
EPA-APPROVED

**TOTAL MAXIMUM DAILY LOAD (TMDL)
FOR THE
RIO RUIDOSO**



DECEMBER 13, 2016



September 29, 2016

By Email and U.S. Mail

Ms. Heidi Henderson
Surface Water Quality Bureau
New Mexico Environment Department
Post Office Box 5469
Santa Fe, NM 87502-5469

Re: Ruidoso's Comments on the New Mexico Environment Department's August 22, 2016 Public Comment Draft Total Maximum Daily Load (TMDL) Document for the Rio Ruidoso

Dear Ms. Henderson:

On behalf of the Village of Ruidoso and the City of Ruidoso Downs (collectively "Ruidoso"), we are providing comments on the referenced August 22, 2016 Public Comment Draft Total Maximum Daily Load ("Draft TMDL") document. Our two municipalities are the members of the Regional Wastewater Treatment Plant Joint Use Board that is responsible for operating Ruidoso's wastewater treatment plant ("Plant"). The Plant discharges treated wastewater into the Rio Ruidoso between Eagle Creek and the US Hwy 70 Bridge. Consequently, references to the "Draft TMDL" are references to the Draft TMDL for this particular segment of the Rio Ruidoso, and references to the "Rio Ruidoso" or "stream" are also to this segment of the Rio Ruidoso unless otherwise noted.

Ruidoso appreciates NMED's willingness to continue working with us and other stakeholders in developing an amended nutrient TMDL for the Rio Ruidoso. Ruidoso believes that these efforts represent significant advances toward developing an approach to controlling nutrient levels in New Mexico streams that recognizes the attributes of nutrients that are unique among water pollutants. Consequently, Ruidoso considers the Draft TMDL to be a positive step that we generally support.

Ruidoso's central concern with the Draft TMDL is how it will be implemented in the Plant's NPDES Permit, currently due to be renewed on August 1, 2017 ("Permit Renewal"). Our comments will describe (1) Ruidoso's concern that any requirement to reduce Total Nitrogen ("TN") in Plant effluent beyond current levels achievable by the

Heidi Henderson
Surface Water Quality Bureau
New Mexico Environment Department
September 29, 2016
Page 2

Plant would be unlikely to improve water quality in the Rio Ruidoso; (2) why it is technically impossible for Ruidoso's new Plant to meet TN effluent limits based on the Draft TMDL's wasteload allocation ("WLA"); (3) Ruidoso's support for NMED's recommendations for implementing the TMDL for the Plant; and (4) why Ruidoso believes it would be premature for EPA to determine a final effluent limit for TN based on the Draft TMDL.

1. **The Proposed Wasteload Allocation for Total Nitrogen is Unlikely to Improve Water Quality in the Rio Ruidoso.**

Our experts, Dr. David Stensel with the University of Washington and Jim Good with Environmental Science Associates, have examined how the presence of nutrients in the Rio Ruidoso contributes to algal growth. Specifically, they have examined how Total Phosphorous ("TP") and TN, considered together, contribute to algal growth. They conclude that TP, rather than TN, is the primary limiting nutrient in the Rio Ruidoso downstream of the outfall of the Plant. Consequently, it is doubtful that any further reduction of TN concentrations beyond the capabilities of the Plant would further reduce potential algal growth. They recommend that the most effective next step to reduce algal growth in the Rio Ruidoso is to continue planned projects to reduce sources of TP throughout the watershed. A copy of Dr. Stensel and Mr. Good's Memorandum addressing these points is enclosed as Attachment A.

