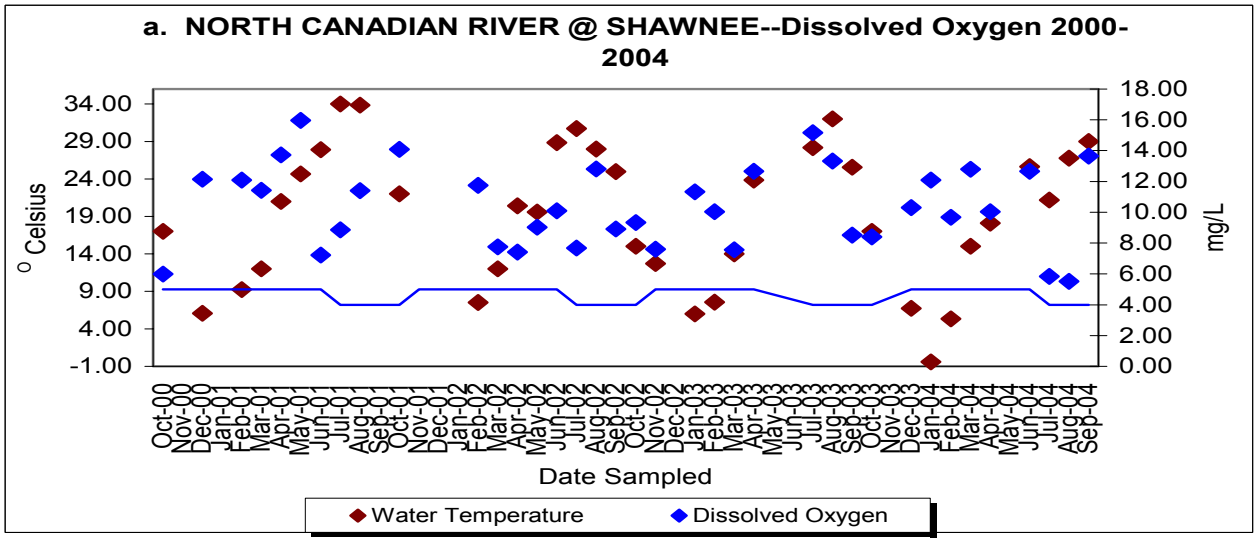
North Canadian River near Shawnee

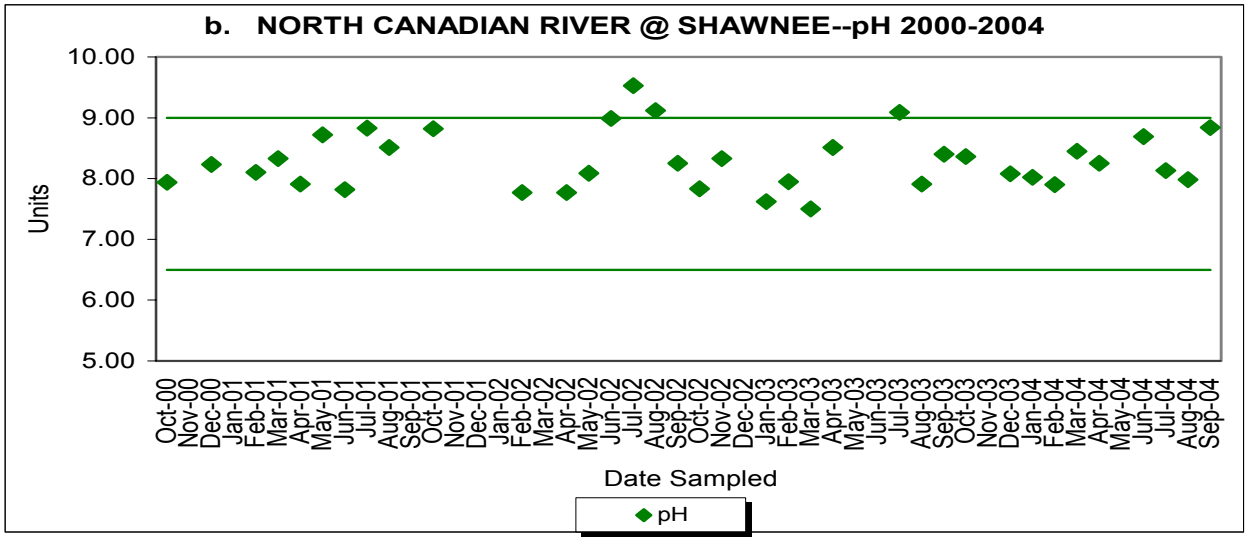
Station AT241700 (520510000110-005AT) is a permanent ambient trend monitoring station located on the North Canadian River in Oklahoma. Situated in the extreme northeast corner of Pottawatomie County, the site was established east of the city of Shawnee off of Interstate 40. In October of 2002, the station was moved to the state highway 3E bridge to facilitate the gathering of discharge data. The station is positioned near the terminal end of stream segment 520510000110 and is classified within the Lower North Canadian River 8-digit HUC watershed (11100302). Water enters the stream system from Shawnee Twin Reservoirs and Tecumseh Lake and from several tributaries including North Deer Creek (Wes Watkins Lake), among others.

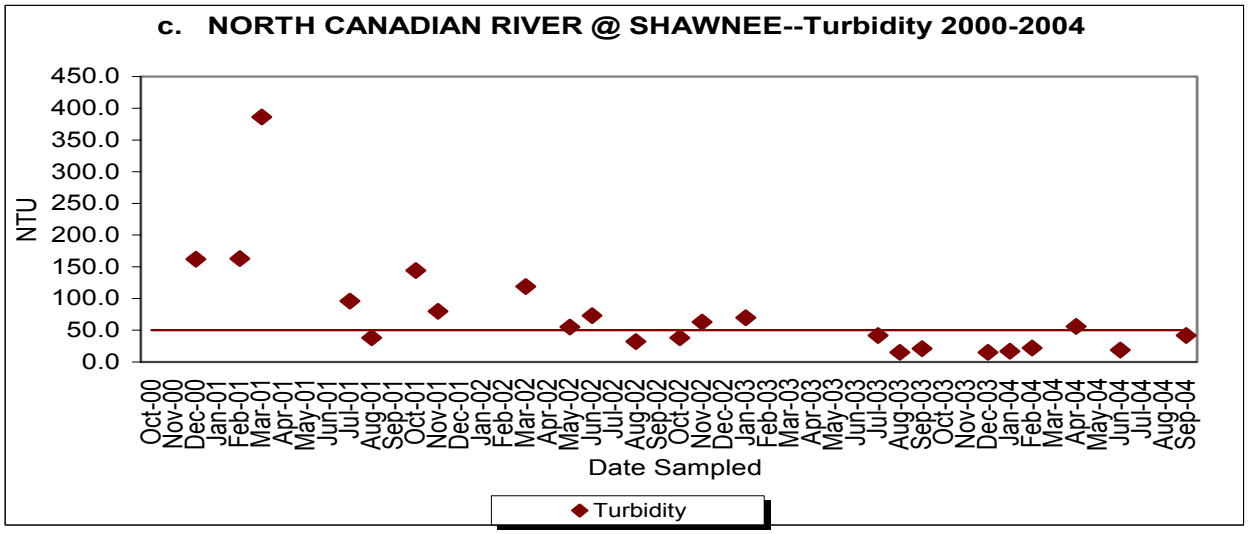
This station on the North Canadian River has been active for all water quality variables since October of 2000. The following assessment of beneficial uses is based on data collected from October of 2000 through September of 2004. For purposes of reporting, this station is representative of the Beaver River from the confluence of an unnamed tributary near Horseshoe Lake (97.1797, 35.5027) downstream to the confluence of Turkey Creek with the North Canadian River (96.632, 35.3922). As per Oklahoma Water Quality Standards, Appendix A, Table 7 of Oklahoma Administrative Code (OAC) 785:45, this water quality management segment is assigned the following designated beneficial uses: 1) Emergency Water Supply (EWS), 2) Warm Water Aquatic Community—Fish and Wildlife Propagation (WWAC), 3) Agriculture—Class I Irrigation (AG), and 4) Primary Body Contact—Recreation (PBCR).

