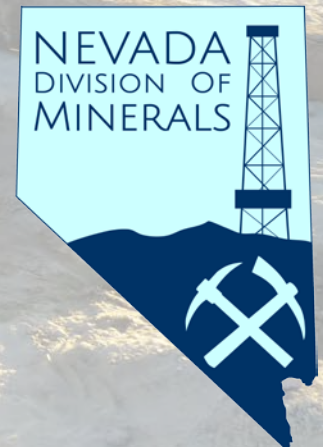


*Dissolved Mineral Resource Bill Draft for 2017
Legislative Session
BDR 258*

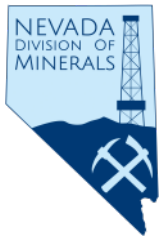


**NMEC Annual Meeting
October 17, 2016**



Background

- **Nevada has the only operating lithium mine in the U.S. – located in Clayton Valley, Esmeralda County**
 - Operated since 1967, employs 85 people
 - Produces lithium carbonate
 - Uses surface evaporation ponds to concentrate lithium after treating brines pumped from 4 aquifers
- **Geologic Model for a lithium brine deposit:**
 - Salar deposits – a salt flat that may represent the basin of a salt lake
 - Accumulations of saline groundwater that are enriched in dissolved lithium.
 - All producing lithium brine deposits share a number of first-order characteristics: USGS Open-File report 2013-1006



Cross-section of lithium-Bearing aquifers in Clayton Valley. From “Hydrogeology Of Clayton Valley Brine Deposits, Esmeralda County, NV. By Danny Zampirro, 2003. NBMG Special Publication 33, p. 271-280