***SWOB response:** Thank you for your comments as well as the additional information provided by Dr. Stensel and Mr. Good in Appendix A. For the three impaired assessment units of the Rio Ruidoso described in the TMDL, causal variables (TN and TP) continue to be present at levels that do not meet the applicable threshold values (as noted in the 2016-2018 Integrated List of Impaired Waters²) and the stream remains impaired for plant nutrients. Increasing nitrogen inputs below the WWTP discharge are likely changing the trophic status of the Rio Ruidoso, which is forcing P-limitation over time³. Literature reviews indicate spatial and temporal variation in nutrient limitation with co-limitation commonly observed across freshwater systems^{4,5,6,7}. This concept is supported by the 2003 algal assay (before the upper reaches were impaired) as well as data collected during SWQB water quality surveys.*

² <https://www.env.nm.gov/swqb/303d-305b/2016-2018/index.html>

³ Sylvan et al. 2007. Eutrophication-induced phosphorus limitation in the Mississippi River plume: Evidence from fast repetition rate fluorometry. *Limnology and Oceanography*. 56(6):2679-2685.

⁴ Elser et al. 2007. Global analysis of nitrogen and phosphorus limitation of primary production in freshwater, marine, and terrestrial ecosystems. *Ecology Letters*. 10:1135-1142.

⁵ Francoeur, S.N. 2001. Meta-analysis of lotic nutrient amendment experiments: detecting and quantifying subtle responses. *Journal of the North American Benthological Society* 20:358-368.

⁶ Harpole et al. 2011. Nutrient co-limitation of primary producer communities. *Ecology Letters*, 14: 852-862.

⁷ Tank, J. and W. K. Dodds. 2003. Responses of heterotrophic and autotrophic biofilms to nutrients in ten streams. *Freshwater Biology* 48:1031-1049.

Historically, nutrient management efforts have focused on controlling a single limiting nutrient (i.e., N or P); however, science has shown that this may be over-simplifying nutrient management⁸. For example, nutrient limitation can change spatially and temporally within the same watershed; aquatic flora and fauna have different nutritional needs such that different species may benefit from N limitation, while others benefit from P limitation or co-limitation; and, focusing on only the perceived limiting nutrient can enhance export of the uncontrolled “non-limiting” nutrient downstream. It is for these reasons that SWQB asserts that reduction strategies for both N and P must be implemented.

2. The New Plant Would Be Unable to Meet Effluent Limits for Total Nitrogen Based on the Proposed Wasteload Allocation.

We understand from our Plant Director and our consultants that it would be impossible for the Plant to meet a TN effluent limit based on the proposed 37.1 pounds-per-day TN WLA. Our consultants reviewed Appendix C4 of the TMDL showing effluent flows and TN concentrations in Plant effluent from January 2012 to April 2016. After converting TN concentrations in milligrams per liter (“mg/l”) to pounds per day, they noted 11 months in which the proposed 37.1 pounds-per-day TN WLA was exceeded. Our consultants believe that 11 exceedances in 52 months are an accurate reflection of the inability of the Plant to meet the proposed WLA.

We understand that the proposed 37.1 pounds per day TN WLA translates to an effluent limit of 2.36 mg/l. Our Plant Director and consultants advise that with careful operation the Plant is capable of producing effluent with an average TN concentration below 4.0 mg/l. Our recommendation, which was included in our March 1, 2013 *Ruidoso Settlement Agreement Final Report* to NMED is that the WLA for TN should be consistent with a TN effluent limit of 4.0 mg/l (30-day average) with no seasonal variation. This recommended WLA is 62.7 pounds per day of TN at an effluent flow of 1.88 million gallons per day (“mgd”) and 90.1 pounds per day of TN at an effluent flow of

⁸ USEPA. 2012. *Preventing Eutrophication: Scientific Support for Dual Nutrient Criteria*. Office of Water. December 2012. EPA-820-S-12-002.

Heidi Henderson
Surface Water Quality Bureau
New Mexico Environment Department
September 29, 2016
Page 3

2.70 mgd. As discussed below, pounds per day in effluent during the summer months could be reduced further if Ruidoso is able to re-use treated effluent for land application.

