

CAG Meeting Summary
Bonita Peak Community Advisory Group
Dec. 7, 2023, 6:30—8:25 PM
Via Computer Conferencing and In Person
at Durango Reclamation Facility
Santa Rita Park

CAG Members in attendance: Parker Newby, Peter Butler, Chara Ragland, Helen Mary Johnson, Charlie Smith, Russ Anderson, Anthony Edwards, Emily Thorn, Susan Livenick, Ty Churchwell, Terry Morris, Jason Fast, Sarah Burch, and Dave Palmer.

Others in attendance: Kirsten Brown, Jimmy Keen, Joy Jenkins, Jim Morris, Scott Roberts
Online: James Hou, Melissa Smeins, Michelle Furi, Athena Jones, Damon Sheumaker, Jill Kugle, Linda Figueroa, Mark Rudolph.

Introductions and Announcements

CAG members serve three-year terms so that a third of the CAG is up for reappointment at the beginning of each year. Peter is not going to reapply to the CAG and will continue as chair through January. He sent out a memo to the CAG, EPA, and many others explaining his decision. Let him know if you want to see it.

Joy thanks Peter for leading the CAG, and his leadership will be missed. They really appreciate his efforts. Meg seconds that.

Kirsten says thank you to Peter for taking her under his wing and teaching her so much. Peter replies that ARSG started in 1994, and Kirsten came up as a high school student to sample. She has a long-term involvement as well.

Kirsten announced that the Rocky Mountain Mining and Reclamation Conference is in Leadville this year, May 22-24.

EPA Update on Fall Activities

Athena said that repository construction has paused for the winter. One area is lined and almost ready to be used, and another area is ready for stub grade construction and asphalt next year. There is still a lot to do in terms of covering the site.

Athena shows before and after pictures. They have about half of the top covered and that is how they are leaving it for the winter. Peter asks what the expectation is of having cell one completed. Athena replies that it should be complete in spring, and they should be able to move material by the end of the season.

Jimmy asks if they on schedule? Athena replies that last year, she thought they would be done by now but that was too ambitious. Similar repositories have taken up to four years to construct, so taking two years seems reasonable.

Joy says on August 26, there was a release from the Gold King pipeline to the treatment plant because of clogging. They have switched the flow to the secondary line. The primary line has been difficult to clear, and there is still a partial obstruction. The secondary line has little iron precipitate in it. They are doing some reconfiguration of clean outs, so this hopefully doesn't happen in the future. They are upgrading both lines in the spring, and they have been brainstorming contingency plans if they have more problems. This is why the state doesn't want to have a lot of lines carrying mine drainage to maintain once they take over the site.

In-Situ Remediation at the Captain Jack Mine.

The Captain Jack mine site is above Boulder, near the Continental Divide. A lot of work has gone into in-situ remediation at the site, and it might be an example of what could potentially be done at the Mogul mine. The Mogul has a bulkhead, but there is a lot of leakage around it. There is also air access to the workings behind the bulkhead through an open stope. The Mogul is at a high elevation with difficult access in the winter and is impacted by the Sunnyside Mine pool. The drainage is also the one of the largest point source, metal contributors, behind only the Gold King and Red & Bonita.

Joy has been a project manager at the Captain Jack site and presented what did they learned at the site and how it went. In-situ treatment involves adding chemicals into the mine pool in the workings to reverse chemical and biological reactions that cause acid mine drainage. It does not refer to using a treatment facility in an underground space for anything that is active treatment.

The idea is to submerge the working with water to reduce oxygen and neutralize with alkalinity. Then add organic carbon material for microbial activity to form sulfide precipitation. This is sort of like an 'engineered wetland' underground. The technology is novel, and EPA doesn't know exactly how well and long it will work.

