

STATE OF COLORADO

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Dedicated to protecting and improving the health and environment of the people of Colorado

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Colorado Department
of Public Health
and Environment

To: Nutrient Criteria Workgroup
From: Joni Nuttle, WQCD
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Subj. March 16, 2007 Nutrient Criteria Development Meeting Summary
Date: March 26, 2007

Meeting Summary

The Water Quality Control Division (WQCD) facilitated a Nutrient Criteria Development Workgroup Meeting at Metro Wastewater Reclamation District on March 16, 2007. Joni Nuttle (WQCD) opened the meeting with introductions and circulated a sign-up list. Those attending included Joni Nuttle (WQCD), Jim Saunders (WQCD), Joan Carlson (USFS), Brittney Hand (Thornton), Craig Wolf (GEI), Laurie Rink (FRICO), Tad Foster (Law Office of Tad Foster), Blair Corning (SACWSD), Tricia Culp (Jackson Kelly), Becky Dunavant (CDM), Jennifer Richards (CH2mHill), Al Polonsky (DEH), Rob Buirgy (BTWF), Gabe Racz (Trout Raley/NCWCD), Mary Fabisiak (City of Westminster), Shelley Stanley (Northglenn), Jean Marie Boyer (Hydrosphere), James McCarthy (Arvada), Steve Lundt (MWRD), Amy Woodis (MWRD), Todd Harris (MWRD), James Dorsch (MWRD), Sharon H. Davis (MWRD), Pam Benskin (Aurora Water), Jim Shelley (City of Boulder), Mark J. Maxwell (Black & Veatch), and Doug Druliner (USGS).

Mark Weber (Colorado Spring Utilities), Chester Anderson (B.U.G.S.), Chuck Wanner, Steve Glazer, and Barb Horn (CDOW) joined the meeting via teleconference.

Chester Anderson presented an update for the Animas River Nutrient Workgroup. Below is a written summary provided by Chester Anderson.

Over a 3 year period (2003, 2004 & 2005) periphyton biomass (measured as chlorophyll-a and ash-free dry mass) was quantified at 12 sites in the Animas River from upstream of the City of Durango to the confluence with the San Juan River in Farmington, NM as well as at 4 sites in 2 reference streams (the Piedra and San Juan Rivers, sites located at similar latitudes and elevations as the Animas sites) during fall low flows. Synoptic sampling of macroinvertebrates and analysis of water samples for total nitrogen and total phosphorus were also completed. The study objectives were:

1. to develop a synoptic nutrient enrichment study between the State of New Mexico, the Southern Ute Indian Tribe, and the State of Colorado for the Animas River;
2. to develop nutrient enrichment protocols acceptable to the State of Colorado and comparable to the Nutrient Assessment Protocols of the SWQB of the New Mexico Environment Department;
3. to confirm or deny nutrient enrichment on the Animas River and;
4. if confirmed, to narrow the focus of future research that identifies sources of nutrients on the Animas River, and,
5. to suggest best management practices that reduces pollutants in the Animas River.

The sampling efforts involved a number of stakeholder groups and staff from the New Mexico Environment Department Surface Water Quality Bureau, the Southern Ute Indian Tribe Water Quality Department and the Colorado Department of Public Health and Environment's Water Quality Control Division.

Higher concentrations of chlorophyll-a, ash-free dry mass, total nitrogen and total phosphorus and degraded macroinvertebrate communities were consistently found in the Animas River during each year of sampling when compared to the Piedra and San Juan reference sites. Nutrient loading appeared throughout the Animas from the northern most sampling station downstream to the confluence with the San Juan River. A recovery of the Animas appeared near the NM/CO State Line.

