

# **2013 Oklahoma Lakes Report**

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## **Beneficial Use Monitoring Program**



State of Oklahoma

**OWRB**

OKLAHOMA WATER RESOURCES BOARD  
the water agency

## EXECUTIVE SUMMARY

It is the intent of this Oklahoma Water Resources Board (OWRB) report to advance concepts and principles of the Oklahoma Comprehensive Water Plan (OCWP). Consistent with a primary OCWP initiative, this and other OWRB technical studies provide invaluable data crucial to the ongoing management of Oklahoma's water supplies as well as the future use and protection of the state's water resources. Oklahoma's decision-makers rely upon this information to address specific water supply, quality, infrastructure, and related concerns. Maintained by the OWRB and updated every 10 years, the OCWP serves as Oklahoma's official long-term water planning strategy. Recognizing the essential connection between sound science and effective public policy, incorporated in the Water Plan are a broad range of water resource development and protection strategies substantiated by hard data – such as that contained in this report – and supported by Oklahoma citizens.

The Beneficial Use Monitoring Program exists as a result of the vital economic and social importance of Oklahoma's lakes, streams, wetlands, and aquifers and the associated need for their protection and management. The data contained in this report is scientifically defensible and has been collected and analyzed following procedures outlined in Use Support Assessment Protocols (USAP), developed by OWRB with input and concurrence of Oklahoma's other environmental agencies. Specifically, USAPs establish a consistent method to determine if beneficial uses assigned for individual waters through Oklahoma Water Quality Standards (WQS) are being supported. The legitimacy of data analyzed following protocols other than those outlined in the USAP (or the Oklahoma Continuing Planning Process (CPP) document where the USAP is silent) for use support determination is not appropriate. If the BUMP report indicates that a designated beneficial use is impaired, threatened, or otherwise compromised, measures must be taken to mitigate or restore the water quality.

The OWRB has worked diligently to follow the guidelines outlined in the USAP. Recommendations in this report should be consistent with recommendations for the state's 303(d) list. Although certain inconsistencies do exist, every effort has been taken to assure compatibility between the BUMP Report and the 303(d) list. Issues regarding stream/lake segmenting additional data from non-BUMP sources and unique non-representative conditions all affect the impairment decision-making process.

Traditionally, the State of Oklahoma has utilized numerous water monitoring programs conducted by individual state and federal agencies. In general, each environmental agency designs and implements its own program with only limited participation with other state, municipal, or federal entities. These programs collect information for a specific purpose or project (e.g., development of Total Maximum Daily Loads, WQS process, lake trophic status determination, water quality impact assessments from nonpoint and point source pollution, stream flow measurement, assessment of best management practices, etc.). Therefore, the information is specific to each project's data quality objectives (DQOs) and is often limited to a very small geographic area.

To synchronize Oklahoma's monitoring efforts related to water quality, the State Legislature appropriated funds in 1998 to create the Beneficial Use Monitoring Program (BUMP) under the direction of the Oklahoma Water Resources Board, who promulgates the WQS and WQS Implementation Rule.

BUMP brings the OWRB's overall water quality management program full circle. From the promulgation of WQS, to permitting and enforcement of permits stemming from WQS-established criteria, to nonpoint source controls, all agency water quality management activities are intended to work in concert to restore, protect, and maintain designated beneficial uses.

The specific objectives of BUMP are to detect and quantify water quality trends, document and quantify impairments of assigned beneficial uses, and identify pollution problems before they become a pollution crisis. This report interprets current Oklahoma Lake data collected as part of the comprehensive, long-term program. As the program has matured, the BUMP report has become one of the most important annually published documents in Oklahoma.

### **Beneficial Use Monitoring Program Components**

***Monitoring Rivers & Streams*** - The OWRB is currently monitoring approximately 84 stations on a 6-week rotation. Fixed station monitoring is based largely upon the 84 planning basins as outlined in the Oklahoma Comprehensive Water Plan (OCWP). In general, at least one sample station is located at the terminal end of each of the planning basins. The OWRB also conducts on-going special studies as well as 25-30 probabilistic monitoring stations annually.

***Fixed Station Load Monitoring*** – The OWRB is currently working with several partners including the US Geological Survey (USGS), US Army Corps of Engineers (USACE), Grand River Dam Authority (GRDA) and National Weather Service to conduct flow monitoring on all our fixed station sites that are not part of the State of Oklahoma/USGS Cooperative Gaging Network. This cooperative effort will allow for loadings to be calculated, trends to be assessed statewide and provide much needed data for the Use Support Assessment process.

***Fixed Station Lakes Monitoring*** – As part of BUMP, the OWRB conducts sampling on lakes and reservoirs across the State of Oklahoma. To accomplish this task, the OWRB has taken a fixed station and probabilistic survey approach for the lakes monitoring program. This survey design allows the state's objectives to be met as well as ensure various sized waterbodies are represented adequately. The survey population includes all lakes above 50 surface acres, which encompasses approximately 206 different waterbodies. The population is then stratified into two groups – lakes greater than 500 surface acres and those below 500 surface acres. The greater than 500 surface acres group includes 68 lakes, of which approximately one-fifth are monitored annually (quarterly samples) on a randomized draw. They are then monitored again during a subsequent year in the 5-year rotation, so that each lake greater than 50 surface acres is sampled 2 non-consecutive years during each 5 year rotation. The lakes managed by our Federal partners, the USACE and Bureau of Reclamation (BOR) are included in the 68 large lakes. Additionally, ten randomly drawn lakes of less than 500 surface acres are sampled annually (quarterly samples) over the 5 year sample frame. Many of these smaller lakes have not been sampled historically through BUMP and include small municipal water supplies.

The OWRB works with other agencies, such as the USACE, for inclusion of additional information on waterbodies managed by the Corps. Data collected consists primarily of water chemistry, nutrients, and chlorophyll-a information. In general, a minimum of three to five stations per reservoir are sampled depending on the size of the reservoir. Stations are located such that they represent the lacustrine, transitional, and riverine zones of the lake. On many reservoirs, additional sites are monitored, including major arms of the reservoir as appropriate. Water quality parameters have been added to the lakes sampling effort over the years to enhance program ability to make use support determinations.

**Groundwater Monitoring (GMAP)** – This new program was made possible as result of a \$1,500,000 increase in funding received from the Oklahoma Legislature for water quality/quantity monitoring based on recommendations of the 2012 Update of the Oklahoma Comprehensive Water Plan. These additional monies were utilized to restore funding levels of the Beneficial Use Monitoring Program as well as to implement the new groundwater program. The new groundwater program prioritizes efforts on Oklahoma’s 21 major groundwater aquifers and will continue to be phased in over the next 3 years. This baseline period will focus on 4-6 aquifers per year and will assess concentrations of nutrients, metals and major ion species. Water quality data will be collected from networks of wells on the basis of an aquifer’s areal extent. This design feature generated sample populations of at least 30 wells for each of Oklahoma’s 15 largest aquifers. Smaller aquifers are represented by fewer wells but proportionally have more sites per areal extent (Table 1).

**Table 1. Sample Networks Based on Aquifer Areal Extent.**

<b>Areal Extent Category</b>	<b>Sample Site Well Density</b>	<b>Sample Sizes Generated</b>
> 5000 km <sup>2</sup>	1 well per 150 km <sup>2</sup> (6 Aquifers)	37 – 89
3001 – 5000 km <sup>2</sup>	1 well per 100 km <sup>2</sup> (5 aquifers)	33 – 48
1501 – 3000 km <sup>2</sup>	1 well per 75 km <sup>2</sup> (6 aquifers)	25 – 33
751 – 1500 km <sup>2</sup>	1 well per 50 km <sup>2</sup> (2 aquifers)	16 – 19
≤ 750 km <sup>2</sup>	2 aquifers	6 – 10

In the first year of sampling, 203 wells in 6 major aquifers were sampled for water quality and 299 wells for water level. When fully implemented, there will be 750 wells in the statewide groundwater quality network statewide. In addition, the OWRB’s annual groundwater level measurement program will be doubled in capacity (from around 530 to 1100 wells) and will be spatially redistributed. Work began on expanding the groundwater level measurement program in January 2014 with the addition of 87 new wells to the program. For one half of the water level network, manual measurements will become tri-annual events. In January 2014, 110 wells were added to the tri-annual measurement network. Additionally, over the 4-year baseline period, the OWRB plans to install 30-50 continuous water level



recorders to obtain daily or hourly measurements that are more sensitive to detecting seasonal changes (brought on by drought or variable climate conditions) than can be obtained by annual measurements. The 16 continuous water level recorders were installed in 8 aquifers across the state for this purpose in the first year of sampling.

***Intensive Investigations*** – Historically, work occurred in the area in the early years of the program, but no work of this nature has occurred in the last 5-6 years. Work was discontinued to address other monitoring needs as the costs to operate the program have continued to increase since program inception.

### **Program History/Overview**

Sampling of the numerous lakes, streams, and rivers across this state was initiated in the summer and fall of 1998. Lake sampling in connection with BUMP began in July of 1998. Sampling on numerous streams and rivers began in earnest in November of the same year. The two sampling programs, one for lakes and one for streams, had separate starting dates for a number of reasons. First, the OWRB had been conducting a lake-sampling program during the warmer summer months since 1990 as part of the Federal Clean Lakes Program. This historical lake sampling program was funded through federal dollars with the express purpose of determining lake trophic status. The trophic status of a lake can range from oligotrophic (low biological productivity) to hypereutrophic (excessive biological productivity). In general, the more productive a lake is the more water quality problems it is likely to experience. Federal dollars to fund this trophic state assessment of our state's lakes were discontinued in 1994. At that time, the OWRB searched for other funding sources, and through working with the Secretary of the Environment and the Oklahoma Conservation Commission, the OWRB was able to obtain a one-time federal CWA 319 nonpoint source grant to continue the lake trophic state assessment program. The OWRB subsequently initiated a quarterly lake sampling program in the spring of 1998 and was able to roll the existing lake program into BUMP.

The OWRB has developed USAPs for lakes and streams, which are essential if the state is to be consistent in identifying waters that are not meeting their assigned beneficial uses or are threatened. The OWRB has incorporated the USAP into Oklahoma Administrative Code (OAC) 785:46 to ensure that consistent determinations for impairments are made by all of the monitoring agencies.

The state must follow consistent procedures for listing waters as impaired. Using the OWRB Use Support Assessment Protocols, it has been possible for OWRB staff to assess whether threats or impairments are present in our waterways. With continued funding, identification of impaired waters will be accomplished on additional waters.

### **Results of Sampling Efforts**

It is essential that Oklahoma quantify impacts in a comprehensive and scientific manner and look for trends in water quality to identify waters that are not meeting their assigned beneficial uses. As a state, we must manage our water resources effectively and direct money to areas in most need of protection

or remediation to ensure that we continue to have good quality and sufficient quantity of water to meet our needs well into the 21st century. Comprehensive statewide data sets on rivers, streams and lakes for accurately assessing beneficial use impairments have not existed since 1993. With the implementation of monitoring on a large scale in October of 1998, this is no longer the case. With the availability of data, it is the desire of the Oklahoma Water Resources Board to provide the legislature and professional water managers with a comprehensive and up-to-date document for their review and approval. Administrative and Technical staff at the OWRB look forward to conducting the Beneficial Use Monitoring Program far into the future and providing the state of Oklahoma with the information it needs to make informed decisions that allow us to effectively manage our precious water resources.