The Captain Jack was a gold and silver mine that closed in 1992. Discharge is into Left Hand Creek and carries zinc, cadmium, copper and manganese. pH is very low. The flow is not too large, spring peak about 160 gpm. Initially, a bulkhead with piping and valves was installed. Crushed limestone was placed behind the bulkhead before it was poured for initial neutralization. There is a recirculation system to pump water from behind the bulkhead to surface through a 200 foot well and another 300 foot well up gradient to send water back down into the mine with the ability to add liquid amendments as needed.

Susan asks if there is access to electric power? Joy replies that yes, solar pumps would not be strong enough.

Results and Lessons Learned:

They closed valves in the bulkhead to create the mine pool in 2018. The system filled faster than expected - 160 feet in 4 months - and there were concerns of water topping out. They had assumed it would equilibrate. So, they opened the valve to release water through the bulkhead and not come out of bore holes.

The discharge through the bulkhead had significantly worse water quality than when the project started. All the concentrations increased substantially except there was no change in pH. They think the water quality change was caused by the rising water level flushing metal-laden salts from the workings that had not previously been mobilized. In addition, when water in the circulating system was injected, it pulled in a lot of oxygen into the system which was unavoidable.

Peter remarks that before the project, water quality from the Captain Jack was typical of water quality in many of the mine drainages around Bonita Peak, but nothing in Bonita Peak has anything approaching the poor water quality seen coming out of Captain Jack after the flushing.

Unfortunately, before the reopening of the bulkhead valves, the samplers were using plastic buckets in the wells, and they weren't actually getting water from the tunnel but from the upper bore hole. They didn't realize how poor the water quality was, and when the valve was opened at the bulkhead, it caused a fish kill. EPA had to then actively treat the drainage coming out of the portal.

EPA did more study of hydrology as the equilibration did not happen as they thought and found that the water was compartmentalized. They wish they had known more about groundwater before they started.

They did a second go round of in-situ treatment in 2020. The valves were closed and they added molasses, starch, methanol, lime and water treatment generated solids. They also periodically added sodium hydroxide. In addition, they increased the treatment zone by adding a further up gradient well to allow for a longer water treatment zone. The main contaminant concentrations dropped way down except for iron and manganese. Sulfides and hydrogen sulfides are low. They continue to maintain the mine pool level with releases through the bulkhead, and they have better than historic water quality results except for iron, manganese, and sulfate. Because iron is high, they oxygenate settling ponds to get it to drop out. EPA is going to add an external polishing system for the iron and manganese.

Kirsten asks if pipes were put in Red and Bonita behind the bulkhead for future in-situ treatment? Peter says it was discussed with the EPA removal program, but he is not sure it was done. That bulkhead was installed around the same time as the Gold King mine release in 2015. Joy is not aware of any piping, but will look into it for the future.

Peter notes that the Sunnyside is far larger and much deeper than the Captain Jack, so he doubts that in-situ treatment would work on something that big because it would be too hard to develop a recirculation system.

Peter thanks Joy and states that this is obviously an experiment. He asks if this approach is cheaper than doing treatment? Monitoring is expensive. Maybe a smaller, more defined system might be easier.

Summer Projects Completed by CDPHE and KBI Contracting

We are at 8:15, and Jimmy has three projects to discuss in San Juan County. He says he will send a presentation to Peter with a link. If anyone has questions, they can email him. Kirsten says his crew at KBI was very professional. They are a minority and disabled vet business. Would love to do more stuff next year.

Administrative Items

- ✓ Meeting Summaries – not ready yet
- ✓ CAG Discussion Time – Tuesday December 12th at 6:30 via Zoom
- ✓ Long-Range Schedule – The CAG is going to start meeting the third week of the month on Thursday which coincides with the best week for the Silverton Planning Group to meet. So the January meeting will be the 18th in Silverton.
- ✓ Future Agenda Items? *Macroinvertebrate Data, Remedial Actions for Gladstone, Lake Emma Drilling, etc.*

Ty says that the website is up to date. He asks Joy if she will send her Captain Jack presentation to him for the website. She will send an updated version with a disclaimer that this is just informational.

8:25 PM Adjourn