We have determined that a Plant upgrade required to meet the proposed WLA for TN is technically and economically infeasible. At the direction of the Ruidoso Joint Use Board, the Board's consultant Molzen Corbin prepared a December 2015 study titled *Affordability of a Wastewater Treatment Plant Upgrade for Total Nitrogen Removal* ("Affordability Study"). A few notable conclusions of the Affordability Study are;

- (1) Reverse osmosis is the only treatment technology capable of further reducing TN to or below 1.0 mg/l. Other candidate technologies considered and rejected are chemical treatment, activated carbon adsorption treatment, ion exchange treatment and advanced oxidation.
- (2) The estimated cost of a reverse osmosis facility is \$31,900,000. This cost approaches the cost of the current Plant of approximately \$34 million.
- (3) Average estimated residential wastewater bills reflecting the cost of a reverse osmosis facility would be likely to impose economic hardship on the residents of both the City of Ruidoso Downs and the Village of Ruidoso. This conclusion is reached using EPA's affordability criteria that include an upward limit of 2% of Median Household Income.

SWQB response: *Based on the Discharge Monitoring Report (DMR) data provided by the WWTP for the January 2012-April 2016 period (Appendix C), SWQB approximated the current average monthly (i.e., 30-day) effluent loading as 30.6 lbs/day TN and 0.74 lbs/day TP. Loading values calculated from Appendix C should be considered estimates as reported "load" on DMRs are calculated with flow on the day of sampling not calculated using an average flow. Section 3.5.2 of the TMDL provides Current WLAs of 37.1 lbs/day TN and 1.64 lbs/day TP. These values are water quality based effluent limits designed to improve water quality to meet standards and protect aquatic life uses in the Rio Ruidoso. SWQB reviewed the 2013 and 2015 reports referenced in your comments and recognizes the improvement in WWTP effluent quality since the development of the 2006 TMDL. As such, SWQB is committed to continuing to work with the City/Village and EPA Region 6 to draft a new NPDES permit that uses permitting tools, such as compliance schedules, additional monitoring and Temporary Standards, and also protects the aquatic life uses in the Rio Ruidoso.*

3. **Ruidoso Supports NMED's Suggestions for Implementing the TMDL.**

Because it is impossible for the Plant to meet effluent limits for TN based on the proposed WLA, NMED's suggestions to EPA in Section 5.1 of the Draft TMDL are significant. These suggestions address Ruidoso's central concern as to how the TMDL will be implemented as effluent limits in the Renewed Permit. We support these recommendations for the following reasons:

A. Effluent Limits as loadings (i.e., pounds per day) rather than concentrations (i.e., mg/l) - The discussion of pounds-per-day effluent loadings at the bottom of page 32 of the Draft TMDL indicates that NMED is suggesting to EPA that effluent limits be expressed as loadings rather than concentrations. Further, the entire Draft TMDL discusses nutrient loadings rather than concentrations. Ruidoso supports this approach because it will allow flexibility in managing effluent. For example, Ruidoso potentially could reduce nutrient loadings to the stream during the summer, when algae growth is most likely, through land application of effluent.

B. Effluent limits implemented as a 30-day average or longer averaging period rather than a daily maximum - We agree with the Draft TMDL's recognition of

the chronic rather than acute nature of nutrient impairments. Because periphyton and aquatic plant growth responses to nutrients in a water body are less immediate than toxic responses to other substances, the presence of nutrients is more appropriately viewed over a longer time frame. Consequently, we support an effluent limit based on at least a 30-day averaging period.

