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INSTITUTIONAL PROBLEMS RELATED TO DEVELOPMENT OF GEOTHERMAL RESOURCES
LOCATED WITHIN DEPARTMENT OF DEFENSE LAND HOLDINGS

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ABSTRACT

Approximately 100 Department of Defense (DOD) installations have been identified world-wide as having geothermal potential. Of this, some 35 sites within the continental United States are worth local geologic review for geothermal potential based on their proximity to known hot springs (see Table 1).

With this large number of potential geothermal resource sites on Defense lands, the likelihood of a direct conflict between energy development and mission capability is staggering. Measures can and must be taken to avert this conflict. To be successful in developing these resources will require the joint effort of all sectors of the government and private industry.

INTRODUCTION

Geothermal resources of significant potential lie within lands under the jurisdiction of the DOD. These resource holdings are located in many states, the more promising prospects being in California, Alaska, Nevada, New Mexico, Arizona, Hawaii and Texas. The estimated magnitude of the resource potential on DOD lands ranges from minimal in some states to, by some estimates, fifty percent of the total Federally-owned geothermal resource potential in California. What impact will development of these resources have on the geothermal industry as well as the mission of the activity within which the resource is located?

Traditionally the geothermal industry has been relatively free to proceed with development of a resource, barring environmental constraints, once a lease has been obtained. The surface owner, whether private or Federal, has not been a controlling factor over industry's movements or activities within the land under lease. Likewise, the DOD activity station commanders have enjoyed unencumbered use of the lands under their control

for the purpose for which they were acquired (again subject to environmental constraints). Now we are asking these two groups to work together on the same lands.

But why should that be a problem when industry and DOD are working together to develop the Coso geothermal resource at the Naval Weapons Center, China Lake, CA? If it can work at Coso, then why not at other resource sites? Further examination will reveal the problems inherent in developing geothermal resources within DOD lands.

LAND USE

From the military viewpoint, the surface use of the lands more often than not entails live weapons testing or training to such an extent that occupation of land by a geothermal developer would represent a safety hazard. Military land uses are typified in the Coso geothermal resource area when both live and inert weapons testing is conducted including: (1) ordnance impact zone; (2) buffer zone for guided missile splash patterns; (3) safety zone for command destruction of out-of-control drones and missiles; (4) laser hazard zone; and low-altitude aircraft overflight zone. These types of activities will not allow uncontrolled access to the geothermal area. Controlled access on the other hand may appear to the geothermal developer as DOD caused delays costing significant amounts of money. But controlled access doesn't have to result in costly delays.

Certainly the development of geothermal resources within and near Military activities is very important to the Nation as a whole, especially for the degree of energy independence it gives us. Further, it is firmly believed that through the cooperation of DOD, the Department of Interior, and industry, in providing careful control of both DOD and industry activities in the area, geothermal resources can safely be developed without interfering with activity missions.

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If this can't be accomplished chances are the majority of the resources will remain undeveloped. How do we accomplish this control?

Many approaches are possible such as: Rescheduling of military activities; proper siting of the industry activities to minimize the hazard; having hardened shelters available for the workers during hazardous times; and generally controlling the number of people on the site, where they actually are and, to some extent actions within that area. Will this cost the industry time and money? Some, but the cost should be minimal. Will it cost DOD mission capability loss? Some, but again the impact should be minimal. The alternative to a DOD/industry aura of cooperation is either the lost use of a resource vital to the Nation or the loss of a portion of the Military capability required for the protection of this Nation, neither of which is in the best interest of all concerned.

CONSTRAINTS

How do we best determine the level or degree of constraints necessary over industry actions? The proper level of constraint will require a site-by-site determination as each Military activity's land use is unique. At most sites the Military uses of the land surface can be scheduled to a large extent around the developer's needs and visa versa. Also specific uses could possibly be temporarily shifted to a different area or perhaps the developer's siting modified to minimize hazard. All of the above considerations are really site specific and will depend on the developer's requirements relative to the Military requirements coupled with the actual terrain, resource location and accessibility. Some of the types of constraints over the developer's actions which were included in the contract for development at Coso are: (1) environmental (2) access (3) security (4) siting (5) personnel protection (6) public release of information and (7) implement the Geothermal Resource Orders. Certainly none of these are particularly limiting or costly to the developer.

