

## Watershed: Austin

**Segments:** 1403, 1427, 1429, 1430

**Water Bodies:** Colorado River, Bull Creek, Barton Creek, Onion Creek, Walnut Creek, Lake Austin, Town Lake

**Population Centers:** Austin, Dripping Springs, Bee Cave, Driftwood, Buda, Del Valle

**Counties:** Blanco, Hays, Williamson, Travis

**Ecoregion:** Central Texas Plateau (Edwards Plateau)

**Ecoregion Description:** This ecoregion is largely a dissected plateau that is hillier in the south and east where it is easily distinguished from bordering ecological regions by a sharp fault line. The region contains a sparse network of perennial streams, but they are relatively clear and cool compared to those of surrounding areas. Originally covered by juniper-oak savanna and mesquite-oak savanna, most of the region is used for grazing beef cattle, sheep, goats and wildlife. Hunting leases are a major source of income.

**Climate:** Subtropical subhumid and annual precipitation averages about 24 inches, with May and September the wetter months. Although dry periods commonly occur in July and August, the driest months are November, December and January.

**Land Use:** Open woodland grazed, forest and woodland grazed, some sub-humid grassland and semi-arid grazing land

**Soils:** Dry mollisols; thin reddish-brown, gravelly and stony, sandy loam prairie soils

**Permitted Discharges:** 33

**Permitted CAFOs:** 1

Austin watershed has many scenic areas.



Fig. 17 - Austin Watershed

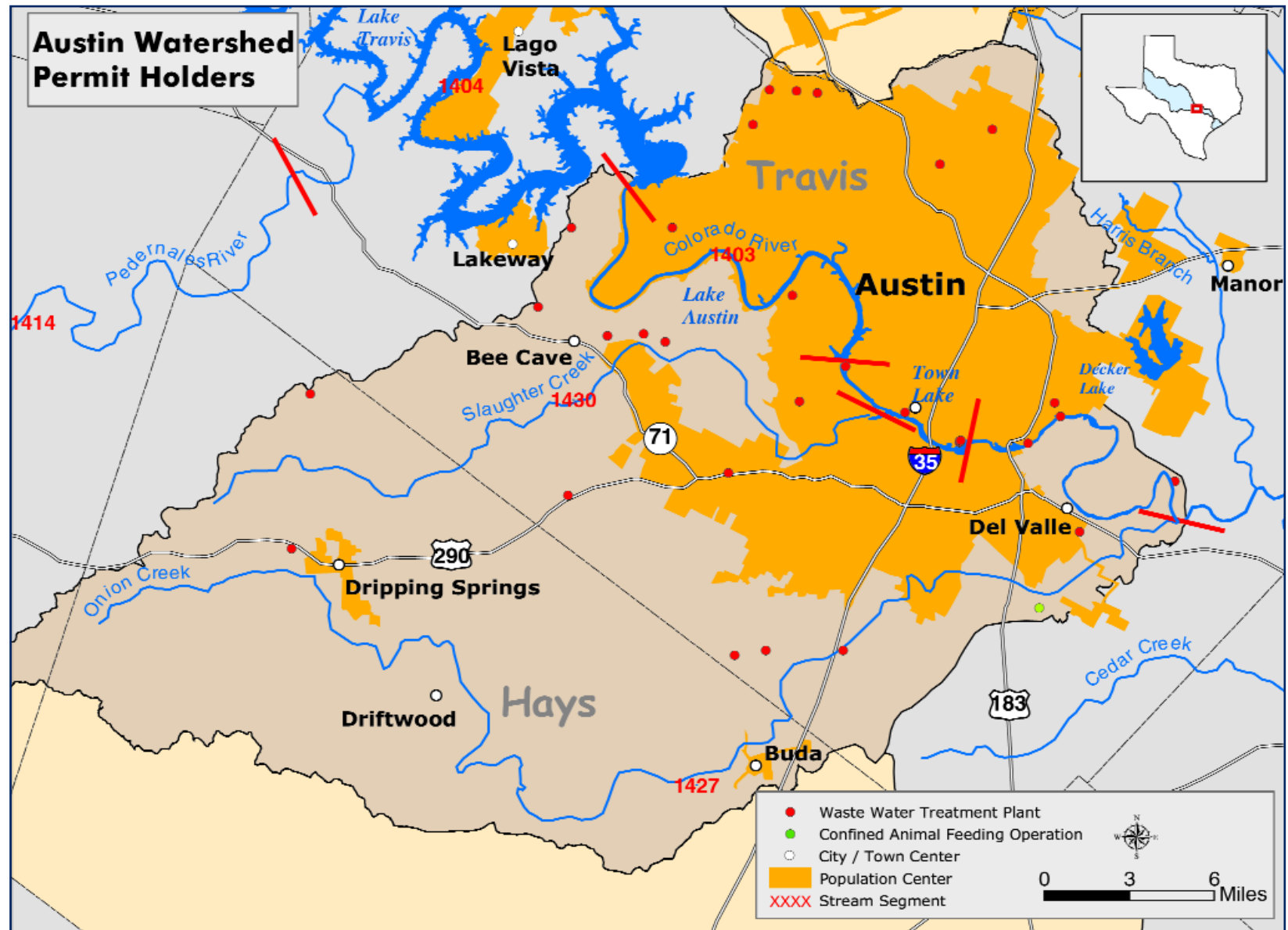


Table 12 - Trend analysis results for Lake Austin watershed and its tributaries.

