SWQB RESPONSES TO COMMENTS ON THE ANIMAS RIVER UAA

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Animas Watershed Partnership
2340 CR 203
Durango, CO 81301
(970) 903-9361

Ms. Deborah Sarabia
New Mexico Environment Department
Surface Water Quality Bureau
P.O. Box 5469
Santa Fe, New Mexico 87502

DECEMBER 19, 2013

Dear Ms. Sarabia,

The Steering Committee of the Animas Watershed Partnership (AWP) wishes to comment on the draft Use Attainability Analysis (UAA) supporting changes to surface water quality standards for the Animas River in San Juan County, in northwestern New Mexico.

The AWP is a local collaborative watershed group taking action to improve water quality in the Animas River based on data and scientific information. As such, we respectfully request the NM Environment Department (NMED) consider AWP as an interested party and key stakeholder on the Animas River in New Mexico.

The AWP formed in 2002 out of concern for high nutrient levels in the Animas River in New Mexico and Colorado. The partnership works together across state and tribal boundaries to protect and improve the quality of water resources in the Animas River. Partners include private landowners, environmental groups, municipalities, counties and states, as well as the Southern Ute Indian Tribe and Ute Mountain Ute Indian Tribe. Currently, the Steering Committee of the AWP consists of nine representatives from municipalities, organizations and private citizens from New Mexico, Colorado and the Southern Ute Tribe.

The following comments are based on a consensus opinion of the partnership's Steering Committee. These comments are not necessarily shared by all of the Steering Committee members, nor do they necessarily reflect the views of the partnership's member organizations.

The Steering Committee of the AWP supports the NMED's use of all existing data to assess uses and water quality. We are encouraged that the UAA incorporates temperature data

collected by the Southern Ute Indian Tribe, and urge NMED to continue to collect temperature (and other water quality) data. The UAA analysis and the data it incorporates appears to support the proposed changes to reflect the on-the-ground situation with respect to temperature and aquatic life uses.

AWP wishes to thank the Surface Water Quality Bureau for the support, attention, care and effort placed on the Animas River, and for their collection of new data and use of available data in this assessment. We urge the Surface Water Quality Bureau to continue monitoring temperature and other water quality conditions on the Animas, and also to continue its support for the collection of water quality data by AWP, San Juan Watershed Group and other local partners. Since its beginnings, the AWP has based its efforts on data collection and the application of scientific principles. The group will continue to engage in field data collection into the future.

Thank you for the opportunity to provide comments.

Sincerely,

Ann Oliver
AWP Coordinator

Paul A. Montoia
AWP Steering Committee Chair

SWQB RESPONSE: *SWQB appreciates ongoing collaboration and data sharing opportunities with stakeholders in and adjacent to NM to help maintain and improve the water quality of the Animas River. The AWP has been added to the SWQB mailing list, and is also encouraged to visit the SWQB website at http://www.nmenv.state.nm.us/swqb/index.html for new information or updates about NM watersheds of interest to AWP. SWQB accepts data from outside sources provided QA/QC requirements as outlined in the QAPP are met. More information can be found at http://www.nmenv.state.nm.us/swqb/DataSubmittals/.*

San Juan Water Commission
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MEMBERS:
City of Aztec
City of Bloomfield
City of Farmington
San Juan County
S.J. County Rural Water Users Assoc.

December 18, 2013

Deborah Sarabia
Surface Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502

Via U.S. Mail and E-mail (*deborah.sarabia@state.nm.us*)

Re: Comments of San Juan Water Commission on November 2013 Public Discussion Draft of Use Attainability Analysis for Aquatic Life Uses for the Animas River in New Mexico

Dear Ms. Sarabia:

Thank you for publishing, and accepting public comment on, the New Mexico Environment Department's ("NMED") Public Discussion Draft of its Use Attainability Analysis for Aquatic Life Uses for the Animas River in New Mexico ("Draft Animas River UAA"). Through this letter, I hereby submit San Juan Water Commission's ("SJWC") comments on the Draft Animas River UAA. SJWC appreciates the opportunity provided by NMED to comment on the Draft Animas River UAA. Further, SJWC commends NMED's effort to modify existing surface water quality standards to reflect site specific information available for the Animas River. As explained in detail below, SJWC supports NMED's determination that "Coolwater" is the most protective aquatic use attainable for both segments of the Animas River in New Mexico. However, SJWC believes that the proposed segment specific maximum temperature criterion of 27°C for the Animas River from Estes Arroyo to the Southern Ute tribal boundary[1] is not appropriate given historic temperature levels. SJWC recommends that the maximum temperature criterion of 29°C for the "Coolwater" aquatic life use, as specified in the use-specific numeric criteria in the Standards for Interstate and Intrastate Surface Waters, 20.6.4.900(H)(4) NMAC (Dec. 1, 2010), be used for the upper segment of the Animas River.

