



United States Department of the Interior



FISH AND WILDLIFE SERVICE

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DEC 22 2016

In Reply Refer To:
Consultation No. 02ETAU00-2017-I-00186

Greg Valentine
Environmental Scientist
NPDES Management Section, Water Division
United States Environmental Protection Agency, Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 78202

Dear Mr. Valentine:

Thank you for your email of October 17, 2016, in which you transmitted a draft permit that would authorize the City of Dripping Springs (City) to discharge up to 0.995 million gallons per day of treated wastewater effluent into Walnut Springs Creek at a point about 0.5 miles above its confluence with Onion Creek in Hays County, Texas. The City has applied for discharge permits from the Environmental Protection Agency (EPA) and the Texas Commission on Environmental Quality (TCEQ). The EPA has requested that the U.S. Fish and Wildlife Service (Service) review the draft permit for potential effects to species listed pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*)(Act). Section 7 of the Act requires that all Federal agencies consult with the Service to ensure that the actions authorized, funded, or carried out by such agencies do not jeopardize the continued existence of any threatened or endangered species or adversely modify or destroy designated critical habitat of such species.

We are providing you with information relevant to this proposed action. The location of the proposed discharge is in the contributing zone of the Barton Springs Segment of the Edwards Aquifer. There are three federally listed, aquifer-dependent species which inhabit the subterranean water-filled conduits of this aquifer and the surface habitat at and near springs (see attached figure). These species are the Austin blind salamander (*Eurycea waterlooensis*), Barton Springs salamander (*Eurycea sosorum*), and Comal Springs dryopid beetle (*Stygoparnus comalensis*) (Figure 1). All three of these species are listed as endangered and the Service has designated critical habitat for the Austin blind salamander (78 FR 51328, August 20, 2013) and the Comal Springs dryopid beetle (72 FR 39248, July 17, 2007).



Clean water is essential to the survival of these aquatic species and to maintaining viable habitat. These species are unique to the local area and are supported by the aquifer recharge water that enters the Edwards Aquifer. The Austin blind salamander and Barton Springs salamander are known only from Barton Springs and associated parts of the Barton Springs Segment of the Edwards Aquifer in Travis County, Texas. The Comal Springs dryopid beetle, an aquatic invertebrate, occurs in two places. It has been found in the Edwards Aquifer at Fern Bank Springs in Hays County and in at Comal Springs in Comal County.

Water Quality

We have reviewed the draft TCEQ permit for the potential of the proposed discharge to affect these listed species and their critical habitat. Wastewater discharge into Little Walnut Creek will flow to Onion Creek. Typically, water that recharges the aquifer from Onion Creek flows to Barton Springs (Slade et al. 1986). Furthermore, under certain conditions, recharge from Onion Creek may flow towards Fern Bank Springs in the San Antonio Segment of the Edwards Aquifer. These endangered species may be affected by water quality degradation based on the location of the proposed discharge into a receiving stream that recharges the Edwards Aquifer. Contaminants of concern in treated municipal effluents that may impact aquatic life include elevated nutrients, ammonia, chlorine, dissolved solids, trace organic or inorganic pollutants (e.g., polycyclic aromatic hydrocarbons, copper), pesticides, bacteria, and contaminants of emerging concern, such as pharmaceuticals and personal care products. Furthermore, we are recommending that the EPA consider the risk of untreated effluent discharged from the proposed facility into receiving water bodies and the subsequent effects of such discharges on listed species and critical habitat (e.g., a treatment plant bypass due to equipment failure or emergency releases) in addition to your consideration of the potential effects of discharged treated effluent as proposed in the draft permit.

The City of Austin has modeled water quality effects based on the EPA's Water Quality Analysis Simulation Program (WASP) including the effects of nitrate (Richter 2016). Their results suggest that nitrates are contributing to eutrophication of Onion Creek and to elevated nitrate levels reaching the Edwards Aquifer recharge zone. The U.S. Geological Survey has documented increased levels of nitrates in the Barton Segment from non-point sources (Mahler et al. 2011). Septic systems and land-application of treated wastewater effluent are considered likely existing sources of nitrates into in the Barton Segment (Mahler et al. 2011, Musgrove et al. 2016). Infiltration and natural degradation processes associated with land-application may help reduce the concentration of some wastewater compounds. However, directly discharging treated wastewater into Walnut Springs Creek, which then flows into Onion Creek, would bypass those processes and have a greater impact on water quality and therefore on listed species.

