope: ORNI 46 LLC used a Round III Renewable Energy Fund grant to complete a staged reconnaissance and assessment of the geothermal resources on Mt. Spurr. Work completed included: aeromagnetic gravity survey, electromagnetic geophysical surveys, LiDAR survey, field work, mapping, geochemical sampling, and drilling two temperature gradient and two slim holes. Work began in the summer of 2010 and was completed in the fall of 2011. Ormat Nevada, Inc. has previously completed the initial reconnaissance field work in 2009.

The activities completed with the grant funds are follow-up activities to determine whether to proceed to drilling production wells and further commercial development of the Mt. Spurr geothermal project. Preliminary analysis of data from field reconnaissance of the region conducted by Ormat Nevada, Inc. in July and August of 2009, coupled with historical exploration work from the mid-1980's, indicated the potential existence of a commercial size geothermal resource; however, further exploration is required in order to confirm it.

The grant had a two-phased program for continued resource studies and assessment surveys. Phase I, included mapping, further geochemical sampling, remote sensing, aerial and ground-based geophysics and temperature gradient drilling. Phase II included slim-hole drilling.

Project Status: Ormat reported disappointing exploration drilling results in 2011, drilling to a depth of 4,500 feet in the eastern leases on Mt. Spurr. The maximum temperature encountered was 140 degrees F, which is substantially less than the minimum for a commercial system.

In the summer of 2012, Ormat conducted a geo-hazard study of the central Mt. Spurr area. This was followed with additional field work in 2013, which was aimed at locating future drill targets in this area. The results of this field work, which was funded by Ormat, are currently under review.

As of Nov. 30, 2013	Budget	Expenditures
Renewable Energy Funding	$1,993,158.00	$1,993,158.00
Other State Funding	$0.00	$0.00
Total State	**$1,993,158.00**	**$1,993,158.00**
Required Local Match	$2,158,603.00	$2,549,052.00
Federal Grant Funding	$0.00	$0.00
Total Project Costs	**$4,151,761.00**	**$4,542,210.00**

Grant 7040032: Mount Spurr Geothermal Project 2

Project Scope: Mount Spurr represents what currently appears to be the best opportunity in Alaska to develop a utility-scale base-load geothermal energy power plant. Located 80 miles west of Anchorage on state lands which were leased by Ormat Nevada Inc. in October of 2008, a successful power project at Mt. Spurr would serve communities along the Railbelt through power purchased by one or more of the Railbelt electric utilities.

This grant request is for the start of construction of the geothermal well field and later on (beyond the scope of this grant application), the power plant itself. The first step in construction of a commercial geothermal well-field is to drill a full-size deep geothermal production well, in order to tap into the geothermal reservoir and flow test the geothermal fluid in order to measure its

temperature, pressure, chemical composition and other attributes. The location of this well will be based on a synthesis of 2010 and 2011 exploration work mentioned before. Follow-up steps (beyond the scope of this grant application) will include drilling additional production wells; drilling one or more injection wells; performing a long-term multi-well flow test to measure the size of the geothermal reservoir; drilling additional production and injection wells and building a power plant, including a geothermal gathering system, utility interconnection facilities etc.

Project Status: The Round 4 grant was never issued, as it was contingent upon successful exploration results from the Round 3 grant supporting feasibility work. The applicant requested that the Round 4 funds intended for production well drilling be used to continue earlier phase work of exploration drilling to identify a hot enough resource. AEA negotiated with Ormat but could not come to an agreement on cost share and Ormat cancelled the project. The Renewable Energy Fund budget for this project of $1,999,972 was released within the Fund to re-grant to Round 8 REF projects during the 2015 legislative session.

As of Nov. 30, 2013	Budget	Expenditures
Renewable Energy Funding	$1,999,972.00	$0.00
Other State Funding	$0.00	$0.00
Total State	**$1,999,972.00**	**$0.00**
Required Local Match	$0.00	$0.00
Federal Grant Funding	$0.00	$0.00
Total Project Costs	**$1,999,972.00**	**$0.00**