With respect to the proposed temperature criterion for the Animas River from Estes Arroyo to the Southern Ute tribal boundary, SJWC notes the following. Using the July air temperature range for the two ecoregions referenced in the Draft Animas River UAA, *i.e.*, 21-22°C, in conjunction with the NMED correlation model for predicting

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[1] As noted in the Draft Animas River UAA, the Animas River flows through Southern Ute tribal land before entering New Mexico. SJWC therefore supports correcting the segment description.

TMAX, the range of predicted temperature values for the upper segment of the Animas River would be: 27.42°C to 28.49°C. This predicted TMAX range would indicate that the water temperature in the upper segment of the Animas River would typically be just below the use-specific criterion of 29°C for the "Coolwater" aquatic life use (20.6.4.900(H)(4) NMAC). However, this predicted TMAX range based on ecoregion air temperatures would exceed the proposed segment-specific TMAX criterion of 27°C. It therefore would seem prudent to retain the current use-specific criterion of 29°C for the upper segment of the Animas River, rather than to adopt the lower, segment-specific temperature criterion. The proposed 27°C criterion would be routinely exceeded because of natural, ambient air temperatures during the summer, resulting in the upper segment continuing to be listed as impaired for temperature in the Clean Water Act §§ 303(d)/305 (b) Integrated List and Report.

In its Draft Animas River UAA, NMED states that the predicted TMAX for the Animas River segment from Estes Arroyo upstream to the Southern Ute tribal boundary meets the "Coolwater" criterion, with only three measurements exceeding the 29°C criterion. Thus, NMED has acknowledged by its own measurements that water temperature in this reach can exceed 29°C. Additionally, the Southern Ute Tribe's data documents that the summer water temperature in the Animas River occasionally exceeds 24°C in their upstream segment at higher elevations. Thus, the Tribe has designated its segment of the Animas River upstream of New Mexico as "Warmwater," which "is similar to New Mexico's Coolwater use." Draft Animas River UAA at 9. Because the Draft Animas River UAA demonstrates that the "Coolwater" aquatic life use is the most protective use attainable for the Animas River, and that aquatic life use has a water temperature criterion of 29°C, aquatic life will be appropriately protected by the typical "Coolwater" criterion without an arbitrary lowering of the temperature criterion by 2°C in the upper segment of the River.

As documented, the water temperature in the upper segment of the Animas River, on occasion, naturally exceeds 29°C, yet Brown trout (a non-native species) have been found in the upper segment. Because there are no barriers to movement upstream or downstream in the River, Brown trout are able to move to survive. Also, as noted in the Draft Animas River UAA, Brown trout can occupy deeper, lower velocity, and warmer waters than other trout species. The 29°C temperature criterion associated with the Coolwater aquatic life use is therefore sufficiently protective of this non-native species, and a segment-specific temperature criterion of 27°C is unnecessary.

The United States Environmental Protection Agency-approved Total Maximum Daily Load ("TMDL") for the Animas Watershed, dated September 30, 2013, contains information that demonstrates that the Animas River in New Mexico is affected by all of the natural factors that impact stream temperature. The TMDL report acknowledges that hill slope and stream bank failures, reduced riparian vegetation, insufficient effective shade, issues with width to depth ratios, sediment problems, and high solar radiation collectively result in higher water temperatures. The TMDL also predicts future

impacts due to population growth and land use changes in the watershed. Based both on the information contained in the TMDL and on other data in the Draft Animas River UAA, NMED has determined:

> The coldwater and marginal coldwater aquatic life uses are *not attainable* because of 40 CFR 131.10 (g)(1): 'naturally occurring pollutant concentrations prevent the attainment of the use . . . .' Specifically, thermal pollution (heat) naturally occurring due to ambient air temperatures prevents the attainment of the coldwater and marginal coldwater uses.

Draft Animas River UAA at 1 (emphasis in original; citation omitted). Therefore, the Draft Animas River UAA should simply propose "Coolwater" as the most protective aquatic life use attainable for both segments of the Animas River.

Thank you for your consideration of these comments. If you have any questions about SJWC's position, or would like to discuss these issues in more detail, please do not hesitate to call me. SJWC looks forward to receiving your response to these comments.

Sincerely,

L. Randy Kirkpatrick
Executive Director
San Juan Water Commission

<u>SWQB RESPONSE:</u> SWQB appreciates SJWC's comments and support for the UAA.

