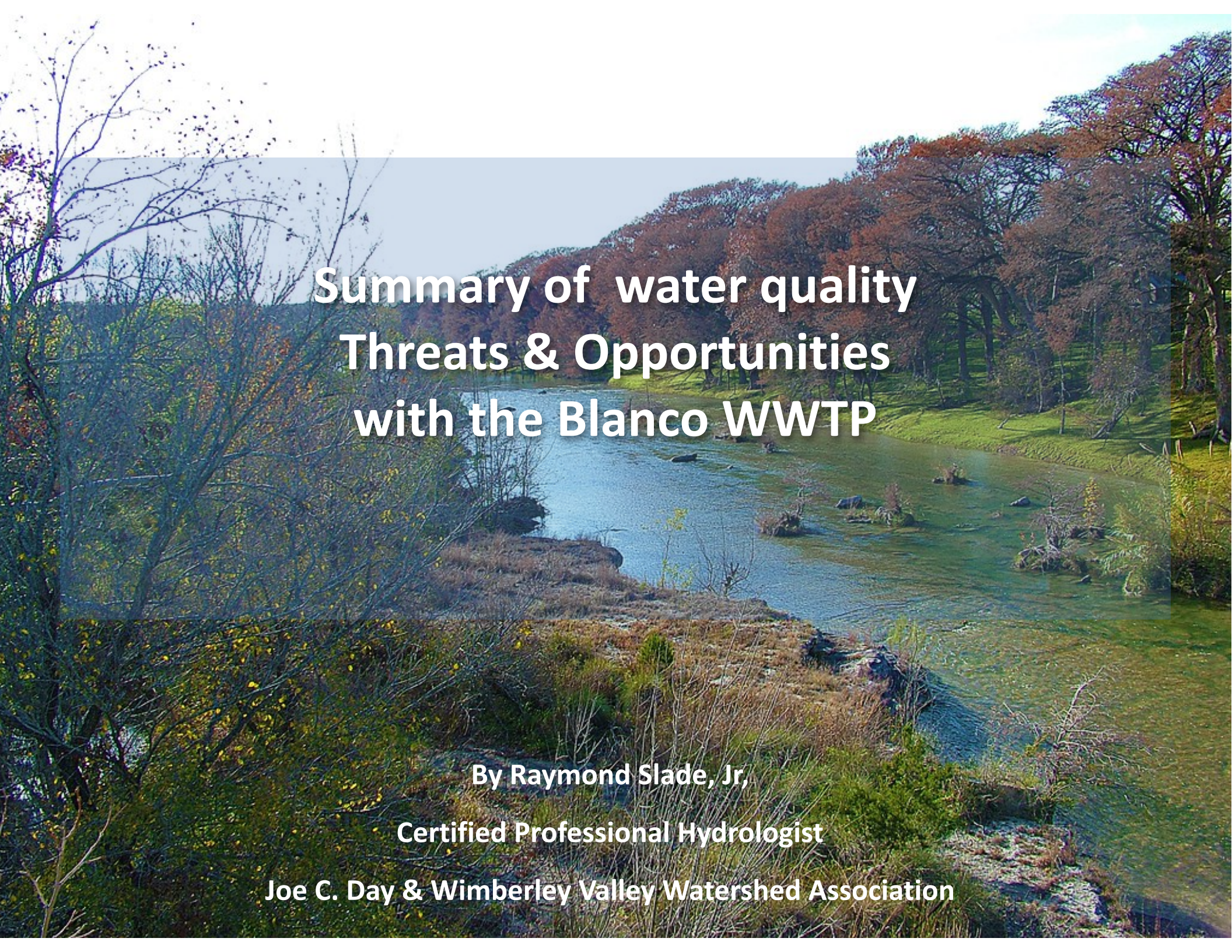


Summary of water quality Threats & Opportunities with the Blanco WWTP

By Raymond Slade, Jr,

Certified Professional Hydrologist

Joe C. Day & Wimberley Valley Watershed Association

Objective

Assist the City of Blanco in promoting a healthy and productive ecosystem in the Blanco River by land application or beneficial reuse of their treated wastewater effluent.

Question:

Why is it a great idea to avoid dumping treated effluent into the Blanco River?

The effluent is dangerous even when treated to TCEQ standards. Not addressed by TCEQ permits are dangerous toxins such as Endocrine Disruptors, Pharmaceuticals minor elements, pesticides, and herbicides.

