Meeting Summary
Bonita Peak Mining District Community Advisory Group
September 16, 2025, 5:32 - 7:42 PM
Via Computer Conferencing and In Person
at Silverton City Hall Conference Room
Silverton, CO

CAG Members attending: Chara Ragland, Chris Hill, Parker Newby, Ken Balleweg, David Palmer, Ty Churchwell, Susan Livenick, Mark Rudolph and Helen Mary Johnson. Online: Jason Fast and Russ Anderson.

Also in attendance: Connor Newman (USGS), Kirstin Brown, Allen McCaw, Emma Reinemann, Julie Babcock, Rob Runkel, Vinessa Ledesman, Lisa Merrill, Jake Kurzweil, Scott Roberts, Nora Dwyer, Rory Cowic, Jason King, David Heinze, Andi Kron, James Livenick, Walt Brown and Julian Hood. Online: Mark Pearson, Jillian Kugle, Mike Boulay, Samantha Wright, Ryan Bennett, Tom Schillaci, Terry Morris, David Jamison, and Jordan Carlson.

EPA attendees: Athena Jones, Joy Jenkins, Jessica Dugan, John McKernan and David Hockey. Online: James Hou.

Introductions and Announcements
Introductions were made around the room by attendees.
Ty Churchwell reported that the CAG website is up to date.

Presentations
Chara introduced Connor Newman (USGS) who gave a presentation titled, "*Transport of Metals from Deep Subsurface to Alpine Streams in the Silverton Caldera*".

Connor began by noting the study area consisted of Cement Creek, specifically the American Tunnel, its three bulkheads, and mines that connect to it underground.
The research study evaluated two questions:

> #1: What net effect does bulkheading have on metal transport?
> #2: Are there multiple mechanisms for solute mobilization to streams and can they be differentiated?

Tools used for #1 included dissolved metals loads in samples collected in nearby adits, seeps and springs. The presentation had three graphs showing bulkhead installation dates, and graphs of sulfate, flow rate and loads. The concentration does not decrease but the flow does, and the load decrease follows the flow decrease.
Tools used for #2 consisted of stable isotope tracer injections and synoptic sampling. Sodium bromide was used as a salt tracer. Samples were collected and analyzed for salts and metals. This methodology was useful for Cement Creek because it shows discharges from seeps and springs as well as surface flow.

#1 - Results of the bulkhead study revealed that metals loads are redistributed by the bulkheads. Graphs showed about 1/3 of the samples had increased load, i.e., more metals came out of some adits after bulkheading. He noted that some individual changes may indicate watershed-scale changes. The report also showed decreased metals loads at watershed-scale; bulkheading reduced Fe and Zn loading. He referenced a conceptual site model: a pre- and post-bulkheading study in *Journal of Contaminant Hydrology.*

#2 – Results of the stable isotope study revealed that sulfur isotopes indicate multiple end members. In one end member, springs are in equilibrium with groundwater. At the other end member, mines are in sync with *in situ* pyrite. Cement Creek water quality changes as it receives inflow from seeps and springs; sulfur sources from pyrite or gypsum vary by the time of year. The results show a sulfate link: the pyrite fraction combines with sulfate in water to get increased load attributed to pyrite versus gypsum. Pyrite attribute is greater in July due to snow melt. Sulfate from gypsum does not change seasonally, which is a signature of long-term weathering processes. This can impact remediation decision-making: pyrite is seasonally available for remedial action, while gypsum must be accepted as a long term sulfur source.

Tracing metal sources and groundwater flow paths in the Upper Animas River watershed using rare earth elements and stable isotopes | Geochemistry: Exploration, Environment, Analysis | GeoScienceWorld

Concentration-discharge relations and transient metal loads reveal spatiotemporal variability in solute-generation mechanisms in a mine-affected watershed - ScienceDirect

For future work, Connor referenced his report on North Fork Cement Creek.