- C. Compliance Schedule – As discussed above, our Plant cannot meet TN effluent limits based on the proposed WLA even though it is a state-of-the-art facility that achieves better results than the widely recognized limits of TN-removal technology. Consequently, we support a compliance schedule as necessary to allow the Plant to continue operating lawfully. For reasons discussed above, there are no currently available, affordable technologies that could allow the Plant to be upgraded to meet the new WLA. However, a schedule of compliance in the Renewed Permit would support efforts (described below in Sections 3.E, 3.F and 4) that should substantially improve water quality and refine water quality objectives in the Rio Ruidoso, ultimately enabling standards to be achieved.
- D. Interim temperature-dependent effluent limits – This approach has proved to be reasonable in the current Permit. It reflects the reality that biological treatment of nutrients at the Plant is more effective when influent temperatures are higher. Ruidoso supports this approach coupled with the other approaches described in this Section.
- E. Ruidoso Sewer Line Relocation Project – As the Draft TMDL points out (pp. 33-34), Ruidoso is in the process of designing the project, which will relocate the main sewer line away from its current location in, or immediately adjacent to, the Rio Ruidoso in the Village of Ruidoso and in the City of Ruidoso Downs. An expected benefit is a substantial decrease in infiltration and inflow into the main sewer line, which will correspondingly decrease wastewater flows to the Plant. Additionally, the new main line will be linked to an expanded wastewater collection system replacing septic systems, as described below. As noted in the TMDL, construction is scheduled to begin in 2017. Ruidoso estimates that construction will be completed by 2020.
- F. Wastewater Collection System Master Plan – This ongoing project, not discussed in the Draft TMDL, provides another basis for Ruidoso to support NMED's recommendations for TMDL implementation. The Village of Ruidoso has directed Molzen Corbin to analyze the existing wastewater collection system within the existing Village limits and a one (1) mile buffer bordering the Village and provide for a 20-year planning period. The analysis will lead to a plan to eliminate septic systems that cumulatively may be contributing

Heidi Henderson
Surface Water Quality Bureau
New Mexico Environment Department
September 29, 2016
Page 5

significant amounts of TN and TP to the Rio Ruidoso. Molzen Corbin expects the Master Plan to be completed by December 2016. Future trunk and lateral lines will be connected to the relocated main sewer line.

-

***SWQB response:** Thank you for your input on TMDL implementation strategies suggested by SWQB in the TMDL document. As noted in Section 5.1 of the TMDL, due to the chronic rather than acute nature of nutrient impairments, SWQB agrees that the TN and TP effluent limits should be implemented as a 30-day average, or longer averaging period, rather than a daily maximum limit in the future permit. Similarly, SWQB suggests that the next permit could only include loading limits that would be based on a 30-day average (or longer averaging period) rather than a daily maximum. The permit could also include a compliance schedule to allow the facility time to meet the new WLA. As previously noted, SWQB is committed to continuing to work with the City/Village and EPA Region 6 to draft a new NPDES permit that uses permitting tools, such as compliance schedules and Temporary Standards, and also protects the aquatic life uses in the Rio Ruidoso. SWQB believes the Ruidoso Sewer Line Relocation Project and the Wastewater Collection System Master Plan will be important in the reduction of non-point sources of plant nutrients in the watershed.*

4. **It is premature for the Renewed Permit to Establish a Final Effluent Limit for Total Nitrogen Based on the Proposed Wasteload Allocation.**

In addition to supporting NMED's recommendations for implementing the TMDL in the Renewed Permit, Ruidoso suggests that it is premature for EPA to determine a final effluent limit for TN in the Permit Renewal. There are at least two efforts underway that could change the water quality objectives for nutrients in the Rio Ruidoso. First, NMED is developing revisions to the Nutrient Assessment Protocol, which translates the narrative nutrient standard for TN into quantitative thresholds. Second, Ruidoso is performing a Use Attainability Analysis ("UAA") for aquatic life uses in the Rio Ruidoso that could lead to changed water quality standards in the Rio Ruidoso.

- A. Nutrient Assessment Protocol – The discussion of load allocations in the TMDL uses "unimpaired concentration" targets that were identified in the recently released *Refinement of Stream Nutrient Impairment Thresholds in New Mexico* summary report. (p.20). This document also describes extensive data analyses for determining the response variables and thresholds that indicate nutrient impairment. From the recent stakeholders' meeting with NMED, we understand that NMED intends to make significant changes in the Nutrient Assessment Protocol in 2017, based on the results of this study. For example, the study concludes that periphyton chlorophyll a concentrations, a measure of algal biomass, are not reliably predicted by nutrient concentrations, and diel fluctuation in dissolved oxygen is a more reliable indicator of nutrient impairment than minimum dissolved oxygen concentrations. Thus the current Nutrient Assessment Protocol is not based on the best available science, and until the Protocol is revised, the measures for success in meeting the narrative standard for TN are moving targets.
- B. Use Attainability Analysis – Ruidoso has observed that the current aquatic life use designation of the segment of the Rio Ruidoso into which the Plant discharges may not be accurate. That segment is currently designated for a "coldwater aquatic life" use. NMED agreed that the current use designation of the Rio Ruidoso segment justified further investigation and performed a fishery survey in September 2015. The survey found no trout in the segment. Consequently, NMED agreed that a UAA of the segment would be reasonable.

