Forest Supervisor Lesley Yen

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**Re: Comments on the Owens River Headwaters and Cottonwood Creek Draft Comprehensive River Management Plans (CRMPs)**

Dear Supervisor Yen:

Thank you for soliciting public comments in response to the draft CRMPs for the Owens River

Headwaters and Cottonwood Creek Wild and Scenic Rivers (WSRs).

The effects of a changing climate and the impacts on ecological resources on the Inyo National Forest have become very clear in the last two years. There is a sense of urgency regarding mitigating impacts of shorter winters with less snowfall and increased interannual variability of snowfall in the Eastern Sierra.

As a hydrologist, I address deficiencies in the Owens River Headwaters part of the CRMP. I studied groundwater and surface water resources in Dry Creek, Deadman Creek and Glass Creek watersheds and examined the geochemical connections between groundwater wells on Mammoth Mountain, upper Dry Creek and the flows emanating from Big Springs. Mammoth Mountain Ski Area recently obtained permission from the Forest Service to increase groundwater pumping for snowmaking. My concern is that the CRMP does not incorporate any of the vast body of hydrologic and geochemical research available from the USGS that shows groundwater flow from Mammoth Mountain provides recharge to the upper Owens River.

The volcanic origins of Mammoth Mountain and the Long Valley caldera has produced over 1,500 research papers on hydrothermal resources, surface water/groundwater flow paths from Mammoth Mountain to Big Springs via fractured basalt and rhyolite flows extending from Mammoth Mountain to Big Springs.

Renowned USGS volcanologist, Wes Hildreth (2015) used petrographic and chemical analyses to identify silicic eruptive units exposed at Mammoth Mountain and basaltic eruptive units in Mammoth Mountain’s near periphery. The basalt flow at Big Springs where the numerous spring heads are located was identified as originating on Mammoth Mountain. Numerous watershed analyses including Mono County Watershed Assessment (2007) include the Dry Creek watershed as contributing subsurface flow to the Upper Owens River. The omission of Dry Creek as a contributing watershed to the upper Owens River is a failure to acknowledge scientific research, official reports and the USGS watershed delineations.

<https://scholarworks.unr.edu/bitstream/handle/11714/2600/Burak_unr_0139M_11874.pdf?sequence=1&isAllowed=y>

The CRMP also ignores the valuable discharge data available from a USGS telemetered station installed in May 2017. How can a management plan provide direction if discharge data is not used? For example, a simple plot of the discharge data from the Owens River Headwaters from May 2017 to today reveals seasonal fluctuations in flow as well as the contribution that Deadman Creek makes to Big Springs. The statement in the draft CRMP that Big Springs discharge is relatively constant on an annual basis is not supported by data. As the impacts of a warming climate

My thesis research and the USGS geochemist, Bill Evans, have found geochemical similarities from MMSA groundwater and waters taken directly from springheads at Big Springs.

Since the purpose of the CRMP is to protect resources, there is a need to consider crucial information regarding groundwater extraction from aquifers that contribute to the flow of the Owens River Headwaters WSR. In its current draft form, the CRMP fails to incorporate widely available hydrologic data to inform decisions regarding potential impacts resulting from groundwater extraction in the Dry Creek, Deadman Creek and Glass Creek watersheds.

Geochemical studies e.g., Heim, 1991, Evan’s et al., 2001, Evan’s et al., 2002, Burak Master’s Thesis, 2015, used available data on geochemistry, transmissivities, isotopic data and volcanic stratigraphy to estimate that 75% of the discharge at Big Springs is groundwater from the Dry and Deadman Creek drainages.

Omission of geochemical evidence of connections between Mammoth Mountain and Big Springs is unacceptable. The recent increase in permitted additional 500 ac-ft of groundwater pumping for snowmaking ignores the possibility that extraction of groundwater can affect discharge at Big Springs. A surface water and groundwater monitoring program should be part of the CRMP goal of protecting the hydrologic resources of the Owens River Headwaters.

Need for a Monitoring program

An example of the need for a comprehensive discharge and water chemistry monitoring program are the high levels of arsenic in the springs at Big Springs, and the Crestview and Caltrans wells. Water chem samples collected in 2011 show the Caltrans and Crestview wells have high levels of arsenic. The Caltrans well provides potable water for the Crestview Rest Station.

While designing and implementing a sophisticated groundwater monitoring program is beyond the technical expertise of the Forest Service, Mammoth Mountain is the appropriate entity to pay for a program. The USGS has conducted scientific studies in the watershed and can design a groundwater monitoring program.

Thank you for considering my comments,

Sue Burak