Every two years, the OWRB analyzes data collected by BUMP and that data is used to identify if the waters of the state are meeting their assigned beneficial uses. If the stream/river segment is not meeting its beneficial use it is submitted for inclusion on the EPA's 303d list. The latest EPA approved 303d list of impaired waters can be found on the Oklahoma Department of Environmental Quality's website. [Oklahoma's 303d list](#)

## INTRODUCTION

Protecting Oklahoma's valuable water resources is essential to maintaining the quality of life for all Oklahomans. Used for a myriad of purposes, such as irrigation, hydropower, public/private water supply, navigation, and a variety of recreational activities, the state's surface and ground waters provide enormous benefits to Oklahoma from both an economic and recreational standpoint.

The National Recreation Lakes Study Commission (NRLSC) estimates that 32,100 people in Oklahoma are employed in support of activities related to our numerous man-made lakes. Also, according to the NRLSC, 18,718,000 visitor days are spent on Oklahoma lakes each year and recreation in and around these lakes contributes approximately \$2.2 billion each year to Oklahoma's economy. Of additional value are the recreational benefits associated with our smaller municipal/watershed projects, Oklahoma Department of Wildlife Conservation (ODWC) lakes, and rivers and streams throughout the state, which infuse millions into state economy through fishing, hunting, camping, and related activities. (In 1987, the Oklahoma Comprehensive Outdoor Recreation Plan estimated that approximately \$10.7 million was realized through camping and \$15.2 million through hunting/fishing). According to a 2011 federal study, fishing activities alone contribute \$730,503,000 dollars to Oklahoma's economy, not including the substantial ancillary costs associated with that extremely popular sport.

In addition to surface waters, abundant groundwater also fuels the state's economy, serving as supply for thousands of municipalities, rural water districts, industrial facilities, and agricultural operations. According to the 2012 Update of the Oklahoma Comprehensive Water Plan (OCWP), groundwater represents the primary water supply for hundreds of cities and towns across Oklahoma and comprises 44 percent of the total water used in the state each year. Groundwater resources also supply approximately 90 percent of the state's irrigation needs.

Oklahoma works to protect and manage its water resources through a number of initiatives, with the OWQS serving as the cornerstone of the state's water quality management programs. The OWRB is designated by state statute as the agency responsible for promulgating water quality standards and developing or assisting the other environmental agencies with implementation framework. State agencies are responsible for implementing the WQS as outlined by the OWRB through development of implementation plans. Protecting our waters is a cooperative effort between many state agencies, and because the WQS are utilized by all agencies and represent a melding of both science and policy, they are an ideal mechanism to assess the effectiveness of our diverse water quality management activities.

The WQS are housed in OAC 785:45 and consist of three main components: beneficial uses, criteria to protect beneficial uses, and an anti-degradation policy. An additional component, which is not directly part of the WQS but necessary to water resource protection, is a monitoring program. A monitoring program is required in order to ensure that beneficial uses are maintained and protected. If uses are not being maintained, the cause of that impairment must be identified and restoration activities should be implemented to improve water quality such that it can meet its assigned beneficial uses.

All state agencies are currently required to implement Oklahoma's Water Quality Standards within the scope of their jurisdiction through the development of an implementation plan specific for their agency.

This process, called WQS Implementation, allows the WQS to be utilized by other state agencies in the performance of their regulatory (statutory) responsibilities to manage water quality or to facilitate best management practice initiatives.

With the development of BUMP, the need for protocols to determine beneficial use impairment was identified. Development of these protocols would facilitate state agencies in directing their time and money to the areas in most need of protection or remediation. The OWRB, working in close concert with other state environmental agencies and concerned parties, developed USAPs to be used by all parties for assessing if waters were meeting their assigned beneficial uses. In addition, protocols were developed that could be coupled with a trend monitoring system to detect threatened waters before they become seriously impaired. Data collection efforts connected with protocol development and/or implementation also serves a vital purpose in refining numerical criteria currently included in the WQS and in developing appropriate numerical and narrative criteria for future WQS documents. It is essential that our waters meet their assigned uses and that WQS implementation protocols are appropriate. Please see Appendix A for the applicable Oklahoma Administrative Code (OAC) 785:46 related to the USAP. Final approval of the USAP occurred in 2000, and the OWRB has constantly worked every year since then to refine the existing protocols and pursue the addition or modification of USAP protocols to further enhance its utility and effectiveness.

Work to be performed towards development and implementation of the critical fourth component of the WQS program, monitoring, is the subject of this report. All sampling activities described and conducted as part of this program were consistent with the Oklahoma USAP. It is also important to note that they are consistent with Environmental Protection Agency (EPA) reporting requirements for the “Integrated Water Quality Monitoring and Assessment Report” [305(b) Report and 303(d) list], CWA §319 Nonpoint Source (NPS) Assessment, and §314 Lake Water Quality Assessment (LWQA).

### **Background and Problem Definition**

The State of Oklahoma has historically had numerous monitoring programs conducted by several state and federal agencies. In general, each environmental agency conducts their monitoring programs with some degree of integration and coordination with other state, municipal, or federal programs. Most water quality monitoring programs in Oklahoma are designed and implemented by each agency to collect information for one specific purpose or project (i.e., development of Total Maximum Daily Loads, the WQS process, lake trophic status determination, determining water quality impacts from point source dischargers, stream flow measurements, documenting success of best management practices, etc.). Information of this type is very specific to each individual project’s data quality objectives (DQOs) and is often limited to a very small geographic area. This document describes sampling activities the OWRB has historically conducted for lakes and efforts that are currently ongoing for lakes and streams across Oklahoma as part of a comprehensive, long-term, statewide Beneficial Use Monitoring Program (BUMP). The goal of the BUMP is to detect and quantify water quality trends, document and quantify impairments of assigned beneficial uses, and identify pollution problems before they become a pollution crisis.

## LAKES MONITORING PROGRAM

Lake trophic status is important from a water quality perspective because it is an indicator of potential nutrient impacts to a lake. In general, the higher the trophic state index (TSI) of a lake, the more nutrient loading into the system is occurring and the more productive the lake. One outcome of historical trophic assessment activity on Oklahoma's lakes was the prioritization of lakes most in need of remediation. Outcomes have included in-lake restoration activities or implementation of best management practices in the lake watershed. Results from the BUMP sampling effort should be viewed as a means to make relative comparisons between lakes and to determine beneficial use impairments based on USAP, detailed in Oklahoma Administrative Code (OAC) 785:46-15-5. Lakes with relatively poor water quality are identified, but that does not necessarily mean that these lakes have beneficial use impairments. Some lakes, due to the nature of their watershed and basin morphometry, may never attain the water quality of some of the state's more pristine waters. For example, an expectation that Broken Bow Lake and Great Salt Plains can attain the same level of water quality would be unrealistic, because these two lakes exhibit great differences in basin morphometry and substrate material and are located in totally different parts of the state. Soil types such as clays have a very small particle size such that the clay particulates are constantly re-suspended in the lake water column and never settle out, which is evident in some lakes across the state. In addition, the shallow nature of many of our lakes contributes to the lake bottom sediments being re-suspended in the water column due to wind action. Because so many factors affect the water quality of any given lake, comparing lakes from various parts of the state should only be viewed as a relative comparison.

For the 2012-2013 sampling season, BUMP identified lakes that had beneficial use impairments or threats. However, a data set to truly determine which lakes are not supporting their beneficial uses due to excess nutrients does not currently exist, nor have nutrient criteria for lakes been promulgated into the WQS. The OWRB has previously identified 21 lakes that are listed in the OWQS as NLWs. More intensive work on these lakes is required before a definitive assessment of nutrient impairment or non-support can be made. The OWRB recommends a Nutrient Impairment Study (NIS) be performed on identified NLW lakes. An NLW is defined in the WQS as "a watershed of a waterbody with a designated beneficial use which is adversely affected by excess nutrients as determined by Carlson's TSI (chlorophyll-a) of 62 or greater." If a lake is identified as having a TSI  $\geq 62$  based on chlorophyll-a, and the minimum data requirements are met (n=10 on lakes with <250 surface acres; n=20 on lakes with >250 surface acres), it is recommended for listing as an NLW through the WQS setting process. Currently, the parameters that are analyzed to determine whether or not there is beneficial use impairment or threat include turbidity, chlorophyll-a, dissolved oxygen, metals, chloride, sulfates, biological collections, total dissolved solids, and pH values. A brief discussion on lake monitoring procedures and methods is provided below with data results following.



## Materials & Methods for Lake Sampling

Data was collected quarterly on 31 lakes across the state from the fall of 2012 through the summer of 2013. Vertical water quality profiles were recorded at one meter intervals from the lake surface to the lake bottom for the following parameters: temperature, pH, dissolved oxygen, salinity, dissolved oxygen % saturation, oxidation-reduction potential (redox), specific conductivity, and total dissolved solids (TDS). A vertical profile was recorded for at least three sites per lake: in the central pool area near the dam (lacustrine zone), in the upper portion of the lake and in the major arms of the water body (riverine zone), and in the area between the lacustrine zone and the riverine zone (transitional zone). Turbidity values for each surface site were measured using a HACH portable turbidimeter. For lakes greater than 250 acres in size with only three routine chemical monitoring stations, additional sample sites have been established to ensure minimum data requirements are met. Secchi disk depths (in centimeters) were determined at all routine water chemistry sample sites. Water quality samples were collected at each site at the surface and one meter from the lake bottom at site 1, the dam, and preserved for analysis of nitrate nitrogen, nitrite nitrogen, ammonia nitrogen, Kjeldahl nitrogen, total phosphorus, chloride, sulfate, and total alkalinity. OWRB staff calculated total nitrogen based on laboratory-derived values. A Van Dorn sampler was used to collect samples near the lake bottom, just above the sediment-water interface, and grab samples were collected at the lake surface. At the dam site, a churn-splitter was used to split the surface sample for Quality Assurance (QA) purposes. Surface samples were also collected at all sites and analyzed for chlorophyll-a and pheophytin concentrations. Filtration and grinding (extraction of the chlorophyll-a collected in a filter with acetone) of the samples was performed immediately upon return to the OWRB lab. All chlorophyll-a samples were filtered, as stated in Standard Methods (APHA 1995), within 24 hours and stored for no more than 30 days in the freezer.

## Sample Lake Locations

Lakes sampled by the BUMP Lakes staff in 2012-2013 are shown in Figure 1. Lake locations are identified on the map and are shaded in different colors based on their calculated TSI values.