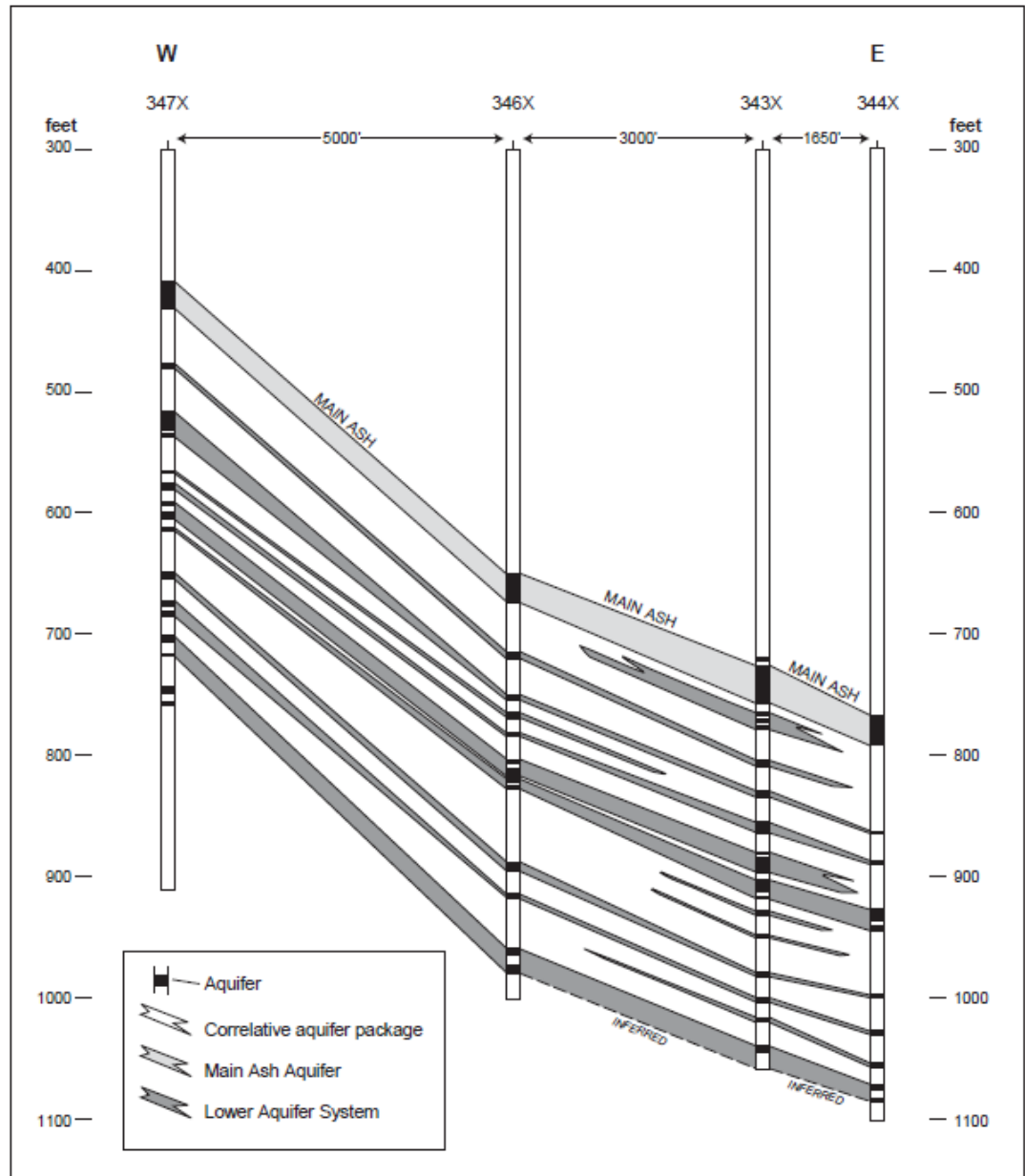
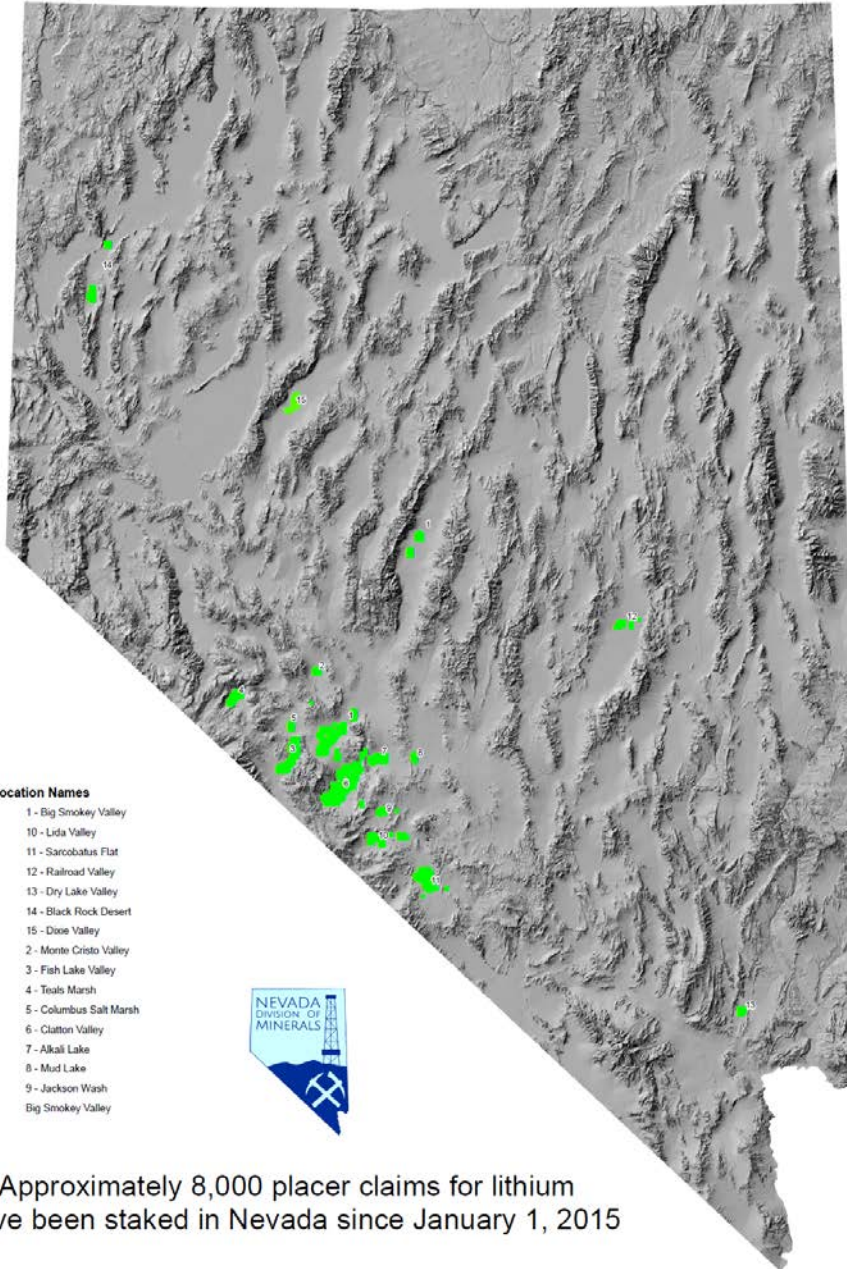


Figure 6. Generalized cross section of the Main Ash and Lower Aquifer System, looking north (depths in feet below the playa surface, modified from a figure drafted by M.W. Hardy, 1993).

