



City of Austin

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Watershed Protection and Development Review Department
P.O. Box 1088, Austin, Texas 78767

Ms. April Hoh
Texas Commission on Environmental Quality (TCEQ)
MC 150
P.O. Box 13087
Austin, TX 78711-3087

October 14, 2009

RE: Barton/Onion Watershed Stakeholder Group - City of Austin Comments on Draft Rule
tceq.state.tx.us/assets/public/permitting/waterquality/attachments/stakeholders/3111draft.doc

Dear Ms. Hoh:

We appreciate the effort you and your staff have made in developing rules limiting wastewater discharge to increase protection of water quality in the Barton Creek and Onion Creek watersheds contributing to the Barton Springs Segment of the Edwards aquifer. Although the City recognizes that the draft rule is an attempt to provide regulatory protection for the sensitive Barton and Onion creek watersheds, City staff analysis indicates it falls far short of the protection goal and is contrary to the desires of the vast majority of stakeholders.

Original Petition to the Commission

The City and the Barton Springs/Edwards Aquifer Conservation District petitioned the TCEQ in October 2008 for a prohibition on wastewater discharges in the contributing zone of Barton Springs Segment of the Edwards Aquifer because of the extreme sensitivity of the area to nutrient enrichment, the need to protect the existing excellent water quality and the federally-listed endangered Barton Springs salamander. Numerous lines of scientific evidence from multiple sources were offered in support of the petition, and the petition was supported not only by the Executive Director of the TCEQ but also by the local jurisdictions from 94% of the affected land area. This petition was not previously necessary because for many years applicants have recognized that wastewater discharge in the contributing zone was inappropriate under any effluent treatment scenario.

Information Provided During Stakeholder Process

No scientific evidence has been presented or referenced by TCEQ staff or stakeholders to demonstrate that the proposed rule will avoid degradation of water quality in the Barton Creek and Onion Creek watersheds contributing to the Barton Springs Segment of the Edwards aquifer. TCEQ staff have stated that the proposed rule was intended to provide an upper limit or ceiling of acceptable effluent concentrations, with incentives for beneficial re-use or land application of effluent to achieve more water quality protection. However, the draft rule actually provides no certain protection because less stringent permit limits are obtainable for an unspecified amount of effluent storage for emergencies, beneficial reuse through irrigation, intermittent discharge, or diluting streamflow if available. An overwhelming majority of stakeholders expressed the opinion that a prohibition against discharges is the most prudent course of action by TCEQ. In fact, there was no data-based opposition to that opinion.

The City and several other jurisdictions spent several years and a significant work effort contesting the wastewater discharge permit for the Belterra subdivision (Hays County Water Control and Improvement District 1, WQ0014293-001). The SOAH Administrative Law Judge for that case found that **the draft Belterra permit effluent limits in a continuous discharge scenario was more than de minimus degradation. The proposed rule effluent limits are the same as the Belterra draft permit.** If these

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rules are approved, stakeholders will unnecessarily be required to contest each and every permit application individually on a case by case basis at the expense of the downstream public. The TCEQ adopted the Administrative Law Judge's findings in Belterra such that the final permit mandated effluent load application whenever possible and restricted releases of effluent to specific instream flow conditions. Monitoring provisions with specific remedies for water quality degradation were included in the permit. The current Barton/Onion proposal clearly flies in the face of this finding and violates the Clean Water Act Antidegradation Policy that is also part of the TCEQ Texas Water Quality Standards in 30 TAC §307.5. Regardless of the clause that allows the Executive Director to impose more stringent levels, the proposed rule results in a presumption that the effluent limits included will be approved by TCEQ. Both the current limits applicable in these watersheds and that proposed by the rule are not capable of protecting the uses currently enjoyed by the citizens of these watersheds and the downstream impacted springs. The site-specific factors in the Belterra discharge to Bear Creek are no different than the conditions in the headwaters of Barton or Onion creeks or any of their tributaries. We suggest that the TCEQ order 2007-1426-MWD1 be reviewed in detail by staff drafting these rules. Although it contains some errors, the order does clearly state that continuous discharge at the proposed effluent quality was unacceptable to the Commission. It is unclear why this effluent level would then be proposed as an acceptable discharge for the entire Barton and Onion Creek watersheds upstream of the Recharge Zone.