1) One task is to look at how faults and fractures may affect flow. He gave an example from North Fork Cement Creek, which is acidic and carries copper. The Gold King #1 waste rock dump changes water pH from 6 to 3, then the water infiltrates before Gold King #3. Then it re-emerges more acidic and higher in copper.
2) Quantify background water quality, which may provide direct remedial targets. Water quality may be estimated using age data (older groundwater versus younger groundwater). We can reconstruct groundwater history and sulfate concentrations versus time from seeps and springs (before mining began).

There were several comments/discussions following the presentation:
Bulkheads - The bulkheads lowered the metal load, but then the treatment plant was shut down, so overall there was no change in Cement Creek water quality.
Lake Emma mine pool – Lake Emma groundwater is very young; pyrite is the sulfur end member because it is a recharge zone. American Tunnel water is older and affected by gypsum in the deep mine pool, so there is some interaction to generate sulfate.

Groundwater ages – ages can be determined from four types of tracers. Typically, tritium is used for age-dating, but there are other more complex tracer methods. Connor reminded us that there should be no pre-mining mineralized groundwater.
Bulkheading - bulkheading forces water back and up into fractures and faults (i.e., Red and Bonita [R&B] mine). Thus, iron precipitates out in fractures but aluminum dissolves in the water. Maintaining the water table in fractures holds iron in those fractures as a precipitate/solid. Aluminum drops out at a pH above 5, so Al-rich surface water does not reach sample location **A72**.

EPA and Other Agency Updates
Joy (EPA) – They are planning for a long-term test valve closure at R&B mine. The plan is to close the valve for one year or longer. They will look for various triggers to justify opening the valve:

- Excessive leakage past Red & Bonita at the rock/concrete contact or in the adit
- Excessive flow at American Tunnel portal
- Excessive flow at Mogul mine
- Flow increases at Gold King that show a marked departure from flows observed over the past five years
- May be other triggers identified later.

The closure is delayed until next year due to:

- Lost staffing
- Did not get the winter shed installed at the bulkhead
- Need avalanche mitigation for the winter.

Joy commented that it seems like Red & Bonita is separate from Gold King.
They are checking Gold King water chemistry and turbidity.
Adams mine portal has a pressure transducer, although it is currently dry.
Other minor adits will also be monitored, although they are currently dry.
The goal is to have fewer sources for treatment. Gold King is 491 feet above the floor of Red & Bonita. That allows a large storage volume of water when the bulkhead is closed. Instruments installed now to monitor weekly/monthly for frequent data collection, plus more monitoring points (gauges) are planned as part of the treatment.

Julie (USACE) – reported a delay on moving mining sludge from the Gladstone treatment plant to the Mayflower storage cell. The cell is not yet ready, they are building a ramp to the cell and getting set up for next year. Clean water is being drained off the pond now, and it is being analyzed.

Jessica (EPA) – they plan to start the drilling project at OU2 in about 2 weeks. Soil borings will be installed around Mayflower.

Joy – A short stoppage of flow occurred at Gold King in mid-July, possibly due to a small collapse. There was more sediment in the water for a while. A bulkhead inspection showed low oxygen level, meaning there was low air flow. They may use a drone in the tunnel next week to look for a collapse that possibly changed something in the tunnel. In the Koehler tunnel they plan some ground support work because acidic water is leaking over the bulkhead and may be eroding it. They will take concrete samples to

test for strength. In addition, the pressure gauge is not working; the main valve has been closed. They will have a contractor on site next week when they open the valve in case it sticks, because it is under pressure.
There have been no improvements made to the Gold King mine road due to contract funds.

Lisa (BLM) – We lost a member (Melissa) who was transferred to Cañon City. Management is looking at replacement options.
BLM has carried out most of its summer plans, and will finish San Juan drainage work this year.
Maintenance issues planned for next year: coordinate with Kirstin on Animas River work, including American Tunnel and sludge management.

Mark (CDPHE) – for the Natural Resources Damage (NRD) grants project, five site proposals have been submitted and they are currently under review.

Administrative Items
The next CAG meeting is scheduled for Tuesday, November 18, 2025 in Durango. Chara will send out a zoom meeting announcement. This meeting was adjourned.

7:42 PM **Adjourn**