The Final Draft UAA supports the coolwater designation as the attainable aquatic life use for both segments of the Animas River, but changes the TMAX criterion for the upper segment to 29°C, instead of a segment-specific 27°C as proposed in the public discussion draft. This change is due to an error discovered in a source table used to calculate the mean July air temperatures. SWQB corrected the error and reapplied the air-water correlation model. The revised calculations increased the predicted water temperatures by approximately 1.2°C, as shown in ***Table 3*** *of the Final Draft UAA. Therefore the coolwater default TMAX criterion of 29°C is appropriate for both segments of the Animas River.*

The purpose of the UAA is not to avoid or remove impairment listings, but rather to identify the most protective attainable designated uses. The temperature impairment in the lower AU has been addressed through a TMDL. The TMDL accounts for both natural and human causes of impairment. Human causes of impairment are not the basis for this UAA. The coldwater and marginal coldwater aquatic life uses are not attainable because of the natural water temperatures resulting from natural ambient air temperatures. The applicable regulatory descriptor is 40 CFR 131.10(g)(1): "Naturally occurring pollutant concentrations prevent the attainment of the use…".

San Juan Watershed Group
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December 18, 2013

Ms. Deborah Sarabia
Environment Department
Surface Water Quality Bureau
P.O. Box 5469
Santa Fe, New Mexico 87502

RE: Comments on Draft Use Attainability Analysis on the Animas River

Dear Ms. Sarabia,

The San Juan Watershed Group (SJWG) wishes to comment on the Draft Use Attainability Analysis and proposed changes to the designated use to the upper Animas River (Segment 404).

The following comments are based on a majority opinion of the group's members and are not shared by all of the group's members, nor should they be construed to reflect the opinions of the member's agencies or organizations.

The SJWG supports changing the Animas River's designated use from Marginal Coldwater Fishery/Warm Water Fishery to Coolwater Fishery. Coolwater Fishery is a relatively new designated use category and more accurately represents the actual conditions in the Animas River valley. The proposed maximum temperature of 27° C is more protective of aquatic life than the category's maximum temperature of 29° C and is attainable in the stream reach. Thank you for the opportunity to provide comments.

The SJWG also supports conducting a Use Attainability Analysis on the lower Animas River (Segment 403) to accurately assess conditions within that reach.

Sincerely,

David Tomko

David Tomko

<u>SWQB RESPONSE:</u> SWQB appreciates SJWG's comments and support for the UAA.

The Final Draft UAA supports the coolwater designation as the attainable aquatic life use for both segments of the Animas River, but changes the TMAX criterion for the upper segment to 29°C, instead of a segment-specific 27°C as proposed in the public discussion draft. This change is due to an error discovered in a source table used to calculate the mean July air temperatures. SWQB corrected the error and reapplied the air-water correlation model. The revised calculations increased the predicted water temperatures by approximately 1.2°C, as shown in ***Table 3*** *of the Final Draft UAA. Therefore the coolwater default TMAX criterion of 29°C is appropriate for both segments of the Animas River.*

SOUTHERN UTE INDIAN TRIBE

December 20, 2013

Deborah Sarabia
NMED-SWQB
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Santa Fe, NM, 87502
deborah.sarabia@state.nm.us

via regular mail and email

Re: Comments on the Draft Changes to the Water Quality Standards for the Animas River in San Juan County, New Mexico

Dear Ms. Sarabia:

The Southern Ute Indian Tribe appreciates this opportunity to comment on the New Mexico Environment Department's proposed changes to the water quality standards for the Animas River. Our Water Quality Program staff have reviewed the proposed changes to the aquatic life use designations and the draft Use Attainability Analysis prepared to evaluate those changes. As a policy matter, the Tribe supports efforts to refine water quality standards to provide protection for appropriate designated uses and to facilitate the prioritization of water quality restoration efforts that will have the most benefit. The Tribe also supports refining designated uses consistent with the aquatic communities that occur, or should occur, and should be protected. NMED's proposal represents a significant step in achieving both of those policy objectives.

The Tribe offers the following specific comments on the proposed changes and UAA:

(1) The Tribe appreciates NMED noting in footnote 1 of the UAA that, as part of the upcoming triennial review, NMED plans to correct the segment description for the upstream-most Animas River segment to acknowledge the Southern Ute Indian Reservation boundary, consistent with its "Estes Arroyo to the Southern Ute tribal boundary" assessment unit description. This clarification will assist the public in understanding the roles of the respective sovereigns in protecting water quality on the Animas River.

(2) The Tribe agrees with the conclusions of the UAA and the proposed changes to the aquatic life uses. The proposal is based on a sound assessment of both temperature and biological data and appropriately takes into consideration available geographic, land use, and economic information. The new aquatic life uses are appropriate for the protection of aquatic life communities in the Animas River.