City modeling using public domain EPA water quality models reviewed with TCEQ staff demonstrates that one 0.5 MGD wastewater treatment plant operating under the draft rule scenario in the contributing zone of the aquifer has the potential to lower dissolved oxygen in Barton Springs below levels that jeopardize the endangered salamander at low spring flows. Multiple wastewater discharges will increase the oxygen deficit. The draft rule does not consider the aquifer as the ultimate receiving water of this effluent nor does it attempt to address cumulative impacts of additional discharges. This was a topic discussed in detail at the stakeholders meetings; however, it is not acknowledged by the proposed rule.

Regional studies by the United States Geological Survey and recent monitoring by Baylor University support the modeling predictions by the City that a continuous discharge under the draft rule would significantly change the trophic status of contributing zone streams from an oligotrophic to eutrophic condition. While such a large change in trophic status is clearly in and of itself more than de minimus degradation of these streams, increases in algal biomass will increase the loading of oxygen-demanding organic materials to the aquifer and further reduce dissolved oxygen levels of Barton Springs thus further jeopardizing the endangered Barton Springs Salamander.

The natural low flows make the surface waters of the contributing zone particularly sensitive to nutrient enrichment, with USGS flow gauges immediately upstream of the recharge zone boundary documenting the low potential for effluent dilution (Barton Creek at Lost Creek, 08155240, n=7,586, 1988-2009, 7Q2 = 0.08 ft³/s; Onion Creek near Driftwood, 08158700, n=11,054, 1979-2009, 7Q2 = 0.19 ft³/s). A single 0.5 MGD discharge in the entire contributing zone segment of Onion Creek (the largest watershed in this area) would dominate the flow approximately 22% of year.

There are 245 measurements of total phosphorus by EPA-approved methods in Onion Creek in the contributing zone from 1974-2008 in the City of Austin database. These measurements include both stormwater and non-storm influenced conditions and yield an average total phosphorus concentration of 0.046 mg/L (stdev=0.11). Ninety percent of the ambient stream water quality data have been below the 0.1 mg/L TP allowed by the proposed rule and measured concentrations greater than 0.1 mg/L TP have only been made during short duration high flow stormwater runoff influenced conditions. The proposed rule allowing continuous discharge of phosphorus at these levels during average and low flow conditions in the creeks can more than **double the instream phosphorus load. TCEQ water quality standards implementation guidance suggests an increase by ten percent of the pollutant load represents degradation.** This contradiction highlights the absence of a TCEQ definition for degradation resulting in

subjective or arbitrary decision-making inappropriate to the protection of water resources. As discussed in the last stakeholder meeting, changes to the Texas Surface Water Quality Standards will not address this definition for the foreseeable future.

Achievable Effluent Nutrient Concentrations

Lower effluent limits than the draft rule are technologically achievable today for both phosphorus and nitrogen. ([idswater.com/Common/Paper/Paper_195/Achieving Low Effluent Total Phosphorus Concentrations1](http://idswater.com/Common/Paper/Paper_195/Achieving_Low_Effluent_Total_Phosphorus_Concentrations1)). As an example, the Iowa Hill WWTP in Breckenridge, Colorado has a two year average of TP=0.008 mg/L. The nearby Farmer's Korner WWTP likewise had a two year average TP of 0.007 mg/L, and Snake River WWTP in Summit County Colorado achieved a three year monthly average of 0.018 mg/L TP. The Norman Cole Jr. WWTP in Fairfax Virginia also achieved a two year average TP of 0.053 mg/L. Vendors have even been able to guarantee meeting some of these limits to their customers with even lower levels achievable depending on process design and operation. One local company manufactures membrane bioreactor units with a guaranteed total nitrogen concentration less than 3.0 mg/L (<http://www.enviroquip.com/products/MBR/Benefits.php>). These are not experimental or pilot facilities but real full scale implementation of current technology. In fact, through the Water Environment Research Foundation, the industry is actively investigating methods to achieve even lower nutrient levels ([02CTS1 at www.werf.org](http://www.werf.org)).

