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April 1, 2010

Ms. Marcella Purkey
Winnemucca Field Office
U.S. Bureau of Land Management
5100 East Winnemucca Blvd.
Winnemucca, Nevada 89445

Re: ***Notice of Intent for Geophysical Survey- Seismic Orientation Survey***
Brady Hot Springs Area, Churchill County, Nevada 2-9

Dear Ms.Purkey:

I am a geologist/geophysicist and am currently involved with a small group that has been granted a U.S. Department of Energy (USDOE) geothermal energy research grant. This USDOE contract is G018191 and was issued in 2009. A description of the project is provided as Attachment A.

This USDOE effort involves geophysical experimental research to help determine where and how fractures exist in the geothermal reservoirs of western Nevada. Basically, our project is designed to help determine how to better collect seismic reflection data in geothermal systems. A better understanding of these features may help in future exploration efforts. This research has been funded for a three year period and uses the Brady Hot Springs area of western Churchill County, Nevada as an experimental area. We have concluded our year one effort (background research) and are just beginning our year two effort (field testing). The year three effort may include an extensive surface geophysical survey.

Our project includes the following groups: (1) Principal investigator, Hi-Q Geophysical, Ponca City, Oklahoma; (2) Industry Partner, Ormat Nevada, operator of Brady Hot Springs and Desert Peak geothermal areas, and; (3) Academic Partner, the University of California Lawrence Berkeley Laboratory, who may provide downhole geophysical instrumentation and investigations. My role as Co-Principal Investigator is to function as the project geologist and geophysicist. My group, Stephen G. Muir Consulting Geologist & Geophysicist (Consultant) will provide all of the surface geophysical investigative work.

This Notice of Intent (NOI) to Conduct Geophysical Survey is to fulfill a specific portion of our year two commitment to USDOE. Other operations forthcoming in the future will have separate NOI forms filed for those activities. A completed NOI Form 3200-9 for the proposed seismic

orientation survey is provided as Attachment B.

Project Description
Consultant wishes to conduct a two phase seismic orientation survey over a portion of the U.S> Bureau of Land Management (BLM) lands that Ormat Nevada has geothermal leases in Township 22 and 23 North, and Ranges 26 and 27 East, western Churchill County, Nevada. These lands are depicted on Plate 1.

Location of Proposed Geophysical Work
Specific Sections involved in the seismic orientation survey include:

Township 22 North, Range 26 East
Sections 1, 2, 11, 12, 13, 14, 23 and 24

Township 22 North, Range 27 East
Sections 6, 7, 18 and 19

Township 23 North, Range 26 East
Sections 35 and 36

Township 23 North, Range 27 East
Section 31

These lands are located principally on BLM lands located in the Forty Mile Desert and Hot Springs Mountains areas of Churchill County. The survey area can be reached by U.S. Interstate 80 and by numerous paved and dirt roads from the Nightengale Interchange (Plate 1).

Overall Purpose of Geophysical Program
The proposed seismic orientation survey is divided into two specific tasks.

Task 1: Seismic Noise Monitoring: Task 1 will be to collect seismic noise at six locations within the overall study area (Plate 1). The purpose of this task is to determine seismic noise levels in the field area from a variety of sources. Seismic noise from the geothermal production and/or injection activities and other man-caused seismic noise such as traffic on Interstate 80 may be present that could affect the results of the Task 2 seismic orientation survey. Task 1 is proposed to be conducted first and will involve only two people. We would like to conduct the Task 1 portion of this effort in June 2010. The Task 1 effort will take about one week to complete.

Task 2: Seismic Orientation Survey:

Task 2 will consist of a seismic survey along one or all four of the lines shown on Plate 1. The lines are located within the main portion of the Brady Hot Springs Geothermal area. The purpose of the lines are to collect seismic data along a profile or series of profiles with experimental acquisition procedures. The overall objective of the Task 2 effort is to determine if seismic reflection surveys can map structure and fractures within the subsurface geothermal reservoirs so that future exploration of geothermal systems in western Nevada can be more effective.