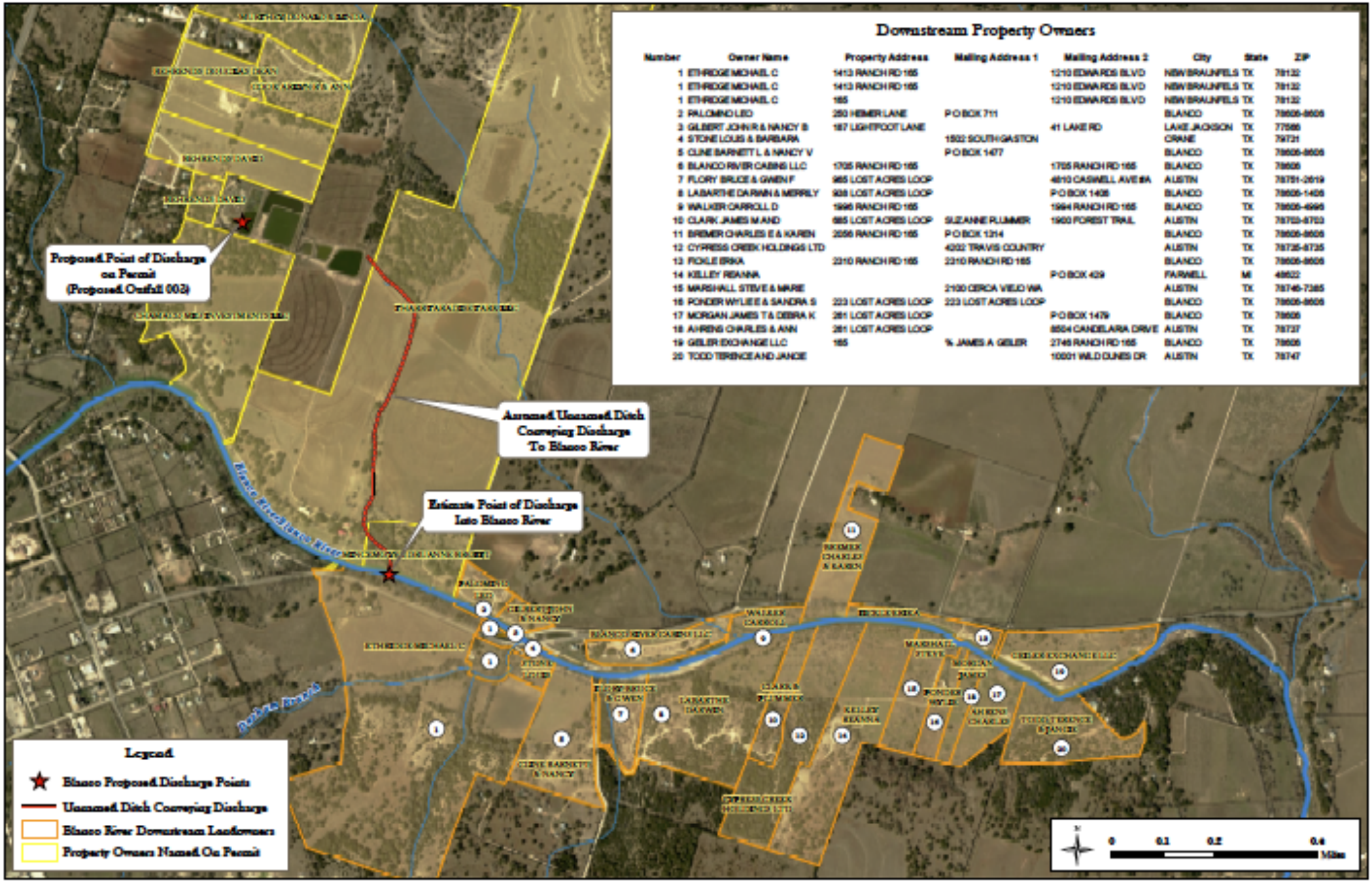










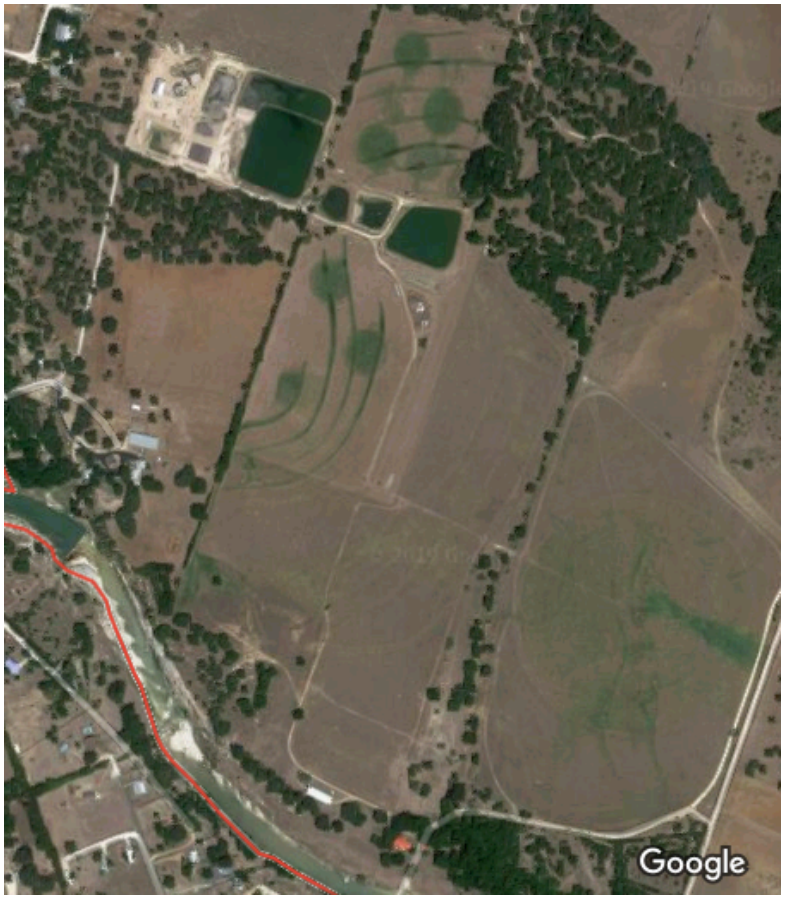


Downstream Property Owners

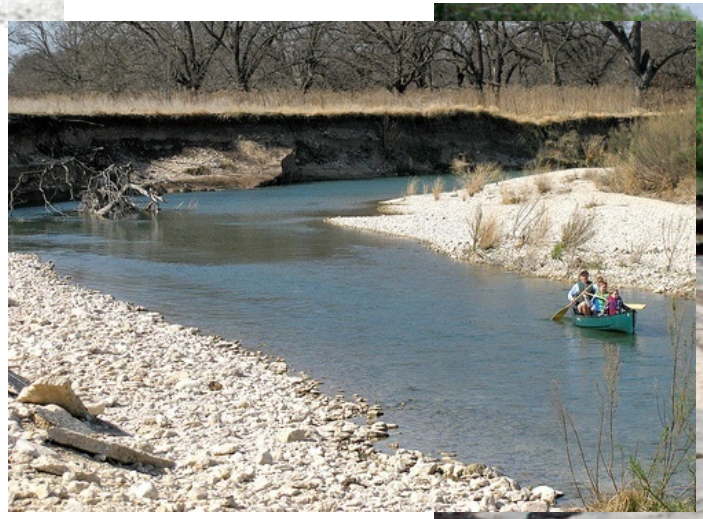
Number	Owner Name	Property Address	Mailing Address 1	Mailing Address 2	City	State	ZIP
1	ETHRIDGE MICHAEL C	1413 RANCH RD 165		1210 EDWARDS BLVD	NEW BRAUNFELS	TX	78132
1	ETHRIDGE MICHAEL C	1413 RANCH RD 165		1210 EDWARDS BLVD	NEW BRAUNFELS	TX	78132
1	ETHRIDGE MICHAEL C	165		1210 EDWARDS BLVD	NEW BRAUNFELS	TX	78132
2	PALOMINO LEO	250 HEIMER LANE	P O BOX 711		BLANCO	TX	78606-8606
3	GILBERT JOHN R & NANCY B	187 LIGHTFOOT LANE		41 LAKE RD	LAKE JACKSON	TX	77566
4	STONE LOUIS & BARBARA		1502 SOUTH GASTON		CRANE	TX	79731
5	CLINE BARNETT L & NANCY V		P O BOX 1477		BLANCO	TX	78606-8606
6	BLANCO RIVER CABINS LLC	1705 RANCH RD 165		1705 RANCH RD 165	BLANCO	TX	78606
7	FLORY BRUCE & GWEN F	965 LOST ACRES LOOP		4810 CASWELL AVE #A	AUSTIN	TX	78751-2619
8	LABARTHE DARWIN & MERRILY	938 LOST ACRES LOOP		P O BOX 1408	BLANCO	TX	78606-1408
9	WALKER CARROLL D	1996 RANCH RD 165		1994 RANCH RD 165	BLANCO	TX	78606-4996
10	CLARK JAMES M AND	685 LOST ACRES LOOP	SUZANNE PLUMMER	1900 FOREST TRAIL	AUSTIN	TX	78703-5703
11	BREMER CHARLES E & KAREN	2556 RANCH RD 165	P O BOX 1314		BLANCO	TX	78606-8606
12	CYPRESS CREEK HOLDINGS LTD		4202 TRAVIS COUNTRY		AUSTIN	TX	78735-8735
13	FICKLE ERIKA	2310 RANCH RD 165	2310 RANCH RD 165		BLANCO	TX	78606-8606
14	KELLEY REANNA			P O BOX 429	FARWELL	MI	49822
15	MARSHALL STEVE & MARIE		2100 CERCA VIEJO WA		AUSTIN	TX	78746-7385
16	PONDER WYLIE E & SANDRA S	223 LOST ACRES LOOP	223 LOST ACRES LOOP		BLANCO	TX	78606-8606
17	MORGAN JAMES T & DEBRA K	261 LOST ACRES LOOP		P O BOX 1479	BLANCO	TX	78606
18	AHRENS CHARLES & ANN	261 LOST ACRES LOOP		8504 CANDELARIA DRIVE	AUSTIN	TX	78737
19	GEILER EXCHANGE LLC	165	% JAMES A GEILER	2746 RANCH RD 165	BLANCO	TX	78606
20	TODD TERENCE AND JANICE			10001 WILD DUNES DR	AUSTIN	TX	78747

TCEQ allows nitrogen and phosphorus (nutrients) levels much higher than required to protect health and prevent eutrophication and algae.

Downstream flow is expected to dilute effluent and channel vegetation is expected to absorb the nutrients.