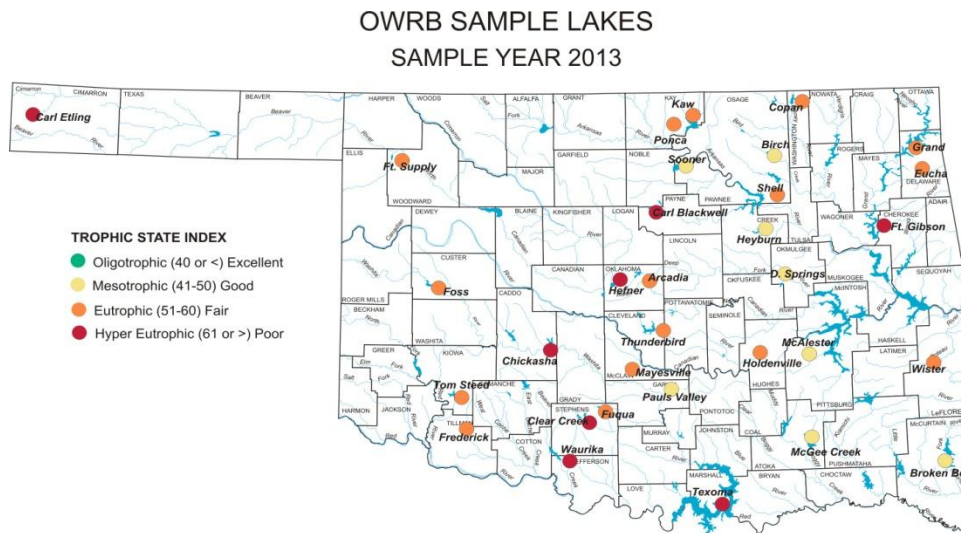


Figure 1. Lakes sampled by the Beneficial Use Monitoring Program in 2012-2013

## Lake Data Analysis Protocols

There are numerous methods available for determining the trophic status of lakes. The majority of the trophic state models rely on a mathematical calculation to generate a single numerical value that is then categorized in an assessment hierarchy. Numerous chemical, and in some cases biological data are utilized in the various trophic indices, which characterize the “trophic status” of a water body. Some of the commonly used water quality parameters utilized in trophic state indices include chlorophyll-a, secchi disc depth, total phosphorus, total nitrogen, aquatic macrophytes, organic nitrogen, turbidity, lake user surveys, and hypolimnetic oxygen depletion rates, etc. Most indices use one or more variables in the determination of trophic status with varying degrees of applicability to systems. The OWRB has traditionally used Carlson’s Trophic State Index (TSI) (Carlson, 1977) for reporting purposes, utilizing chlorophyll-a concentrations in calculating the lake trophic status. Carlson’s TSI equation using chlorophyll-a (in µg/L) as the trophic status indicator is as follows:

$$\text{TSI} = 9.81 \times \ln(\text{chlorophyll-a}) + 30.6.$$

In 1998, 1999, and 2000, the TSI was calculated using chlorophyll-a concentrations from the growing season (spring and summer only). Beginning in sample year 2001, an annualized trophic assessment was made as this was determined to be a more accurate reflection of trophic conditions for each waterbody. In order to make beneficial use determinations, minimum data requirements must be met as listed in OAC 785:46-15-3. A minimum of 20 samples is required on lakes greater than 250 surface acres, and a minimum of 10 samples on lakes with 250 surface acres and less. In 2001-2002, sites were added for chlorophyll-a and turbidity collections on lakes greater than 250 surface acres, in order to meet the minimum data requirements annually. Although data can be aggregated and historical values used, there was a concern in using data that was collected in the summer only as this would bias the data. An analysis of the limnological data collected on lakes is performed to determine the trophic state of each lake monitored. Chlorophyll-a concentrations for each lake sample site are determined and all values are averaged for each lake for all four sampling quarters. This annual chlorophyll-a value is then used in Carlson’s TSI equation to determine trophic status of the lake. Through use of this technique the presence of localized trophic conditions are minimized (i.e. the effects of a single elevated chlorophyll-a value is minimized in the calculation of the TSI). The derived TSI represents an accurate assessment of the water quality as a whole and individual isolated areas that may be impacted due to eutrophication will be minimized in the reported TSI. A list of lake trophic state categories and corresponding TSI numerical values are displayed in Table 2. There are other descriptive terms and subset categories for trophic status, like dystrophic; however, Carlson’s TSI has four major categories and these will be used to describe lake trophic status. Further discussion is included in each of the lake summaries as necessary. As stated earlier, prior to 2001, the TSI was based on growing season (spring and summer) chlorophyll-a concentrations. However, beginning in 2001, all TSI evaluations were based on annualized chlorophyll-a value for each lake and comparisons to previous TSI calculations will be specified as annual, growing season, or summer only evaluations. Prior to the onset of BUMP collections, lakes were sampled only in the summer and therefore the TSI was typically much higher than the annual assessments that are being done currently.

**Table 2. Lake Trophic State Categories**

Carlson TSI No.	Trophic State	Definition
≤ 40	Oligotrophic	Low primary productivity and/or low nutrient levels
41 - 50	Mesotrophic	Moderate primary productivity with moderate nutrient levels
51 – 60	Eutrophic	High primary productivity and nutrient rich
≥ 61	Hypereutrophic	Excessive primary productivity and excessive nutrients

The beneficial use support determinations for the lakes sampled were determined following guidelines outlined in the USAP promulgated into OAC 785-46: Subchapter 15. In general, the USAP states that environmental data must be collected to take seasonal conditions into consideration. A minimum of 20 samples is required on lakes more than 250 surface acres to assess beneficial use support for water quality parameters such as dissolved oxygen, pH and temperature. In addition, data more than ten years old should not be used for use support purposes unless more recent data is not available. A minimum of 10 samples is required on lakes or lake-arms of 250 surface acres or less. Samples may be aggregated to meet the minimum data requirements. For some parameters such as metals, organic compounds, or toxics, fewer samples are required. Toxicants (metals and organics) require a minimum of 5 samples to determine use support, but less than 5 samples can be used to determine if a use is partially supported or not supported. Furthermore, if at least 2 sample concentrations of a toxicant exceed the criteria prescribed in the WQS by two or more orders of magnitude, then the use is determined to be “not supporting”.

The USAP also addresses the issue of how the data should be used spatially for lake monitoring. In general, when determining what size area the data is representative of best professional judgment is used. Such things as major tributaries and major lake arms are considered when deciding the extent of the area that the data was applied to. Arms or portions of lake may be treated separately from the main body of a lake, however in most instances OWRB staff chose to deal with the lake as a single unit. Unless it was demonstrated to the contrary, a single site was not considered representative of an entire lake or an arm of the lake that was greater than 250 acres in size.

### ***Default Protocols***

USAP outlines the procedures for determining whether a set of data points for a particular variable support, partially support, or do not support a particular beneficial use. These protocols are constructed around two distinct types of numerical variables--short-term averages and long-term averages. In each case, samples collected for the range of water quality parameters are analyzed and aggregated in different ways.

Short-term average numerical variables measure variables with exposure periods of less than seven days (e.g., turbidity or a sample standard for chlorides). In other words, the set of samples that is being

analyzed considers each sample as a separate entity. For example, turbidity samples collected monthly from January through December are considered unique samples, and consequently, are not aggregated into a single sample for analysis but are considered a fraction of the whole.

Long-term average numerical variables measure variables with exposure periods of greater than or equal to seven days (e.g., yearly mean standard for chlorides). In other words, the set of samples that is being analyzed is considered a unique entity. For example, chloride samples collected monthly from January through December are aggregated through the calculation of a geometric mean. Use support determination for long-term numerical variables requires a three-step process:

1. Samples for a particular variable are aggregated into a geometric mean,
2. The geometric mean is compared to the prescribed criterion or screening level, and
3. Use support is determined to be supporting if the mean is less than the prescribed criterion or screening level or not supporting if the mean is greater than the prescribed criterion or screening level.

Because the long-term average compares only one value (the geometric mean) to the prescribed criterion or screening level, it cannot be considered partially supporting. In most instances, at least 10 samples are required to calculate a geometric mean.

#### ***Assessment of Fish & Wildlife Propagation Beneficial Use Support***

The Fish & Wildlife Propagation (FWP) beneficial use utilizes five different water quality variables to assess use support: dissolved oxygen (D.O.) concentration, toxicants, hydrogen ion activity (pH), and turbidity. For purposes of this report, only D.O., metals concentrations in the water column, pH, and turbidity will be used in the assessment.

The USAP for each parameter as it relates to USAP are located in OAC:45-5-12 and can be found on the OWRB website:

[www.owrb.ok.gov/standards](http://www.owrb.ok.gov/standards)

#### ***Assessment of Agriculture Beneficial Use Support***

The Agriculture beneficial use utilizes three variables to assess use support: total dissolved solids, chlorides, and sulfates. Numerical criteria for both yearly mean standards and sample standards are located in Appendix F of OAC 785:45. The yearly mean standard for each variable is compared to the geometric mean of the samples using a long-term average numerical protocol. The sample standard for each variable is also compared to each sample using a short-term average numerical protocol. A description of the USAP for the Agriculture beneficial use can be found on the OWRB website:

[www.owrb.ok.gov/standards](http://www.owrb.ok.gov/standards)

### ***Assessment of Aesthetics Beneficial Use Support***

The Aesthetics beneficial use is assessed using a couple of water quality parameters--true color and nutrients. The sample standard for each variable is compared to the each sample using a short-term average numerical protocol. Criteria are located in OAC 785:45-5-19 which can be found on the OWRB website:

[www.owrb.ok.gov/standards](http://www.owrb.ok.gov/standards)

### ***Assessment of Primary Body Contact Recreation (PBCR) Support***

The PBCR beneficial use utilizes the following microorganisms to assess use support: Escherichia coli (E. coli), and enterococci (Ent.). The criteria are located in OAC 785:45-5-16 and can be found on the OWRB website:

[www.owrb.ok.gov/standards](http://www.owrb.ok.gov/standards)

### **Lake Monitoring Results & Discussion**

A lake-wide annual average of the chlorophyll-a values were calculated for each lake and used in the final calculation of the TSI. A summary table is included (Table 3) to present the number of lakes and appropriate surface acre size for each of the four trophic categories in 2012-2013 as well as the percentages of the total. As shown in Table 3, ten lakes were hypereutrophic, fourteen were eutrophic, eight were mesotrophic, and one was oligotrophic. Of the total 262,207 surface acres sampled, 17,733 were classified hypereutrophic, 118,742 were classified as eutrophic, 120,004 were classified as mesotrophic and 5,728 acres were classified as oligotrophic. TSI results, county, surface area, and volume for lakes sampled in 2012-2013 are listed in Table 3.

**Table 3. Summary of Lake Trophic Status Results**

Trophic Status	Number of Lakes	Percent of Total Lakes	Surface Area ( Acres)	Percent of Total Surface Acres
Hypereutrophic	8	26%	120,571	7%
Eutrophic	16	52%	106,328	45%
Mesotrophic	7	23%	27,698	46%
Oligotrophic	0	0%	0	2%
Totals =	31	100%	254,597	100%

Although TSI based on the chlorophyll-a concentration is used for BUMP, a comparison of TSI values calculated with total phosphorus and secchi disk depth was generated and displayed on Table 4. Data displayed is for the growing season using the various water quality parameters that can be used in calculating Carlson's TSI. The chlorophyll-a and phosphorus TSI calculations were derived through results of regression analysis relating secchi disk depth to the other two variables.