Description of Geophysical Work

The vast majority of the field area is accessible by truck or ATV by using numerous dirt roads. A total of three Honda ATV and three F250/350 trucks with trailers will be used in the field effort We do not anticipate using the 4x4 pickup trucks off any of the existing dirt roads with the exception of the recorder truck which may have to move off existing dirt roads in order to plug into the seismic data cables.

All staging activities will be conducted using existing Ormat Nevada office and shop space located in Section 1, T22N/R26E (Plate1).

Task 1: Seismic Noise Monitoring Field Work:

Seismic noise monitoring is anticipated to be collected at about six locations as shown on Plate 1. Each site will have up to twenty 3-component geophone stations laid out on two legs that are 90 degrees apart (Figure 1). Station spacing will be 55 feet. Each leg of the monitoring array will be 1100 feet long. Stations will be surveyed by global positioning system. Station locations will be marked with 36" tall pin flags that will be numbered.

The geophones and cables will be laid out by approximately 2 to 4 people using ATVs. Activity will be limited to a width of about 10 feet along each leg of each profile. Once the geophones and cables are all appropriately connected and checked the noise monitoring will begin. We anticipate listening for about 4 hours at each site. We believe that we can complete all six sites within five field days.

Once the noise monitoring has been concluded at each site we will pick up all of the equipment. No flagging or pin flags will be left behind. The legs of each profile will be inspected for any ground disturbance caused that may have to be repaired by shovel.

Any area that has identified as a biological or archeological resource will be avoided. Any area that has volcanic fumeroles, significant brush or steep terrain will be accessed on foot. Areas of steep topography will not be subject to ATV use.

Task 2: Seismic Orientation Survey:

The results of the Task 1 effort will be used to help establish recording parameters for the Task 2 effort. The Task 2 profiles are depicted on Plate 1. Where possible, each of the profiles will be located along an existing dirt or paved road. Activity along each line will be limited to a width of about 10 to 20 feet. Each of the lines in Task 2 will take about one week on average to complete the data acquisition. Delays may be anticipated from from wind or rain.

Receiver and/or source stations along each line will be marked with numbered pin flags. Receiver station spacing will be either 10 or 20 foot intervals. Source points will be 20 or 40 foot intervals and will be the same location as the receiver stations.

Seismic Field Data Acquisition Procedures

Seismic source will be a Bolt LSS-3B air impactive source mounted on a John Deere Company 540B log skidder that is self propelled. Figure 1 depicts the Bolt energy source. The Bolt energy source has 28 inch wide tires that are designed as flotation and will support the vehicle in soft sand. The Bolt energy source has a plate or pan that it places on the ground. This pan is 48 inches in diameter and provides a smooth surface for the impactive seismic source to impart seismic energy into the ground. We anticipate about 6 to 12 pops per source point. The source is initiated by radio link from the recorder truck. All source points will be acquired along the receiver line stations. As described previously we anticipate sourcing every other receiver station.

In the event that a sensitive biological or cultural area is present we can either skip those affected areas from sourcing or we can offset the source points.

The source points will have a slight impression left in the surface soil from the 48 inch diameter pan that is about ½ to 1 inch deep. At the conclusion of the survey each line will be inspected to insure that no significant ruts or permanent marks have been left in the ground surface from the seismic survey. Any damage to the ground surface will be repaired by shovel or by use of a rubber-tracked Bobcat skidder to restore ground surface to original condition.

We anticipate making four individual passes along each line or profile. Pass 1 will be to survey in the stations by ATV or by foot. Pass 2 will be to lay out the cable and geophones and will utilize about four people with two ATVs and trailers. Pass 3 will be to drive the Bolt energy source along the line and acquire data. Two people will be involved with that effort. Pass 4 will be to pickup the cable and geophones. It is anticipated that not more than four people will be involved with that effort

We would like to conduct the Task 2 portion of this effort during the time frame of June to September, 2010. Assuming all four lines are acquired, the Task 2 effort may take about 4 to 5 weeks to complete.