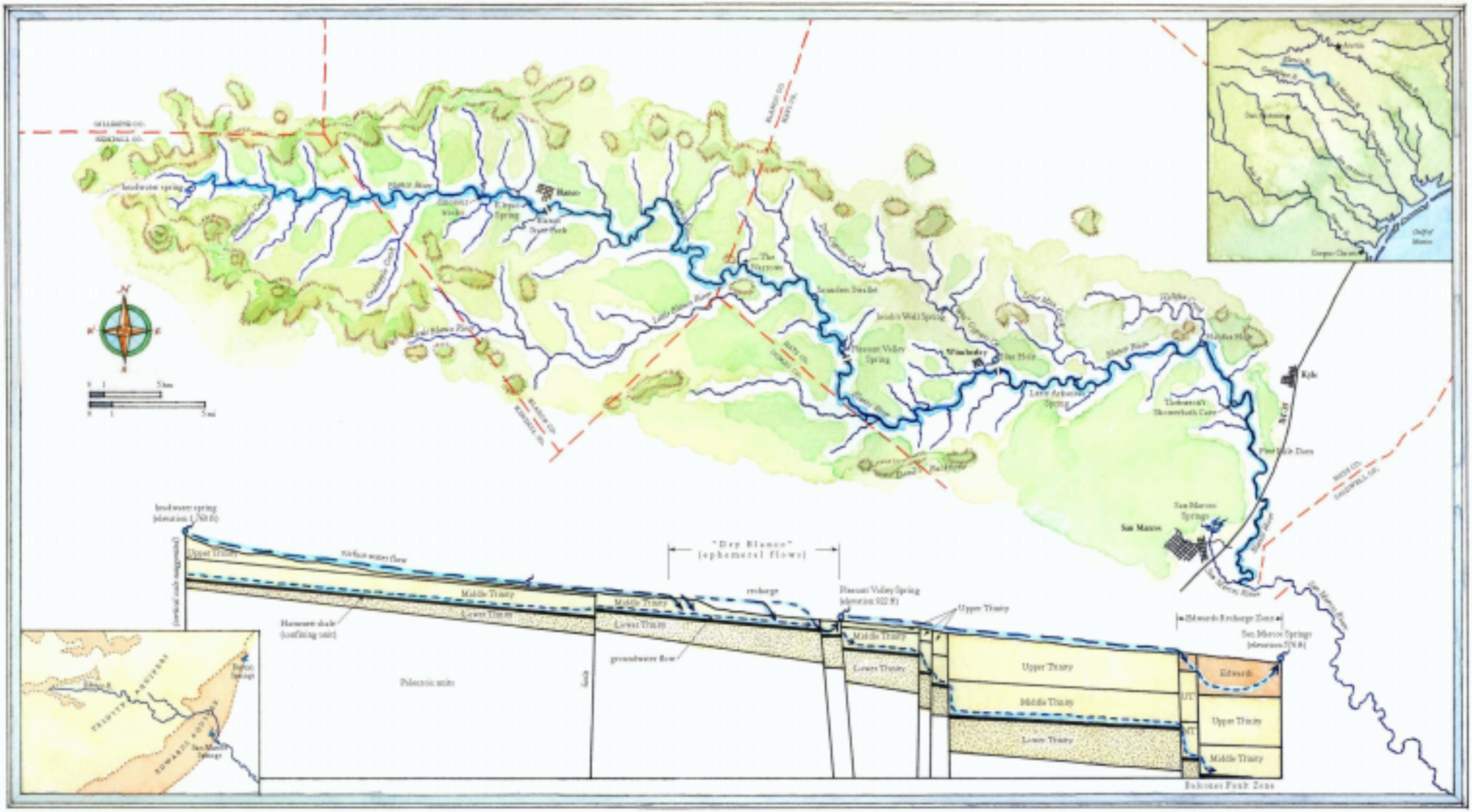


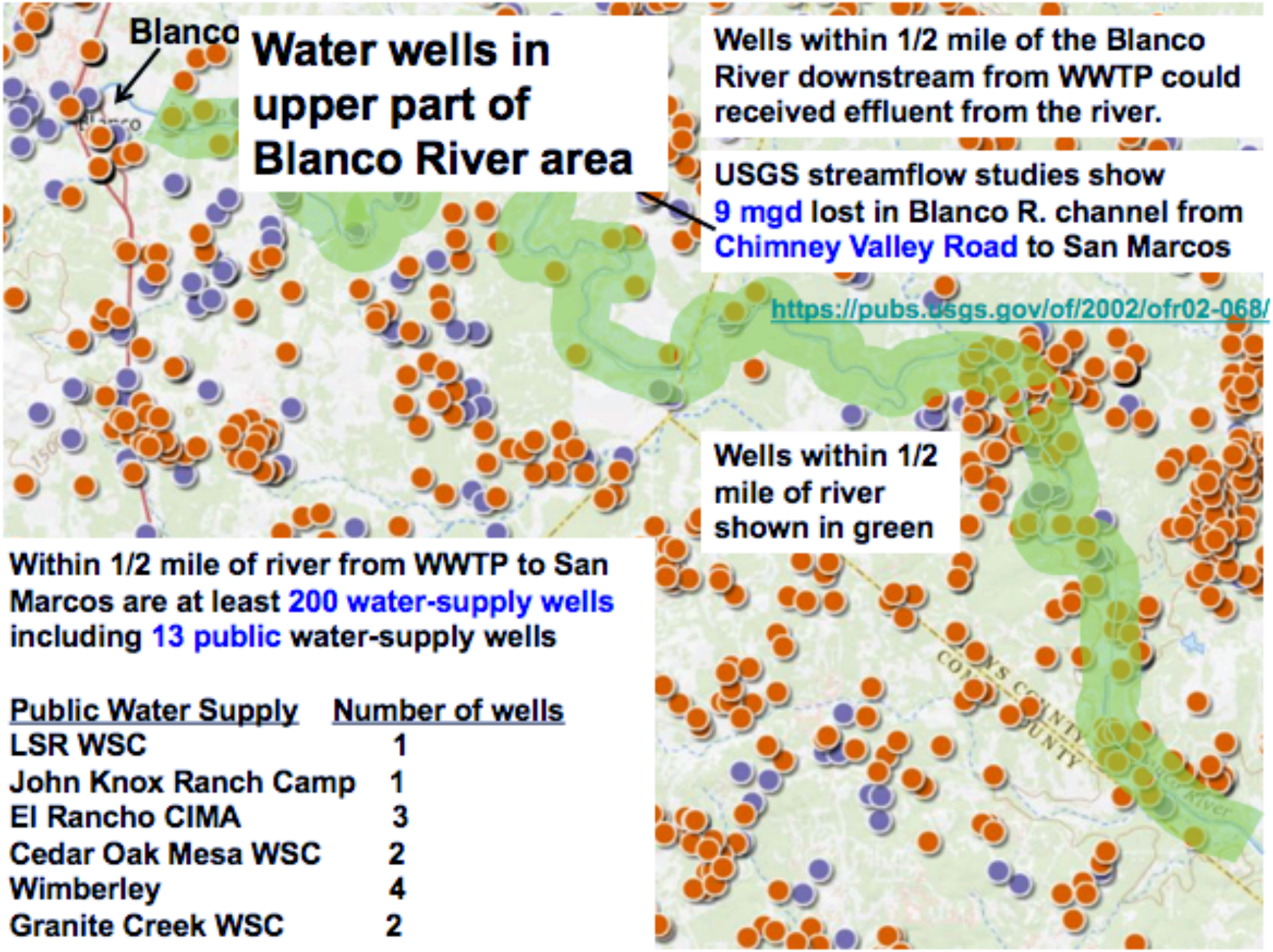
However, most Hill Country streams go dry and contain little vegetation so nutrient levels are high downstream



Effluent can travel miles and be in aquifers in a few days thus polluting streams and aquifers

The Blanco River losses up to 9 mgd thus possibly impacting hundreds of wells proximate to the river. The impacted wells represent more than a dozen public water-supply wells which include Wimberley


headwater spring
Blanco
The Narrows
Pleasant Valley Spring
Wimberley
Blue Hole
Little Arkansas Spring
Kyle
Five Mile Dam
San Marcos Springs
San Marcos
San Marcos River
Balcones Fault Zone
headwater spring (elevation 1,760 ft)
Upper Trinity
surface water flow
"Dry Blanco" (ephemeral flows)
Middle Trinity
Lower Trinity
recharge
Hammett shale (confining unit)
groundwater flow
Paleozoic units
Pleasant Valley Spring (elevation 922 ft)
Edwards Recharge Zone
San Marcos Springs (elevation 576 ft)
Edwards
UT
MT
Balcones Fault Zone



Within 1/2 mile of river from WWTP to San Marcos are at least 200 water-supply wells including 13 public water-supply wells

Public Water Supply	Number of wells
LSR WSC	1
John Knox Ranch Camp	1
El Rancho CIMA	3
Cedar Oak Mesa WSC	2
Wimberley	4
Granite Creek WSC	2