Lithium exploration in Nevada

- **>8000 placer claims staked since 1/1/15 in playas, presumably for lithium brine**
- **15 different hydrographic basins in Nevada**
- **25 different exploration entities, mainly “Juniors”**
- **Typical initial exploration is drilling of boreholes, sampling both sediment and brines, using “dual wall reverse rotary” boreholes.**
- **Open boreholes in unconsolidated playa sediments can be unstable, unable to sample multiple aquifers without casing holes and doing packer tests.**

Nevada Placer Lithium Claims Staked Since 2015



Approximately 8,000 placer claims for lithium have been staked in Nevada since January 1, 2015

Lithium Exploration in Nevada

-continued

- **9 exploration companies have contacted NDOM in the past year, some with question about “how do we drill a well to sample aquifers?”**
 - **Unless a lithium claim holder has a geothermal lease and can apply for a geothermal temperature-gradient or observation well, NDOM can only refer them to the water well drilling regulations in NAC 534.010 to 534.450 (NDWR).**

Regulatory authority

- **Lithium brines are a locatable mineral using a placer claim on Federal lands**
- **NOI's or POO's administered by BLM, BMRR also for reclamation if a POO**
- **Drilling of unlined boreholes, same as any mineral exploration, under NAC 534.4369 (NDWR regulations). Can not divert water and groundwater can not be contaminated. Must be plugged within 60 days of drilling.**
- **A borehole that is completed with casing becomes a well (NAC 534.220) and must be completed according to NAC 534.360**
- **A well must have a water right before being drilled – NRS 534.050**