		Time vs. Constituent							
Station	Description	DO	CI	Fecal	Nutrients		Ch a	Secchi	TSS
					TP	NO <sub>3</sub> -N			
12300	Lake Austin Headwaters		↓	↑	↑		↓		
12297	Lake Austin City Park		↓		↑				
12294	Lake Austin Dam		↓		↑				
12486	Town Lake Headwaters		↓		↑		↓		
12476	Town Lake Dam		↓		↑				
12215	Bull Creek FM 2222	↓			↑	↑	NA		
12487	Barton Creek footbridge	↓		↓			NA		
12436	Onion Creek US 183	↑					NA		
12475	C.R. Pleasant Valley		↓		↑		NA		
12474 FP site	C.R. US 183		NA	NA	NA	NA	NA		NA
12469	C.R. FM 973		↓		↓	↓	NA		
12466	C.R. Webberville		↓		↓	↓	NA		

See Appendix A: Glossary on page 76 for definition of terms.

## Austin Watershed Trend Analysis

Twelve sampling locations were evaluated for trends in water quality during the 1988 to 1998 trend analysis period. Two locations (Onion Creek and Bull Creek) were analyzed against flow, six sites are located in reservoirs and four are located on the Colorado River downstream of the city of Austin. One location (12474; Colorado River at US 183) is monitored only for field parameters.

Town Lake and Lake Austin exhibited a similar pattern to that observed in upstream watersheds with increasing nutrient trends. However, chlorophyll concentrations and secchi visibility did not respond as observed upstream. One possible explanation may be the short residence time. Both water bodies are considered “run of the river” and therefore have relatively short residence times. Five water bodies within this watershed were reported on 1998 Clean Water Act 303d list as “impaired.” They are Lake Austin (1403; high bacteria and low dissolved oxygen), Town Lake (1429; chlordane in fish tissue), Barton Creek (1430; high bacteria and toxic substances in the sediment), Onion Creek (1427; high bacteria, sulfates and total dissolved solids and low dissolved oxygen), and the Colorado River below Town Lake (1428; high bacteria). Since this analysis, a TMDL has been completed on Lake Austin and the fish consumption advisory for Town Lake has been lifted. See Table 13 for complete results.

Two major events affected water quality in the Austin watershed during the past 10 years. These events listed in chronological order are “salt” spill from Natural Dam Lake (1986) and the Christmas Flood (1991-92).

## Austin Watershed Special Projects

### Bull Creek Study

In 1997, a group of citizens known as the Bull Creek Foundation identified increased development in the Bull Creek watershed as having an impact on water quality. TCEQ (formerly TNRCC) studied the watershed in 1981, but there was no way of knowing if the recent development degraded the creek since the earlier study.

At the request of the Bull Creek Foundation, LCRA conducted an intensive water quality survey on Bull Creek in February 1998. The objectives of the study were twofold:

- ◆ Characterize the current water quality of the creek.
- ◆ Compare results to the survey performed in 1981.

Biological, chemical and physical parameters were measured at eight sites in the Bull Creek watershed. Water chemistry parameters were similar in both concentration and longitudinal distribution between this study and the 1981 survey. Benthic macroinvertebrates scored high to exceptional. These ratings were similar to what was found in the 1981 study. Bull Creek demonstrates the ability to support a diverse benthic community, and the data is consistent with its assumed high life use. The study did not find any identifiable degradation of Bull Creek water quality since 1981.

### Metals

Results for the Austin Watershed dissolved metals in water sampling in August of 1998 is located in Appendix E on page 82.

