ARSG MEETING SUMMARY
May 27, 2014

ATTENDEES: Peter Butler, Larry Perino, Steve Fearn, Bill Simon, John Ferguson, Paula Schmittdiel, Lisa Richardson, Todd Hennis, Dan Wall, Cynthia Peterson, Ray Ferguson, Dan Randolph, Chuck Wanner, Darlene Marcus, Ty Churchwell, Buck Skillen, Tom Schillaci, Gwen Lachelt.

ANNOUNCEMENTS:

Creede Mining and Water Conference – Peter said that the Creede Conference went well and the organizers thought it was the biggest attendance of any of the four conferences they have put on so far.

April Sampling in 3a – Lisa said she was able to get weekly samples at A68 and the Howardsville gage starting in late March through April. She targeted warm days when there was more melting and tried to sample in afternoons. The samples will be processed by River Watch.

Topics

Possible Additions to Risk Assessment by EPA: Bill talked about the importance of ferrous (Fe++) and ferric (Fe+++) quantification at draining adits for treatment purposes. Ferrous iron is water soluble and can be removed using ion exchange. It looks clear in drainage water and doesn't create orange films which clog up piping and apparatus. Once exposed to oxygen, ferrous turns to ferric iron fairly quickly. Ferric iron forms the common orange straining we see around the Animas Basin and is makes water treatment for removal of other metals more difficult.

There was also discussion on benthic macroinvertebrate sampling. Trout Unlimited is sponsoring sampling at three locations in Durango, EPA is going to cover sampling from Baker's Bridge up to Howardsville, and ARSG may have some sampling done in Mineral Creek. We are planning to have Scott Roberts do all the sampling using the same protocols and locations that have been sampled in the past by Chester Anderson. ARSG had Chester sample the entire length of the Animas in 1996 – 97 to set a baseline. Over the years, he did several other samplings, the most recent in 2010.

In response to a question, Dan Wall clarified that "hazard quotients" in the risk assessment are based upon individual samples. Using the hardness in a sample, the table value standard for each particular metal of interest is calculated and then divided into the particular metal concentration in the sample. Anything above one is greater than the table value standard.

EPA Meeting with BOCC: The San Juan County Commissioners asked EPA to meet with them and answer questions about the CERCLA listing process and what that might entail. There were complaints from some ARSG participants that little notice was given for the meeting before it took place. Overall, there wasn't much discussion within ARSG, but it was noted that EPA is sampling in the Animas River above Cement Creek to Howardsville to better characterize metal loading in that reach, and EPA mentioned possible sampling at some old mill sites around Silverton that might be a potential human health hazard.

SGC proposed road map: The group discussed Sunnyside Gold Corp's letter outlining a game plan for activities over the next few years to address water quality. Trout Unlimited had previously sent out a public letter supporting the game plan at this time as long as progress is made to reduce metal loading to the Animas River. Todd Hennis wanted SGC to make an additional commitment to building and operating a treatment plant capable of handling 350 gpm to treat the American Tunnel and the Gold King #7 Level (which Todd owns) over the next twenty years. He felt SGC should take this action as a good corporate citizen. Others at the meeting noted that while individuals in ARSG have asked other participants to take (or not take) certain actions, ARSG has rarely made any formal requests of actions by individual participants. ARSG has also avoided implicitly assigning blame for metal loading in order to keep the group cohesive. At the end of the discussion, the group thought that a timeline of actions was preferable to a game plan and that there needed to be a caveat that circumstances affecting events on the timeline may be beyond ARSG's control. The coordinators will work on a draft timeline for a later meeting.

Silverton Student Presentation: Hannah deKay, a student at the Silverton School, made a presentation on scientific studies that she and her fellow student, Raelen ? , have been conducting. The girls have presented to ARSG in the past and have won several science fair contests. This year they have been looking metal uptake in trees along Cement Creek. They identified several trees along the creek and several up the hillside as a control. Small core samples were removed and taken to lab in the Front Range where each ring in the core was vaporized using a laser and tested for metal concentrations. During specific years, trees near the creek did take up higher levels of metals. The girls are trying to find a correlation as to why this occurred for specific years. The group was quite impressed with their efforts.