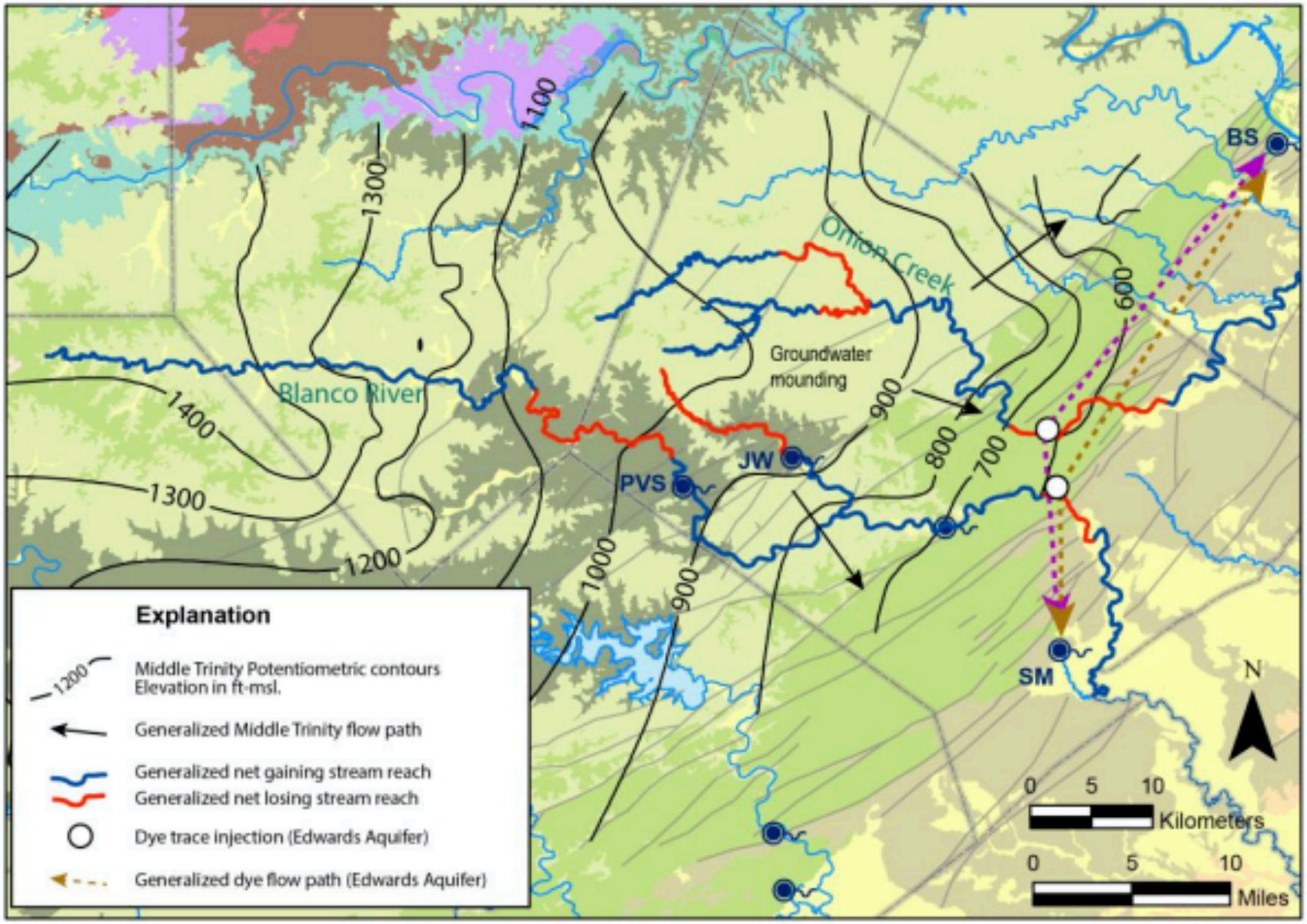
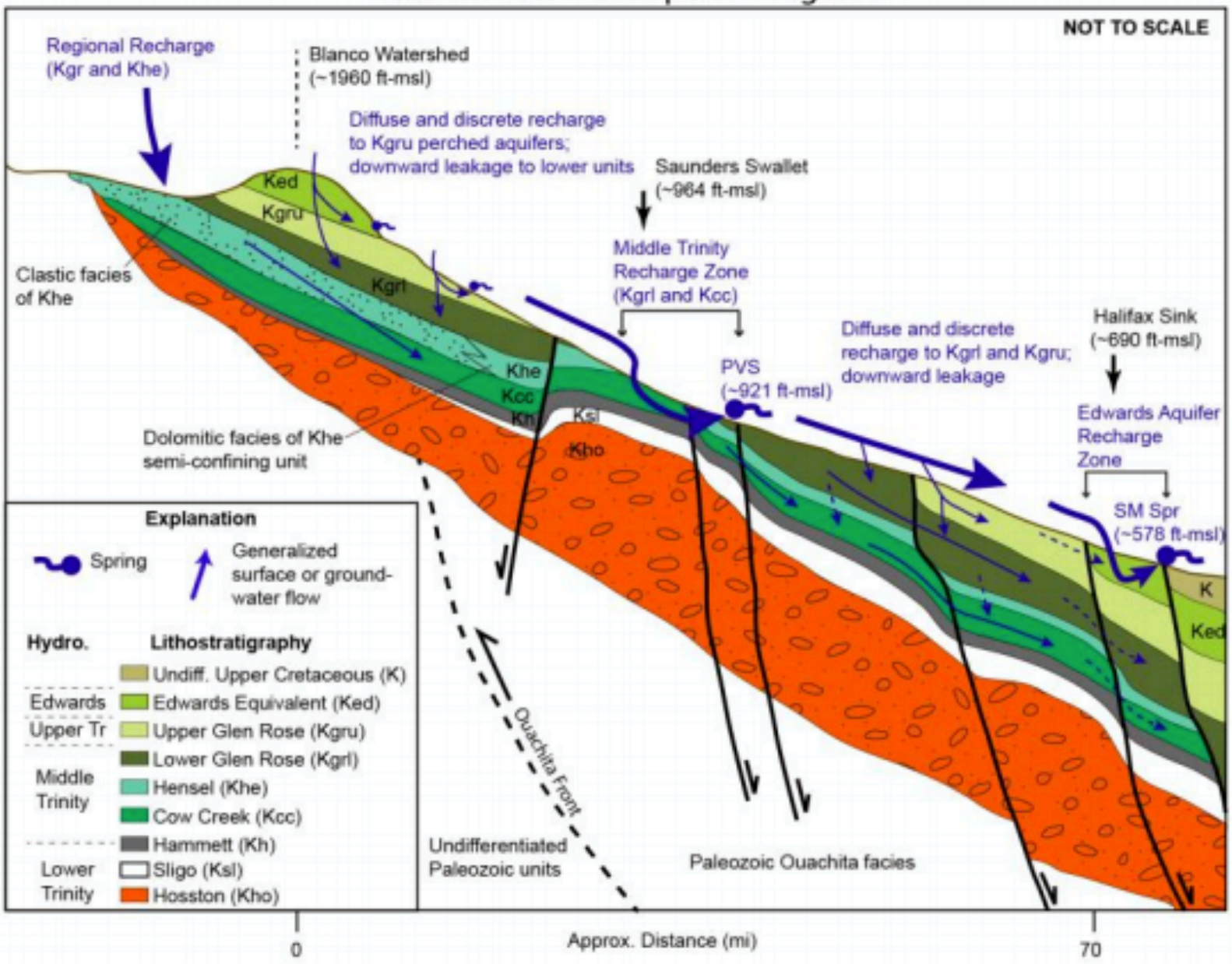


Figure 9. *Generalized potentiometric map of the Middle Trinity Aquifer and flow paths (dashed lines) within the Edwards Aquifer. Potentiometric contours show flow from west to east in the study area and a general mounding effect over upper portions of the Blanco River and Onion Creek net losing sections. Potentiometric contours from Hunt et al. (2010) and dye trace results summarized from Smith et al. (2012).*

Blanco River Conceptual Diagram



Blanco River flow varies—on average for 3 months each year, river flow will be at least one-half effluent if Blanco plant expanded to discharge 1.6 mgd

- **Blanco has not responded to FOIA request or TCEQ with required monitoring data for its previous land application, suggesting they have not been tracking how much effluent was irrigated or the pollutant levels of the effluent.**
- **The City repeatedly failed to report Discharge Monitoring Reports to EPA on time--often between 100-200 days late.**
- **The reports submitted show that Blanco has frequently exceeded permit levels for effluent.**
- **For example, TCEQ sampling downstream from plant shows bacteria levels to exceed safe recreation levels 10 % of time**

- **Proper irrigation on adequate soils provides natural filtration of contaminants thus reducing chance of illness from permitted and non permitted pollutants.**

- **TCEQ is currently working on rules to make it easier to beneficially reuse wastewater, without having to set aside as much land under a TLAP, which Blanco could take advantage of, but only if it kept its land application provisions in its permit. TCEQ expects to implement the rules by the end of the year.**

Land application and beneficial reuse are preferred method of disposal for the City of Blanco and the Blanco River.

Even though the new plant is undeniably better than the old plant, it is not designed to (nor does any version of the current or Draft permit require it to) treat the wastewater to levels that would protect the Blanco River in the case of a direct discharge.

Proper irrigation on adequate soils provides natural filtration of unwanted contaminants.

Proper irrigation also provides a buffer from pathogenic bacteria and parasites that can cause disease and illness when ingested, or from other emerging contaminants that are not currently regulated.

TCEQ is currently working on rules to make it easier to beneficially reuse wastewater, without having to set aside as much land under a TLAP, which Blanco could take advantage of, but only if it kept with its land application provisions in its permit. They expect to implement the rules by the end of the year.

Conclusion

Let's all agree that what we really want is for the City of Blanco to be a good river steward and good neighbor and promote a healthy and productive Blanco River ecosystem. The way to do that is:

Withdraw the draft permit request to increase to 1.6 MGD and either keep it at 0.225 MGD or make a small increase to account for population increases in the City limits.

Work with MCWE, stakeholders, environmental groups, downstream landowners and regional partners on developing a long-term comprehensive land and water use plan that will serve as a model for the Texas Hill Country

Pass the One Water Resolution

WHAT IS ONE WATER?