Acceptable Restrictions on Discharge

Several times during the stakeholder meetings TCEQ staff asked the group if a discharge was necessary what effluent limit for phosphorus would be acceptable. Our response was that algae growth experiments conducted by the City (using methods found in studies funded by TCEQ in the Bosque River) indicated any phosphorus increase above 0.004 mg/L would stimulate excessive algae growth. According to a recent study by Baylor University which was provided to TCEQ staff at the last stakeholder meeting (also funded by TCEQ), any wastewater discharges must be less than the benthic algae "change point" levels of 0.02 mg/L total phosphorus (King 2009) or effluent discharge must be conditional on instream flows sufficient to dilute phosphorus concentrations below this threshold in order to avoid impacts to the aquatic ecology of these streams.

Additional geographic restrictions upstream of the recharge zone are necessary to protect the aquifer. City modeling has demonstrated that significant increases in algal biomass would occur that result in a change of predicted algal trophic status from an oligotrophic to eutrophic state as far as 6 miles downstream of the Belterra discharge to Bear Creek. Effectively, the plant discharge consumes almost all of the assimilative capacity of the creek. Increases in oxygen-demanding organic matter loading will decrease dissolved oxygen levels within the aquifer. Thus, any wastewater outfalls in the contributing zone must be located sufficiently upstream of the upstream recharge zone boundary to allow assimilation of nutrients and to provide protection for the aquifer.

Necessary Changes to the Draft Rule

The draft rule as proposed constitutes more than de minimus degradation from multiple lines of reasoning and analysis. If a prohibition on wastewater discharges in the contributing zone is not attainable for whatever reason, then the following specific comments on the language in the draft rule should be incorporated:

- §311.93. Industrial wastewater dischargers into this water quality protection area should meet the same standards as domestic wastewater discharges, as the effects of nutrient additions from either source are equivalent.
- §311.94. The effluent limitations set forth in Figure §311.93(a) must include specified 7-day averages, daily maximums and single grab maximums for total nitrogen and total phosphorus. There are standard multipliers for these other averaging periods in the TCEQ implementation guidance (page 59). Unfortunately, they do not consider the rapid transport in the Barton Springs

segment of the Edwards aquifer. Since dye injection studies from these watersheds have shown transport to Barton springs often in less than 24 hours, and the surface flow travel time to the recharge zone will be highly variable depending on plant location, size, and hydrologic conditions, it is recommended to flip the currently suggested effluent set to be the daily maximum value and the statistical factor of 3.11 be used to determine the long term average. The daily average could then be determined using the 1.47 factor and other averaging periods equidistant between. Therefore, if the daily maximum TP were 0.1mg/L, the long term average would be 0.03 mg/L, the daily average would then be 0.05 mg/L, the 7 day average would be 0.07 mg/L, and the single grab maximum would be 0.11. Likewise, for Total nitrogen, if the daily maximum TN were 6.0 mg/L, the long term average would be 1.9 mg/L, the daily average would be 2.8 mg/L, the 7 day average would be 4.4 mg/L. These limits would have some scientific basis as they recognize the unique situation of discharging into the contributing zone of Barton Springs.

