

CRATER LAKE FACT SHEET

In April, 1982, California Energy Company, Inc. (CECI) filed geothermal lease applications on the Winema National Forest adjacent to Crater Lake National Park. In January of 1984, CECI was issued leases totalling approximately 78,000 acres by decision of the Bureau of Land Management. Geothermal Development was considered to be an acceptable and compatible land use on this designated "multiple use" forest ground. The area has been and continues to be commercially logged. Selective logging practice has left convenient tree coverage to facilitate visual "screening" and the logging activity has resulted in more than ample existing road access. By virtue of the topographic setting, the probable project area is well removed from the touristed part of the park. In point of fact, visitors to the park would not perceive the geothermal project except from the top of Mount Scott, a 9,000 foot peak on the east flank of the park, two and one-half miles from the closest drill site.

During the past six years, CECI has conducted geological, geophysical and geochemical exploration of this acreage position and initiated drilling a small diameter (approximately 4") test hole on the southeast flank of Mt. Scott (see attached map). This test hole was permitted to drill to 4,000 feet, but drilling was stopped at 1350' by mutual agreement between CECI and the BLM due to the occurrence of lost circulation of drilling fluids. The original environmental assessment (E.A.) contained language suggested by the United States Geological Survey that precluded drilling with lost circulation. Drilling with lost circulation simply means that the muddy water that lubricates the bit is leaking into cracks in the rock. It is standard practice to drill diamond core holes under lost circulation conditions and no other drill hole in the state has ever had that restriction placed upon it. The alternative to drilling with lost circulation was to try to plug the cracks with lost circulation material (L.C.M.) such as cottonseed hulls, shredded newspaper and globs of sticky clay. The attempts to plug off the cracks proved ineffective and the placement of L.C.M. was considered by all involved parties to be less environmentally acceptable than drilling with lost circulation. Therefore, the drilling was suspended by mutual agreement until such time as reworking could be inserted into the E.A. to facilitate this preferred method of drilling.

In the spring of 1987, the BLM drafted a Supplemental E.A., which contained an explanation of core drilling and drilling with lost circulation. The Supplemental E.A. also contained a comprehensive hydrologic analysis contracted by the BLM and conducted by Edward Sammuel and Sally Benson, two highly qualified professional hydrologists. Their conclusion was that the regional groundwater flow direction was away from Crater Lake and Crater Lake National Park, and that..."Drilling without returns will not pollute Crater Lake, nor will it affect the hydrologic regime in the immediate vicinity of Crater Lake Caldera." (abs. Sammel and Benson, 1987).

Reassured by the hydrologic modeling which showed that water runs downhill away from the park, the BLM announced on July 2, 1987, that they were prepared to issue CECI permission to drill to 5,500 feet with fluid loss to the subsurface. By a letter dated July 28, 1987, the Sierra Club, and others, filed an appeal to that BLM decision. On September 15, 1987, the Sierra Club served the Portland Oregon office of the BLM with its statement of reasons for appeal. That appeal is now under review process by the Interior Board of Land Appeals.

The principle concerns expressed in the Sierra Club appeal were: 1) that drilling with lost circulation could somehow impact the lake and, 2) that hydrothermal vents

on the lake floor could be effected by the drilling, thereby disrupting a significant, positive aspect of the lake. The consideration that the lost drilling fluids could enter the lake or any type of vents (springs) on the lake floor would literally require water to run uphill in defiance of gravity.

The subject of hydrothermal vents in the lake is being used as a ploy to oppose the geothermal project despite the fact that no such vents have ever been located or identified. Those opposed to the project have put forth a misleading statement to the effect that: 1) such hydrothermal vents are identified; 2) that they are beneficial to the lake; and 3) that they are threatened by the proposed geothermal project. Each of these contentions are individually and summarily totally false. In April, 1986, and again in July 1987, Destry Jarvis of the National Parks and Conservation Association provided statements to the United States Senate Subcommittee that hydrothermal vents in Crater Lake contribute to the unique clarity and deep blue color of the lake. (Jarvis, 1986, p.8; 1987, p.6). This statement is ludicrous. Any logical individual would appreciate that putting mineralized thermal fluids into a pristine body of rain water would make it less, not more, clear. The deep blue appearance of the lake is totally a result of the backscattering of light from optically pure water (Smith et al. 1973).

The assertion that hydrothermal vents actually exist in Crater Lake remains purely hypothetical. This hypothesis stems from the subjective interpretations of various data. A meeting of involved and personally concerned scientists was convened in Portland Oregon in February, 1987, to discuss the interpretation of the Crater Lake data. There was no consensus on the interpretation of the data; however, there was a consensus that the geothermal project could not effect any hydrothermal vents that might be present. The basis for that level of confidence is the simple fact that any vents or springs on the lake floor would be subject to the pressure of the overlying lake. If there were open hydraulic communication between the lake floor and flanks of volcano at elevations lower than the lake surface, the flow direction would be away from the lake thereby precluding the possibility of venting into the lake.