(3) The UAA cites 40 C.F.R. § 131.10(g)(1) as the regulatory basis supporting the revised aquatic life uses. The Tribe suggests also considering subsection (g)(5) as the regulatory basis, or an additional regulatory basis, supporting the revisions. Subsection (g)(5) speaks to "physical conditions" as opposed to "pollutant concentrations." While naturally-occurring thermal heat may be deemed a pollutant, it may also be described as a physical condition that interacts with other physical conditions (e.g., substrate, cover, flow, depth, pools, riffles, and the like)

to influence stream temperatures and aquatic life habitat. For this reason, subsection (g)(5) may be a more accurate and readily understood basis to support the revised aquatic life uses.

(4) The Tribe appreciates NMED incorporating physical and biological data shared by the Tribe for incorporation into the UAA, as well as information the Tribe shared concerning its analysis of appropriate aquatic life use designations for the Animas River with the Reservation. Because the Tribe is still preparing its draft water quality standards and has not yet applied for treatment-as-a-state status under the Clean Water Act from the EPA, the Tribe proposes the following edits and clarifications to the second full paragraph on page 9 of the UAA:

> The Southern Ute Indian T~~t~~ribe has jurisdiction over the Animas River upstream of New Mexico, and plans to propose~~applies~~ its own criteria and aquatic life uses for adoption pursuant to the Clean Water Act (Table 5). The T~~t~~ribe's proposed Cold water threshold is 68°F (20°C) and ~~their~~ its proposed Cool water threshold is 75°F (24°C). Above 75°F is considered Warm water. The T~~t~~ribe's proposed Cool water threshold is the same as New Mexico's Coldwater TMAX. Therefore, although the Warm water use has no upper threshold, it is similar to New Mexico's Coolwater use. According to the T~~t~~ribe's data, summer water temperature in the Animas River often exceeds the Cold water and occasionally the Cool water thresholds, depending on flow conditions, and aquatic life known to occur during summer months is associated with warm-water habitat (SUIT 2013). The T~~t~~ribe anticipates proposing to~~has~~ designate~~d~~ the~~ir~~ section of the Animas River immediately upstream of New Mexico as Warm water.

The Tribe also requests adding the word "Proposed" as the first word in the title for Table 5. NMED may also consider revising references to the "Southern Ute Indian Tribe" and the "Southern Ute Indian Reservation" in the UAA to be consistent throughout the document.

Thank you in advance for considering the Tribe's comments. Please contact Mr. Pete Nylander in our Water Quality Program at (970)563-0135 ext. 2214; if the Tribe can provide any additional information. The Tribe looks forward to continued coordination of our efforts to protect and improve water quality in the Animas River and other waters that cross the Southern Ute Indian Reservation before entering New Mexico.

Sincerely,

Jimmy R. Newton, Jr., Chairman
Southern Ute Indian Tribal Council

Cc: Sadie Hoskie, EPA-Region 8 Water Program Director (via email: hoskie.sadie@epamail.epa.gov)

<u>SWQB RESPONSE:</u> SWQB appreciates ongoing collaboration and data sharing opportunities with stakeholders in and adjacent to NM to help maintain and improve the water quality of the Animas River. SWQB acknowledges and appreciates the Tribe's comments and support. The Final Draft UAA clarifies that the Tribe's WQS are proposed but not yet applied, and also refers to the Tribe's name consistently throughout the document.

RECEIVED
DEC 18 2013
SURFACE WATER

THE SOUTHWESTERN WATER CONSERVATION DISTRICT
Developing and Conserving the Waters of the
SAN JUAN AND DOLORES RIVERS AND THEIR TRIBUTARIES
IN SOUTHWESTERN COLORADO

West Building – 841 East Second Avenue
DURANGO, COLORADO 81301
(970) 247-1302

December 16, 2013

Deborah Sarabia
Surface Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502-5469

Dear Ms. Sarabia:

On behalf of the Southwestern Water Conservation District ("District"), I would like to express our support for recent efforts by the New Mexico Environment Department's Surface Water Quality Bureau to reevaluate aquatic life uses of the Animas River in San Juan County, New Mexico.

Our District was established by the Colorado legislature to conserve and protect the waters of the San Juan and Dolores Rivers and their tributaries. Following this mandate, we believe the results of your bureau's draft Use Attainability Analysis (UAA), which demonstrates that the attainable aquatic life uses of the Animas River in San Juan County are coolwater for the lower reach, will benefit the river as a whole and lead to improved management.

The District thanks you and your staff for your efforts in continuing to improve water quality in the region.

Best Regards,

Bruce Whitehead
Executive Director

cc: SWCD Board of Directors
Jeff Kane (Maynes, Bradford, Shipps & Sheftel)

<u>SWQB RESPONSE</u>: SWQB acknowledges and appreciates the District's comments and support of the UAA.