Description of USBLM Lands with Geothermal Leases

USBLM Lease	Section/Township/Range	Lessee
N40353	T22N/23N/R26E, Section 1	Ormat
N40355	T22N/23N/R27E, See Plate 1	Ormat
N10922	T22N/R26E, Section 2	Ormat
BHS Unit and PA	T22N/R27E, Section 6	Ormat
N65561	T22N/R26E, Section12	Ormat
N65558	T22N/R26E, Section 14	Ormat

Privately held lands within the gravity survey area will have separate permits for entry and use. These lands are depicted on Plate 1 and are primarily the former Southern Pacific Land Company parcels. The individual parcel identification numbers are shown on Plate 1. These lands are now owned by BNSF, Inc. Ormat Nevada has geothermal leases now held through BNSF, Inc. on their lands as shown on Plate 1 and has arranged access for geothermal exploration activities. Ormat Nevada has already provided permission for us to conduct this operation on their leased lands.

An access permit will be requested from ConAgra for their plant area located in Section 10, T23N, R26E. As we understand the ConAgra geothermal leases are operated by Ormat. We will confirm this and if required will obtain a permit to enter from ConAgra.

Also, any required permits will be obtained from USDOT and from Nevada DOT for access along their respective right-of -ways, if necessary.

Description of Resolution of Identified or Potentially Present Biological and Archeological Conflicts

Care will be taken to minimize all environmental impacts. Fire danger is not anticipated to be a problem. We have not had a problem getting to the project site area during previous orientation trips conducted by Ormat Nevada personnel without leaving existing dirt roads. Special care will be taken to minimize all off-road disturbances and maintain a safe and clean working environment.

Consultant is very much aware of the need to preserve identified or potentially present biological and archeological sensitive areas (BASA). In the event that BLM personnel or BLM contract personnel identify BASA that must be avoided we will either (1) modify the survey to avoid these areas or (2) provide professional biological and/or archeological consultants to mitigate the conflict. Consultant has a business relationship with Native X, a Reno-based archeology contractor who is familiar with the BLM Winnemucca field office protocols for resolution of potential access conflicts. However, if we have an identified or potential BASA issue we will avoid the BASA location and offset the seismic station(s) to mitigate the conflict at this time. None of the individual seismic stations are sufficiently important to the integrity of the data base or resultant interpretation.

Inventory of Proposed Survey Areas

Task 1: Seismic Noise Monitoring

Site	Description	Profile Length (feet)	Profile Width (feet)	Area of Disturbance
SSN1	Noise monitoring	2,200	10	½ acre
SSN2	Noise monitoring	2,200	10	½ acre
SSN3	Noise monitoring	2,200	10	½ acre
SSN4	Noise monitoring	2,200	10	½ acre
SSN5	Noise monitoring	2,200	10	½ acre
SSN6	Noise monitoring	2,200	10	½ acre
			Total	**6 acres**

Task 2: Seismic Orientation Survey

Site	Description	Profile Length (feet)	Profile Width (feet)	Area of Disturbance
BHS-101	Seismic profile	12,000	10	2.75 acre
BHS-102	Seismic profile	12,000	10	2.75 acre
BHS-103	Seismic profile	7,000	10	1.6 acre
BHS-104	Seismic profile	7,000	10	1.6 acre
			Total	**8.7 acres**

Estimated total area of disturbance of both Task 1 and Task 2 is under 15 acres.

Reclamation Measures

It is anticipated that the single passage of the Bolt energy source along each profile along with restricting wheeled vehicle access along the profiles to ATVs will limit the surface ground disturbance to a minimum. Reclamation will include post-surface inspection of all lines to insure all flagging and lath have been removed and repair of any ruts left by wheeled vehicles.

