LONG VALLEY
HYDROLOGIC ADVISORY COMMITTEE

DRAFT MINUTES
February 5, 2020

PUBLIC MEETING ATTENDEES

Ormat: Robert Selwood, John Akerley
USGS: Jim Howle, Bill Evans
BLM: Dale Johnson, Mark Spendel, Matt Wokosin
CalGEM (formerly DOGGR): Amar Rao, Jerry Salera
MCWD: John Pedersen, Mark Busby, Clay Murray, Berry Hylton
GBUAPCD: Tom Schaniel, Jacklyn Bryan
Mono County: Nick Criss & CD Ritter
Lahontan RWQCB: Tom Browne
Public: Dave Harvey

1. **Call to order & attendee introductions:** Nick Criss called the meeting to order at 10:04 a.m. in the Town/County Conference Room in Minaret Village Mall, Mammoth Lakes. Attendees introduced themselves and their agencies.

2. **Public comment**: None

3. **Minutes:** Approve minutes of August 7, 2019, as submitted.

4. **Subcommittee status reports:** Fourth quarter Ormat report on production wells.

5. **USGS current monitoring data:** Jim Howle presented PowerPoint on data through December 2019. Sherwin Creek wells away from all others. Well 14A-25 had new data with upward trend, northern edge of shallow system. Well 28A-25 piezometers track closely. Recharge pulse after 130% normal winter. BLM-1 across from USFS office. Recharge response flattened out after big winter. Instrument drift possible. Unsure of upward tick. Showed data of three wells. Pressure response more subdued at well 14A-25. Well 28-25 had big swings due to changes in Casa Diablo well field production and injection. Well CH-108, lowest monitoring point, changes fairly small, nice increase from last big winter. Well LV-19 north of airport had small recharge pulse in 2017-18. Sherwin Creek-1 and -2 (data problem, submersible transducer died, hoped to recover data prior. Installed new transducer in November. Most likely a gap will result. Water levels much higher in 1980s. Well 14A-25-1 plots at tail end of recharge pulse slightly warmer August 2018. Equipment issues resolved, back out later this month. 28A-25-1: During drilling of 28-25 long slow process back to where in May 2017. Warmer below 400'. Upcoming log may get back to 2017 data. BLM-1-1: Very little temp difference top to bottom of well. 28-25 well: different setup for logging hot wells. Large differences, max temp 1.5 degrees C, not happy about that, get calibrated at Menlo Park. Spring discharge at fish hatchery. AB and CD have small thermal component, desirable for raising trout. Groundwater/surface water mix. Daily mean flows: AB changes reflect surface/groundwater interplay. CD changes less. H-2,3 gets water from groundwater divide between Convict and Mammoth creeks.

Pedersen: Get rep samples. Data that talks about Convict/Mammoth creeks. No geothermal components based on water chemistry.

Howle: LV 19 close in temperature to H-2, 3. Pedersen: component of groundwater from Laurel Creek/Laurel Springs. Contributing? Howle: H-2,3 not do chemistry, do no AB and CD spring groups. Boron/chloride. Seasonality to AB and CD. AB 2%, CD closer to 1%. Total spring discharge AB and CD shown. Hot Creek Flume discharge spikes resemble others. Hot Creek Gorge thermal spring discharge. 245 liters/sec. Precip from ML ranger station: Desert Research Institute collects that data. Need more-reliable record. Fill in data gaps if possible. December's two atmospheric river storms were main events.

Salera: Value in pressure/temperature logs? JH: Not have pressure/temp tool. Costly.

**Bill Evans showed region below ML, 1,000' depth. Alpine 1 privately owned well.

6. **USGS Mammoth Aquifer Hydraulic, Geochemical & Thermal Monitoring Report:** In

7. **USGS water chemistry of MCWD wells & new Basalt Canyon monitoring wells:** ** P17 standout well. Chloride concentration high in geothermal samples. Big decline not certain. Correlates inversely with water levels. Likely related to climatic effect, serious drought followed by wetter years. P17 with all wells. No long-term change in chloride. Only well with long-term change is 14A-25 to north. Chloride down, also sodium and sulfate. Boron and chloride judge geothermal input. All other Mammoth productions wells show bit of shift over time, but not on geothermal line. No geothermal component except P17. Four samples of 28-25. 5% geothermal and pure water. Down to less than 1%.

Pedersen: CalGEM permit on Alpine 1, only one water quality sample. Another sample?

Salera: No permit for well except drilling, will review permit conditions. No permit to inject well, only drilling.

Pedersen: App for injection permit? *Salera: Unaware of one.*

Pedersen: report on app for second well. Salera: Proposed well, not drilled. Prior to start of injection would sample proposed injection zone. Make sure not USW.

8. **CD IV Groundwater Monitoring & Response Plan (GMRP):** Spendel: Currently working on calendar year 2019 annual report. Met weeks ago on well by fire station on USFS land, RV park, or somewhere in town. No decisions, depends on funding.

9. **Existing subsidence monitoring program:** JH: In 2014 USGS establish vertical control network from CD IV production. 2014 network of 37 benchmarks. Existing benchmarks along Hwy 203, new at fire station and at corner of Sawmill Cutoff road. Rod benchmarks designed to be stable, deep-seated. Sleeve (2.5' deep) isolates rod from frost heaves. Designed for leveling. Two types of surveying. Four-mile Hwy 203 marks. Roving GPS setups. Base station data collects 10-12 hr/day. CD IV trees exclude GPS use. One week three days for base station that vary from 6mm go 9 mm, average value. Twenty-one benchmarks. Short spurs out to other wells north, not there in 2014. Geodetic leveling rods weight 45 lb a piece. Read vert scale to 0.01 mm. Trivots disperse weight of rods. Precise readings. Max distance is 80 meters between rods, usually closer due to elevation changes. If greater than 0.2 mm… Sawmill Cutoff line (2.52 km); Shady Rest Line (2.6 km). Preliminary data: Sawmill show magmatic uplift in area. Increase to north. Shady Rest Line: 8 mm/yr uplift. Graben Line east/west: Fault exists. 12 mm/hr.Hwy 203 Line. Uncertainties of GPS vs leveling. GPS uncertainty +/- 2 cm. Cumulative leveling error <1 cm. Subsidence around Casa Diablo 1 cm/yr. Next survey will have signal well above noise. Wait

and see if trend continues. Network in place, discussions with BLM prior to CD IV another survey on baseline without production, new set of date to compare after production starts.

10. Adjourn at 11:11 a.m. to next meeting August 5, 2020. Field tour? MS: Will arrange tour after meeting.