

TECHNICAL SUPPORT DOCUMENT

EPA Technical Review of Use Attainability Analyses Supporting Amendments To The New Mexico's Standards For Interstate and Intrastate Surface Waters 20.6.4 NMAC

Segments 20.6.4.403 and 20.6.4.404 of the Animas River

**U.S. EPA REGION 6
WATER QUALITY PROTECTION DIVISION**

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I. Introduction

Background

The purpose of this Technical Support Document (TSD) is to provide the results of the Environmental Protection Agency Region 6 technical review of the supporting use attainability analyses (UAA) for the lower Animas River, from the San Juan River to Estes Arroyo, and the upper Animas River from the Estes Arroyo to the Southern Ute tribal boundary (segments 20.6.4.403 and 20.6.4.404 NMAC). The findings from this UAA for the lower and upper segments of the Animas River are expected to be used by the New Mexico Environment Department (NMED) as a basis for proposed amendments to New Mexico's water quality standards in the current 2015 triennial revision or in a subsequent interim rulemaking.

The Region's technical review does not constitute a final action under §303(c) of the Clean Water Act (CWA), but is an interim action utilizing previously approved performance-based provisions (*See* 65 FR 24647, 24648 ((April 27, 2000))). This approach is intended to allow the state to make appropriate water quality management decisions for the water(s) identified above based on the findings outlined in this TSD prior to final submission to EPA by the New Mexico Water Quality Control Commission.

Chronology of Events

The Surface Water Quality Bureau (SWQB) initially developed a UAA for the upper and lower segments of the Animas River and posted a public discussion draft on November 18, 2013. The SWQB held a public meeting to discuss its findings on December 17, 2013. The public comment period for the draft UAA ran from November 18th to December 20, 2013.

The SWQB requested that Region 6 review its initial public discussion draft UAA in April 2014. Region 6 provided informal comments to the SWQB later that month, followed by more formal comments on May 6, 2014. Based on those comments, the SWQB revised the document and provided a final draft UAA for the Region's technical review pursuant to §20.4.6.15 C. NMAC on July 7, 2014. Region 6 is providing its technical determination on the final draft UAA in this TSD.

Summary of the Use Attainability Analysis Findings

The final draft UAA developed by the SWQB was intended to allow the state to determine the attainable aquatic life uses in the lower and upper segments of the Animas River. The SWQB determined that the marginal coldwater and coldwater aquatic life uses that currently apply to these segments are not attainable because of the naturally high ambient water temperatures. The final draft UAA concludes that the coolwater aquatic life use is the most protective attainable use for both the lower Animas River and the upper Animas River.

II. EPA Review and Technical Determination

Consistent with the Clean Water Act (CWA) §101(a)(2), section 20.6.4.6 NMAC of the New Mexico surface water quality standards, require that wherever attainable, water quality shall provide for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water. Also consistent with federal regulations at 40 CFR 131.10, the New Mexico standards at §20.6.4.15 NMAC provide for the development of a UAA by the SWQB or a 3rd party.

Review of Use Attainability Analysis Results

The SWQB's draft final UAA discussed the physical characteristics of the Animas River in detail. The most significant aspects include the physical description of the ecoregions that the Animas River lays in, the correlation of ambient air and water temperatures using the Air-Water Temperature Correlation (NMED/SWQB, 2011) protocol, and an extensive look at the scientific literature and thermographic data to determine the specific temperature needs or preferences for native aquatic species in the San Juan basin. A discussion of these factors follows.

Watershed Description

The UAA describes the Animas River as flowing out of the State of Colorado and the Southern Ute Indian Tribe reservation, entering New Mexico at an elevation of 6000 feet. The UAA describes the Animas River as flowing 37 miles and dropping 700 feet to an elevation of 5300 feet at its confluence with the San Juan River. There are two ecoregions specific to the Animas River, Ecoregion 20c (San Juan/Chaco Tablelands and Mesas) and Ecoregion 22i (Semiarid Benchlands and Canyonlands). (Griffith 2006). New Mexico has divided the Animas River into separate regulatory segments described above, with the 19.6 mile long upper Animas in Ecoregion 20c and the 16.9 mile long lower Animas, is located in Ecoregion 22i. These two ecoregions differ in elevation, physiography, vegetation, hydrology, and mean annual precipitation. These differences alone could likely result in differing levels of aquatic life use support between the upper and lower portions of the Animas River.

New Mexico has defined the Animas River as two separate regulatory segments. In §20.6.4.403 NMAC, the lower Animas is designated with a marginal coldwater aquatic life use. The lower Animas River is described as running from its confluence with the San Juan River upstream to Estes Arroyo and is designated with a marginal coldwater aquatic life use. In §20.6.4.404 NMAC, the upper Animas is designated with a coldwater aquatic life use. Temperature criteria are the primary parameter in determining aquatic life use support in colder waters in New Mexico.