Completed USBLM Form 3200-9

Attachment B is a completed USBLM Form 3200-9.

Description of Consultant Background

Consultant is a licensed Professional Geologist and Geophysicist in California and has over thirty years of experience in geology and geophysics, a large potion of which has been conducted in the Basin and Range Province. Consultant owns all of the geophysical equipment required for this project and has conducted numerous gravity and seismic reflection surveys in California, Nevada, Oregon and Utah. Consultant has general liability insurance, commercial auto insurance and workers compensation insurance at industry-standard minimums. Consultant routinely works for mining and energy exploration companies throughout the western United States.

Health and safety plans will be made available for BLM review, if requested. All personnel involved have extensive field experience and are aware of rules and regulations regarding work on federal and state lands. We anticipate having no more than four to six of our personnel on the ground at any given time.

I hope this letter and attachments included outline the proposed seismic orientation survey project in sufficient detail to allow rapid approval as "casual use" of "BLM lands. We would like to schedule this work as soon as possible. If you have any questions you can contact me at (209) 369-9421 or (209) 601-6694. Thank you for this consideration.

Sincerely,

Stephen G. Muir

Stephen G. Muir
California Professional Geophysicist #GP 945
Expiration Date: 08/30/2010

cc: Dr. John Queen, Hi-Q Geophysical, Inc.
Mr. Peter Drakos, Ormat Nevada

Figure 1: Photograph of Noise Spread Cable Layout
2: Bolt LSS-3B energy source at USDOE Teapot Dome Facility, Wyoming

Plate 1 Map of Micro-gravity Survey Brady Hot Springs Area, Churchill County Nevada

Attachments:
Attachment A: See this link for USDOE project description:
http://apps1.eere.energy.gov/geothermal/projects/projects.cfm/ProjectID=132?print
Attachment B: Completed USBLM Form 3200-0

ATTACHMENT A
DOE Project Description

U.S. Department of Energy - Energy Efficiency and Renewable Energy

Geothermal Technologies Program

Seismic Fracture Characterization Methods for Enhanced Geothermal Systems

This is a summary of a project funded on a cost-shared basis by the U.S. Department of Energy through its Geothermal Technologies Program (GTP). This work is one of several projects funded by GTP under its mission to conduct research, development, and demonstration to advance geothermal energy technologies. This summary was prepared as part of the application process by the subsequent recipient of a funding opportunity grant and is offered only as a general overview of the project's scope and direction at the time of the award.