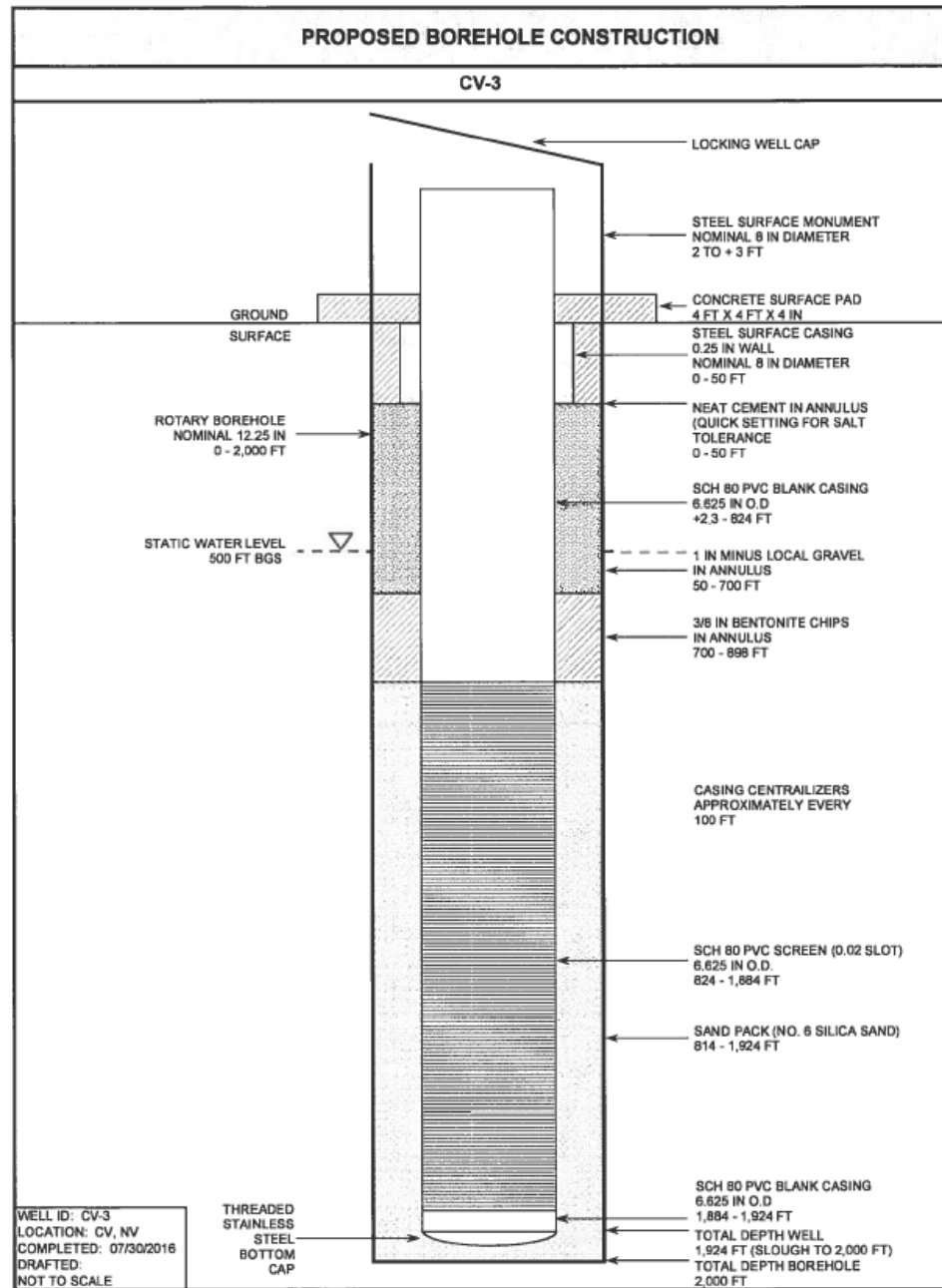
Regulatory authority

- **Dissolved or entrained minerals can be recovered in the process of removing geothermal energy – NRS 534A.010 (NDOM statute)**
- **A claimant can not drill a geothermal well to remove energy or dissolved minerals unless they have a geothermal lease on Federal land**
- **In summary, one can not legally drill a well to sample for dissolved mineral brines without a water right or a geothermal lease.**

Proposed remedy: Add Dissolved Mineral Resource to Geothermal Statutes in NRS 534

- **Proposed a definition of dissolve mineral resource to NRS 534A**
- **In geothermal statutes, this would allow for drilling a cased well and reasonable use of water to sample**
- **Would require a water right for permanent consumptive use. ie: if a process was built**
- **Would allow for reinjection of brine, same as geothermal, but would require a UIC permit**

Example of a lithium-brine exploration well proposed by a Nevada exploration Entity.



BDR 258 Proposes to add Dissolved Mineral Resources to Geothermal Statutes in NRS 534A

- **BDR 258 is an agency policy bill through the Governor's office**
- **State Engineer (NDWR) is supportive, this would resolve an issue that is consuming time with applications and protests for water rights that are only being used to sample brine aquifers for lithium**
- **NDEP is supportive, wants to ensure groundwater in basins is not contaminated by requiring casing and seals to ensure no contamination between fresh and brine aquifers**
- **Industry: NVMA, mineral attorneys and those who contacted NDOM were contacted for comments**

BDR 258 Proposes to add Dissolved Mineral Resources to Geothermal Statutes in NRS 534A (cont)

- **If bill is passed, rule-making in NAC 534A.170-690 would be required to address:**
 - **Applications, design of well**
 - **Casing seals**
 - **Abandonment and plugging**
- **If bill was passed, this could happen is Q3 2017. Updating NAC 534A requires public hearings, and final regulations would have to be approved by the Commission on Mineral Resources, with final adoption by the interim Legislative Committee**



Arguments in favor of this bill

- **Exploration for a locatable mineral under the mining law of 1872 should not be regulated by Nevada water law or need for a geothermal leases.**
- **Allows exploration entities the ability to discover a deposit using cased wells, then if water is needed to process, acquire water rights only for consumptive use (similar to geothermal). Developing Li-extraction technology does not utilize evaporation, but rather SX-EW and ion-specific exchange, with re-injection of brines.**
- **NDOM is best suited to regulate dissolved mineral brine wells, as the regulator of geothermal, oil, gas wells in Nevada. Would ensure fresh water is protected and obsolete wells are plugged and abandoned properly.**
- **BLM would rely on NDOM for permitting of dissolved mineral brine wells on federal lands as condition of NOI's or PoO's.**