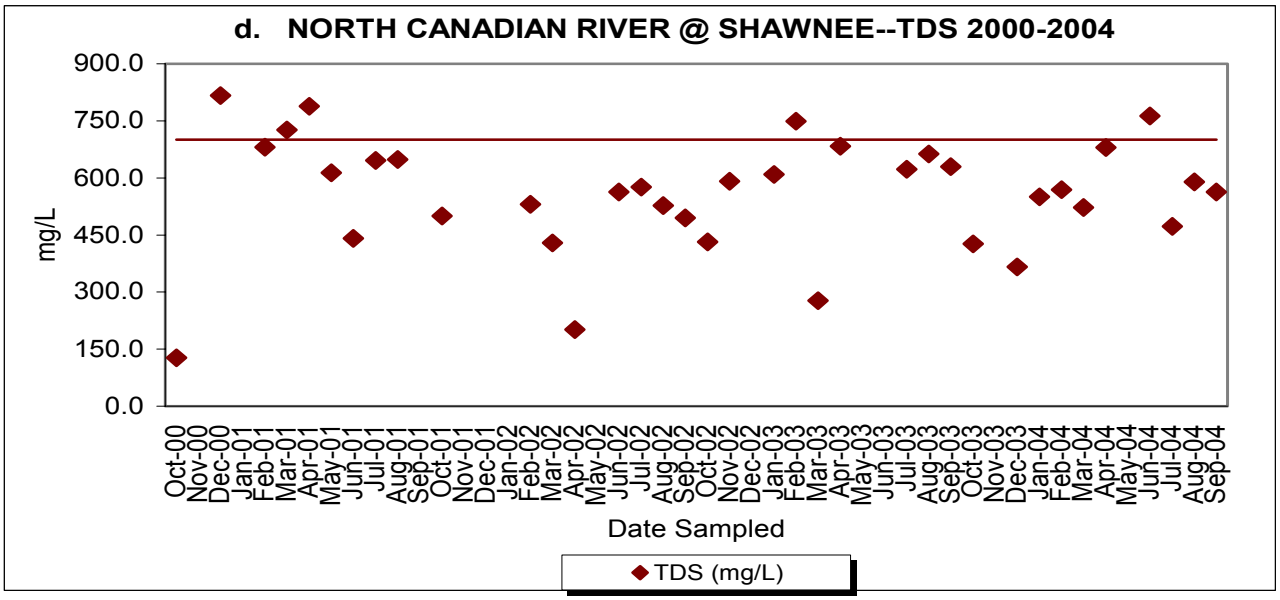
The WWAC beneficial use is not supported. Of the fifty-three (53) segment wide turbidity samples (Figure 52c), thirty-four (34) samples (or 64%) exceeded the numerical criterion of 50. Of the eighty-three (83) segment wide pH values, twelve (12) samples (or 14%) exceed the maximum criterion of 9.0 units. Of the nine (9) lead samples collected, four (4) of the concentrations (or 44%) exceeded the prescribed, hardness-dependant chronic criterion of 10.51 µg/L (Table 22). The segment is unimpaired for organics in all but one section. With five (5) pesticide samples collected at each of five stations throughout the segment, all but one of the reported values for all of the organic analytes were below the detection limit. At the Econtuchka station near the lower end of the segment and below the Shawnee station, one of the methyl parathion samples (or 20% of samples) is at 0.48 µg/L, which is above the chronic criterion of 0.013 µg/L. Dissolved oxygen (Figure 52a) and pH (Figure 52b) samples met the criteria prescribed in the WWAC beneficial use. The AG beneficial use is supported for total dissolved solids, chlorides, and sulfates (Figure 52d and Figure 52e). The PBCR beneficial use is not supported (Table 23). Of the forty-five (45) segment wide enterococci concentrations, twelve (12) samples exceeded the prescribed screening level of 406 cfu/mL, and the geometric mean (200.8 cfu/mL) exceeded the prescribed mean standard of 33 cfu/mL. Fecal coliform and *E. coli* values are below the screening levels and prescribed geometric means. This segment of the North Canadian River is nutrient-threatened. The median of the segment wide total phosphorus concentrations (0.738 mg/L) exceeded the threshold median of 0.36 mg/L. The station also has a mean organic or mixed turbidity of 72 NTUs. The nitrate/nitrite median value was below the threshold median of 5.0 mg/L (Figure 52f).