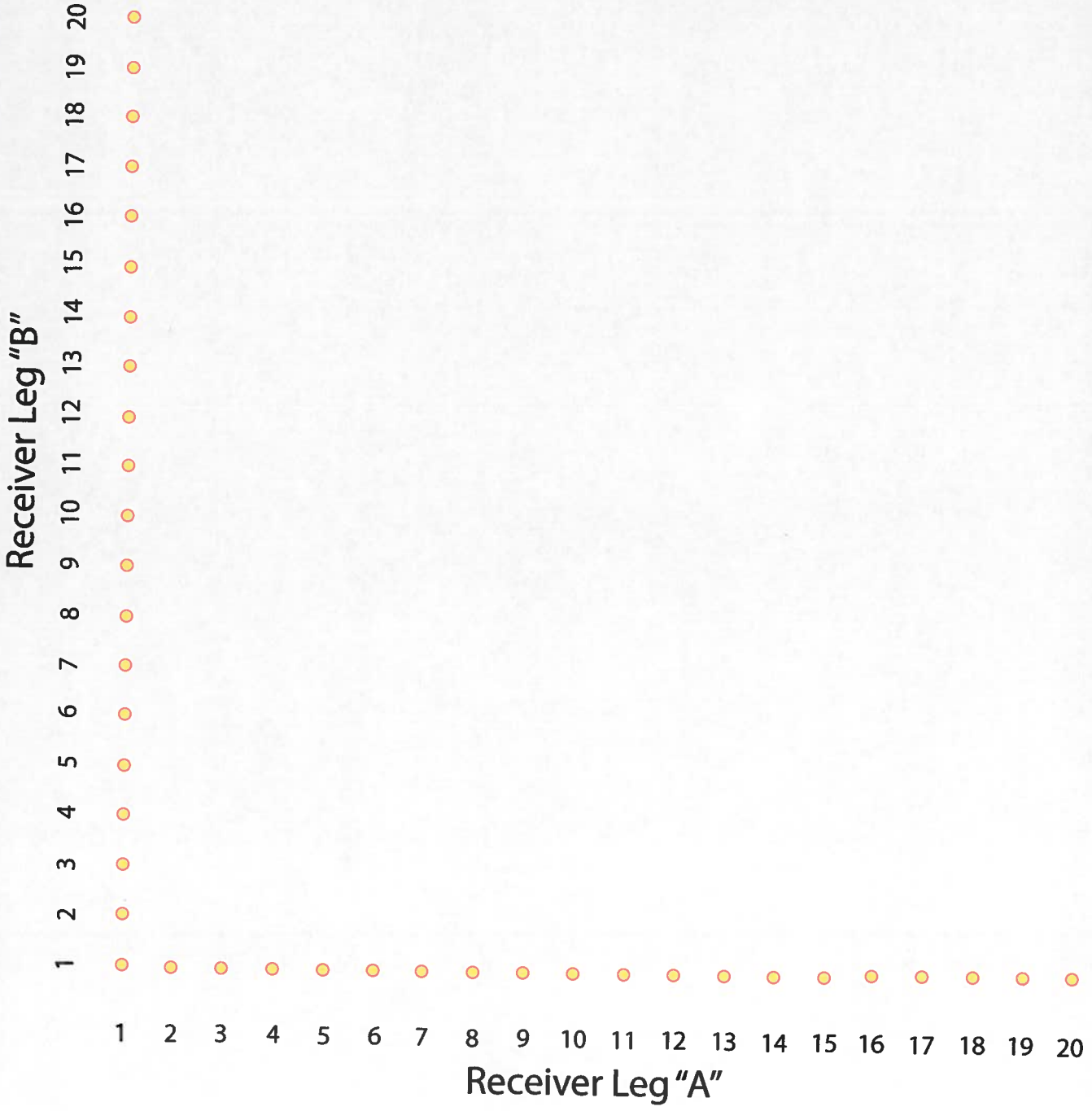
Project Technology Type	EGS Component R&D › Fracture Characterization
Awardee	Hi-Q Geophysical Inc
Partners	Ormat Technologies, Inc., Stephen Muir with Lawrence Berkeley National Laboratory
Location	Ponca City, OK
Objectives	Develop surface and borehole seismic methodologies using both compressional and shear waves for characterizing fractures in Enhanced Geothermal Systems.
Funding Opportunity Announcement	DE-PS36-08GO98008: Enhanced Geothermal Systems Research, Development, and Demonstration (PDF 279 KB) Download Adobe Reader.
Funding Source	FY 08 Appropriations
DOE Funding Level*	Total Award: $817,757
Awardee Cost Share	$542,000
Total Project Cost	$1,359,757

Funded to Date:	$817,757
Award Date	Oct 1, 2008
Project End Date	Jun 30, 2012
Principal Investigator(s)	John H. Queen, Hi-Q Geophysical, Inc Other Investigators: Stephen Muir
Description	Seismic methods have enjoyed tremendous success in the exploration, development, and production of oil and gas reservoirs, including the characterization of fractured reservoirs. There have been many attempts to translate these methods to the geothermal arena, unfortunately with little positive outcome. The lack of success with seismic methods in geothermal areas is attributed to a number of factors making geothermal reservoir development quite different from oil and gas reservoir development. These include volcanic cover, highly altered rocks, severe structure, and lack of distinct velocity contrasts associated with target lithologies. Recent studies have suggested that many of these problems can be overcome. Selection of source and receiver geometries quite different from those used in oil and gas exploration should help overcome the structural problems. Use of shear waves has also been proposed for volcanic cover areas. Getting receivers away from the surface by placing geophones in boreholes as is done with the Vertical Seismic Profile (VSP) method should also solve many of these problems. Finally, emphasizing nontraditional processing methods which focus on fracture scattering and associated frequency effects may allow the identification of fractures in zones with little expected velocity contrast. If successful, this work will have tremendous impact on the development of enhanced geothermal systems. The high resolution offered by seismic methods cannot be matched by any