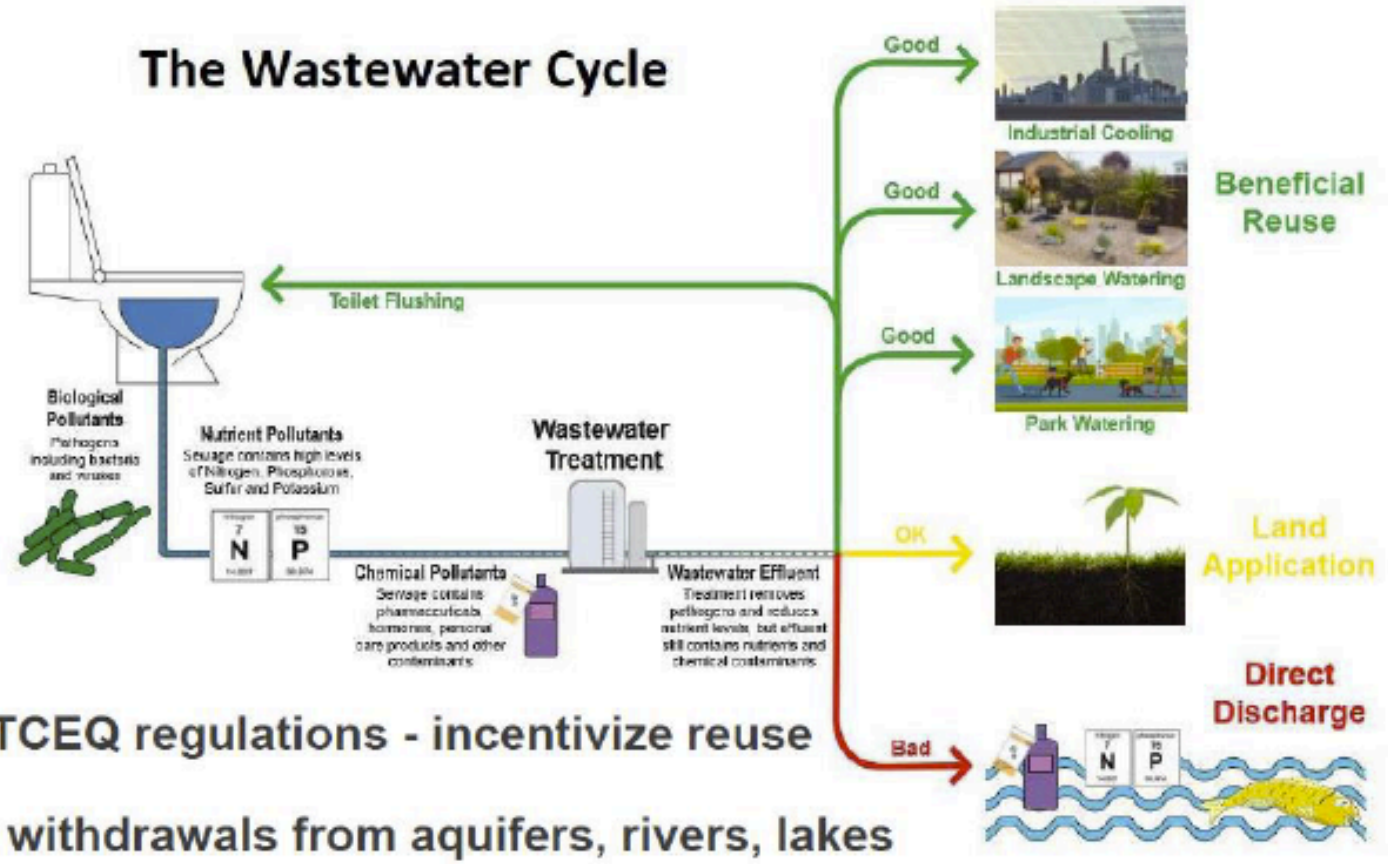
An intentionally INTEGRATED approach to water

One Water promotes the management of **all water** — drinking water, wastewater, stormwater, greywater— as a **single resource**.

Across types of water

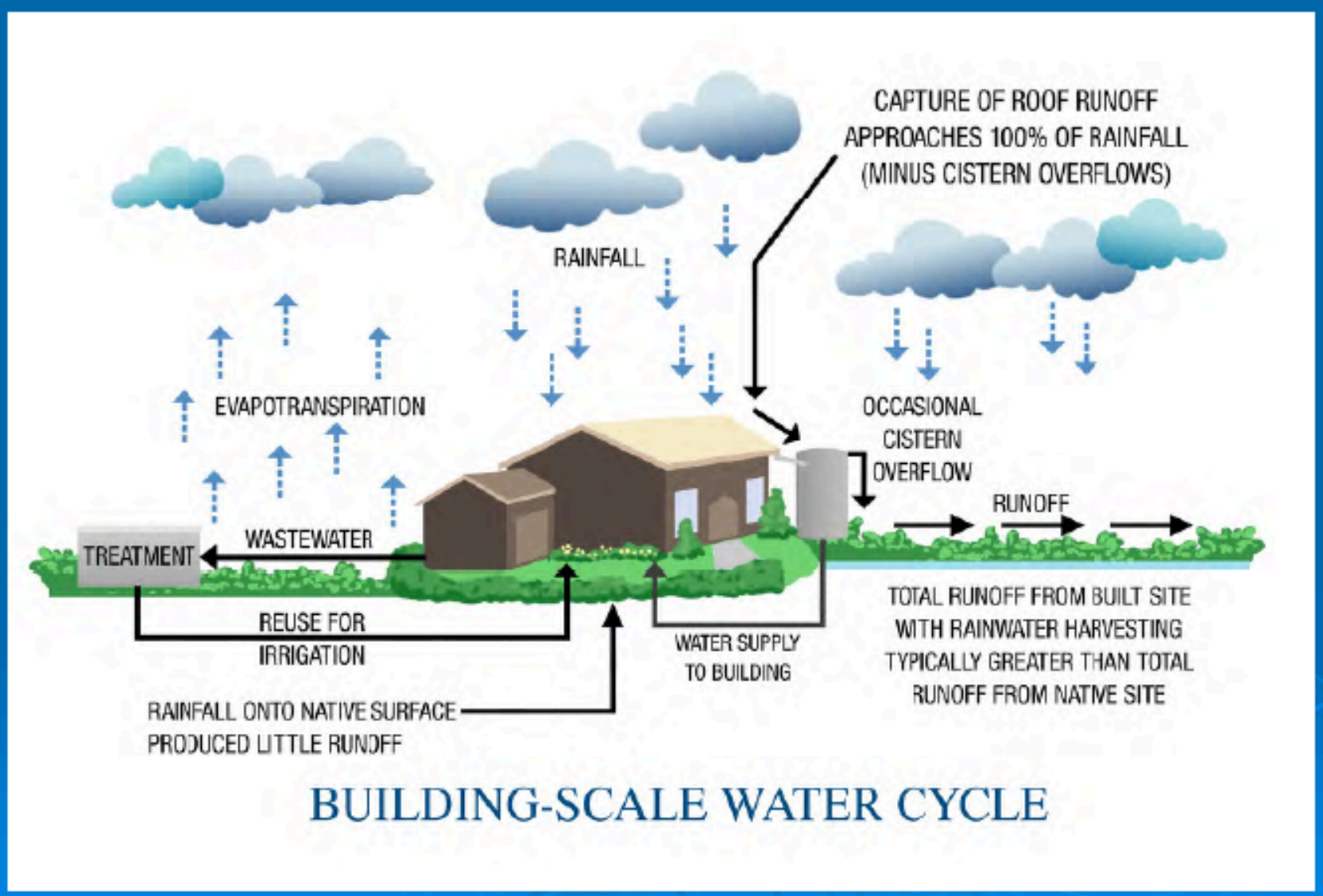
Across regions/ watersheds

Wastewater as a Water Supply



- Modify TCEQ regulations - incentivize reuse
- Reduce withdrawals from aquifers, rivers, lakes
- Preserve aquifers and streams natural character

DOUCET & ASSOCIATES



BUILDING-SCALE WATER CYCLE

LOCAL

Wimberley school to make history as first 'One Water' school in Texas

A 'One Water' school means it will use 90 percent less groundwater than a typical school of this size.