EPA Comments

Use Attainability Analysis
Public Discussion Draft

Aquatic Life Uses for the Animas River in New Mexico

Summary

There is a conceptual problem with the summary statement indicating that "the coldwater and marginal coldwater aquatic life use is not attainable because of 40 CFR 131.10(g)(1)." It would be reasonable to say that the coldwater and marginal coldwater use(s) are not attainable because of naturally occurring thermal pollution as described in 40 CFR 131.10(g)(1), but not because of the regulatory descriptor itself.

SWQB RESPONSE: SWQB has made the requested clarification.

Background

The first full paragraph on page 2 seems misplaced, and placing it between the current second and third paragraphs would create a better hierarchical flow. This would give a sequence of referring to Clean Water Act (CWA) and federal regulatory requirements, then the discussion of the state's definition of "segment" and assessment unit (AU) description, leaving the specific description of the Animas River segments in the third paragraph last.

SWQB RESPONSE: SWQB has made editorial revisions to the UAA document, including this section, to improve logical flow and readability.

Watershed Description

The second paragraph on page 4 (following **Figure 2**) indicates that there are three existing point sources with individual NPDES permits along the lower Animas River *(San Juan River to Estes Arroyo)*. These include the City of Farmington's Animas Steam Plant that discharges to Willett Ditch immediately above the Animas River. There are two things to consider here. This statement refers to a discharge point "above the Animas River. Since Farmington is at the confluence of the San Juan River and the lower segment of the Animas, does this mean that the discharge is actually in the San Juan. And although the plant is not currently discharging, this document reports that there are plans for the discharge to resume in the near future, but there is no discussion of the potential impacts from the withdrawals for the Farmington's Animas Steam Plant or the discharge. This should be of interest, particularly since there are potential increases in temperatures and total dissolved solids as the result of any withdrawal or discharge. The paragraph also refers to the City of Aztec Water Treatment Plant (WWTP) discharge to the Lower Animas Ditch, flowing into the Animas River, and the City of Aztec WWTP discharges directly to the Animas River. What are the impacts of the related withdrawals from either groundwater or from the Animas itself in terms of temperature variations?

<u>SWQB RESPONSE:</u> SWQB revised the statement to clarify that the Animas Steam Plant discharge is to Willett Ditch, a tributary of the Animas River, and not directly to the Animas River. SWQB also added more detail to the description of the NPDES permitted facilities, as referenced in the TMDL for the lower Animas River AU (see NMED/SWQB 2013b in the Final Draft UAA). None of these sources have been shown to be increasing water temperature in the Animas River.

<u>Ecoregions</u>

The first paragraph on page 4 in this section refers to ecoregions characteristics, including the Roman numeral hierarchical scheme describing increasing levels of ecological detail. It is unclear what the purpose of describing the hierarchical scheme is, particularly since the narrative does not indicate what ecoregion level is being discussed. The second paragraph reports that the Animas watershed is contained in two "moderately warm and dry ecoregions: 22i and 20c" as shown in **Figure 3**. Although **Table 1** includes mean annual precipitation for these two ecoregions, but there's nothing to describe what these phrase "moderately warm and dry" means in terms of the context of supporting the finding in this use attainability analysis (UAA).

<u>SWQB RESPONSE:</u> SWQB has removed explanation of the numerical scheme, which is already discussed in detail in the ecoregion reference (see Griffith 2006 in the Final Draft UAA).

<u>Water Temperature and Aquatic Life</u>

Comments related to fish species identified in the Animas River (**Table 2**) have been integrated with those related to fish species on page 10 of the UAA. (See Fish Abundance below).

Table 2 includes a general statement of water temperature preference for these species, referring to New Mexico Department of Game and Fish (NMDGF). Given that the major division between the state's aquatic life use subcategories is based on temperature, **Table 2** would be more meaningful if it provided a range of numeric values rather than the general terms "intermediate (cool)," "warm," " cool," etc,. Otherwise, it's not clear what the water temperature criteria for aquatic life uses are being discussed in the paragraph following **Table 2**, and included in **Table 3**, and what they mean in terms of use attainability.

<u>SWQB RESPONSE:</u> See SWQB's response to comments under "fish abundance".

The paragraph between Table 2 and Table 3 referring to the statistics noting how the state's temperature criteria were derived and describing their expression may be confusing to some readers. This may be better explained by simply reversing the order of the sentences and not using the word "statistics" in explaining how they were derived. The paragraph following Table 3 may be confusing to readers as well. The only definitive statement there is that NMED has water thermograph data for three (3) locations on the Animas. The paragraph is not clear on whether the thermographs deployed over several months and if they were actually deployed through the critical summer months. It may be helpful to combine both paragraphs.