Edwards Aquifer Recharge

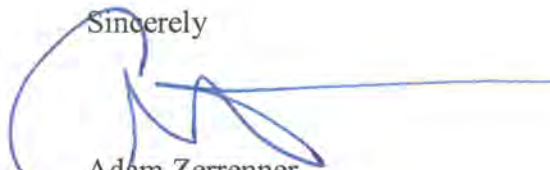
Onion Creek is estimated to provide 34.6 percent of recharge to the Barton Springs segment in the form of channel flow loss (Slade et al. 1986). Similarly, a more recent effort with extensive dye tracing and continuous gauge data at downstream stations has estimated Onion Creek contributes 32.6 percent of Barton Segment recharge as channel flow loss (Hauwert 2009). An

estimated 29 percent (Slade et al. 1986) to 39 percent (Barrett and Charbeneau 1996) of the total Barton Segment aquifer recharge comes from Onion Creek.

Groundwater Flow Paths to Barton Springs

The Barton Springs Edwards Aquifer Conservation District and the City of Austin have investigated the flow paths of the Barton Springs Segment. The time it takes for water from Onion Creek to reach the Antioch Cave recharge feature at Barton Springs is 7.1 days (Andrews et al. 2015) based on dye tracing studies. The recommended means of treating wastewater in the contributing zone is disposal by carefully planned land application rather than discharging treated effluent into creeks or rivers. In this case, land application is preferable because of (a) the likely influence of Onion Creek water on the quality of water at Barton Springs, (b) the relatively brief travel time from the point of recharge to detection at Barton Springs, and (3) the vulnerability to contamination inherent in karst aquifers.

We are recommending that the EPA consider the direct and indirect effects of the proposed permit on three federally endangered species and critical habitat. Please let me know if you need additional technical assistance regarding these species, their critical habitat, or the section 7 consultation process. Thank you for your commitment to conserving imperiled species. If you have questions, please contact Tanya Sommer at 512 490-0057 extension 222.

Sincerely

Adam Zerrenner
Field Supervisor

cc: Erik Orsak, USFWS, Arlington, TX

References Cited

- Andrews, Alan, Nico Hauwert, Fernando Hernandez, Brian Hunt, David Johns, Raymond Slade Brian Smith, and Kevin Thuesen. 2015. Karst and recharge in the Barton Springs Segment of the Edwards Aquifer: field trip to the City of Austin's Water Quality Protection Lands. Austin Geological Society Field Trip Guidebook 35.
- Barrett, Michael E. and Randall J. Charbeneau. 1996. A parsimonious model for simulation of flow and transport in a karst aquifer. University of Texas at Austin Center for Research. CRWR Technical Report 269. pp. 149.
- Barton Springs / Edwards Aquifer Conservation District. 2014. Draft habitat conservation plan for managed groundwater withdrawals from the Barton Springs Segment of the Edwards Aquifer. For U.S. Fish and Wildlife Service. Austin, TX. pp. 217.
- Hauwert, Nico M. 2009. Groundwater flow and recharge within the Barton Springs segment of the Edwards Aquifer, Southern Travis and Northern Hays counties, Texas. Dissertation. University of Texas at Austin.
- Hunt, Brian B., Alex S. Broun, Douglas A. Weirman, David A. Johns, and Brian A. Smith. 2016. Surface-water and groundwater interactions along Onion Creek, central Texas. Available from BSEACD.ORG
- Johnson, Steve, Geary Schindel, George Veni, Nico Hauwert, Brian Hunt, Brian Smith, and Marcus Gary. 2012. Tracing groundwater flowpaths in the vicinity of San Marcos Springs. Report by Edwards Aquifer Authority, San Antonio, TX. pp.147.
- Mahler, Barbara J., MaryLynn Musgrove, Chris Herrington, and Thomas L. Sample. 2011. Recent (2008-10) concentrations and isotopic compositions of nitrate and concentrations of wastewater compounds in in the Barton Springs Zone, South-Central Texas, and their potential relation to urban development in the contributing zone. Scientific Investigations Report 2011-5018.
- Musgrove, MaryLynn, Stephen Opsahl, Barbara J. Mahler, Chris Herrington, Thomas L. Sample, and John R. Banta. 2016. Source, variability, and transformation of nitrate in a regional karst aquifer: Edwards aquifer, central Texas. *Science of the Total Environment* 568:457-469.
- Richter, Aaron. 2016. WASP model analysis of a City of Dripping Springs proposed wastewater treatment plant discharge to Onion Creek. City of Austin Watershed Protection Report SR-16-05.
- Slade, Raymond M., Michael E. Dorsey and Sherree L. Stewart. 1986. Hydrology and water quality of the Edwards aquifer associated with Barton Springs in the Austin Area, Texas. Prepared in cooperation with the City of Austin. U.S. Geological Survey Water-Resources Investigations Report 86-4036.

Figure 1. Federally listed endangered species and designated critical habitat in Travis and Hays counties, Texas highlighting Onion Creek, the Edwards Aquifer recharge zone, and groundwater flow paths. Adapted from Figure 3.2 in the Draft Habitat Conservation Plan from the Barton Springs Edwards Aquifer Conservation District, November 13, 2014. Note groundwater travel time from Onion Creek recharge to Barton Springs is as fast as 3 days.

