

ARSG MEETING SUMMARY

Nov. 21, 2013

ATTENDEES: Peter Butler (ARSG), Bill Simon (ARSG), Steve Fearn (ARSG), Jim Bush (CH2M Hill), Dennis Grubb (CH2M Hill), Jen Beck (CH2M Hill), Dale Rodebaugh (Durango Herald), Brad Florentin (AMEC), Chuck Wanner (Trout Unlimited), Larry Perino (Sunnyside Gold), Jason Willis (Trout Unlimited), Jacob Waples (Golder), Eric Kern (Golder), Scott Roberts (Ecosphere Environmental), Craig Gander (CDPHE), Kay Zillich (BLM), Kirstin Brown (DRMS), Paul Nazaryk (BHP-Billiton), Lisa Richardson (BLM), Steve Wharton (EPA), Paula Schmittiel (EPA), Rich Palladino (Aerix Industries), Buck Skillen (Trout Unlimited), Ray Ferguson (citizen), Chris Peltz (local scientist)

ANNOUNCEMENTS:

- San Juan Resource Conservation and Development Council had their annual meeting last week. The Council is the 501(c)(3) that ARSG uses as its fiscal agent. Peter made a presentation at the meeting about our technology initiative regarding InnoCentive. Chuck handed out the Council's annual report at our ARSG meeting which describes ARSG's work along with other entities the Council sponsors.
- Funds for Arrastra Gulch characterization – There is funding for the characterization within the Bullion King 319 grant. Bill will check into when the funding will actually be available.
- FLC honors program participation; Durango's Mountain School Water Science Fair – Students from both Fort Lewis College and Durango Mountain School have been working local water quality issues including the Animas River. Water quality is getting a lot of local student interest.
- Scott Roberts took macro-invertebrate samples from South Mineral Creek for ARSG this fall. South Mineral has a good trout fishery, but as of several years ago, bug populations were dropping. We don't know why, but there is one priority mine remediation site discharging into the creek. BLM is going to process the samples.

Topics

Generally, we don't get a lot of consultants coming to our meetings, but several different companies are working on some innovative technologies, and they ended up coming to the same meeting to make presentations

1. Bagasse presentation - Dennis Grubb with CH2M Hill discussed work he is doing with a colleague using sugar cane bagasse. Bagasse is the shredded stalk fiber remaining after the sugar is removed from the sugarcane. It is light and porous with a high amount of surface area per volume. It also provides a great deal of simple carbons and acts as a good host-media for sulfide-reducing bacteria (anaerobic). At CU in Boulder, they are testing the ability of bagasse (with the bacteria) to remove metals in acid water by pushing the water through 1 inch tubes filled with bagasse. They have experimented with other additives such as manure and different densities of bagasse related to the amount of acid and metal laden water pushed through it. In addition, they have tested bagasse at various temperatures and have found that it performs almost as well at near freezing temperature as room temperature. In some instances, the water froze, but once it was thawed, the bacteria started right up again. At this point, they have been pushing 33 ml/min through one inch tubes (8 inches long) for 15 months and the metals are still being removed. The group was very interested in the presentation and started to think about locations where it could be field tested.

2. pHoam update - Eric Kern and Jacob Waples with Golder & Associates updated the group on their work with pHoam. They are doing the work in conjunction with Aerix Industries (formally Concrete Solutions). The idea is inject foam into mine waste piles as a way to distribute amendments to reduce acid generation without having to move or open up the waste pile. Initially, they are testing just the foam to see how it will move and distribute through piles. Since ARSG and DRMS were already moving some mine waste at Carbon Lakes this fall, the equipment was used to make a pile of mine waste about 8 feet high and 45 feet long. The foam was injected with a dye into several locations in the pile. Then the pile was pulled apart for ultimate disposal down an old incline (mixed with cement). The foam was distributed fairly uniformly. The next step is to test the foam in some other locations, possibly the Bullion King since this dump is slated to be moved into an on-site repository.
3. Making wetlands work in cold climates – Brad Florentin with AMEC out of the Durango office made a presentation on use of wetlands to remove metals. They have been working on a pilot wetlands treatment elsewhere in the San Juans which is now in its second winter. Unfortunately, at this time they can't share much detailed information about the site until given permission by their client. Overall, AMEC studied the literature regarding wetlands and really focused on the two common problems, clogging of hydraulic flow and freezing. They believe they've developed some good methods to mitigate these issues.
4. Avivid Technologies Update – Peter showed a powerpoint send to him from Tim Conarro with Avivid. Avivid is testing an electro-coagulation system that uses a unique water flow system, an abrasive and rotating cathode to minimize clogging and plating. Avivid gave a presentation to the group last spring. This fall, they collected 300 gallons of American Tunnel water for testing in the system. Their first system was about 1 gpm. Now they are building a 25 gpm. They hope of come to Gladstone next summer to do an on-site test.
5. Technology Initiative - Innocentive update and Brainstorming session – We are close to reaching our funding goals for posting a challenge on the InnoCentive website. We've had a number of conversations with InnoCentive and have a draft master contract from them. We would like to post the challenge this winter while people are not as busy in the field. We are also looking into convening a brainstorming session with a number of experts in the field of mine drainage treatment. We'd like to conduct the session in Denver this winter.
6. Update on Bullion King Mine Waste Remediation project – Because the snow came in early, we were unable to get a mini-trackhoe up to the Bullion King. Therefore we will probably do test holes to better characterize the dump next summer and the actual remediation may not occur until 2015.
7. Revegetation of Carbon Lakes area – Unfortunately, we ran out of time for Bill to show a powerpoint presentation on revegetation work for this site. Bill did show a number of test cups in which he has been growing grass. (It's legal now.) The soil in the cups is from Carbon Lakes, and Bill added different combinations of amendments such as red mud, biochar, lime, humic acid, protein crumbles and micro-rizen. The soil has high concentrations of copper and arsenic. Bill found that a soil pH of 5.0 is the sweet spot where copper is no longer available for plant uptake and arsenic is just beginning to become mobilized. This fall, amendments were added to the soils at Carbon Lakes based on Bill's experiments.
8. Maintenance on past 319 projects – this topic we put off for a later meeting.

Potentially For Jan.:

Maintenance on 319 projects

Innocentive update
Arrastra Gulch
Red & Bonita