Calculations using secchi disk depth may not be a good parameter to use in highly colored or turbid reservoirs where turbidity is inorganic in nature. Both are common components of Oklahoma lakes. Additionally, phosphorus may not be an accurate variable to use in calculating the TSI in lakes that are not phosphorus-limited or those that are highly turbid due to clay particulates. Carlson (1977) stated chlorophyll-a seems to be the most acceptable parameter to use in calculating TSI, especially during the growing season, and for estimating algal biomass. In accordance with historical calculations at OWRB and Carlson's suggestion to measure chlorophyll-a, rather than secchi disk depth or total phosphorus, it is the variable utilized for BUMP's TSI calculations. The values displayed in Table 4 were calculated using lake-wide annual averages for all three parameters.

**Table 4. List of Lakes Sampled in Sample Year 2012-2013**

LAKE NAME	COUNTY	SURFACE AREA	VOLUME	TSI	YEAR SAMPLED	THREATS OR IMPAIRMENTS	CARLSON'S TSI
ARCADIA	OKLAHOMA	1,820	27,520	59	2013	TURBIDITY, CHLOR-A	Eutrophic
BIRCH	OSAGE	1,137	19,200	49	2013	DO, TURBIDITY	Mesotrophic
BROKEN BOW	MCCURTAIN	14,200	918,070	45	2013	DO, PH	Mesotrophic
CARL BLACKWELL	PAYNE	3,370	61,500	61	2013	TURBIDITY, PH, NLW	Hypereutrophic
CARL ETLING	CIMARRON	159	1,717	68	2013	TURBIDITY CHLOR-A	Hypereutrophic
CHICKASHA	CADDO	820	41,080	63	2013	NLW	Hypereutrophic
CLEAR CREEK	STEPHENS	722	7,710	62	2013	SULFATES	Hypereutrophic
COPAN	WASHINGTON	4,850	43,400	58	2013	TURBIDITY CHLOR-A	Eutrophic
EUCHA	DELAWARE	2,860	79,600	55	2013	DO, CHLOR-A, NLW	Eutrophic
FORT GIBSON	CHEROKEE	14,900	355,200	61	2013	DO, TURBIDITY, NLW	Hypereutrophic
FORT SUPPLY	WOODWARD	1,820,	13,900	60	2013	TURBIDITY CHLOR-A, NLW	Eutrophic
FOSS	CUSTER	8,800	256,200	54	2013		Eutrophic

LAKE NAME	COUNTY	SURFACE AREA	VOLUME	TSI	YEAR SAMPLED	THREATS OR IMPAIRMENTS	CARLSON'S TSI
FREDERICK	TILLMAN	925	9,526	55	2013	TURBIDITY	Eutrophic
FUQUA	STEPHENS	1,500	21,100	52	2013	TURBIDITY	Eutrophic
GRAND	MAYES	46,500	1,672,000	55	2013	DO, TURBIDITY	Eutrophic
HEFNER	OKLAHOMA	2,500	75,000	62	2013	DO	Hypereutrophic
HEYBURN	CREEK	880	7,105	48	2013	DO, TURBIDITY	Mesotrophic
HOLDENVILLE	HUGHES	550	11,000	58	2013	DO, TURBIDITY, CHLOR-A	Eutrophic
KAW	OSAGE	17,040	428,600	58	2013	TURBIDITY	Eutrophic
MAYESVILLE	McCLAIN	302	2,082	58	2013	TURBIDITY	Eutrophic
McALESTER	PITTSBURG	1,521	13,398	48	2013	TURBIDITY	Mesotrophic
McGEE CREEK	ATOKA	3,810	113,930	49	2013	DO, PH	Mesotrophic
PAULS VALLEY	GARVIN	750	8,730	44	2013	TURBIDITY	Mesotrophic
PONCA	KAY	805	14,440	56	2013	DO, CHLOR-A	Eutrophic
SHELL	OSAGE	573	9,500	54	2013	DO	Eutrophic
SOONER	PAWNEE	5,400	149,000	41	2013		Mesotrophic
TEXOMA	BRYAN	88,000	2,643,300	61	2013	DO, TURBIDITY	Hypereutrophic
THUNDERBIRD	CLEVELAND	6,070	119,600	56	2013	DO, CHLOR-A TURBIDITY, NLW	Eutrophic
TOM STEED	KIOWA	6,400	88,9970	58	2013	CHLOR-A, TURBIDITY,	Eutrophic
WAURIKA	JEFFERSON	10,100	203,100	61	2013	TURBIDITY CHLOR-A	Hypereutrophic
WISTER	LEFLORE	7,333	62,360	60	2013	DO, CHLOR-A, PH TURBIDITY, NLW	Eutrophic

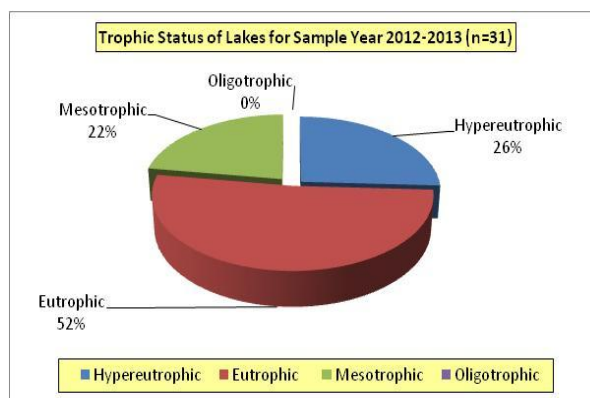
**Table 5. Comparison of Methods Used to Calculate Carlson's Trophic State Index for 2012-2013**

	CHL-A	Trophic State	TOTAL P	Trophic State	SECCHI	Trophic State
ARCADIA	59	Eutrophic	54	Eutrophic	72	Hypereutrophic
BIRCH	49	Mesotrophic	30	Oligotrophic	65	Hypereutrophic
BROKEN BOW	45	Mesotrophic	32	Oligotrophic	48	Mesotrophic
CARL BLACKWELL	61	Hypereutrophic	49	Mesotrophic	75	Hypereutrophic
CARL ETLING	68	Hypereutrophic	72	Hypereutrophic	79	Hypereutrophic
CHICKASHA	63	Hypereutrophic	44	Mesotrophic	67	Hypereutrophic
CLEAR CREEK	62	Hypereutrophic	43	Mesotrophic	72	Hypereutrophic
COPAN	58	Eutrophic	66	Hypereutrophic	83	Hypereutrophic
EUCHA	55	Eutrophic	35	Oligotrophic	58	Eutrophic
FORT GIBSON	61	Hypereutrophic	74	Hypereutrophic	64	Hypereutrophic
FORT SUPPLY	60	Eutrophic	68	Hypereutrophic	81	Hypereutrophic
FOSS	54	Eutrophic	47	Mesotrophic	70	Hypereutrophic
FREDERICK	55	Eutrophic	66	Hypereutrophic	92	Hypereutrophic
FUQUA	52	Eutrophic	35	Oligotrophic	67	Hypereutrophic
GRAND	55	Eutrophic	66	Hypereutrophic	64	Hypereutrophic
HEFNER	62	Hypereutrophic	70	Hypereutrophic	68	Hypereutrophic
HEYBURN	48	Mesotrophic	69	Hypereutrophic	91	Hypereutrophic
HOLDENVILLE	58	Eutrophic	39	Oligotrophic	71	Hypereutrophic
KAW	58	Eutrophic	73	Hypereutrophic	70	Hypereutrophic
MAYESVILLE	58	Eutrophic	72	Hypereutrophic	79	Hypereutrophic
MCALESTER	48	Mesotrophic	73	Hypereutrophic	94	Hypereutrophic
MCGEE CREEK	49	Mesotrophic	34	Oligotrophic	56	Eutrophic
PAULS VALLEY	44	Mesotrophic	41	Mesotrophic	71	Hypereutrophic
PONCA	56	Eutrophic	45	Mesotrophic	68	Hypereutrophic
SHELL	54	Eutrophic	44	Mesotrophic	65	Hypereutrophic
SOONER	41	Mesotrophic	28	Oligotrophic	54	Eutrophic
TEXOMA	61	Hypereutrophic	49	Mesotrophic	65	Hypereutrophic
THUNDERBIRD	56	Eutrophic	49	Mesotrophic	74	Hypereutrophic
TOM STEED	58	Eutrophic	65	Hypereutrophic	80	Hypereutrophic
WAURIKA	61	Hypereutrophic	70	Hypereutrophic	77	Hypereutrophic
WISTER	60	Eutrophic	54	Eutrophic	74	Hypereutrophic

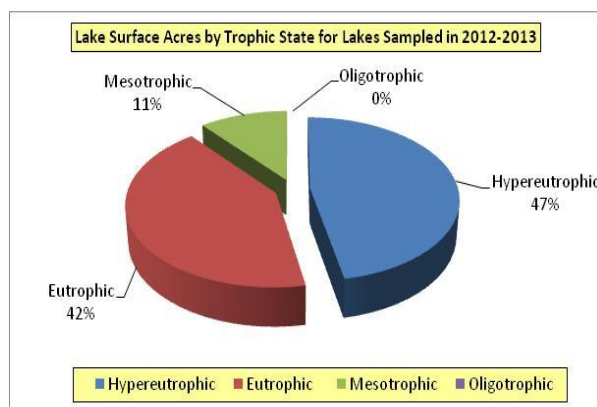
Using the chlorophyll-a methodology, four lakes were hypereutrophic, twenty- lakes were eutrophic, ten lakes were mesotrophic, and none were oligotrophic. Using total phosphorus and secchi disk depth in the TSI calculation produced a much different result although classification using these two variables is somewhat comparable to each other. Using the total phosphorus variable for TSI, six lakes were hypereutrophic, thirteen lakes were eutrophic, thirteen lakes were mesotrophic and two were oligotrophic. Using the secchi disk depth variable for TSI twenty-four lakes were identified as hypereutrophic, none lakes were eutrophic, one lake was mesotrophic and zero lakes were oligotrophic. The TSI values calculated using secchi depth were the highest of the three variables. For example, Heyburn Lake was classified as mesotrophic using chlorophyll-a concentration, eutrophic using total phosphorus as the, and hypereutrophic using secchi disk depth. Most of the TSI values were lowest using the chlorophyll-a concentration; therefore, it seems reasonable to say that this parameter is the most conservative variable to use.