	other geophysical method. Once demonstrated to be effective, with the ample availability of seismic contractors, it is anticipated that these methods would be widely adopted in the exploration, development, and production of enhanced geothermal systems.
Targets/Milestones	The proposed work program begins with assessment of existing data from the study area and construction of a preliminary geological / geophysical model. With a starting model in hand, seismic simulations will be run to determine the optimal parameters for imaging fractures in the test area. Both VSP and surface multicomponent acquisition geometries will be evaluated. The emphasis of the modeling effort will be to identify potential advantages of very fine source / receiver spacings, far offsets, and multicomponent acquisition in the context of scattering effects from fractured zones. This will be followed by the design of actual VSP and multicomponent surface reflection surveys for the study area. Design of these surveys will include specification of extensive orientation tests to validate and modify the results of the modeling studies. The first part of seismic data acquisition program will consist of orientation tests using both VSP and surface seismic geometries. Gravity data will also be acquired to constrain density estimates in the models. Using information gained from these tests, the second phase of seismic acquisition will be designed to include extensive VSP and surface multicomponent reflection surveys with large areal coverage. These data will then be processed using advanced seismic imaging methods. In addition, more specialized processing aimed at identifying fracture related scattering such as time frequency analysis will be applied. The processed data will then be interpreted for fracture characteristics. This will be followed by an overall assessment of the methodologies developed.

*DOE Funding Level is up to the amount stated and is subject to negotiation.

FIGURES



0 100 200

Scale (feet)