Table 13 - Austin Watershed Data Summary

Segment	Year	Temperature (°C)	Dissolved Oxygen (mg/L)	pH (S.U.)	Ammonia (mg/L)	Nitrate + Nitrite (mg/L)	Total Phosphorus (mg/L)	Ortho Phosphorus (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	E. coli (cfu/dL)	Chlorophyll (µg/L)
<b>Town Lake</b> Segment 1429 2 sites	1996	20.43	8.30	7.84	0.071	0.156	0.315	0.009	61.2	38.1	51	4.4
	1997	21.41	8.17	7.62	0.053	0.302	0.135	0.014	44.5	33.8	21	14.8
	1998	20.69	7.86	7.59	0.109	0.296	0.089	0.010	42.0	34.1	23	1.5
	1999	24.38	7.89	7.73	0.021	0.065	0.070	0.010	48.8	54.0	46	0.8
	2000	-	-	-	-	-	-	-	-	-	-	-
	Mean	21.38	8.09	7.68	0.075	0.224	0.193	0.011	51.1	37.1	32	6.9
	Benchmark	<b>32.22</b>	<b>5.00</b>	<b>6.5 - 9.0</b>	<b>0.106</b>	<b>0.320</b>	<b>0.180</b>	<b>0.050</b>	<b>75.0</b>	<b>75.0</b>	<b>126</b>	<b>21.4</b>
Violation Rate	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>17.40</b>	<b>20.70</b>	<b>15.00</b>	<b>0.000</b>	<b>0.0</b>	<b>3.4</b>	<b>13</b>	<b>6.5</b>	
<b>Barton Creek</b> Segment 1430 1 site	1996	21.62	8.13	7.24	0.070	1.229	0.358	0.007	45.5	41.8	228	1.6
	1997	20.37	8.34	7.27	0.050	0.684	0.070	0.013	26.5	34.4	99	1.5
	1998	20.46	8.37	7.11	0.095	1.00	0.082	0.041	23.1	29.5	153	0.5
	1999	21.38	6.74	6.98	0.031	1.420	0.040	0.010	34.1	33.4	133	0.5
	2000	-	-	-	-	-	-	-	-	-	-	-
	Mean	<b>20.90</b>	<b>8.06</b>	<b>7.16</b>	<b>0.072</b>	<b>1.035</b>	<b>0.187</b>	<b>0.018</b>	<b>33.7</b>	<b>36.0</b>	<b>154</b>	<b>1.2</b>
	Benchmark	<b>32.22</b>	<b>5.00</b>	<b>6.5 - 9.0</b>	<b>0.170</b>	<b>2.760</b>	<b>0.80</b>	<b>0.500</b>	<b>50.0</b>	<b>50.0</b>	<b>126</b>	<b>11.6</b>
Violation Rate	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>8.30</b>	<b>0.000</b>	<b>10.00</b>	<b>0.000</b>	<b>6.7</b>	<b>0.0</b>	<b>19</b>	<b>0.0</b>	
<b>Lake Austin</b> Segment 1403 3 sites	1996	19.57	8.12	7.98	0.070	0.122	0.239	0.009	63.9	38.7	13	2.6
	1997	17.85	8.29	7.82	0.067	0.202	0.061	0.016	48.2	32.7	8	13.8
	1998	19.14	7.74	7.65	0.137	0.197	0.141	0.010	44.5	33.1	24	1.7
	1999	19.19	8.69	7.92	0.024	0.041	0.047	0.010	43.9	29.6	4	1.4
	2000	19.80	7.12	7.86	0.031	0.116	0.022	0.010	45.1	29.4	10	1.0
	Mean	<b>19.07</b>	<b>7.98</b>	<b>7.83</b>	<b>0.067</b>	<b>0.141</b>	<b>0.110</b>	<b>0.011</b>	<b>49.9</b>	<b>33.0</b>	<b>11</b>	<b>4.5</b>
	Benchmark	<b>32.22</b>	<b>5.00</b>	<b>6.5 - 9.0</b>	<b>0.106</b>	<b>0.320</b>	<b>0.180</b>	<b>0.050</b>	<b>100.0</b>	<b>75.0</b>	<b>126</b>	<b>21.4</b>
Violation Rate	<b>0.00</b>	<b>9.00</b>	<b>0.00</b>	<b>11.90</b>	<b>7.70</b>	<b>10.90</b>	<b>0.000</b>	<b>0.0</b>	<b>0.0</b>	<b>1</b>	<b>3.8</b>	
<b>Bull Creek</b> Unclassified Stream 1 site	1996	20.93	9.10	8.07	0.070	0.265	0.274	0.007	55.0	63.2	125	1.6
	1997	18.00	10.07	8.09	0.067	0.383	0.110	0.016	37.5	45.7	52	3.5
	1998	20.03	8.95	7.73	0.088	0.486	0.088	0.010	37.0	53.4	170	0.6
	1999	22.48	8.30	7.95	0.020	0.220	0.044	0.010	53.0	130.1	52	0.5
	2000	20.86	8.75	8.05	0.020	0.554	0.020	0.010	46.7	137.1	404	0.9
	Mean	<b>20.38</b>	<b>9.06</b>	<b>7.95</b>	<b>0.051</b>	<b>0.379</b>	<b>0.111</b>	<b>0.011</b>	<b>46.3</b>	<b>84.5</b>	<b>121</b>	<b>1.5</b>
	Benchmark	<b>32.22</b>	<b>5.00</b>	<b>6.5 - 9.0</b>	<b>0.170</b>	<b>2.760</b>	<b>0.80</b>	<b>0.500</b>	<b>100.0</b>	<b>75.0</b>	<b>126</b>	<b>11.6</b>
Violation Rate	<b>3.80</b>	<b>0.00</b>	<b>0.00</b>	<b>0.000</b>	<b>0.000</b>	<b>5.00</b>	<b>0.000</b>	<b>0.0</b>	<b>16.7</b>	<b>21</b>	<b>4.2</b>	

Mean - annual average value

Benchmark - state standard or threshold

Violation Rate - percent of sample exceeded benchmark

Fig. 18 - Austin Watershed Monitoring Locations