### Results of Lakes Sampling Efforts

Data was collected by the OWRB on a quarterly basis for 31 lakes from the October of 2012 through August of 2013. The results of the sampling efforts are summarized below. As shown in Figure 2, 26% of lakes sampled were determined to have serious water quality nutrient concerns based upon their classification as hypereutrophic. Lakes classified as hypereutrophic have the potential for beneficial use impairments due to low dissolved oxygen concentrations, taste and odor problems, nutrient inputs, excessive productivity, and general lake aesthetics. Hypereutrophic waters are adversely impacted primarily by excessive nutrients and primary productivity and should be monitored intensively in the future to document the presence or absence of “beneficial use impairments.” Fifty-two percent of the lakes sampled were classified as eutrophic, characterized by high primary productivity and nutrient rich conditions. A eutrophic lake also has the potential for beneficial use impairments, though the potential is less than for hypereutrophic waters. Mesotrophic waters have a small potential for beneficial use impairments and overall are representative of good water quality, low to moderate levels of nutrients, and productivity. Of the lakes sampled, 22% were classified as mesotrophic. Oligotrophic waters have very low levels of primary productivity and usually low concentrations of nutrient constituents. In Oklahoma, oligotrophic waters are either very clear waters with little nutrient inputs and genuinely good water quality conditions, or the waters are



**Figure 2. Trophic Status of Lakes for Sample Year 2012-2013**

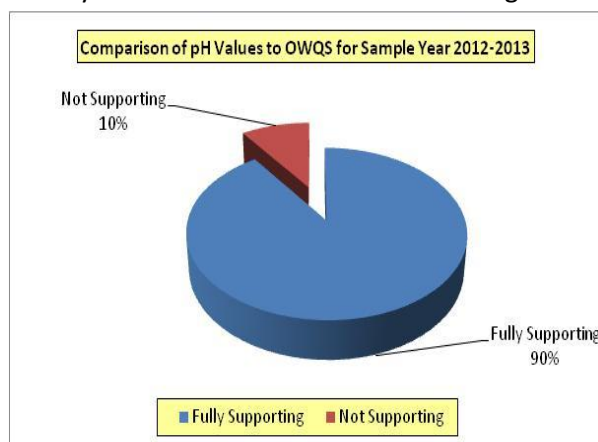


**Figure 3. Lake Surface Acres by Trophic Status for Lakes Sampled in 2012-2013**

very turbid with poor water clarity with the absence of sufficient ambient light inhibiting lake productivity. None of the 31 lakes sampled was classified as oligotrophic. Based on the results for trophic state index calculations, 47% of the waters sampled were exhibiting high to excessive levels of primary productivity and nutrient rich conditions characteristic of eutrophic and hypereutrophic waterbodies.

The distribution changes somewhat when the lake surface acres for each are classified into the corresponding trophic status. Results in Figure 3 are different than Figure 1, indicating the lakes classified as hypereutrophic were larger in surface acres than the lakes classified as mesotrophic and eutrophic. Lake trophic status, when broken out by the number of lake surface acres in each trophic state category, finds 42% of all surface acres sampled were eutrophic, 11% mesotrophic, 47% hypereutrophic, and 0% oligotrophic. One of the largest lakes sampled in 2012-2013, Lake Texoma, was classified as hypereutrophic, which skewed the surface acres percentages heavily towards the hypereutrophic category. In general, the larger lakes in the state have more extensive watersheds and are generally deeper than smaller lakes, which increase the likelihood of beneficial use impairments being present since a larger surface area is available. During stratification, the larger/deeper lakes have a greater portion of the water column that becomes anoxic for long periods of time, which also increases the potential for nutrient release from sediments. It is obvious that many lakes in Oklahoma are experiencing adverse environmental impacts. However, with the available data it is not possible to adequately assess if lakes are meeting their assigned beneficial uses as they relate to nutrients. At this time, 21 lakes have been identified by the OWRB as “Nutrient-Limited Watersheds” (NLW) in the WQS and efforts should be taken to definitively determine if NLW waters are meeting their uses through initiation of a nutrient impairment study to definitively determine the presence or absence of nutrient impairments in our NLW lakes. NLW are lakes with a TSI  $\geq 62$ , based on Carlson’s trophic state classification system and using chlorophyll-a as the trophic state indicator.

As stated previously, the OWRB is currently monitoring 30 to 40 lakes with repeat sampling on each scheduled to occur every few years. Prior to 1998, data was only collected once for each lake during the summer months. In 1998, the OWRB began collecting data quarterly. This greatly improved the data set available to resource managers. Lakes that are identified as hypereutrophic should be sampled more often than quarterly, especially during the warmer months. Lakes identified as NLW should also be sampled more intensively to confirm if a water quality threat or impairment is present. Minimum data requirements as listed in USAP were closely followed to make beneficial use determinations. All impairments are listed in the Integrated Water Quality Report that is updated every two years. Toxicity concerns, if present, are listed as provided by the ODEQ as part of their Rotating Lakes Toxics Program and/or through sampling



**Figure 1. Comparison of pH values to OWQS for Sample Year 2012-2013**



conducted by the OWRB.

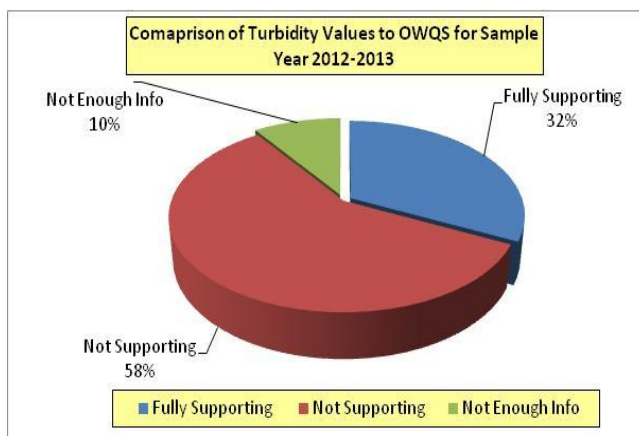
The pH was examined and compared to the WQS for pH, 6.5 to 9 units, listed in 785:45-5. Twenty-eight of the 31 lakes sampled in the 2012-2013 sampling season were listed as supporting the Fish & Wildlife Propagation (FWP) beneficial use based on pH values and one lake was listed as not supporting (Figure 4).

Turbidity, in Nephelometric turbidity units (NTU), was measured via a HACH turbidimeter for all sites on each lake sampled to identify lakes that exceeded the WQS of 25 NTU. Of the 31 lakes sampled in the 2012-2013 sampling season, 18 lakes were not supporting their FWP beneficial use, 3 did not have enough information and 10 were fully supporting the use based on turbidity values (see Figure 5).

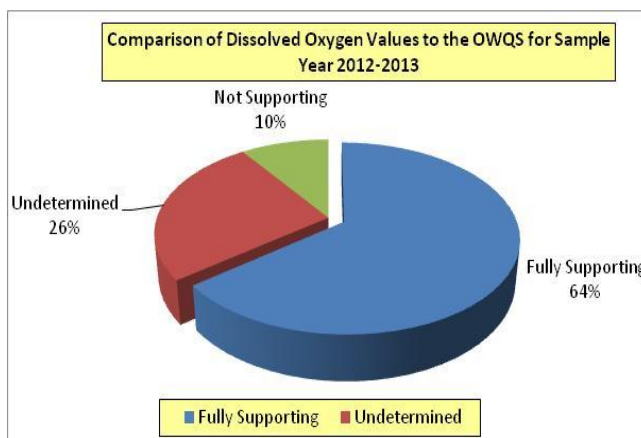
For dissolved oxygen (D.O.) vertical profiles recorded with a YSI® were examined to determine if anoxic conditions were present and whether or not the lake was meeting the FWP beneficial use. The USAP lists D.O. violations as values below 2.0 mg/L in > 70% of the entire water column, undetermined if between 50% and 70% of the water column and fully supporting if 50% of the water column is below 2.0 mg/L. Of the 31 lakes sampled in the 2012-2013 sampling season, only three lakes were not supporting the FWP beneficial use based on anoxic conditions, primarily in the summer season (See Figure 6.).

Chloride and sulfate water quality parameters were also added to the lake sampling program in year 2003-2004. These additions allow for an assessment of the agriculture beneficial use of our lakes and much like metals sampling is a sampling effort that we plan on continuing into the future. The chloride and sulfate data revealed that 27 of the 31 lakes sampled were supporting the Agriculture beneficial use (See Figure7).

Bacteria analysis indicated 27 of the lakes sampled were supporting their Primary Body Contact Recreation beneficial use and 4 did not have enough information (See Figure 8).

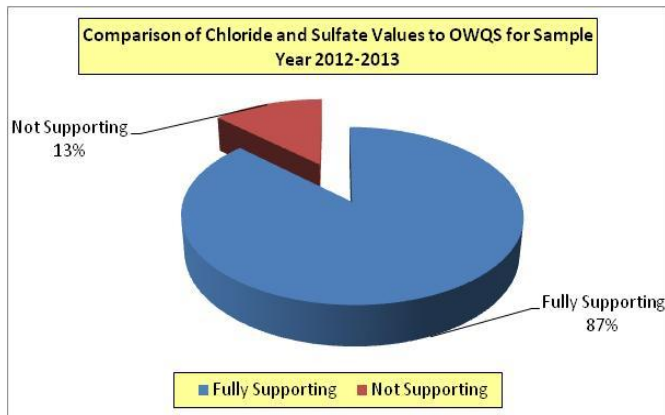


**Figure 2. Comparison of Turbidity Values to OWQS for Sample Year 2012-2013**

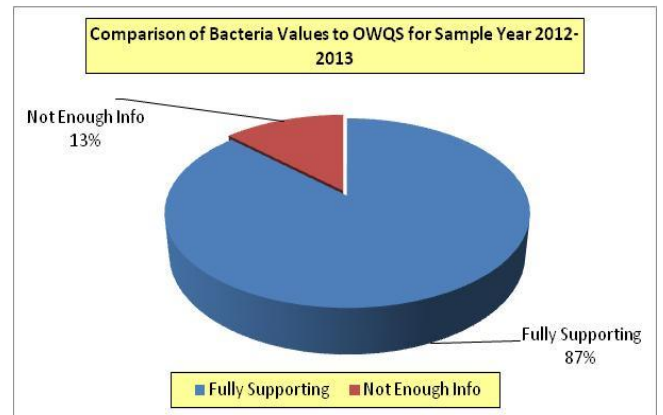


**Figure 3. Comparison of Dissolved Oxygen Values to OWQS for Sample Year 2012-2013**

It is the intent of the OWRB monitoring program to pursue adding additional monitoring parameters to the lake sampling initiative to allow all beneficial uses to be assessed. It is also the OWRB's intent to accomplish this without having to reduce the number of lakes sampled annually.



**Figure 5. Comparison of Chloride & Sulfate Values to OWQS for Sample Year 2012-2013**



**Figure 4. Comparison of Bacteria Values to OWQS for Sample Year 2012-2013**

*Each of the following pages represents a summary of the conditions for a given sample year. An interactive map on each page allows users to retrieve data for both current and past sample locations.*

## LITERATURE CITED

APHA. 2005. Standard methods for the examination of water and wastewater. 21st ed.

American Public Health Association, Washington D.C.

Carlson, R.E. 1977. "A trophic state index for lakes". *Limnology and Oceanography*. 22:361-369.

Hounslow, A.W., 1995, *Water Quality Data Analysis and Interpretation*: Lewis Publishers, Boca Raton, FL.

Mueller, D.K., Hamilton, P.S., Hales, D.R., Hitt, K.J., and Ruddy, B.C., 1995, *Nutrients in Ground Water and Surface Water of the United States--An Analysis of Data Through 1992*: U.S. Geological Survey Water-Resources Investigations Report 95-4031, 74 p.

Oklahoma Department of Tourism and Recreation. "Oklahoma Statewide Comprehensive Outdoor Recreation Plan - This Land is Your Land". 1987. 216pp.

Oklahoma Water Resources Board. "Lakes of Oklahoma". May 2012. 179pp.