Author: Shawna Reding
Published: 8:04 AM CST December 3, 2018
Updated: 11:06 AM CST December 3, 2018

Threats to Water Quality in the Wimberley Valley

Declining groundwater levels – lower flows result in worsening water quality

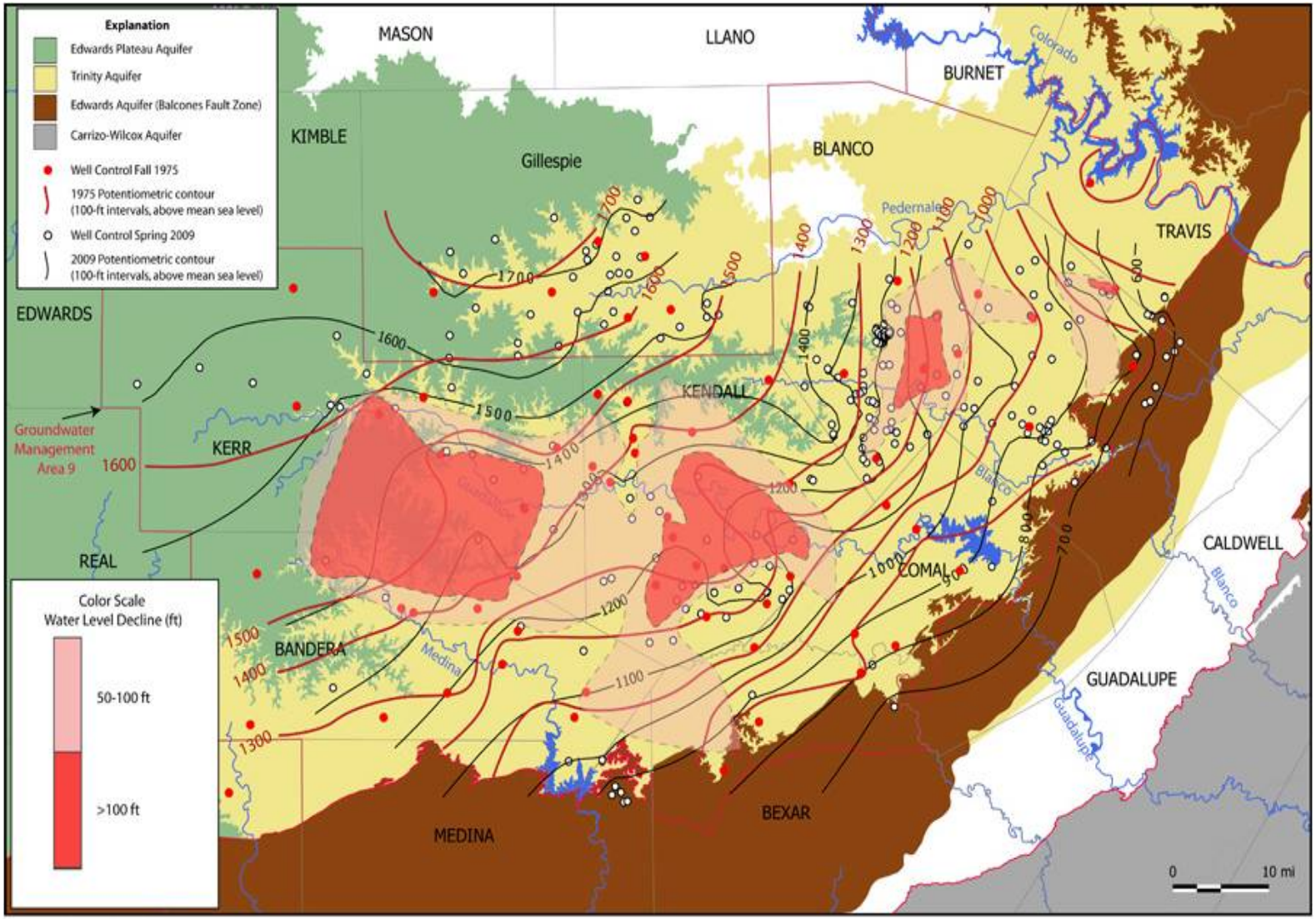
Impacts of drought – lower flows, increased temperatures negatively affect dissolved oxygen and bacteria

Growth, development – increased impervious cover/ increased stormwater flows; nonpoint source pollution from homes, cars, businesses; changes in wildlife habitat/patterns; aging infrastructure

The Meadows Center for Water and the Environment
201 San Marcos Springs Drive | San Marcos, TX. 78666
Ph. 512.249.9200 | meadowscenter@txstate.edu

Conventional vs One-Water Cost Summary

WATER SUBSYSTEM	COST TYPE	CONVENTIONAL	ONE-WATER
WASTE WATER + REUSE	CAPITAL COST	$ 750,000	$ 446,778
	ANNUAL O & M COST	$ 26,695	$ 6,000
RAINWATER + AC CONDENSATE COLLECTION FOR TOILET FLUSHING	CAPITAL	$ -	$ 250,000
	ANNUAL O & M COST	$ 19,488	$ 10,188
STORMWATER MANAGEMENT (LID & GREEN INFRASTRUCTURE)	CAPITAL COST	$ -	$ 125,000
	ANNUAL O & M COST	$ -	$ -
SUM TOTAL ALL WATER SYSTEMS	CAPITAL + 30 YEAR O & M COST	$ 2,135,490	$ 1,307,418



Basemap data provided by the Texas Water Development Board: Major Aquifers of Texas, Major Rivers, and Groundwater Management Areas.

Combined Fall 1975 and Spring 2009 Middle Trinity Potentiometric Maps and net water-level decline map

Blanco WWTP Quarterly Compliance Summary

https://echo.epa.gov/detailed-facility-report?fid=TX0054623&sys=ICP

Program/Pollutant/Violation Type	QTR 1	QTR 2		QTR 5	QTR 6	QTR 7
	2016				2017	
A (Source ID: TX0054623)	01/01-03/31/16	04/01-06/30/1		01/01-03/31/17	04/01-06/30/17	07/01-09/30/17
Facility-Level Status	Unknown	Unknow		No Violation Identified	Unknown	Violation Identified
Quarterly Noncompliance Report History	Undetermined	Undetermi		Resolved	Undetermined	Other Violation

Compliance Status

- Unknown
- No Violation Identified
- Violation Identified
- Significant/Category I Noncompliance

Program/Pollutant/Violation Type	2017 QTR 8	QTR 9	QTR 10	QTR 11	QTR 12	2019 QTR 13+
		2018				
A (Source ID: TX0054623)	10/01-12/31/17	01/01-03/31/18	04/01-06/30/18	07/01-09/30/18	10/01-12/31/18	01/01-06/07/19
Facility-Level Status	Significant/ Category I Noncompliance	Significant/ Category I Noncompliance	Significant/ Category I Noncompliance	Significant/ Category I Noncompliance	Significant/ Category I Noncompliance	Violation Identified
Quarterly Noncompliance Report History	Failure to Report DMR - Not Received	Failure to Report DMR - Not Received	Failure to Report DMR - Not Received	Failure to Report DMR - Not Received	Failure to Report DMR - Not Received	

Monthly compliance status of the Blanco WWTP

- Monthly compliance status available from Apr 2016 - Jun 2019
- During that 39 month period the following are reported:
- 2 months—known compliance
- 9 months—unknown compliance status (reason not identified)
- 18 months—significant non compliance— no data reports from plant including every month in 2018
- 6 months—other violations (mostly no reports)
- 6 months—water-quality violation
- 1 month—outfall discharge violation Jan 2019 report--188 mgd flowed through the plant (reporting error?)

- The above months add up to more than 39 months because of multiple violations some months

- Last reported sample: Apr. 30, 2019, E. COLI. Bacteria was 687 col/100 mL—4.5 times greater than EPA recommended limit for recreational water

- Despite these infractions, the Plant has not had an informal or formal enforcement action during the last at least 5 years

https://echo.epa.gov/detailed-facility-report?fid=TX0054623&sys=ICP

Alternatives and solutions

Preferred wastewater treatment technology in the Hill Country http://wimberleywatershed.org/wp-content/uploads/2019/04/PartenReport.pdf

Water reuse https://therivardreport.com/zero-net-water-sustainable-alternative/

City of Austin proposed rule changes for wastewater discharges

http://www.austintexas.gov/department/proposed-wastewater-management-rule-revisions

Wastewater discharge issues and solutions by the Greater Edwards Aquifer alliance

https://aquiferalliance.org/waste-water-discharge/

Senate bill to restrict wastewater discharges in Cen Texas streams

https://www.kut.org/post/bill-seeks-restrictions-dumping-treated-wastewater-central-texas-creeks

References for additional studies (cont.)