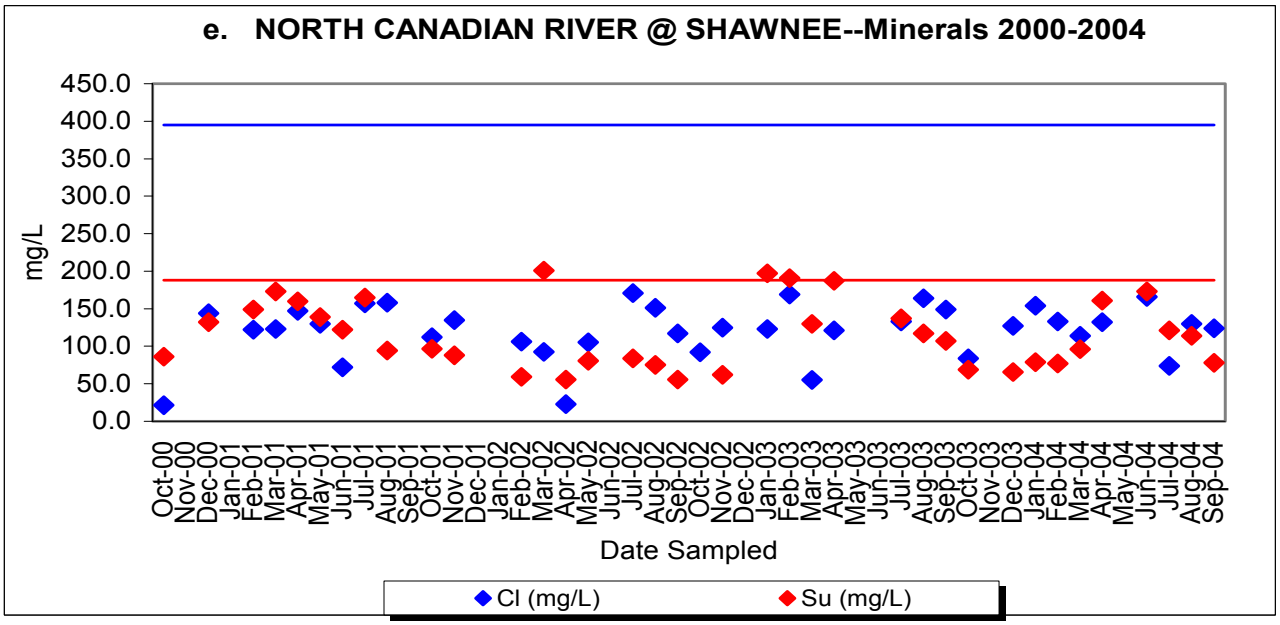
Figure 52a-f. Dissolved Oxygen (a), pH (b), Turbidity (c), Total Dissolved Solids (d), Minerals (e), and Nutrients (f) on the North Canadian River at Shawnee (AT241700), 2000-2004.