The discussion of the application of the SWQB's temperature correlation model to five equidistant temperature sampling locations, including the three thermograph locations are referred to in Table 4. It appears that of the five locations, the three with specific reference dates represent the actual sample sites. But since there is a single date referenced, it's unclear what the number of replicates/samples taken at each of these sites where. The number of replicates makes a significant difference when developing a predictive model or determining if the presumptions about an actual site are reasonable.

<u>SWQB RESPONSE:</u> SWQB has clarified that the term statistics in this context is used to mean numeric values that summarize each dataset; specifically, 4T3, 6T3 and TMAX, which are compared to the numeric temperature criteria. SWQB also added specific deployment dates, locations, and number of measurements collected for each thermograph. Details on the development of the air-water correlation model and on the evaluation of thermograph datasets are evaluated are provided in the UAA references (see NMED/SWQB 2012b and 2013a in the Final Draft UAA).

<u>Discussion</u>

The second paragraph of this section refers the Total Daily Maximum Load (TMDL) that was developed for the lower Animas (San Juan to Estes Arroyo). It clearly explains that although there are a few exceedences, the applicable temperature criteria are appropriate. However, the discussion following that is somewhat unclear. Several factors are identified that may contribute to the temperature exceedences seen in this segment, including low flow, the removal of riparian vegetation and natural causes. But no definitive discussion or explanation is given concerning these factors and if they are anthropogenic or natural. Is the low flow natural/seasonal, and typical of the ecoregion, or possibly influenced by diversions or withdrawals? If anthropogenic, can withdrawals/diversions be managed differently or eliminated? Since the removal of riparian vegetation is clearly anthropogenic, can it be restored and how would that influence attainment? The limitations from natural conditions and their affect on attainment should be discussed briefly as well. It is important not only to identify the current conditions, but to explain why they exist, how they influence what is or is not attainable and if they can be remedied.

<u>SWQB RESPONSE:</u> The TMDL identified solar radiation and air temperature as the most significant contributors to water temperature in the Animas River. SWQB has added explanation of how flow, shade and natural air temperatures were considered in the TMDL.

The conditions in upper segment of the Animas (Estes Arroyo to Southern Ute boundary) appear to be significantly different from the downstream segment. The rates of exceedences in both measured and predictive temperatures make it unlikely that the coldwater criteria can be met in this segment. But as noted in the previous paragraph, the approach here should not only be identifying current conditions, but identifying what is or is not attainable and why.

It is not entirely clear what the comparison between the Southern Ute and New Mexico uses and associated criteria are intended to convey. If the intent is to show some consistency between assessments by the Southern Ute and this UAA, it should be more clearly stated. If relying on the Southern Ute's data that the temperature in their portion of the Animas occasionally exceeds

their criteria and New Mexico's corresponding criteria during the summer months, that data should be referenced. Otherwise, this comparison it's of limited to no value.

<u>SWQB RESPONSE:</u> SWQB does not have temperature data for the Animas River upstream of New Mexico. The Southern Ute Indian Tribe (SUIT) data were used to confirm that New Mexico's proposed temperatures were reasonable and compatible with the SUIT's proposed standards, and vice-versa. SWQB has added the reference to the SUIT data (see SUIT 2013 in the Final Draft UAA).

<u>Fish Abundance</u>

Looking back, **Table 2** includes a list of fish species found in the Animas and a general statement of water temperature preferences. It is unclear if the temperature descriptions in **Table 2** equate to the numeric values related to the use designations detailed in **Table 3**. If not, what do they mean? How does this equate to the use and associated criteria changes being recommended here?

Table 2 includes following species:

Colorado pikeminnow (*Ptychocheilus lucius*)
Razorback sucker (*Xyrauchen texanus*)
Roundtail chub (*Gila robusta*)

These species are significant in this discussion because of their federal listing status and the implications for consultation under the Endangered Species Act (ESA). Given EPA's has committed to consultation with the U.S. Fish and Wildlife Service (USFWS) on new/revised standards and their potential affect on the threatened and endangered (T/E) species, it's important that the potential effects the proposed standards may have on these species be adequately addressed.

Table 2 indicates that the two federally listed endangered species, the Colorado pikeminnow and razorback sucker are warmwater species that have been extirpated from the Animas River (D. Propst, personal communication). This personal communication is not referenced in the UAA. The BISON-M database indicates that the Colorado pikeminnow has been extirpated from Arizona but not New Mexico (Checklist of the Extinct, Extirpated, and Vanishing Wildlife of New Mexico, NMGF, 1991). There are some reports in BISON-M that the razorback sucker has been extirpated from New Mexico. The database also indicate that while it s presumed extirpated from the San Juan River in New Mexico, a few individuals have been collected in the San Juan River in Utah (NMDGF, 1994) and that it has been reintroduced into the San Juan River from stock maintained at Dexter National Fish Hatchery, Dexter, in San Juan County, New Mexico (Propst, 1995).

