

LONG VALLEY HYDROLOGIC ADVISORY COMMITTEE

DRAFT MEETING NOTES

August 2, 2017

PUBLIC MEETING ATTENDEES

Ormat: Janice Lopeman (by phone), Steve Henricksen, Mark Hanneman, Cheryl Eanes & Edward Pozek.

USGS: Jim Howle & Bill Evans

BLM: Mark Spendel & Dale Johnson.

Lahontan Regional Water Board: Tom Browne

CA DOGGR: Chris Costa

USFS: Janelle Walker

MCWD: Pat Hayes, John Pedersen & Irene Yamashita

California Energy Commission: Elisabeth deJong

Mono County: Nick Criss & CD Ritter

Other: Dave Harvey, Southern Mono Historical Society; Jamie Robertson, Town of Mammoth Lakes

- 1. Call to order & introductions:** Nick Criss called the meeting to order at 10:01 a.m. in Town/County Conference Room at Minaret Village Mall, Mammoth Lakes. Attendees introduced themselves and their agencies.
- 2. Public comment:** None
- 3. Meeting notes:** Approve meeting notes of February 1, 2017, as amended: 1) Item 6, line 1: "...aerial survey by Quantum Spatial (QS). Aerial thermal imaging flew in 2014"; 2) item 7, third –to-last graph: Evans noted 28A-25 has few percent of geothermal water based on boron, chloride, bromide; 3) same graph as 2): MMSA puts halide halite (NaCl) on slopes; and 4) item 9, ninth graph from end: ~~MCWD rep~~ Tom Browne of Lahontan opined...
- 4. Subcommittee status reports:** Bill Evans showed a field guide to Long Valley Caldera, will send link to attendees. Ormat long-term flow test starting Aug. 21, continue till steady flow and pressure for 24 hours. Inject tracer Aug. 22. Janice Lopeman wanted to be confident of no shutdown for any reason. USGS sampled eight MCWD wells two weeks ago.
 - Temporary pump? *For 30 days.*
 - First hard start date; any protocol items done prior? *Reducing interval on day loggers. Will discuss in afternoon meeting.*
 - Dale Johnson cautioned Ormat on coordination of tools and equipment around people recreating in the area.
- 5. USGS monitoring data:** Jim Howle noted all wells saw pressure-response rise after record low since 1985.
 - LV-19** east of airport, which has done very little over years, is approaching record high. Usually recharge starts February or March. Steep rise in January, will be record if rises another foot.
 - Sherwin Creek-1 and -2** are 50' apart. Record high. Recharge peaked mid-July, but water level continued to climb. **SC1 recharge peaked in early July - had 50 ft of water level recovery (record high) – deeper SC2 still recovering as of mid-July.**
 - Well 14A-25** west of Sawmill Cutoff Road saw steady level decline till January, but responding to recharge. Also shows up in temperature profiles.
 - Well 28A-25** south of Shady Rest Park had transducer issues in deep monitoring well. Installed two, one died. Switched to nitrogen bubbler system. Hope to have shallow and deep **recording before 14A-25 flow test begins. 14A-25 shallow still blocked, will get obstruction removed this fall.**

Fish Hatchery Springs responded nicely to big winter, still climbing mid-July, FHCD approaching record high. FH23 fed by groundwater divide between Mammoth Creek, Hot Creek and Convict Creek drainages. Temperatures on par. Flows at FHCD had been so low that temperature probe was affected by ambient air temp. All-time record high Hot Creek flume discharge approached mid-June.

Hot Creek Gorge had nothing to report. Precipitation at Mammoth Visitor Station usually collected by USFS, then turned over to Visitor Center. Equipment malfunctioned, so no reliable record in December and January. Most likely would have been very high bars. No response to inquiries suggests need for alternate site. Could estimate, gauge not getting attention it formerly got.

Hot Creek Gorge measured through flume? Many different springs in creek bed, some above surface. Challenging. Surface water discharge measurement and chemistry sample collected upstream of hot springs. Go downstream of springs and make another discharge measurement and collect water chemistry sample. The increase in chloride and boron concentrations from the upstream to downstream sites are used to estimate thermal water discharge in the Hot Creek gorge.

Uptick in flow. Impact on data? Next meeting more data points.

Thermal discharge declining in last year or so? Howle cited steady state, but downward trend. Can't speculate why. Sample in same time frame as flux samples. Find hottest spring in gorge and sample for chloride and boron. Highly variable where hottest water occurs.

Water quality consistent or variable? Sample hottest, fairly consistent.

Janice Lopeman noted thermal component decreasing last year or so.

- 6. Water chemistry of MCWD wells & new Basalt Canyon monitoring wells:** Bill Evans noted quarterly sampling on MCWD wells P1, P6, P15, P16, P17, P20, P25, M26, 14A-25 and 28A-25. Analyzed by national water quality lab in Denver and by USGS lab in Menlo Park. One minor discrepancy between two labs on P16. Official records quite reliable and give great background records. P17 flagged for more study of chloride. Boron and arsenic more difficult, Lithium tougher, so bigger difference between two labs. If geothermal sample sent to national water quality lab, not used to analyzing pure geothermal samples. Request reruns, get agreement.

What's monitored? Chloride, boron, lithium and arsenic, picked out of 20 constituents. Not sure how long Menlo Park will be functional. Minor declines in chloride and boron in P17. Geothermal mixing occurs. Well P17 indicated higher percent geothermal water into wells. Ski area salts slopes with halite (NaCl). Chloride vs bromide plot, mostly around geothermal trend line. Slight variation of geothermal trend. Well P17 has long-term record of chloride and sulfate, started to decline due to mixing ratio. April 1 snowpack was used for estimate of recharge. Appears chloride might decrease after wet year. Water level data was gleaned from annual reports.

Jon Pedersen suggested going back, trueing it up.

Evans considered monthly pumpage and chloride concentration of well P17 over time.

- 7. RV Park monitoring well:** Mark Spindel mentioned two potential sites, started NEPA process with USFS geologist in Bishop. Hope to be later in fall.
- 8. CD IV Groundwater Monitoring & Response Plan (GMRP):** Mark Spindel indicated no updates since January version. Will address in afternoon meeting. All parties still conforming, monitoring efforts going well. Last meeting discussed well cost, can look at sites now in absence of snow. Database HydroDaVE pleased everyone. USGS would monitor Well 28-25.

- 9. Adjourn** at 10:54 am to Feb 7, 2018

Prepared by CD Ritter with edits by Howle & Evans