Oklahoma Water Resources Board. "2012 Update of the Oklahoma Comprehensive Water Plan " February 2012.

Oklahoma Water Resources Board. "Use Support Assessment Protocols". July 2011.

OAC 785:46

U.S. Environmental Protection Agency. "The Lake and Reservoir Restoration Guidance Manual". August 1990. 326pp.

U.S. Department of Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. "2011 National Survey of Fishing, Hunting, and Wildlife Associated Recreation." 2011. 82 pp.

Wetzel, Robert G. "Limnology – Second Edition". 1983. 767pp.

## **APPENDIX A**

### **Oklahoma's Use Support Assessment Protocols**

Amendments effective as of 07/01/2011

## **TITLE 785. OKLAHOMA WATER RESOURCES BOARD**

### **CHAPTER 46. IMPLEMENTATION OF OKLAHOMA'S WATER QUALITY STANDARDS**

#### **SUBCHAPTER 15. USE SUPPORT ASSESSMENT PROTOCOLS**

[http://www.owrb.ok.gov/util/rules/pdf\\_rul/current/Ch46.pdf#page=18](http://www.owrb.ok.gov/util/rules/pdf_rul/current/Ch46.pdf#page=18)

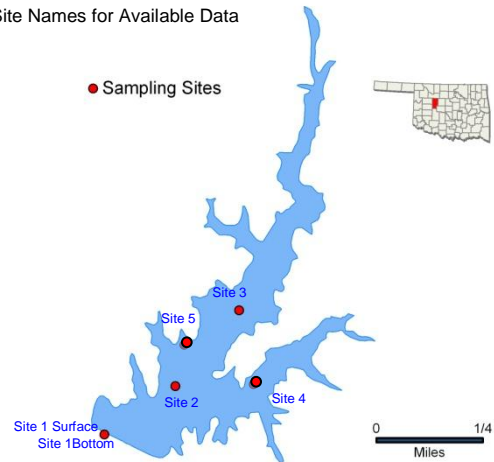


# American Horse

Click Site Names for Available Data

Sample Period	Times Visited	Sampling Sites
October 2007 - July 2008	4	3

General	Location	Blaine County	Click map for site data
	Impoundment	1966	
	Area	100 acres	
	Capacity	2,200 acre-feet	
	Purposes	Recreation	



Parameters	<b>Parameter</b> ( <a href="#">Descriptions</a> )		<b>Result</b>	<b>Notes/Comments</b>
	Average Turbidity		13 nephelometric turbidity units (NTU)	Lake-wide average
	Average True Color		54 units	25% of values > OWQS of 70
	Average Secchi Disk Depth		118 cm	
	Water Clarity Rating		good	
	Trophic State Index		38	Previous value = 49
	Trophic Class		oligotrophic	
	Profile	Salinity	0.07 - 0.13 ppt	
		Specific Conductivity	151.5 - 274.7 µS/cm	
		pH	7.01 - 8.08 pH units	
		Oxidation-Reduction Potential	-4 to 551 mV	
		Dissolved Oxygen	Up to 60% of water column < 2 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.38 mg/L to 1.07 mg/L	
		Surface Total Phosphorus	0.018 mg/L to 0.053 mg/L	
		Nitrogen to Phosphorus Ratio	19:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	NS	NEI							
	Aesthetics					S	NS					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
<b>S = Fully Supporting</b> <b>NS = Not Supporting</b> <b>NEI = Not Enough Information</b>		Notes	Lab accident – not enough data to make an assessment									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

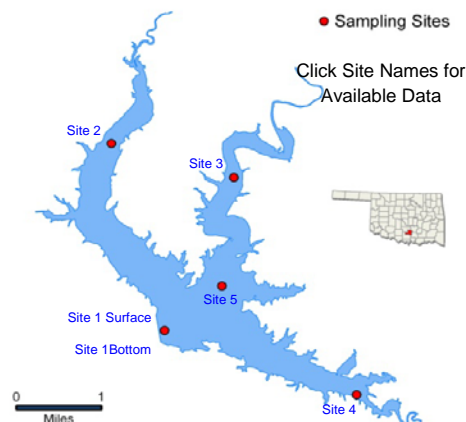
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Arbuckle

Sample Period	Times Visited	Sampling Sites
October 2010-June 2011	4	5

General	Location	Murray County	Click map for site data
	Impoundment	1967	
	Area	2,350 acres	
	Capacity	72,400 acre-feet	
	Purposes	Water Supply, Flood Control, Fish and Wildlife, and Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	5 NTU	100% of values < OWQS of 25 NTU (n=20)
		Average Secchi Disk Depth	177 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	7 mg/m3	
		Trophic State Index	50	Previous value = 59
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.03-0.23 ppt	
		Specific Conductivity	88.7-454.3 µS/cm	
		pH	6.77-8.28 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-68-406 mV	
		Dissolved Oxygen	Up to 57% of water column < 2.0 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.35 mg/L to 0.57 mg/L	
		Surface Total Phosphorus	0.013 mg/L to 0.027 mg/L	
		Nitrogen to Phosphorus Ratio	26:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E.coli	Chlor-a
	Fish & Wildlife Propagation	S	S	NS	S							
	Aesthetics					S	*					
	Agriculture							*	*	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	Notes *Did not collect for these parameters										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

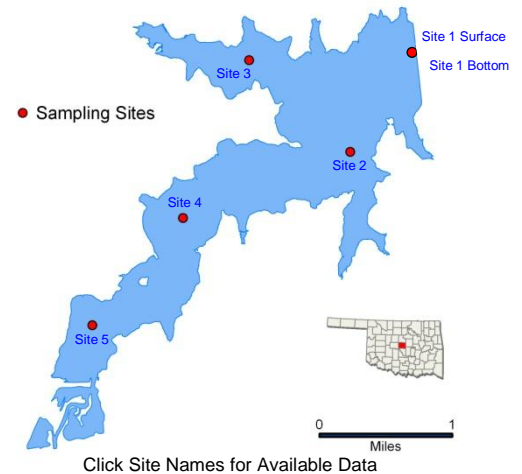
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Arcadia

Sample Period	Times Visited	Sampling Sites
October 2012 - August 2013	4	5

General	Location	Oklahoma County	Click map for site data
	Impoundment	1986	
	Area	1,820 acres	
	Capacity	27,520 acre-feet	
	Purposes	Water Supply, Flood Control, Recreation	



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	24 NTU	20% of values > OWQS of 25 NTU
		Average Secchi Disk Depth	44 cm	
		Water Clarity Rating	average	
		Chlorophyll-a	18 mg/m3	
		Trophic State Index	59	Previous TSI = 58
		Trophic Class	Eutrophic	
	Profile	Salinity	0.11 – 0.22 ppt	
		Specific Conductivity	236 - 462 µS/cm	
		pH	7.47 - 8.81 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	36 to 4123mV	
		Dissolved Oxygen	Up to 60% of water column < 2 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.77 mg/L to 1.62 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.100 mg/L	
		Nitrogen to Phosphorus Ratio	32:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	S							
	Aesthetics						S	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												NS
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

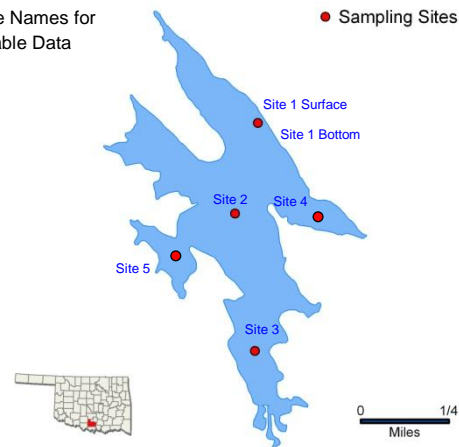
OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Ardmore City

Click Site Names for  
Available Data



Sample Period			Times Visited	Sampling Sites
October 2006 - August 2007			4	3
General	Location	Carter County		Click map for site data
	Impoundment	1910		
	Area	142 acres		
	Capacity	600 acre-feet		
	Purposes	Recreation		

Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		10 NTU	100% of values < OWQS of 25 NTU
	Average True Color		25 units	100% of values < OWQS of 70
	Average Secchi Disk Depth		106 cm	
	Water Clarity Rating		excellent	
	Trophic State Index		52	
	Trophic Class		eutrophic	
	Profile	Salinity	0.13 – 0.18 ppt	
		Specific Conductivity	278.6 – 365 µS/cm	
		pH	7.16 - 8.85 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	48 to 436 mV	
		Dissolved Oxygen	Up to 63% of water column < 2 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.32 mg/L to 0.62 mg/L	
		Surface Total Phosphorus	0.009 mg/L to 0.035 mg/L	
		Nitrogen to Phosphorus Ratio	22:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterococci & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	NS	S							
	Aesthetics						S	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes										

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

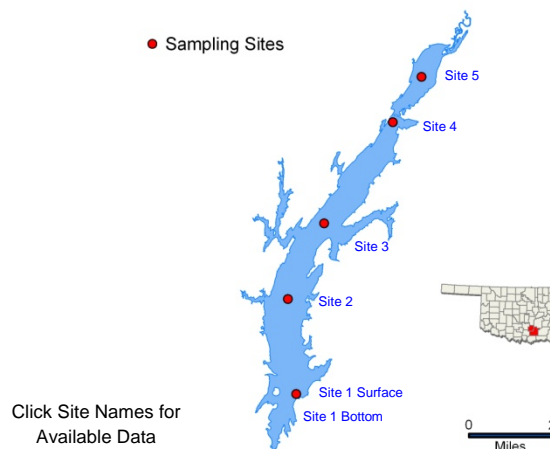
mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci

# Atoka

Sample Period	Times Visited	Sampling Sites
November 2011 - August 2012	3	5

General	Location	Atoka County	Click map for site data
	Impoundment	1964	
	Area	5,700 acres	
	Capacity	125,000 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	115 NTU	100% of values > OWQS of 25 NTU
		Average Secchi Disk Depth	17 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	16 mg/m3	
		Trophic State Index	58	
		Trophic Class	Eutrophic	
	Profile	Salinity	0.05 – 0.06 ppt	
		Specific Conductivity	103 – 106 µS/cm	
		pH	6.98 – 8.27 pH units	All recorded values within standards
		Oxidation-Reduction Potential	192 to 538 mV	
		Dissolved Oxygen	All data are above screening level of 2.0 mg/L	
	Nutrients	Surface Total Nitrogen	0.47 mg/L to 1.73 mg/L	
		Surface Total Phosphorus	0.047 mg/L to 0.226 mg/L	
		Nitrogen to Phosphorus Ratio	11:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS*	S	S	S							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												NS
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*N/A – parameters not collected in current sample year. * Although 100% of the turbidity samples exceed 25NTU, an assessment for the current sample year cannot be made due to minimum data requirements not being met.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