In discussing the optimal temperature ranges for fish species recorded in or near the Animas River in New Mexico, the document notes that the optimal water temperatures for native fish species in the San Juan basin range from 20°C – 26°C (ERI 2007). The document also reports that the Colorado pikeminnow and razorback sucker are warmwater species (unreferenced

personal communication from or to D. Propst). The problem with this statement is that it is not clear as to what "warmwater" means since Table 3 describes the warmwater category as a TMAX as 32.2°C, but the preferred temperatures of the pikeminnow range between 22.9 - 24.8°C (Bulkley and Pimentel 1983), with the upper avoidance temperatures range from 27.4 - 31.6°C. And what does the reference to these species not being "…able to survive or reproduce in consistently cold waters" (NMDGF 2013) mean when the temperature range from the high quality to marginal coldwater from 4T3 of 20°C to a 6T3 of 25°C taken from **Table 3** is compared to the lower avoidance temperatures for the pikeminnow, which ranges from 8.0 - 14.7°C, the latter depending on the acclimation temperature (Bulkley and Pimentel 1983) (Sublette and Hatch, 1990).

*<u>SWQB RESPONSE:</u> SWQB has clarified that the term "warmwater" as used to describe the thermal preferences of a fish species is not the same as the term "warmwater" as used to describe an aquatic life use. Water quality standards and designated aquatic life use categories may vary among states and tribes. For example, SUIT "warmwater" aquatic life use is similar to NM's "coolwater" aquatic life use, and both uses describe similar aquatic communities. The designated aquatic life use categories referred to in the UAA and in NM's Water Quality Standards are coldwater, marginal coldwater, coolwater and warmwater. SWQB has added definitions for these uses in **Appendix 2** of the Final Draft UAA. The temperature criteria for each use protect the aquatic life community as a whole through all life stages.*

Temperature needs of fish species are usually presented as a range; and a generalized thermal category such as cold, intermediate or cool, or warm may be assigned to the species. Even these broad categories may vary somewhat. Research approaches vary and may be conducted in a controlled laboratory setting, or through field observations; and may measure maximum or minimum avoidance temperatures, temperature tolerances, temperature preferences, critical thermal maxima or upper incipient lethal temperature; the latter two of which vary depending on the acclimation temperature applied. All of these temperature needs and preferences vary among life stages (egg, larva, juvenile and adult) as well. SWQB assigned the categories based on scientific consensus, review of the available research, and best professional judgment.

The previous questions suggest that there may be factors other than temperature that should be considered here. The last paragraph on page 10 gets to this to a degree by stating that natural conditions have always been more supportive of intermediate and warm water fish. But looking at, **Table 6**, comparing fish abundance in the upper segment of the Animas (Estes Arroyo to Southern Ute boundary) from the 1974-1989 and 1990-2000 shows an increase in coldwater fish and a modest increase in intermediate fish, and a fairly significant decrease in warmwater fish. This doesn't seem to support the contention that natural conditions have always been more supportive of intermediate and warm water fish. However, the lower segment of the Animas (San Juan River to Estes Arroyo) from the same time frames again shows an increase in coldwater fish but a significant decrease in intermediate and smaller decrease in warmwater fish. If natural conditions have always been more supportive of intermediate and warm water fish, there should not be a significant shift in the abundance of intermediate and warmwater fish numbers. The shift in abundance strongly suggests that there is something other than natural conditions influencing conditions the lower segment of the Animas. The 1992 data (state line to

Florida River) shows a significantly higher abundance of intermediate temperature fish, but with no comparative data, it's unclear how to use this data.

<u>SWQB RESPONSE:</u> SWQB recognized that providing the frequency provided inadequate information, because the many different datasets referenced are not directly comparable. For a more meaningful comparison, SWQB revised the comparison to show the percent relative abundance of fish in each category of temperature preference instead of a frequency. The percent relative abundance shows that most fish species reported are in the intermediate temperature category.

EPA's Biological Evaluation (2009) notes that the greatest threat to the pikeminnow is not directly related to water quality but to quantity through fragmentation of range, water depletion and modification of natural flows. What may be most pertinent here is the work by Jones and Tyus (1985) that has shown that abnormally high water releases from upstream dams during the primary nursery period are detrimental to survival of larvae, and that surviving larvae showed a significantly lower growth rate. Nursery areas in warmer water tributaries may produce larvae which drift downstream to encounter cold water plumes from upstream reservoirs; such thermal shocks can produce adverse effects or death of young larvae (Berry 1988) (Sublette, et al, 1990).