The approach to constraint determination should be fairly standard. DOD will have to formulate the constraints controlling the developer's actions and then sound them out with other government agencies and the geothermal industry. But the true proof of the adequacy of the constraints will be through their actual implementation. The best way to implement them, force the activity/industry interface to work, and allow for ease of modification, is to have DOD contract for the first development at an activity. The most important of these objectives is forcing the activity/industry interface. By and large it is expected that activities will resist getting involved in geothermal development due to the anticipated interference with their mission. However, offering them increased energy availability with a possible cost savings should and would get them interested. Thus the first step of allowing DOD to contract for the initial development should overcome activity resistance. Second, and equally important, is the working out of problems with the constraints as originally written. If the constraint proving is through a DOD contract, then the impacts of any changes made will be directly felt by DOD through mission capability, contract costs or both. This makes an equitable set of constraints not only a must to industry but DOD as well. Without this initial DOD contracting for geothermal development, constraints will likely not be harmonized to the mutual satisfaction of all involved and geothermal resources will remain undeveloped as a result. However, by DOD first phase development the constraints will be harmonized and thus allow the remainder of the resource to be developed, through the leasing process if so desired.

So yes, geothermal lands within DOD holding's can be developed and it is in everyone's best interest to do so. However, the mutual interest and cooperation of all is going to be required if the resource is to be utilized while pursuing the primary purpose for which the lands were acquired by DOD ... that of being prepared to defend this country.

Table 1

DOD INSTALLATIONS IN CONTINENTAL UNITED STATES WORTH LOCAL
GEOLOGIC REVIEW FOR GEOTHERMAL POTENTIAL
BASED ON PROXIMITY TO KNOWN HOT SPRINGS

NAVY

- * Naval Weapons Center, China Lake, CA
- Radio Station, Jim Creek, WA
- Support Activity, Seattle, WA
- 29 Palms Marine Corps Training Center,
29 Palms, CA
- * Naval Air Station, Fallon, NV
- Ship Parts Control Center, Mechanics-
burg, PA
- * Chocolate Mountain Aerial Gunnery
Range, CA
- * Naval Air Facility, El Centro, CA
- * Auxiliary Landing Field, El Centro, CA
- Marine Corps Supply Center, Barstow, CA

AIR FORCE

- * Mountain Home Air Force Base, Mountain
Home, ID
- Hill Air Force Base, Clearfield, UT
- Kirtland Air Force Base, Albuquerque, NM
- * Williams Air Force Base, Phoenix, AZ
- Lowry Air Force Base, Denver, CO
- Warren Air Force Base, Boulder, WY
- McDill Air Force Base, Lynnhaven, FL
- * Ellsworth Air Force Base, Ellsworth, SD
- Norton Air Force Base, San Bernardino, CA
- Beale Air Force Base, Marysville, CA

ARMY

- * Army Ammunition Depot, Hawthorn, NV
- Camp Obispo, San Luis Obispo, CA
- Fort Douglas, Salt Lake City, UT
- Defense Depot, Ogden, UT
- Tooele Army Depot, Tooele, UT
- * Navajo Depot Activity, Flagstaff, AZ
- Pueblo Army Depot, Pueblo, CO
- Radford Army Ammunition Plant, Radford,
VA
- Holston Army Ammunition Plant, Kings-
port, TN
- Fort Ritchie, Blue Ridge Summit, PA
- Fort Mead, Laurel, MD
- Fort Indiantown Gap, Lebanon, PA
- Carlisle Barracks, Carlisle, PA
- Wateruliet Arsenal, Wateruliet, NY
- New Cumberland Army Depot, New Cumber-
land, PA
- Fort Irwin, Barstow, CA

* Particularly promising areas.