Legend

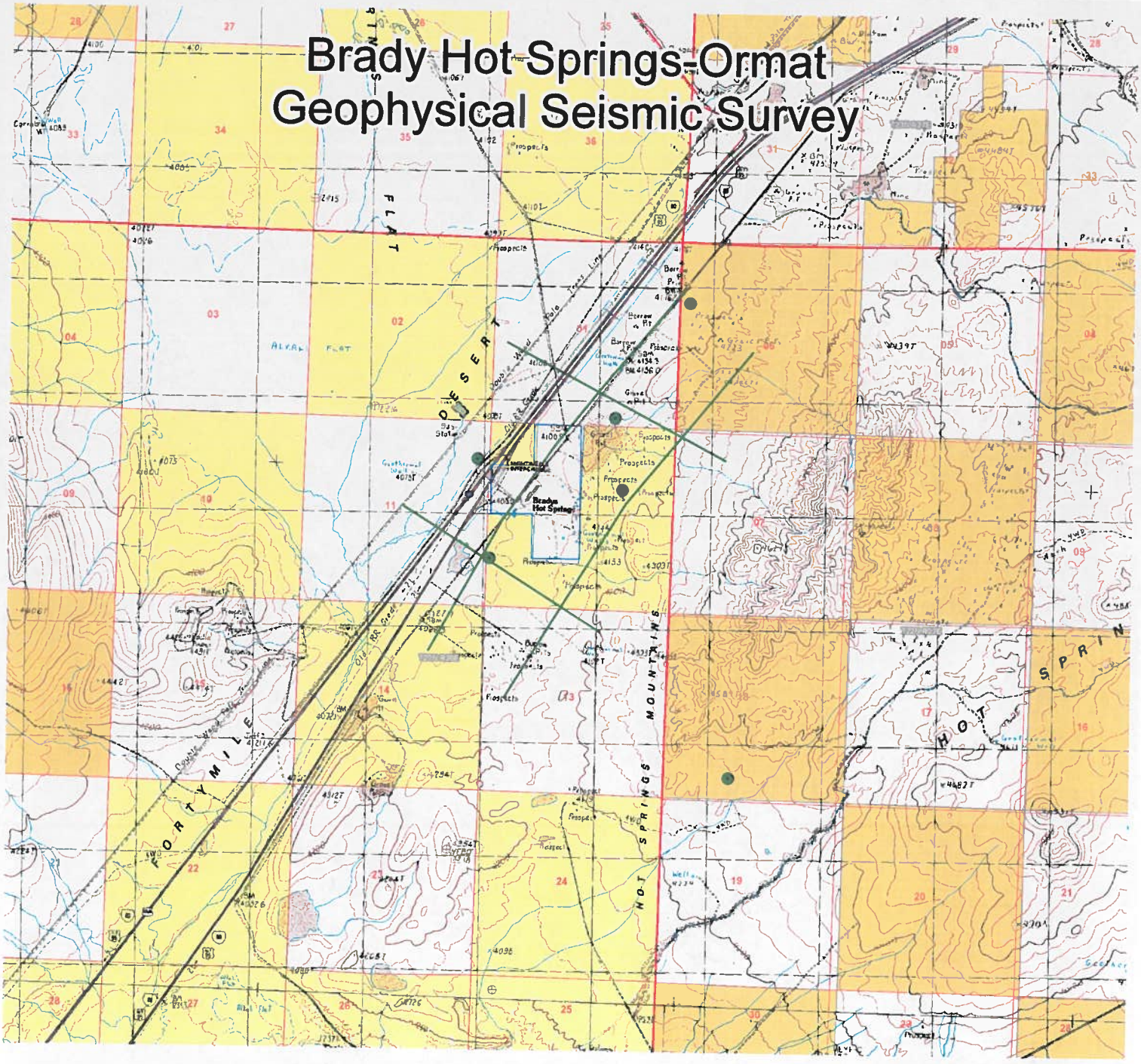
- 3-component geophone station

Hi-Q Geophysical, Inc.		
Fracture Characterization for EGS Brady's Hot Springs, Churchill County, Nevada		
Noise Monitoring Station Layout Map		
March 2010		Figure 1

Bolt LSS3B Land Airgun with 75 cubic inch gun chamber mounted on John Deere 540B Logskidder. This energy source provides approximately 28,000 pounds peak energy force with frequencies ranging from 6 to 70 Hz..

Figure 2

Brady Hot Springs-Ormat Geophysical Seismic Survey

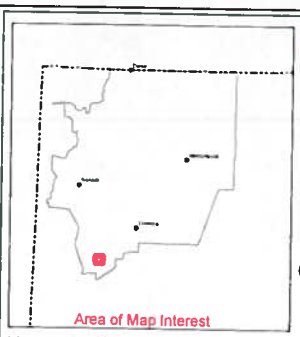


Legend

- Surface Seismic Noise Test Locations Task 1
- Seismic Orientation Profile Lines Task 2
- Ormat Geothermal Lease Boundary (Current January 2010)
- ConAgra Lease