The Biological Evaluation also identifies habitat fragmentation by dam construction and cold tailwater releases from reservoirs, reduction of flows, modification of the natural flow regime, and loss of flooded bottomlands as the primary threats to the razorback sucker, along with predations of young by catfish (Rinne and Fletcher, 1994) and other nonnative predators (e.g., red shiner) which prey upon larval razorback sucker (NMDGF, 1995) and possibly parasites (AZGF, 1996). Much like populations of pikeminnows, existing populations of razorback suckers are made up of only old individuals, some greater than 40 years of age, due to the lack of recruitment of young fish into the population.

Although not identified as such in Table 2, the roundtail chub is a federal candidate species. Candidate species are plants and animals where the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but has not listed them yet because of other higher priority listing activities. EPA consults on candidate species as it would a T/E species. The BISON-M database contains a number of references identify main threats to the roundtail chub. These include habitat modification (stream channelization, damming, and removal of riparian vegetation) and establishment of non-native predators are probably the primary factors contributing to the decline of the species. Contaminant loading in the San Juan River also contributes to the imperiled status of the species there (NMDGF, 1995). The establishment of non-native predators is probably a primary factor contributing to the decline of the species (NMDGF, 1996).

In summary, the discussion above does not mean that natural conditions in both the upper and lower segments of the Animas are not more supportive of intermediate and warm water fish. What it means is that the information that has been presented leaves some questions that need to be answered. It is important not to discount habitat loss or modification or other anthropogenic causes as part of an explanation of why the coldwater use and associated criteria may not be appropriate.

SWQB RESPONSE: *Anthropogenic activity has negatively impacted native aquatic species for all the reasons mentioned above, but does not affect the attainable and natural water temperature in the Animas River. The UAA demonstrates that the coldwater use and associated criteria are not attainable because of natural ambient air temperatures in the watershed, and is not appropriate because it fails to protect the native aquatic life including threatened and endangered species.*

References

Arizona Game and Fish Department. 1996. Wildlife of Special Concern in Arizona (draft). Nongame and Endangered Wildlife Program, Arizona Game and Fish Department, Phoenix.

Checklist of the Extinct, Extirpated, and Vanishing Wildlife of New Mexico (March 11, 1991). New Mexico Department of Game and Fish, Endangered Species Program.

Ecosystems Research Institute (ERI). 2007. *San Juan River Fishes Response to Thermal Modification.* Logan, UT. February 2007. Accessed online at www.fws.gov/southwest/sjrip/pdf/DOC_San_Juan_River_fishes_response_thermal_modification.pdf, November 15, 2013.

Jones and Tyus. 1985. As referenced in BISON-M species account 010470, 3/2002. Colorado Pikeminnow (Ptychocheilus lucius).

Nelson, R.L., 2009. *Biological Evaluation - Informal Consultation on the New Mexico Water Quality Standards*. Unpublished manuscript. U. S. Environmental Protection Agency Region 6. New Mexico Dept. of Game and Fish. 1991. Handbook of Species Endangered in New Mexico. NM Department of Game and Fish, Santa Fe, NM.

New Mexico Department of Game and Fish, 1994. Endangered Species of New Mexico - 1994 Biennial Review and Recommendations. Authority: New Mexico Wildlife Conservation Act (NMSA 17-2-37, 1978).

New Mexico Department of Game and Fish. September, 1995. Recommended Changes: List of Endangered Species in New Mexico. pp. 1-12.

New Mexico Department of Game and Fish. 1996a. New Mexico Department of Game and Fish. 31 January 1996. Threatened and Endangered Species of New Mexico -- 1996 Biennial Review and Recommendations. Authority: Wildlife Conservation Act (NMSA 17-2-37 through 17-2-46, 1978).

New Mexico Department of Game and Fish (NMDGF). Biota information system of New Mexico (BISON-M). Accessed at www.bison-m.org. April 2014.

Richard Pimentel and Ross V. Bulkley. (1983). Influence of water hardness on fluoride toxicity to rainbow trout. Environmental Toxicology and Chemistry. Volume 2, Issue 4, pages 381–386, November 1983.

Rinne, J. and R. Fletcher. 1994. Can we sustain SW aquatic habitats and fishes? Forestry Research West. pp.13-17.

Sublette, J.E., M.D. Hatch, and M. Sublette. 1990. The Fishes of New Mexico. The University of New Mexico Press, Albuquerque. Threatened wildlife and plants; Determination of threatened status for the spikedace. Federal Register 51: 23769-23781.

Sublette, J.E., M.D. Hatch, and M. Sublette. 1990. The fishes of New Mexico. University of New Mexico Press, Albuquerque, New Mexico. 393 pp.