In October, 1986, a rider bill was placed on the continuing appropriations resolutions for fiscal year 1987. This bill, known as the "Significant Thermal Features Bill," was intended to provide additional protection for thermal features that significantly contribute to the statutory purpose for which the area was set aside by Congress (eg. the tourist attractions at Yellowstone National Park). The need for such a bill is questionable as all features within the National Park System are already protected by pre-existing legislation. During the public response period of this bill the National Park Service received fourteen public comments specifically addressing Crater Lake. Twelve of these fourteen responses opposed listing Crater Lake as a significant thermal feature (Hodel, 1987), mainly because it does not meet any local or official definition of the word "thermal." In response to the Significant Thermal Features Bill, the Geothermal Research Program Coordinator of the United States Geological Survey commented to the National Park Service: "First of all, the temperature in the bottom 300 m of Crater Lake is only 3.5° to 3.6°C; thus it does not seem logical to call the lake itself a thermal feature. Measured temperature anomalies near the lake bottom are approximately 0.05° - 0.1°C and no one has ever measured a temperature high enough to qualify as thermal water (10°C above mean annual air temperature)" (Muffler, 1987).

In August, 1987, the National Park Service conducted an intensive search for the elusive, hypothesized thermal vents. A remotely controlled submersible mounted with a video camera was repeatedly deployed to the lake bottom in the area of the 0.1°C

temperature anomaly. The suspect area is actually quite restricted being only about 200 meters across. About noon of the second day of the search, the Park Service announced to the press that they had observed hydrothermal venting. The vent was described as "a milky white substance oozing from a crack." This announcement was made in lieu of any actual temperature measurement of what was observed. Although the researchers had a very expensive and highly accurate thermometer available to them, they did not deploy this instrument until the following day, at which time they were unable to record any thermal component associated with the mysterious milky white substance. A report on last summers submersible investigations was forwarded from the researchers and the park service to the Secretary of Interior (Collier & Dymond, 1987). This report was a very non-objective interpretation of the actual observations. What was actually recorded was a 0.1°C anomaly uniformly distributed in the bottom water of the "thermal" area. Precipitates of iron were observed to occur as small patches on the lake floor. The report repeatedly referred to these iron precipitates as "hydrothermal deposits," despite the fact that precipitates of iron most commonly occur in mineralized cold groundwaters. There was no mention in the report of the mysterious milky white substance; however, the researchers claimed that they saw "evidence of diffuse flow," but failed to provide any further explanation of what that evidence was. One should appreciate that a milky white substance is not "diffuse." The Park Service report was reviewed by the United States Geological Survey, and found not to provide proof of hydrothermal venting (Christiansen, 1987).

In January 1988, the Park Service sent a copy of the non-objective report to a writer for the Associated Press. His article summarizing the report was viewed as confirmation of hydrothermal vents in the lake. A barrage of press was released by the newspapers and TV stations in Oregon resounding the false claim of "vents confirmed." Immediately after this media event, Senator Hatfield placed wording in Senate Bill S.1889 which places Crater Lake on the Significant Thermal Features list. This action circumvents the authority mandated to the Secretary of Interior by Congress to determine whether or not there are thermal features in Crater Lake and whether they are significant.

Secretary of Interior, Don Hodel, had announced via a letter to Morris K. Udall, Chairman, Committee of Interior Insular Affairs, dated December 8, 1987, that a manned submarine would be placed in the lake in the summer of 1988 to gain additional data. Secretary Hodel obviously intended to base his decision on facts as opposed to misleading press release. The proposed legislation which creates thermal features through political action alone obviously precludes the prudent intentions of the Secretary of Interior. This premature legislation also ensures that taxpayers will have to support annual submersible dives in the lake because it mandates that the "significant thermal features" be monitored hence forth. Since it requires a submersible to try to locate these questionable features it will most certainly require a submersible to monitor them, even if they only consist of a few iron stains and tiny flow of milky white substance oozing from a crack.

Some of the press and even some of the politicians have confused the issue of the geothermal drilling with the reported loss of water clarity in Crater Lake. This loss of clarity, which constitutes very serious impact to the unique pristine water quality, was first recognized by Dr. Douglas Larson of the Army Corps of Engineers in 1978 (Larson, 1978). The 1987 annual report of Crater Lake National Park reports that the lake has experienced a 25% reduction in clarity and that the lake has lost some of the famous deep blue color. This loss of clarity is apparently due to a proliferation of phytoplankton facilitated by sewage infiltration from the Park

Service facility on the caldera rim (Larson et al, 1985). Since there was no geothermal drilling anywhere near the Park until October, 1986, it is ludicrous to suggest that the clarity loss could be even remotely attributable to that activity.

In 1982, congressman Denny Smith sponsored a bill to fund a study of why the lake is losing clarity. In recent years, that very limited funding has been channeled into the search for the elusive hydrothermal vents. The search for vents has been announced to be the Park's number one budgeting priority.

In summary, a proposed geothermal project on multiple use national forest ground is being opposed purely arbitrarily. The project would not diminish the aesthetics of the Park. In fact it would be imperceptible from Rim Drive or the popular tourist overviews and hiking trails on the caldera rim. The project could not possibly impact the lake in any manner nor could it impact any hydrothermal vents which may or may not be present in the lake. Were such vents present in the lake they would be deleterious to the clarity of the lake which is already being seriously impacted, apparently by sewage infiltration. Politicians are proposing legislation to protect hypothetical hydrothermal vents from an impossible theoretical impact while totally ignoring the real impact to the lake which has been ongoing for decades. It would be very unfortunate for the people of Klamath County to be denied the tax revenue and job opportunity potential from this geothermal resource because of misimpressions and false statements put forth by biased individuals.

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