Ownership

- Bureau of Land Management
- Bureau of Reclamation
- Private



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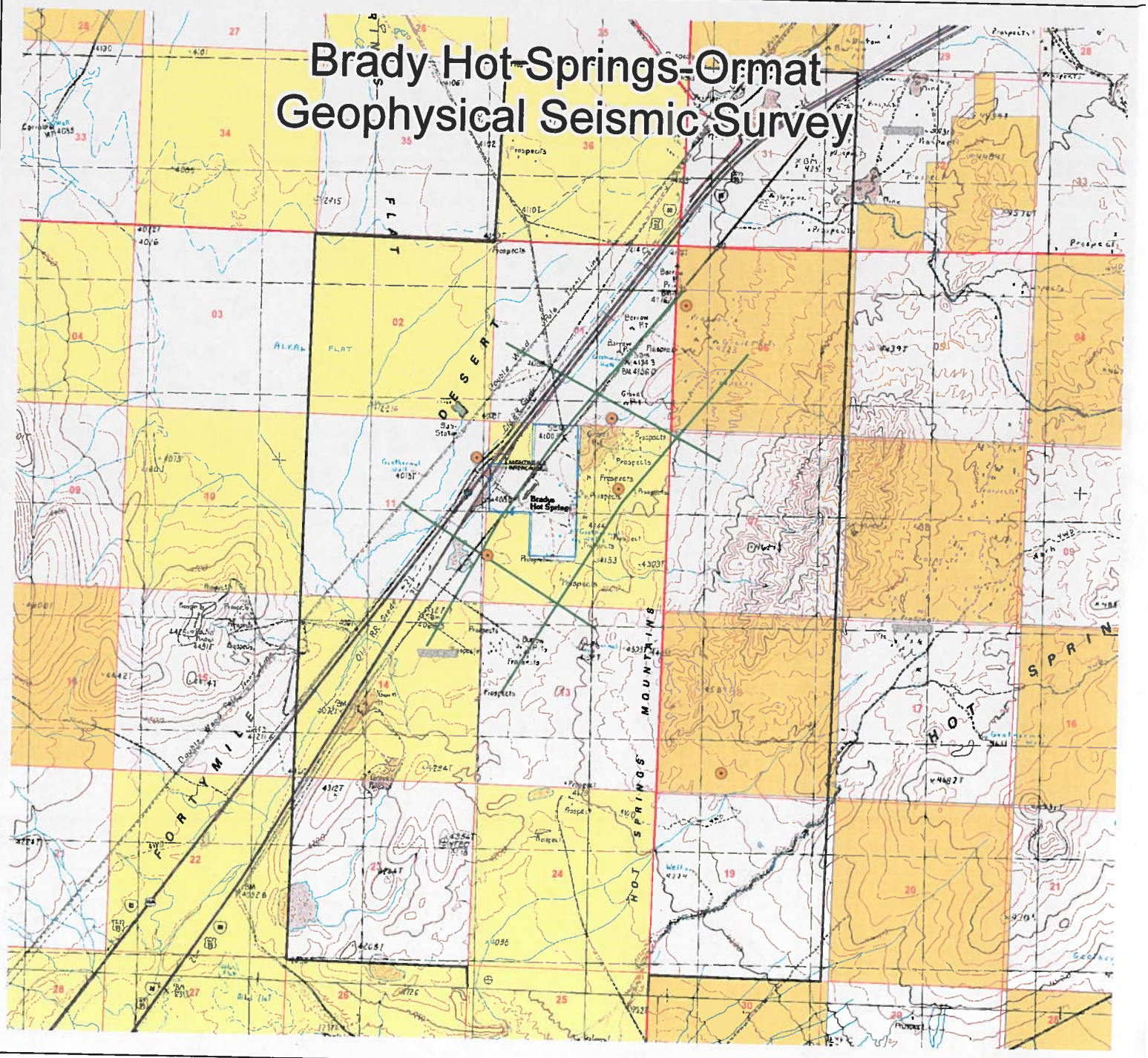
Winnemucca District Office

Humboldt River Field Office
5100 E. Winnemucca Blvd.
Winnemucca, NV 89445

0 0.25 0.5 1 Miles

Map Date: April 2010

Brady Hot Springs-Ormat Geophysical Seismic Survey



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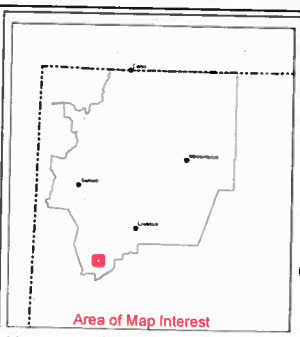

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