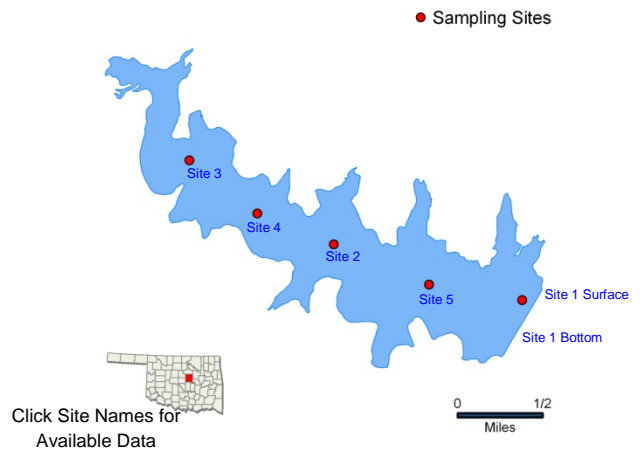
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Bell Cow

Sample Period	Times Visited	Sampling Sites
October 2011 - July 2012	4	3

General	Location	Lincoln County	Click map for site data
	Impoundment	1990	
	Area	1,153 acres	
	Capacity	15,613 acre-feet	
	Purposes	Water Supply, Flood Control, Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	23 NTU	50% of values > OWQS of 25 NTU
		Average Secchi Disk Depth	31 cm	
		Water Clarity Rating	Fair	
		Chlorophyll-a	18 mg/m3	
		Trophic State Index	59	Previous Value = 52
		Trophic Class	Eutrophic	
	Profile	Salinity	0.17 - 0.21 ppt	
		Specific Conductivity	359 - 429 $\mu$ S/cm	
		pH	7.27 - 8.88 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	52 to 536 mV	
		Dissolved Oxygen	Up to 60% of water column < 2 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.93 mg/L to 1.13 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.043 mg/L	
		Nitrogen to Phosphorus Ratio	53:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	*	S							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	<div>*N/A – parameters not collected in current sample year.</div> <div>*50-70% range is undetermined for DO.</div>									

NTU = nephelometric turbidity units  
 $\mu$ S/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

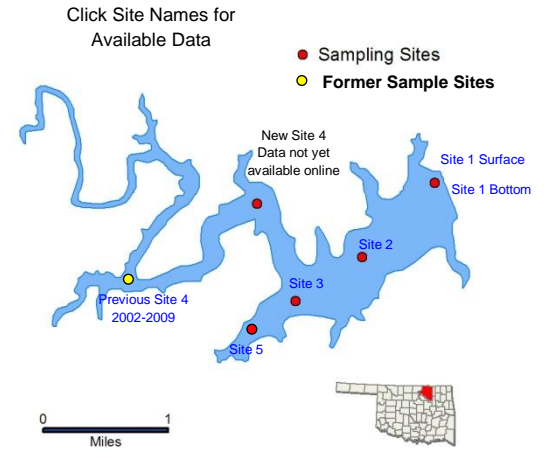
mg/L = milligrams per liter  
 $\mu$ S/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Birch

Sample Period	Times Visited	Sampling Sites
October 2012-August 2013	4	4

General	Location	Osage County
	Impoundment	1977
	Area	1,137 acres
	Capacity	19,200 acre-feet
	Purposes	Water Supply, Recreation, Flood Control, Water Quality Control and Fish and Wildlife



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	11 NTU	6% of values > OWQS of 25 NTU (n=16)
		Average Secchi Disk Depth	70 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	7 mg/m3	
		Trophic State Index	49	Previous value = 51
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.07 – 0.14 ppt	
		Specific Conductivity	149 – 301 µS/cm	TDS=12.8 g/L
		pH	6.17 – 8.43 pH units	
		Oxidation-Reduction Potential	-91 to 287 mV	
		Dissolved Oxygen	Up to 54% of water column < 2.0 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.80 mg/L to 0.99 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.009 mg/L	
		Nitrogen to Phosphorus Ratio	151:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	NS	S							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	Notes *Did not collect for these parameters.										

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci



# Bixhoma

## Sample Period

October 2005 - July 2006

## Times Visited

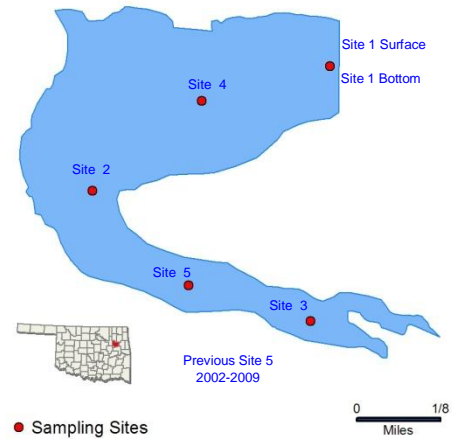
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## Sampling Sites

3

## General

Location	Wagoner County	Click map for site data
Impoundment	1965	
Area	110 acres	
Capacity	3,130 acre-feet	
Purposes	Water Supply, Recreation	



## Parameters

### Parameter ([Descriptions](#))

### Result

### Notes/Comments

Average Turbidity	5 NTU	100% of values < OWQS of 25 NTU
Average True Color	23 units	100% of values < OWQS of 70
Average Secchi Disk Depth	146 cm	
Water Clarity Rating	excellent	
Trophic State Index	45	
Trophic Class	mesotrophic	
Salinity	0.01 – 0.05 ppt	
Specific Conductivity	47.4 – 127.5 µS/cm	
pH	6.44 – 8.63 pH units	Only 3 (2.3%) values < 6.5 pH units
Oxidation-Reduction Potential	111 - 482 mV	
Dissolved Oxygen	Up to 56% of water column < 2 mg/L in the fall & 67% in July	
Surface Total Nitrogen	0.25 mg/L to 0.45 mg/L	
Surface Total Phosphorus	0.010 mg/L to 0.026 mg/L	
Nitrogen to Phosphorus Ratio	22:1	Phosphorus limited

## Beneficial Uses

[Click to learn more about Beneficial Uses](#)

Turbidity

pH

Dissolved Oxygen

Metals

TSI

True Color

Sulfates

Chlorides

Total Dissolved Solids

Enteroc. & E. coli

Chlor-a

Fish & Wildlife Propagation

S

S

NS

Aesthetics

S

S

Agriculture

S

S

S

Primary Body Contact Recreation

S

Public & Private Water Supply

S = Fully Supporting  
NS = Not Supporting  
NEI = Not Enough Information

Notes

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
µS/cm = microsiemens/cm

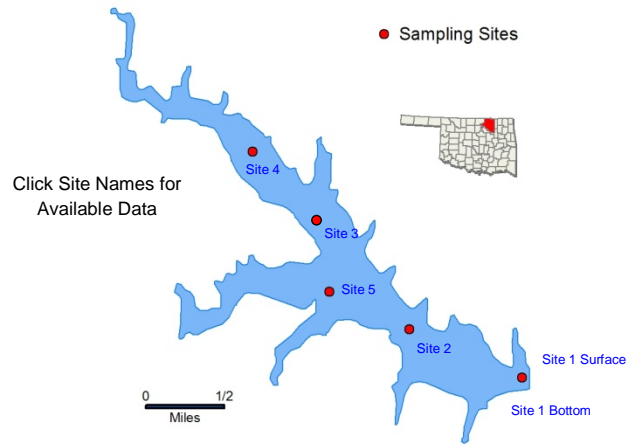
ppt = parts per thousand  
En = Enterococci



# Bluestem

Sample Period	Times Visited	Sampling Sites
December 2011 - July 2012	4	4

General	Location	Osage County	Click map for site data
	Impoundment	1958	
	Area	762 acres	
	Capacity	17,000 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	28 NTU	25% of values > OWQS of 25 NTU (n=16)
		Average Secchi Disk Depth	38 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	6 mg/m3	
		Trophic State Index	48	
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.00 – 0.16 ppt	
		Specific Conductivity	271 – 327 µS/cm	
		pH	7.02 – 8.27 pH units	
		Oxidation-Reduction Potential	118 - 473 mV	
		Dissolved Oxygen	Up to 67% of water column < 2.0 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.36 mg/L to 0.98 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.041 mg/L	
		Nitrogen to Phosphorus Ratio	44:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En terro.& E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	*	*							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	<i>S = Fully Supporting</i> <i>NS = Not Supporting</i> <i>NEI = Not Enough Information</i>		Notes	*N/A – parameters not collected in current sample year. *50-70% range is undetermined for DO.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

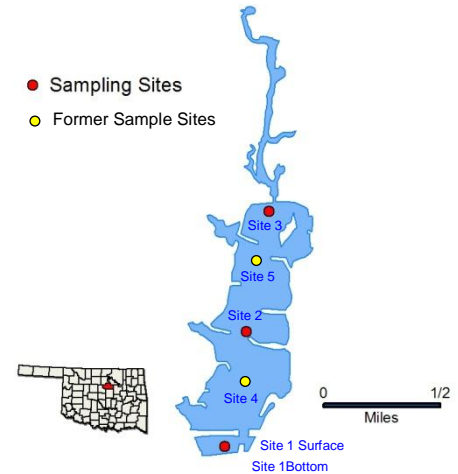
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Boomer

Sample Period	Times Visited	Sampling Sites
November 2008 - August 2009	4	3

General	Location	Payne County	Click map for site data
	Impoundment	1932	
	Area	260 acres	
	Capacity	3,200 acre-feet	
	Purposes	Cooling Water and Recreation	



Parameters	Profile	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	24 NTU	42% of values > OWQS of 25 NTU (n=12)
		Average True Color		Did not collect for these parameters
		Average Secchi Disk Depth	42 cm	
		Water Clarity Rating	Average	
		Trophic State Index	59	Previous value = 51
		Trophic Class	Eutrophic	
	Nutrients	Salinity	0.10 - 0.21 ppt	
		Specific Conductivity	278 – 424.5 µS/cm	
		pH	7.17 - 8.26 pH units	
		Oxidation-Reduction Potential	-19 to 574 mV	
		Dissolved Oxygen	Up to 38% of water column < 2.0 mg/L in August	
		Surface Total Nitrogen	0.49 mg/L to 0.97 mg/L	
		Surface Total Phosphorus	0.010 mg/L to 0.071 mg/L	
		Nitrogen to Phosphorus Ratio	18:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	*							
	Aesthetics						S	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*Did not collect for these parameters. The PBCR beneficial use cannot be assessed as minimum data requirement were not met due to QA/QC issues for <i>E.coli</i> .									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

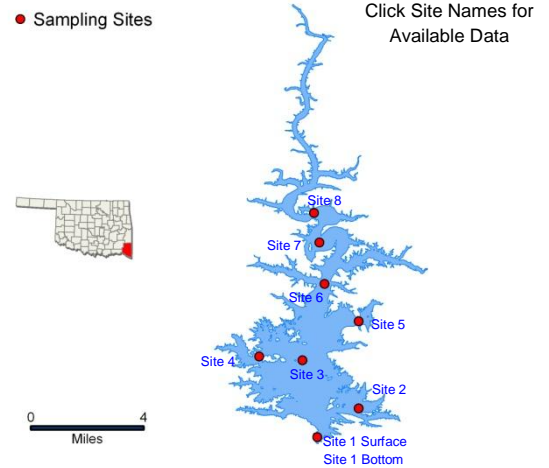
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Broken Bow