Water Temperature

The presumption is that natural water temperatures resulting from naturally high ambient air temperatures prevent attainment of the coldwater and marginal coldwater aquatic life uses in the Animas River. To test that presumption, the SWQB relied on its Air-Water Temperature Correlation protocol to correlate ambient air temperatures with water thermograph data. The

correlation model uses the average air temperature to predict the maximum and varied duration temperatures for a given water body to estimate the effect of air temperature on aquatic life uses (NMED/SWQB 2012b). This model has proven effective in evaluating waters where thermograph data are not available, although final impairment determinations are based on actual water temperature measurements. The model has also been used previously in determining the appropriate use in other waters in New Mexico.

The SWQB deployed five water thermographs in the Animas River from June to September of 2013, utilized data from two deployed in 2003 (Aztec and Cedar Hill); and three in 2010 (Farmington, Aztec and near the state line). The Southern Ute provided SWQB with thermograph data less than one mile upstream of the NM/Southern Ute boundary from 2013. Looking at the data, very few exceedences of the coolwater criterion of 29° C are seen. The SWQB applied its air-temperature model to the data from five roughly equidistant locations along the Animas River, including the Southern Ute thermograph site. What stands out here is that the thermograph data strongly suggest that water temperatures in the Animas River is more closely associated with the coolwater use than the existing coldwater uses.

The SWQB considered potential impacts on water temperature from low flow and permitted discharges. Both segments 20.6.4.403 and 404 NMAC were listed in the state's 2012-2014 Integrated List as impaired due to temperature (NMED/SWQB 2012a), based on thermograph data from a 2010 survey (NMED/SWQB 2012c) and the current assessment (NMED/SWQB 2013a). Subsequently, a temperature TMDL was developed and has since been approved by EPA for the lower Animas River (NMED/SWQB 2013b). Incorporating the critical low flow (4Q3) into its calculations, the TMDL concluded that water temperature in the Animas River is driven mainly by air temperature and solar radiation, and that low flow was not a factor in impairment (NMED/SWQB 2013b).

There are two significant discharges to the Animas River, the Animas Steam Plant and the City of Aztec Waste Water Treatment Plant. While the NPDES discharge permit for the Animas Steam Plant has a maximum temperature criterion of 29°C, the TMDL assigned a Waste Load Allocation of 25°C. The Aztec Water Treatment Plant doesn't have an effluent temperature limitation because it discharges to the Lower Animas Ditch, not directly to the Animas River (NMED/SWQB 2013b). However, given the distance from the Animas River, it is unlikely to affect the temperature in the Animas River itself. These permitted discharges have not been shown to be increasing water temperature in the Animas River. Given that the criteria exceedences are likely not due to external sources, but represent normal conditions, this suggests that the aquatic life uses that apply to these waters may not be appropriate.

Aquatic Life

New Mexico's has structured its aquatic life uses and criteria to protect the aquatic communities based on habitat requirements for individual species, reflecting generalized thermal categories protective of native fish species in New Mexico. The critical question to be answered is what the highest attainable aquatic life use that can be attained given the watershed characteristics and ambient air and water temperatures.

In an effort to answer this question, the SWQB looked to the scientific literature to determine the specific temperature needs or preferences of a given species at various life stages for waters in the San Juan basin (ERI 2007). The SWQB also reviewed the literature for species documented in the Animas River in or near New Mexico (Miller 2000, Nehring 1992), identifying their general thermal category and the percent relative abundance by thermal category. The conditions in the Animas River are influenced by anthropogenic-induced changes in water temperature, the hydrography, channel geomorphology, and the introduction of exotic fish species in the basin. The conditions in the San Juan below the Navajo Dam is a stark example, where water temperature in the river was 20-25°C before the dam was built, and are now 4-8°C (ERI 2007). This essentially permanent hydromodification has created unnaturally cold water temperatures downstream that impact the native fish community. Conversely, alteration and loss of riparian habitat combined with high ambient air temperatures has the opposite effect.

These impacts have resulted in a decline in native fish species in the San Juan River. The decline in the mainstem impacts the dispersal of native species into its tributaries including the Animas River. A number of native species are now federally listed as endangered, including Colorado pikeminnow (*Ptychocheilus lucius*) and razorback sucker (*Xyrauchen texanus*). Both occupy the Animas River. Similarly, the roundtail chub (*Gila robusta*) is now rare in the Animas and is listed in New Mexico as endangered and is a candidate for federal listing as well (BISON-M 2013).