Arrastra Gulch and its impacts on Segment 3a: Peter presented some zinc loading numbers for the Upper Animas Basin and Arrastra Gulch. The gage figures were derived using data from 2007 – 2011. They didn't include the last couple of years of EPA data. Essentially he found that at the mouth of Cement Creek (CC48), low-flow zinc loading is a little over 200 lbs/day, of which about 110 lbs/day comes from the four major discharging adits. Low-flow zinc loading in the Animas just above Cement Creek (A68, which is at the bottom of segment 3a) is 100 lbs/day. Low-flow zinc loading from the mouth of Mineral Creek (M34) is about 30 lbs/day which is 35 lbs/day less than before remediation began in Mineral Creek (good work team!). Low-flow loading below Silverton (A72) is around 300 – 350 lbs/day. (These values are very similar to the ones produced in a Sunnyside Gold Corp. commissioned report using 2010 data.) During peak runoff in May and June, the load at CC48 is over 700 lbs/day and the load at A68 is over 800 lbs/day.

In addition to the gage data, he discussed two detailed tracer studies conducted by USGS in 2002 and 2003 on the Animas River from above Arrastra Gulch to A68. One was during low-flow conditions where they determined that out of 87 lbs/day of zinc at A68 during the tracer injection, 76% or 66 lbs/day entered the river from Arrastra Gulch on down to A68. The other tracer event was in April which is when the highest zinc concentrations are seen at A68. For that tracer, they determined that of the 226 lbs/day at A68, 62% or 140 lbs/day entered the river from Arrastra Gulch on down.

In contrast, low-flow zinc loading from Arrastra itself is about 5 lbs/day or 5% of the zinc load at A68. Arrastra contributes a larger percentage of the low-flow cadmium load at A68, about 10%. Water quality in Arrastra does not meet standards (Table Value Standards, TVS) for zinc and cadmium. In the past, we've thought this was mostly due to very low hardness in Arrastra which leads to very low metal standards. But after closer examination, TVS still wouldn't quite be met using hardness values typically found at A68.

This summer we should have all the Arrastra data, including the most recent, pulled together. Bill suggested that we should revisit the Royal Tiger Mine. When samples were taken in years past, the discharge was conveyed by pipe down to Silver Lake. When several of us visited a couple of years ago, the pipe was broken, and the discharges went into the talus. He also suggested we sample the mine again wherever the discharge is now coming from. In addition, the stream dries up at certain times of year below Silver Lake, and we would like to get a photographic record.

InnoCentive: The group made awards for four InnoCentive solutions in May out of the 54 we received. Awards were given to ideas regarding: periodic draining limestone lined ponds to reduce scaling; treating cotton waste fibers to absorb metals; using chlorides to precipitate metals; and using an ionization filter process. We have not yet received contact information for the authors from InnoCentive. Thanks to people who reviewed all or at least some of the proposals: Bill Simon, Steve Fearn, Larry Perino, Kirstin Brown, Peter Butler, Jason Willis, John Ferguson, Chris Peltz, Dan Ramey's group at Freeport-McMoRan, Jim Bush, Terry Chatwin, Brian LaFlamme, and Charles Bucknam. At our meeting, a request was made for the coordinators to write up a summary of our process and a summary of what we learned.

Sipper data and data base: At the end of the meeting, the group had a short discussion regarding sipper data which EPA has been collecting. Sippers generally take data every day. The question posed is does ARSG want to incorporate each sample into its general database, which is what EPA has done. It could be denoted in the database as sipper data. Or does the group want to keep the data in a separate file. The issue will be discussed at the next meeting.

<u>Topics for Next Meeting</u>:
How to incorporate sipper data in database
Arrastra Gulch
Bullion King
Henrietta 3