Decentralized systems and threats from wastewater systems

- A city of Austin report entitled "Wastewater disposal practices and change in development in the Barton Springs Zone" http://www.hillcountryalliance.org/uploads/HCA/WastewaterBartonSprings.pdf
- A report by Dr. Lauren Ross entitled "Land Applied Wastewater Effluent Impacts on the Edwards Aquifer" http://www.hillcountryalliance.org/uploads/HCA/EAWastewaterImpact.pdf
- US. Geological Survey website on toxic substances in wastewater https://toxics.usgs.gov/investigations/cec/wastewater_treatment.html
- Information by David Venhuizen about decentralized non potable reuse of wastewater http://www.venhuizen-ww.com/ and https://waterblogue.com/
- A report by Susan Parten entitled "Analysis of Existing Community-Sized Decentralized Wastewater Treatment Systems" http://www.ndwrcdp.org/documents/04-DEC-9/04DEC9RD_Research_Digest.pdf
- EPA interactive website presenting information on wastewater violations https://echo.epa.gov/facilities/facility-search/results
- KVUE TV report on "Should treated wastewater be dumped into Central Texas waterways?" https://www.kvue.com/article/news/should-treated-wastewater-be-dumped-into-central-texas-waterways/269-588834547 and
- KVUE TV report on threats from wastewater discharges https://www.kvue.com/article/news/investigations/defenders/the-dirty-truth-about-texas-water/269-342366238
- TCEQ webpage on existing and pending municipal wastewater permits https://www.tceq.texas.gov/permitting/wastewater/municipal/WQ_Domestic_Wastewater_Permits.html

References for additional studies

Organic compounds in wastewater and water supplies

- Occurrence of Selected Pharmaceutical and Organic Wastewater Compounds in Effluent and Water Samples from Municipal Wastewater and Drinking-Water Treatment Facilities in the Tar and Cape Fear River Basins, North Carolina, 2003-2005 http://pubs.er.usgs.gov/usgspubs/ofr/ofr20091046
- Water-Quality Data for Pharmaceuticals and Other Organic Wastewater Contaminants in Ground Water and in Untreated Drinking Water Sources in the United States, 2000-01 http://pubs.er.usgs.gov/usgspubs/ofr/ofr20081293
- Effect of On-Site Wastewater Disposal on Quality of Ground Water and Base Flow - A Pilot Study in Chester County, Southeastern Pennsylvania, 2005

  http://pubs.er.usgs.gov/usgspubs/ofr/ofr20071253
- Occurrence of organic wastewater contaminants, pharmaceuticals, and personal care products in selected water supplies, Cape Cod, Massachusetts, June 2004 http://pubs.er.usgs.gov/usgspubs/ofr/ofr20051206
- Water-quality data for pharmaceuticals, hormones, and other organic wastewater contaminants in U.S. streams, 1999-2000 http://pubs.er.usgs.gov/usgspubs/ofr/ofr0294
- Occurrence of Organic Wastewater Compounds in Selected Surface-Water Supplies, Triangle Area of North Carolina, 2002-2005 http://pubs.er.usgs.gov/usgspubs/sir/sir20075054
- Organic compounds downstream from a treated-wastewater discharge near Dallas, Texas, March 1987 http://pubs.er.usgs.gov/usgspubs/wri/wri934194

References for additional studies (cont.)

Water quality threat from phosphorus

- North Bosque River: A TMDL Project for Phosphorus
  https://www.tceq.texas.gov/waterquality/tmdl/06-bosque.html
- Effect of the restricted use of phosphate detergent and upgraded wastewater-treatment facilities of water quality in the Chattahoochee River near Atlanta, Georgia http://pubs.er.usgs.gov/usgspubs/ofr/ofr9499
- Review of Phosphorus Control Measures in the United States and Their Effects on Water Quality http://pubs.er.usgs.gov/usgspubs/wri/wri994007
- New Technologies Aim to Remove Excess Phosphorus http://twri.tamu.edu/newsletters/newwaves/nw-v16n3.pdf
- Nitrogen and Phosphorus in a Stretch of the Guadalupe River, Texas, with Five Main-Stream Impoundments http://www.springerlink.com/content/t2h511051312n772/
- Handbook of Detergents: Environmental impact http://books.google.com/books?id=WM0fiQuH7w0C&printsec=frontcover&source=gbs_v2_summary_r&cad=0#v=onepage&q=&f=false
- Phosphorus-free Fertilizer
  http://www.american-lawns.com/grasses/phosphorus.html

References for additional studies (cont.)

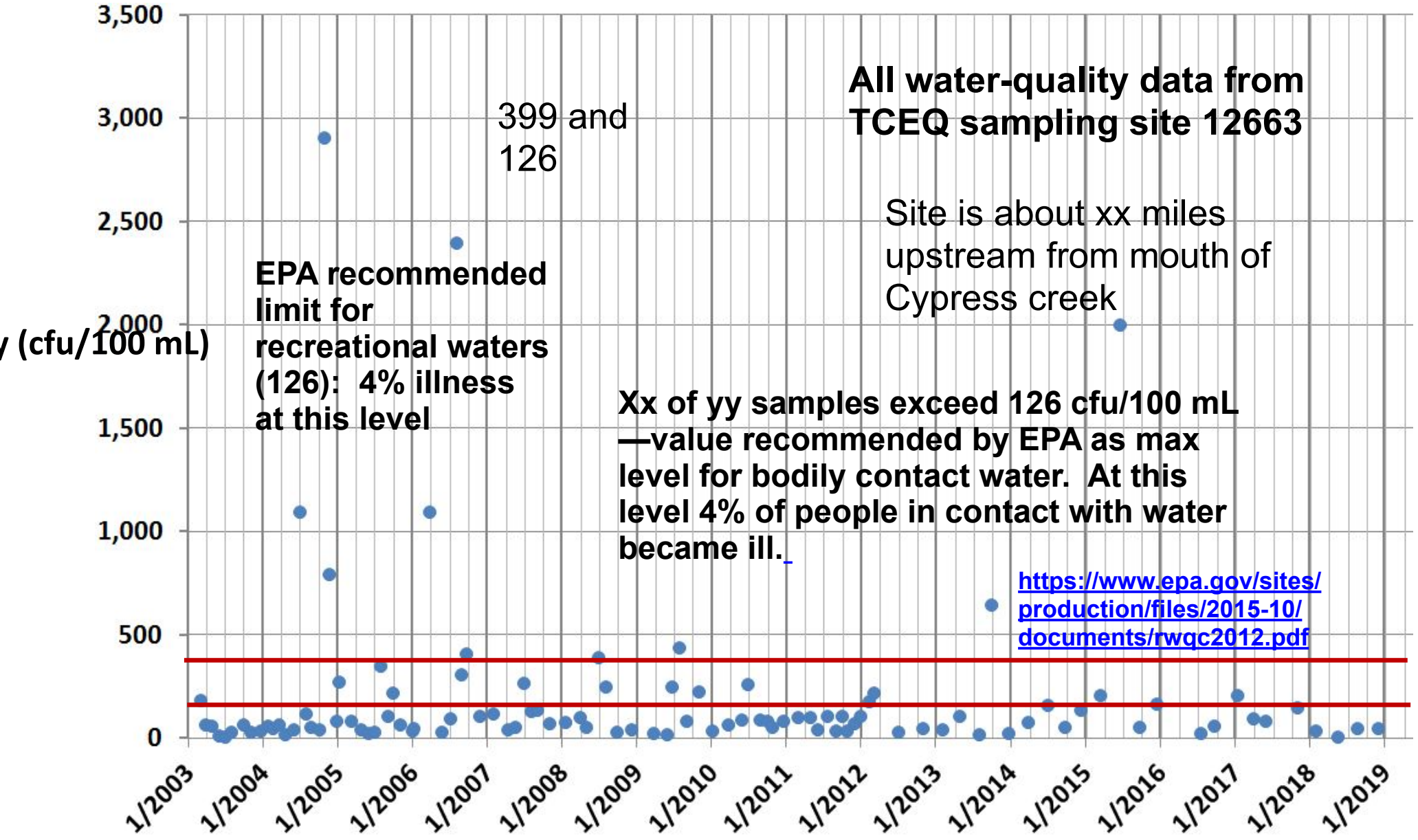
Wastewater irrigation

Studies have shown that the long-term application of wastewater onto land can be done without damage to the environment. One such study "Impact of long-term application of wastewater" available at http://www.webpages.ttu.edu/cfedler/research/landapps/asae-2055.pdf presents such an example.

