

ITEM: 18

SUBJECT: I'SOT Inc., Geothermal Heating System
Modoc County

BOARD ACTION: *Consideration of NPDES Permit Renewal*

BACKGROUND: I'SOT Inc. a non-profit corporation (hereinafter Discharger), operates a group home/school (hereinafter Facility) at 22416 Highway 299 E. in Canby, Modoc County. The Discharger heats approximately 55,000 square feet of office, classroom, and greenhouse space by pumping geothermal fluid from a well to a heat exchanger and discharges the spent geothermal fluid to the Pit River at a point approximately 425 feet upstream from the County Road 54 Bridge (Discharge 001). In addition, hot water for showers, cleaning dishes, etc. is provided using the same heat exchange system.

The geothermal well produces fluid averaging 190° F from approximately 2000 feet below ground surface. The maximum sustainable flow from the well during development and testing was approximately 40 gallons per minute (gpm). The Discharger's consultant indicated that the flow may increase as the formation opens up. For this reason the Discharger requested a flow limit of 60 gpm which is consistent with the hydraulic capacity of primary and secondary heat exchangers. The fluid temperature drops to approximately 120° F after passing through the classroom heat exchangers. The Discharger proposes to add additional circulation through a greenhouse and a laundry building. The temperature of the discharge from the laundry building is estimated to be 80° F.

The produced fluid contains up to 225 ng/L (0.225 ug/L) mercury which is considerably higher than the 50 ng/L (0.050 ug/L) California Toxics Rule human health criterion for consumption of water and organisms. As the Regional Board refused the Discharger's request for a dilution credit for mercury, the Discharger installed a treatment system consisting of two 2,000-pound activated carbon filters in series to remove mercury from the fluid prior to discharge. The fluid between the two tanks is analyzed for mercury and when breakthrough occurs after the first tank, the fluid flow is re-plumbed so that the second activated carbon filter becomes the first filter in the series and the spent activated carbon filter is replaced. The treatment system has been effective at reducing the mercury in the effluent to below the 50 ng/L limit.

Following treatment, the fluid is discharged via a 5,100 ft, 3-inch diameter polyvinyl chloride line and a diffusion manifold into the Pit River, a water of the United States. A concrete weir, located immediately upstream from the diffusion structure, enhances the

mixing of the discharge with the receiving water. The United States Geological Survey (USGS) Gauging Station PCN (Station PCN), approximately four miles downstream of the discharge, is the nearest gauging station. The flow at Station PCN approximates that at the discharge point since there are no major tributaries between Discharge 001 and Station PCN. During the summer months most of the flow of the Pit River is diverted for irrigation use and at times there may be flow in the vicinity of the proposed discharge but not at Station PCN. When this occurs, the discharger is allowed to measure the flow rate at the discharge location. The permit requires that a minimum dilution of 22.5 to 1 (Pit River flow to discharge flow) be maintained.

ISSUES: This item is uncontested at this time.

RECOMMENDATION: Adopt the proposed order.

Mgmt. Review _____
Legal Review _____

13/14 September 2007 Regional Water Board Meeting

City of Clovis Council Chambers
1033 Fifth Street
Clovis, CA 93612