



## Improving Water Quality in the Colorado River Below E.V. Spence Reservoir

# Protecting General Uses

In 2000, water quality testing found elevated levels of chloride, sulfate, and total dissolved solids (TDS) in the Colorado River Below E.V. Spence Reservoir. High concentrations of chloride can cause a bad taste in drinking water, harm plumbing, and increase the risk of hypertension in humans. High concentrations of sulfate can cause drinking water to smell or taste bad. Large amounts of dissolved solids can be toxic to species that live in fresh water.

In response to these conditions, TCEQ developed a total maximum daily load (TMDL) to restore water quality in the river. A TMDL determines the amount (or load) of a pollutant that a body of water can receive and still support its designated uses. This allowable load was then allocated among categories of sources within the watershed. Stakeholders developed a plan to implement TMDLs (I-Plan) with measures that reduce pollution.

A variety of man-made and natural sources can be responsible for elevated levels of chloride, sulfate, and total dissolved solids (TDS). For example, a common man-made source of dissolved solids is brine, a by-product of oil production. Salt cedar, a natural source of TDS, is an invasive, non-native plant species whose high rate of water consumption creates imbalances in the soil, causing higher concentrations of unwanted substances.

Learn more about water quality standards, monitoring, and TMDLs by reading [Preserving and Improving Water Quality](#)<sup>1</sup>, available on our website and in print.

### Project Watershed

The Colorado River Below E.V. Spence Reservoir, Segment 1426, is a 66-mile freshwater stream located within the larger Colorado River Basin. Segment 1426 receives the majority of its flow from E.V. Spence Reservoir. It begins at Robert Lee Dam and flows southeasterly through Coke and Runnels Counties, ending 2.3 miles below its confluence with Mustang Creek in Runnels County.

The Edwards-Trinity aquifer is the principal source of groundwater in the watershed. The Edwards-Trinity is composed of sandstone and carbonate-rock aquifers and encompasses an area of 818 square miles.



Most of the land is well adapted to cultivation. The land use and economy are chiefly agricultural, with land devoted to both crop and animal production.

Oil and gas production and exploration are the dominant industrial activities in the watershed. Mineral resources include brick-making clay in addition to oil and gas deposits.

### Project Development

TCEQ contracted with EA Engineering, Science, and Technology to study the segment and develop TMDLs. EA Engineering collected additional data under a range of stream flow conditions, including wet weather, and accounted for direct discharges from point sources (such as wastewater treatment plants) and runoff from nonpoint sources (such as agricultural operations, land-clearing activities, abandoned oil and gas wells, and carbonate dissolution).

In June 2004, the Bureau of Economic Geology (BEG) surveyed electromagnetic conductivity in and around the creek. Their survey supported the groundwater component of models used to develop the TMDLs.

<sup>1</sup> <https://www.tceq.texas.gov/publications/gi/gi-351>

Based on analysis of these studies and other information gathered during the investigation, the stakeholders and TCEQ developed TMDLs and an I-Plan for the watershed. TCEQ adopted the TMDLs in February 2007 and approved the stakeholders' I-Plan on October 10, 2007.

### Status

The Colorado River Below E.V. Spence was removed from the index of all impaired waters in the *2020 Texas Integrated Report of Surface Water Quality*. Based on data collected from 12/01/11 through 11/30/18, concentrations of dissolved solids in the river segment are now within the criteria in the Texas Surface Water Quality Standards. The TMDLs remain in effect.

During TMDL implementation, the Railroad Commission (RRC) eliminated many potential sources of salinity by plugging orphaned or abandoned unplugged wells. The RRC also completed a feasibility study for placing a recovery well between older oil fields and receiving streams.

The Texas State Soil and Water Conservation Board (TSSWCB) removed salt cedar in the watershed using both chemical and biological methods.

In 2014, the Upper Colorado River Authority (UCRA) and TCEQ assisted stakeholders in evaluating their progress and changes needed to continue improving the river. The stakeholders submitted revisions to their I-Plan in 2014.

### Public Participation

In all its projects, TCEQ seeks to gather opinion and information from people who represent government,

permitted facilities, agriculture, business, environmental, and community and private interests in the watershed. TCEQ solicits advice from the public at meetings and through print and electronic media notices. A group of watershed stakeholders advised TCEQ on development of the TMDLs and developed the original I-Plan.

UCRA coordinated the 2014-15 review of the I-Plan. People who participated in developing the original TMDL and I-Plan and people new to the process were encouraged to join the stakeholder group. UCRA worked with this group to develop a document that explains adjustments needed to continue water quality improvements in the watershed.

The I-Plan revision stakeholder group included a coordination committee and work groups, who were responsible for evaluating the I-Plan and revising it as needed. The coordination committee included representatives from a variety of different sectors—industries, interest groups, universities, water districts, cities, and federal and regional government organizations.

### For More Information

Visit our webpage at:

[www.tceq.texas.gov/waterquality/tmdl/nav/32-colorado/](http://www.tceq.texas.gov/waterquality/tmdl/nav/32-colorado/)

E-mail us at [tmdl@tceq.texas.gov](mailto:tmdl@tceq.texas.gov) or call us at 512-239-6682.

### TMDL Dates

**TCEQ Adoption:** February 7, 2007

**EPA Region 6 Approval:** April 9, 2007

### I-Plan Dates

**TCEQ Approval:** October 10, 2007

**Revised:** March 2014

### Highlights

- The RRRRC eliminated many potential sources of salinity by plugging orphaned or abandoned unplugged wells.
- TSSWCB removed salt cedar in the watershed using both chemical and biological methods.
- The stakeholder coordination committee developed a revision to the I-Plan in 2014 and reported their progress on the updated measures in May 2016.
- The Colorado River Below E.V. Spence was removed from the index of all impaired waters in the *2020 Texas Integrated Report of Surface Water Quality*. Based on data collected from December 2001 through November 2018, concentrations of dissolved solids in the river segment are now within the criteria in the Texas Surface Water Quality Standards. The TMDLs remain in effect.