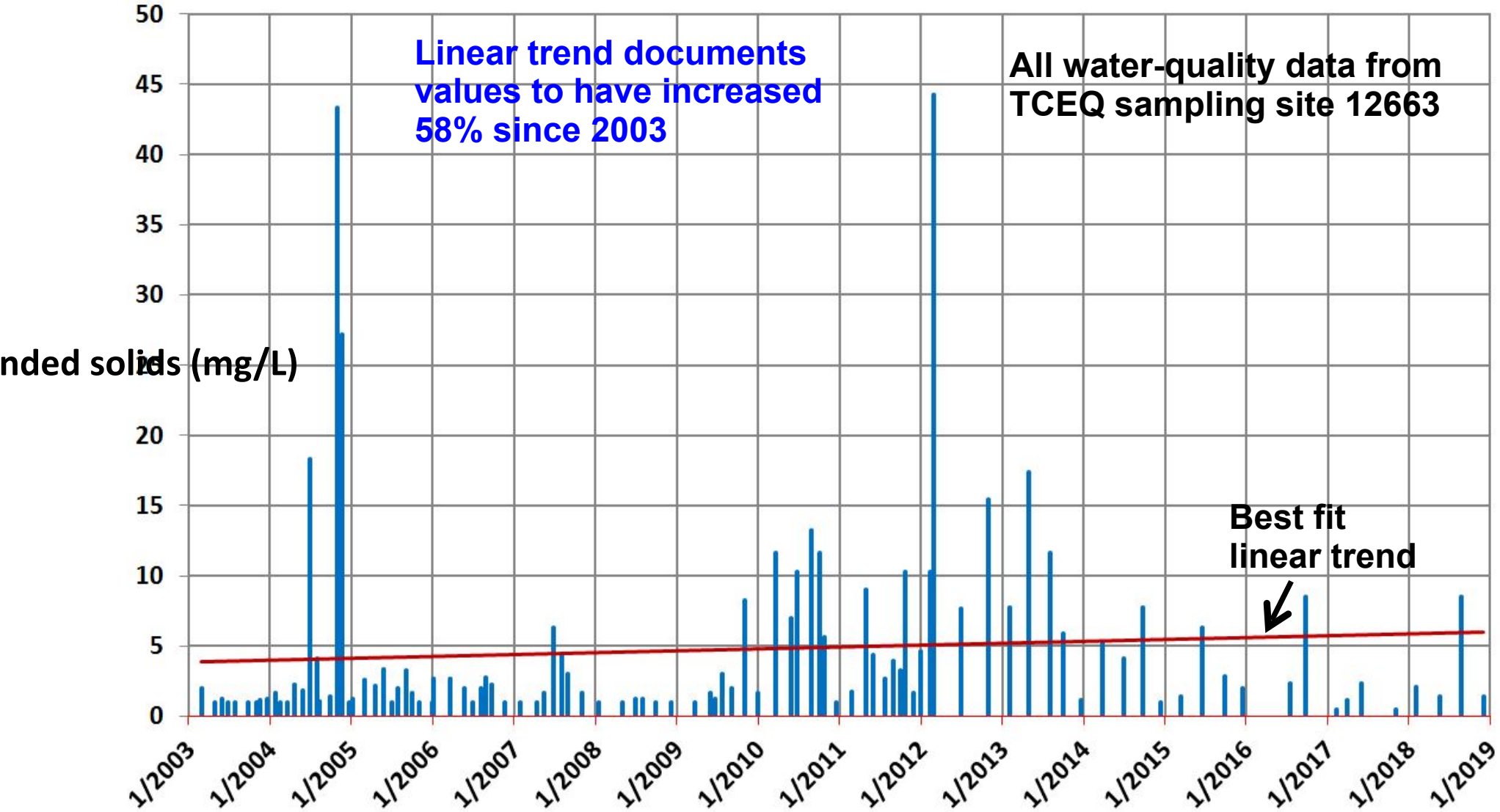
The EPA conducted 8 studies at 8 sites in 7 states, each entitled "Long-term effects of land application of domestic wastewater" and found no adverse impacts on the environment. An example of one of the reports (Vineland New Jersey) is at https://books.google.com/books?id=K22aKDQB42UC&printsec=frontcover&source=gbs_ViewAPI#v=onepage&q&f=false

The other studies were conducted in Camarillo, California; Dickinson, North Dakota; Hollister, California; Mesa, Arizona; Milton, Wisconsin; Roswell, New Mexico; and Tooele, Utah.

E. Coli bacteria in the Blanco River immediately upstream from Wimberley

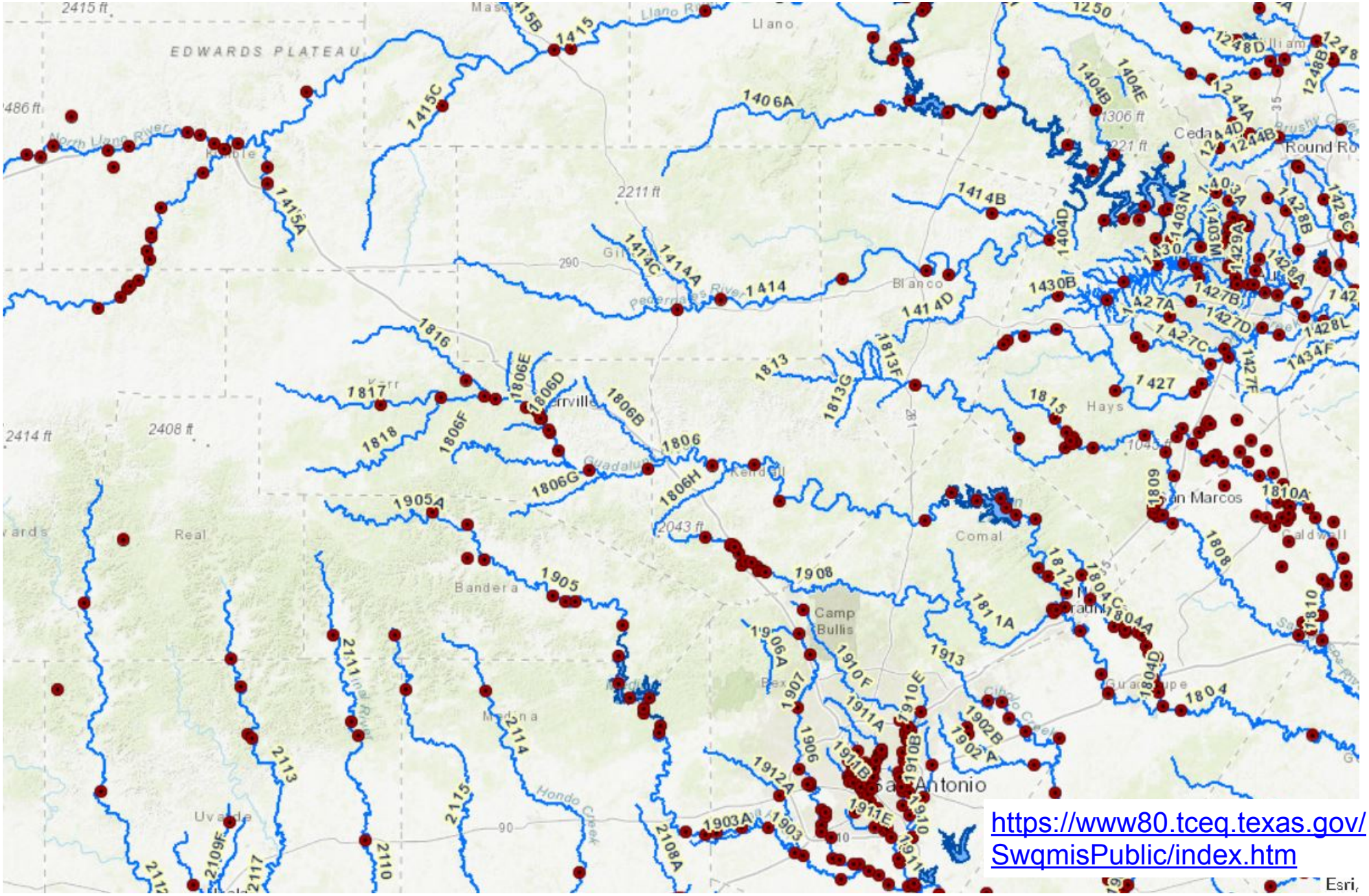


Trends in total suspended solids in the Blanco River immediately upstream from Wimberley



https://www80.tceq.texas.gov/SwqmisWeb/public/crpweb.faces

TCEQ has been collecting water-quality data for many years at many sites as part of the Clean Water Act sec 303 (d) and 305 (b)—data that can be used to assess water-quality impacts from WWTPs



USGS has been presenting online current and historic streamflow discharge and water-quality data for many years at many sites. The water quality data can be used to assess current and historic stream degradation due to WWTPs. The current streamflow discharge data can be used to identify current mixture percent of runoff and effluent which identifies dilution of effluent thus current water-quality conditions.