Ruidoso has appreciated the guidance of NMED in developing a Work Plan for the UAA. Earlier this month Ruidoso transmitted the Work Plan to EPA for

Heidi Henderson
Surface Water Quality Bureau
New Mexico Environment Department
September 29, 2016
Page 6

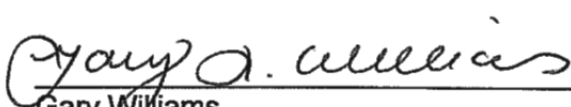
review, with copies to NMED and the New Mexico Department of Game and Fish. Upon completion of the UAA, Ruidoso will confer with NMED to determine if the UAA supports a change in the aquatic life use designation of the Rio Ruidoso. If the UAA supports such a change, then a proposed change of standards would be presented to the Water Quality Control Commission ("WQCC"). Such a change of standards would be highly relevant to whether the Rio Ruidoso is impaired for nutrients and consequently to a final effluent limit for TN in a future Permit.

5. **Conclusion**

Although we remain concerned that further TN reduction would be unlikely to improve water quality in the Rio Ruidoso, Ruidoso generally supports the Draft TMDL and its approval by the WQCC. Because our state-of-the-art Plant is not capable of meeting TN effluent limits based on the TN WLA, our primary concern is with how that WLA will be implemented in the Renewed Permit. We support the suggestions for implementation discussed in the TMDL. Finally, we urge NMED and EPA to not include a final effluent limit for TN in the Renewed Permit. Such a determination of a final effluent limit would be premature due to efforts now underway that could change water quality objectives for nutrients in the Rio Ruidoso.

Ruidoso appreciates your consideration of our comments on the Draft TMDL.

Sincerely,



Gary Williams,
Mayor
City of Ruidoso Downs



Tom Battin,
Mayor
Village of Ruidoso

Enclosure:

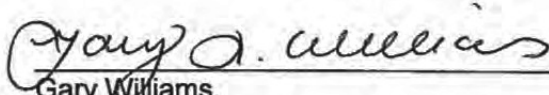
(A) Memorandum from Dr. David Stensel and Mr. Jim Good

SWOB response: *SWQB recognizes that results in the Refinement of Stream Nutrient Impairment Thresholds in New Mexico summary report⁹ will result in changes to the 2017 Assessment Protocols for nutrients. However, a comparison of existing TN and TP data to the new, proposed threshold values will still result in a determination of impairment for plant nutrients for the Rio Ruidoso. Additionally, SWQB recognizes the current work on the UAA for the Rio Ruidoso and received a draft UAA to review from Jim Good at Environmental Science Associates on September 22, 2016. However, the UAA proposes a change in aquatic life use from coldwater to coolwater aquatic life with a corresponding change in the dissolved oxygen criteria from 6.0 mg/L to 5.0 mg/L. The proposed change to the dissolved oxygen criteria will itself alone not result in a delisting of the Rio Ruidoso for plant nutrients because the assessment protocol for nutrients relies on a weight-of-evidence approach that integrates causal variables such as TN and TP and response variables such as dissolved oxygen.*

⁹ <https://www.env.nm.gov/swqb/Nutrients/>

Sincerely,

Sincerely,



Gary Williams,
Mayor
City of Ruidoso Downs



Tom Battin,
Mayor
Village of Ruidoso

Enclosure:

(A) Memorandum from Dr. David Stensel and Mr. Jim Good

ATTACHMENT A – to Ruidoso’s 9/29/16 Comments on TMDL