d. NORTH CANADIAN RIVER @ SHAWNEE--TDS 2000-2004
900.0
750.0
600.0
450.0
300.0
150.0
0.0
mg/L
Oct-00
Nov-00
Dec-00
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Sep-01
Oct-01
Nov-01
Dec-01
Jan-02
Feb-02
Mar-02
Apr-02
May-02
Jun-02
Jul-02
Aug-02
Sep-02
Oct-02
Nov-02
Dec-02
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03
Aug-03
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04
Feb-04
Mar-04
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Date Sampled
TDS (mg/L)


e. NORTH CANADIAN RIVER @ SHAWNEE--Minerals 2000-2004
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
mg/L
Oct-00
Nov-00
Dec-00
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Sep-01
Oct-01
Nov-01
Dec-01
Jan-02
Feb-02
Mar-02
Apr-02
May-02
Jun-02
Jul-02
Aug-02
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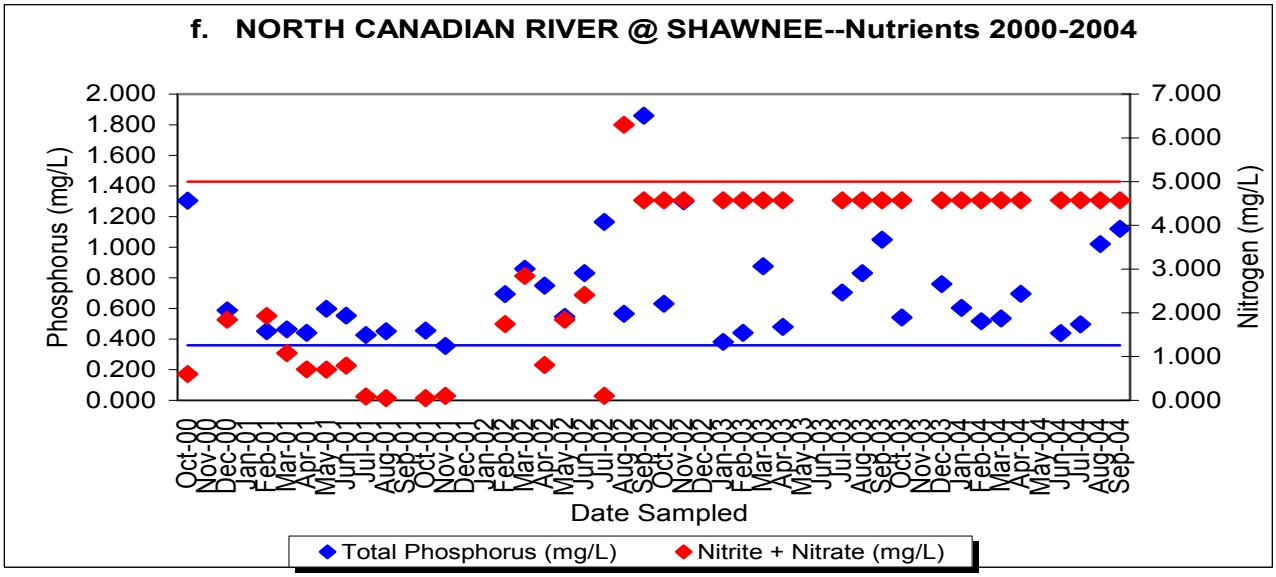
Sep-03
Oct-03
Nov-03
Dec-03
Jan-04
Feb-04
Mar-04
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Date Sampled
Cl (mg/L)
Su (mg/L)


f. NORTH CANADIAN RIVER @ SHAWNEE--Nutrients 2000-2004
2.000
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
Phosphorus (mg/L)
7.000
6.000
5.000
4.000
3.000
2.000
1.000
0.000
Nitrogen (mg/L)
Oct-00
Nov-00
Dec-00
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Sep-01
Oct-01
Nov-01
Dec-01
Jan-02
Feb-02
Mar-02
Apr-02
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Oct-03
Nov-03
Dec-03
Jan-04
Feb-04
Mar-04
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Date Sampled
Total Phosphorus (mg/L)
Nitrite + Nitrate (mg/L)