There are a number of factors that may be contributing to the excessive quantities of algae found in the Animas River:

1. Excessive inputs of nitrogen and phosphorus beyond the assimilative capacity of the river and
2. Degraded assimilative capacity of the river due to:
 - a. metals from mines and natural sources in the upper basin, reducing the macroinvertebrate community,
 - b. non-point runoff from urban areas and agricultural fields,
 - c. bank hardening and channel modification,
 - d. fine sediment deposition from gas development, agricultural fields and natural sources that negatively impact the biota and isolate the river water from its hyporeheic zone,
 - e. degradation of streamside riparian habitat and wetlands,
 - f. historical and current contamination from the uranium processing mill at Durango,

Factors that appeared to not be significant contributors include the Valley and Missionary Ridge Fires and drought conditions. The fires undoubtedly released significant quantities of nutrients. However, nutrients from burn areas are quickly assimilated and the burn areas were rapidly stabilized, significantly reducing runoff from the burn areas into the Animas. The amount of algae in the Animas was also largely independent of drought conditions of 2002 and 2003. Flows in 2004 and 2005 were average and above average respectively and there were significant spikes in flows weeks prior to each sampling event along with high concentrations of algae.

Suggested future research and projects:

1. Measuring periphyton community composition at each sampling site,
2. Completing a loading analysis of all the point sources of pollutants and bracketing non-point sources of pollution,
3. Quantifying how much water is being diverted for irrigation practices and locating exactly where the diversions are,
4. Quantifying the impact of storm-water runoff from urban areas
5. Locating and quantifying return flows from agricultural fields,
6. Completing a land-use database and analysis,
7. Implementing an educational program for decision makers and the general public about the threat of nutrients and other pollutants to streams and rivers.
8. Identifying and implementing best management practices (BMPs) to reduce pollutant loading to the Animas River.

Mary Fabisiak, City of Westminster, presented a draft alternate proposal for nutrient criteria for lakes and reservoirs with a water supply use classification. This draft alternate proposal was developed by a sub-committee of interested drinking water suppliers, and would apply to reservoirs with a direct connection to a drinking water treatment facility as identified using SWAP data

Key points:

1. Problem: Excess nutrient loads in reservoirs may increase disinfection byproduct precursors, leading to impairment of use.
 - a. Naturally occurring organic materials combine with the disinfectants used to treat raw water to potable water standards, producing carcinogenic disinfection byproducts (DBPs).
 - b. DBPs are regulated by the Safe Drinking Water Act (SDWA).
 - c. Other problems are caused by a eutrophic, or highly productive lake, such as taste and odor events, increased chemical costs, and toxins produced by algae.
2. The WQCD proposed Nutrient criteria that is based on optimizing productivity for aquatic life would not be protective of drinking water use.
3. Propose a subcategory for direct use water supplies – “waters of the state” where there is a direct connection between a reservoir and a water treatment facility. Terminal reservoirs are not considered waters of the state and therefore are not included.
 - a. Develop a chlorophyll a (chl a) standard that is protective of the direct use water supply classification
 - b. Sub-category approach is similar to categories for recreation use classification and temperature
4. Next steps:
 - a. Explore other states’ approaches to water supply
 - i. California – Beneficial use risk categories
 - ii. MD, OR, MI – specific chl a standards

Questions and discussion items that followed:

1. Why wouldn’t nutrient criteria based on aquatic life, and optimizing productivity be protective of water supply use?
 - a. Usually aquatic life is the most sensitive use. In this case, water supply would be the most sensitive use, where limiting, or decreasing productivity (chl a) is more protective of the use.
2. More discussion of California’s report and nutrient criteria:
 - a. Divide lakes and reservoirs in to 3 categories, based on dissolved organic carbon (DOC) and chl a
 - i. Categories 1 and 3: Either they were clearly meeting the nutrient criteria, or they weren’t
 - ii. Second category, where they weren’t sure, more investigation (site specific) was done.
3. Are we basing a lot of conclusions on a limited data set?
 - a. Perhaps. California’s report was very thorough, and several states refer to that and the same references.
4. Next steps:
 - a. Need to look at a regional approach
 - b. Need to gather consistent, comparable data for where we do have good data sets.

The presentation is posted on the Division’s web site at: <http://www.cwqf.org/Workgroups/nutrient.asp>

Next Steps

The workgroup is encouraged to send comments, questions and concerns to Joni Nuttle and Jim Saunders at WQCD.