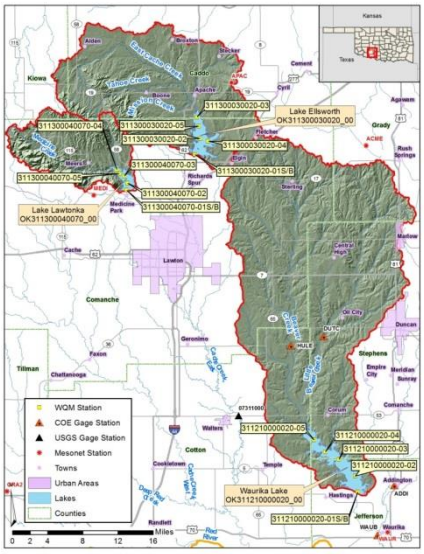
# 208 FACTSHEET REGARDING CHLOROPHYLL-*a* TMDLs in the LAKE LAWTONKA, WAURIKA LAKE, and LAKE ELLSWORTH WATERSHEDS




**Watershed:** This TMDL Study Area was in southwestern Oklahoma in the Upper Red River Sub-basin (HUC 1113). Lake Lawtonka (OK311300040070_00) and Lake Ellsworth (OK311300030020_00) are located in the Cache watershed (USGS HUC 11130202). Waurika Lake (OK311210000020_00) is in the Northern Beaver watershed (USGS HUC 11130208).

**Beneficial Uses and Impairments:** This TMDL study was done because the Public and Private Water Supply beneficial use for all three of these lakes is impaired because of elevated chlorophyll-*a* levels.

**Point Source Discharges in the Lawtonka/Ellsworth/Waurika Watersheds:** There are no municipal or industrial wastewater facilities, CAFOs, or NPDES-regulated stormwater dischargers in the Lawtonka/Ellsworth/Waurika watersheds. There are currently six no-discharge facilities in the Waurika Lake[1] watershed and one no-discharge facility in the Lake Ellsworth[2] watershed. More information about these facilities can be found in Table 3-1 of the Chlorophyll-*a* Total Maximum Daily Load Report for Lake Lawtonka, Waurika Lake, and Lake Ellsworth. Between 2003 and 2012 in the Lake Lawtonka/Ellsworth/Waurika watersheds, non-discharging facilities reported 10 sanitary sewer overflows (SSOs) ranging from 200 to 150,000 gallons. A summary of these can be found in Table 3-2 of the TMDL report. Given the small size of the wastewater collection systems of these no-discharge facilities and the low occurrence of reported SSOs, the amount of nutrients into Lakes Lawtonka/Ellsworth/Waurika is considered to be negligible. Since nutrients from point sources is negligible, almost all nutrient loading to the Lake Lawtonka/Ellsworth/Waurika watersheds comes from nonpoint sources.

**Recommendations:** The TMDL models used in this Study were SWAT and BATHTUB. The following table summarizes the percent reduction goals for nutrient loading established for each lake.

**Total Phosphorus and Nitrogen Load Reductions Needed to Meet Chlorophyll-*a* In-lake Water Quality Targets**

| Lake | Chlorophyll-*a* In-lake Target (µg/L) | Percent Reduction | Maximum Allowable Load (kg/yr)[a] | |
|---|---|---|---|---|
| | | | Total Phosphorus | Total Nitrogen |
| **Lake Lawtonka** | 10 | **55%** | 3,240 | 23,760 |
| **Waurika Lake** | 10 | **40%** | 28,320 | 165,300 |
| **Lake Ellsworth** | 9 | **45%** | 14,900 | 129,140 |

[a] Loads do not include atmospheric deposition

These maximum allowable loads include an inherent margin of safety through the use of limits on loading for both nitrogen and phosphorus.

1 Elgin WWTF, Sterling WWTF, Marlow-West WWTF, Marlow-Northwest Lagoon, Shiflett Transport Services Maintenance, and Battison Auto Center.

2 Fletcher WWTF

**TMDLs for Chlorophyll-*a* Expressed in Kilograms of Total Phosphorus and Nitrogen Per Day**

| Waterbody Name | Waterbody ID | Nutrient | TMDL | WLA | LA | MOS |
|---|---|---|---|---|---|---|
| **Lake Lawtonka** | OK311300040070_00 | **Total Phosphorus** | **31.3** | 0 | 31.3 | Implicit |
| | | **Total Nitrogen** | **236.7** | 0 | 236.7 | Implicit |
| **Waurika Lake** | OK311210000020_00 | **Total Phosphorus** | **272.6** | 0 | 272.6 | Implicit |
| | | **Total Nitrogen** | **1,599** | 0 | 1,599 | Implicit |
| **Lake Ellsworth** | OK311300030020_00 | **Total Phosphorus** | **151.3** | 0 | 136.2 | 15.1 |
| | | **Total Nitrogen** | **1,323** | 0 | 1,191 | 132 |

The full Lake Lawtonka, Waurika Lake, and Lake Ellsworth TMDL report can be found on the following DEQ webpage: http://www.deq.state.ok.us/WQDnew/tmdl/index.html.

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