EPA Determination

Determining the appropriate designated uses for of the Animas River from the San Juan River to the Southern Ute Indian Tribe boundary (segments 20.6.4.403 and 404 NMAC) depends on understanding the watershed characteristics, the anthropogenic effect of hydrologic modification(s) and the natural aquatic community.

The SWQB presented the following to support the coolwater aquatic life use designation:

- The Animas watershed is contained in Ecoregions 22i and 20c, which are naturally xeric ecoregions characterized by warm air temperatures, low precipitation, and limited surface water, and not associated with cold water habitats.
- Thermograph data that strongly indicate that water temperatures in the Animas River in both segments more closely associated with the coolwater use than the coldwater use. Native fish species documented in the Animas River are intermediate (cool) or warm water species.
- Optimal water temperatures for the various life stages of several native species in the San Juan basin range from 19°C to 26°C. Optimal water temperatures for the federally listed endangered and candidate species are greater than 20°C for Colorado pikeminnow, razorback chub and roundtail chub.
- The aquatic community dominated by coolwater species which suggests that the habitat is not optimal for cold water species. Only a small percentage of the fish in the Animas watershed are cold water fish, mostly brown trout (*Salmo trutta*) and some rainbow trout (*O. mykiss*). Coldwater species that are present tend to exhibit behavioral

thermoregulation, seasonally migrating to cooler stream reaches (Wehrly 2007). Low flow and permitted discharges were considered as possible impacts on water temperature.

- The Animas River TMDL concluded that water temperature is not driven by discharges, but mainly by air temperature and solar radiation. Low flow was not shown to be a factor in impairment (NMED/SWQB 2013b).

Although the coldwater and marginal coldwater aquatic life uses that currently apply to segments 20.6.4.403 and 404 NMAC of the Animas River may be attainable in some small areas, the ability to attain those uses are after effects of hydromodification, as in the example of the San Juan below the Navajo Dam. Based on the discussion and supporting data presented, EPA agrees that this is atypical of the natural conditions in the watershed and the Animas River in particular. EPA does not consider the current uses for these segments are appropriate to protect the native aquatic life and does not consider them attainable due to ambient air temperatures, consistent with the factors identified in 40 CFR 131.10 (g)(1). EPA considers this UAA to be technically approvable, supporting the designation of the coolwater aquatic life use for both the lower Animas River (San Juan River to Estes Arroyo) and the upper Animas River (Estes Arroyo to the Southern Ute tribal boundary).

III. REFERENCES

Federal Water Pollution Control Act (Clean Water Act) (CWA) Title 33, Navigation and Navigable Waters, Chapter 26-Water Pollution Prevention and Control, Section 101 [As Amended Through Pub.L. 111-378, January 4, 2011] (33 U.S.C. § 1251 et seq.)
Federal Clean Water Act. 33 U.S.C. 1251 et seq.

Ecosystems Research Institute (ERI). 2007. *San Juan River Fishes Response to Thermal Modification*. Logan, UT. February 2007. Accessed at http://www.fws.gov/southwest/sjrip/pdf/DOC_San_Juan_River_fishes_response_thermal_modification.pdf

Griffith, G.E., Omernik, J.M., McGraw, M.M., Jacobi, G.Z., Canavan, C.M., Schrader, T.S., Mercer, D., Hill, R., and Moran, B.C. 2006. Ecoregions of New Mexico (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey.

Nehring, R.B. Colorado Division of Wildlife (CDOW). 1992. *Assessment of the Fish Fauna of the Animas River from Purple Cliffs to the New Mexico State Line July 1-9, 1992*. Montrose, CO. July 22, 1992.

New Mexico Administrative Code (NMAC). 2013. *State of New Mexico Standards for Interstate and Intrastate Surface Waters*. New Mexico Water Quality Control Commission (WQCC). As amended through February 14, 2013 (20.6.4 NMAC).

New Mexico Environment Department/Surface Water Quality Bureau (NMED/SWQB). 2013a. *Procedures for Assessing Water Quality Standards Attainment for the State of New Mexico CWA §303(d)/§305(b) Integrated Report*. June 24, 2013.

- , 2013b. *TMDL for the Animas River Watershed*. September 30, 2013.
- , 2012a. *2012-2014 State of New Mexico Clean Water Act §303(d)/§305(b) Integrated Report, Appendix A*. Santa Fe, NM.
- , 2012b. *Lower Dry Cimarron Use Attainability Analysis, Attachment 4, Air-Water Temperature Correlation*. March 2012.
- , 2012c. *Water Quality Survey Summary for the San Juan and Animas Watersheds 2010*. Santa Fe, NM.
- , 2008. *Fish Characteristics*. Unpublished document with references. 2008. Santa Fe, NM.