- §311.94. The 30-day average for total phosphorus in Figure §311.93(a) must be 0.02 mg/L if no mixing from upstream flow is available. This would override the suggestions above for plants located upstream of perennial baseflow. Basically, the 0.02 mg/L could be used as the wasteload allocation (WLA) in the calculations of permit limits as outlined in the TCEQ implementation guidance (p 57) and the remaining averaging period limits calculated from it.
- §311.94(b). Remove the allowance for increasing the effluent limitations if additional disposal measures like reuse are used. Instead, require conditional land application or reuse if the current effluent set (0.1 mg/L total phosphorus) is maintained such that the instream concentration at the discharge is < 0.02 mg/L of total phosphorus under all flow conditions.
- §311.94. Modify the treatment limit for total nitrogen to be 3.0 mg/L. This will be necessary since streams in this system have been shown to be nitrogen limited for at least part of the year and technology is capable of meeting these limits. Even if the recommendations based on transport time to Barton Springs using 6.0 mg/L as the basis above (not technical or water quality based but in the current proposal) resulting in a 2.8 mg/L daily average TL limit are not accepted, at least the 3.0 mg/L TN daily average should be used for water quality protection..
- Addition: Dissolved oxygen modeling must be performed by the applicant to the recharge zone boundary for each permit application to ensure that the ambient instream DO and ultimate BOD20 both return to established/historical ambient baseflow and storm flow levels before reaching the upstream recharge zone boundary. This is required to ensure protection of the salamander and maintenance of Barton Springs DO at current levels.
- Addition: No new wastewater discharges may be permitted within 8 miles of the upstream recharge zone boundary unless specific water quality modeling is provided by the applicant showing no degradation of surface waters at the recharge zone boundary with all other dischargers current or in the permit process included in the model. Alternately, a general prohibition 8 miles upstream of the recharge zone may be preferable in recognition that if the Belterra discharge did not even meet the antidegradation standards, dischargers closer to the aquifer would in all probability fail this test.
- Addition: Require at least four TCEQ inspections per year for each wastewater discharge. Inspections should be specified in the permits to include any facilities added to the treatment plant proper (irrigation sites for beneficial reuse, storage lagoons, streamflow measurement devices, etc.).
- Addition: Require action to eliminate any non-compliance identified during TCEQ inspections within 5 days of verbal notice by inspector onsite. Normal response times and paperwork verification for these permits is inadequate for plants discharging in close proximity to a karst aquifer recharge zone with travel times less than 5 days to Barton Springs.
- Addition: No more than 2 violations of the wastewater permit should be allowed before an Administrative Enforcement Order is issued by the TCEQ to the wastewater permit holder.

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- Addition: Each service area for a wastewater permit site should submit a detailed Water Pollution Abatement Plan for public review and approval by TCEQ. This requirement should be added now as this rule represents the threat to water quality in the Barton Springs Segment of the Edwards Aquifer, and cannot wait for revisions to the 30 TAC 213 Edwards Aquifer Rules to implement.

In conclusion, there does not appear to be any scientific basis for the proposal brought forward as TCEQ staff's response to the stakeholder process on the petition to prohibit wastewater discharge into the contributing zone of the Barton Springs Segment of the Edwards aquifer. Governmental jurisdictions covering 94% of the affected watersheds were in support of initiating rulemaking on the petition for a "no discharge" rule.. The November 19, 2008 TCEQ order (2008-1601-RUL) instructed staff to implement a stakeholder process and "take appropriate action, as a result of that stakeholder input." This directive did not appear to require a proposal for a discharge alternative or suggest that a no-discharge alternative was unacceptable.

Prior to initiating the formal rule-making process we request additional analyses be conducted by TCEQ staff to determine potential impacts of the rule to water resources of the affected area. Until that time, we respectfully request that no action be taken to proceed with these rules as drafted and that this item not be placed on a future Commission agenda. We will gladly participate in a Technical Advisory Group and assist TCEQ staff with this analysis to accomplish a better outcome for protection of the Barton Springs Zone creeks, Barton Springs segment of the Edwards Aquifer, and Barton Springs.

If you have any questions regarding these comments, please contact me at 974-2652 or Edward D. Peacock, P.E. at 974-2224.

Sincerely,



Nancy L. McClintock, Assistant Director
Watershed Protection Department

cc: Sue Edwards, Assistant City Manager, City of Austin
Victoria J. Li, P.E., Director, Watershed Protection Department
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