Sample Period	Times Visited	Sampling Sites
November 2012 – July 2013	4	8

General	Location	McCurtain County	Click map for site data
	Impoundment	1970	
	Area	14,200 acres	
	Capacity	918,070 acre-feet	
	Purposes	Flood Control, Hydropower, Water Supply, Recreation, Fish & Wildlife	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	3 NTU	3% of values > OWQS of 25 NTU (n=32)
		Average Secchi Disk Depth	237 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	4 mg/m3	
		Trophic State Index	45	Previous value = 41
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.01 – 0.03 ppt	
		Specific Conductivity	27 – 65 µS/cm	
		pH	4.71 – 12.45 pH units	75% of values < 6.5 pH units
		Oxidation-Reduction Potential	-100 – 504 mV	
		Dissolved Oxygen	Up to 75% of water column < 2.0 mg/L in the summer	
	Nutrients	Surface Total Nitrogen	0.26 mg/L to 1.08 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.045 mg/L	
		Nitrogen to Phosphorus Ratio	59:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	NS*	NS	S							
	Aesthetics						S	*					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*Slightly acidic conditions are not unusual in this part of the state due to relatively low soil pH and lack of soluble bedrock. Because of these conditions it is likely that the low pH values may be due to natural causes; therefore, the Water Board is looking at the applicability of developing site-specific criteria for waters in the southeastern portion of the state. *Did not collect for these parameters.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

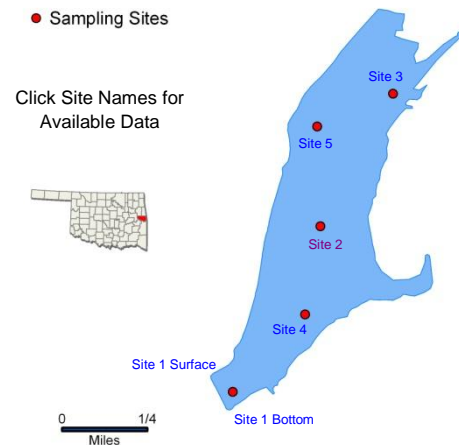
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Brushy Creek

Sample Period	Times Visited	Sampling Sites
October 2007 - July 2008	4	5

General	Location	Sequoyah County	Click map for site data
	Impoundment	1964	
	Area	358 acres	
	Capacity	3,258 acre-feet	
	Purposes	Flood Control and Recreation	



Parameters	<b>Parameter</b> ( <a href="#">Descriptions</a> )		<b>Result</b>	<b>Notes/Comments</b>
	Average Turbidity		10 nephelometric turbidity units (NTU)	25% of values > 25 NTU
	Average True Color		41 units	25% of values > OWQS of 70
	Average Secchi Disk Depth		103 cm	
	Water Clarity Rating		good	
	Trophic State Index		53	Previous value = 51
	Trophic Class		eutrophic	
	Profile	Salinity	0.00 - 0.10 ppt	
		Specific Conductivity	36.3 - 605 µS/cm	
		pH	6.02 - 8.12 pH units	Only 7 values < 6.5 units
		Oxidation-Reduction Potential	33 to 606 mV	
		Dissolved Oxygen	Up to 69% of water column < 2 mg/L in July	Occurred at site 1, the dam
	Nutrients	Surface Total Nitrogen	0.38 mg/L to 0.72 mg/L	
		Surface Total Phosphorus	0.016 mg/L to 0.050 mg/L	
		Nitrogen to Phosphorus Ratio	20:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	NS	S							
	Aesthetics					S	S					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
<b>S = Fully Supporting</b> <b>NS = Not Supporting</b> <b>NEI = Not Enough Information</b>		<b>Notes</b>	Precipitation data suggests the peak in color & turbidity are likely due to runoff, therefore the uses are considered supporting.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

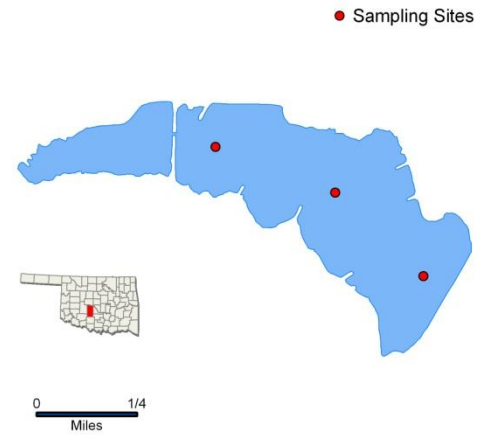
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Burtschi

Sample Period	Times Visited	Sampling Sites
November 2005 - August 2006	4	3

General	Location	Grady County	Click map for site data
	Impoundment	1958	
	Area	180 acres	
	Capacity	2,140 acre-feet	
	Purposes	Recreation	



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	11 NTU	100% of values < OWQS of 25 NTU
		Average True Color	18 units	100% of values < OWQS of 70
		Average Secchi Disk Depth	72 cm	
		Water Clarity Rating	good	
		Trophic State Index	63	
		Trophic Class	hypertrophic	
	Profile	Salinity	0.53 – 0.67 ppt	
		Specific Conductivity	1011 – 1273 µS/cm	
		pH	7.19 – 10.74 pH units	16% of values were > 9 pH units
		Oxidation-Reduction Potential	42 - 428 mV	
		Dissolved Oxygen	Up to 38% of water column < 2 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.92 mg/L to 1.82 mg/L	
		Surface Total Phosphorus	0.027 mg/L to 0.109 mg/L	
		Nitrogen to Phosphorus Ratio	24:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	NS								
	Aesthetics						S	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

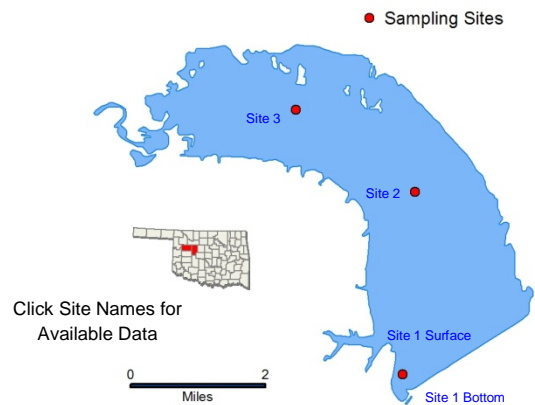
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Canton

Sample Period	Times Visited	Sampling Sites
November 2011 - August 2012	4	3

General	Location	Blaine County	Click map for site data
	Impoundment	1948	
	Area	7,910 acres	
	Capacity	111,310 acre-feet	
	Purposes	Flood Control, Water Supply, Irrigation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	35 NTU	75% of values > OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	22 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	29 mg/m3	
		Trophic State Index	64	Previous value = 60
		Trophic Class	Hypereutrophic	
	Profile	Salinity	0.71 – 0.97 ppt	
		Specific Conductivity	1420 – 1920 µS/cm	
		pH	7.62– 8.34 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	196 - 530 mV	
		Dissolved Oxygen	All data are above screening level of 2.0 mg/L	
	Nutrients	Surface Total Nitrogen	0.94 mg/L to 1.65 mg/L	
		Surface Total Phosphorus	0.048 mg/L to 0.091 mg/L	
		Nitrogen to Phosphorus Ratio	18:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	*							
	Aesthetics						S	N/A					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes *N/A – parameters not collected in current sample year.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

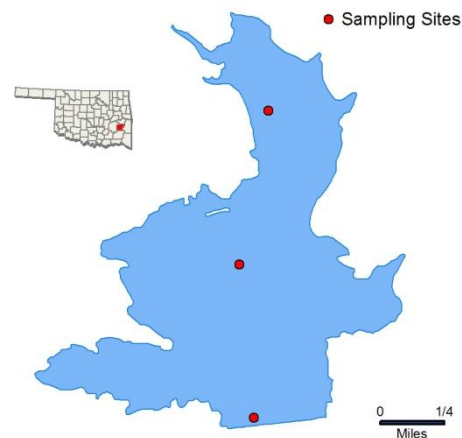
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Carl Albert

Sample Period	Times Visited	Sampling Sites
October 2007 - July 2008	4	3

General	Location	Latimer County	Click map for site data
	Impoundment	1964	
	Area	183 acres	
	Capacity	2,739 acre-feet	
	Purposes	Water Supply, Flood Control, and Recreation	



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	14 nephelometric turbidity units (NTU)	All values < 25 NTU
		Average True Color	72 units	50% of values > OWQS of 70
		Average Secchi Disk Depth	90 cm	
		Water Clarity Rating	good	
		Trophic State Index	41	Previous value = 41
		Trophic Class	mesotrophic	
	Profile	Salinity	0.00 - 0.01 ppt	
		Specific Conductivity	36 - 97 $\mu$ S/cm	
		pH	5.8 - 7.32 pH units	21% of values <6.5 units
		Oxidation-Reduction Potential	22 to 553 mV	
		Dissolved Oxygen	Up to 62% of water column < 2 mg/L in August	Occurred at site 1, the dam
	Nutrients	Surface Total Nitrogen	0.28 mg/L to 0.49 mg/L	
		Surface Total Phosphorus	0.013 mg/L to 0.031 mg/L	
		Nitrogen to Phosphorus Ratio	16:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	NS	NS	*							
	Aesthetics						S	NS					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	*Not supporting for lead as chronic criteria was exceeded. All other toxicants are fully supporting.									

NTU = nephelometric turbidity units  
 $\mu$ S/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 $\mu$ S/cm = microsiemens/cm

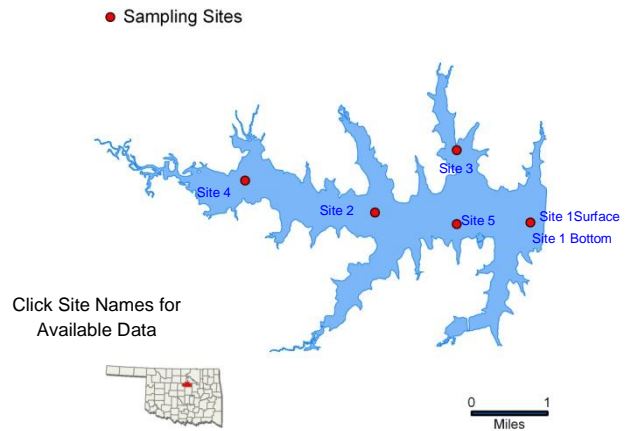
ppt = parts per thousand  
 En = Enterococci



# Carl Blackwell

Sample Period	Times Visited	Sampling Sites
October 2012 - July 2013	4	5

General	Location	Payne County	Click map for site data
	Impoundment	1937	
	Area	3,370 acres	
	Capacity	61,500 acre-feet	
	Purposes	Water Supply and Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	27 NTU	36% of values > 25 NTU (n=14)
		Average Secchi Disk Depth	36 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	23 mg/m3	
		Trophic State Index	61	Previous value = 51
		Trophic Class	Hypereutrophic	
	Profile	Salinity	0.18 – 0.23 ppt	
		Specific Conductivity	378 - 477 µS/cm	
		pH	7.19 – 8.71 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-95 – 341 mV	
		Dissolved Oxygen	Up to 42% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.77 mg/L to 1.36 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.041 mg/L	
		Nitrogen to Phosphorus Ratio	48:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	S							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											NS
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes *Did not collect for these parameters.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

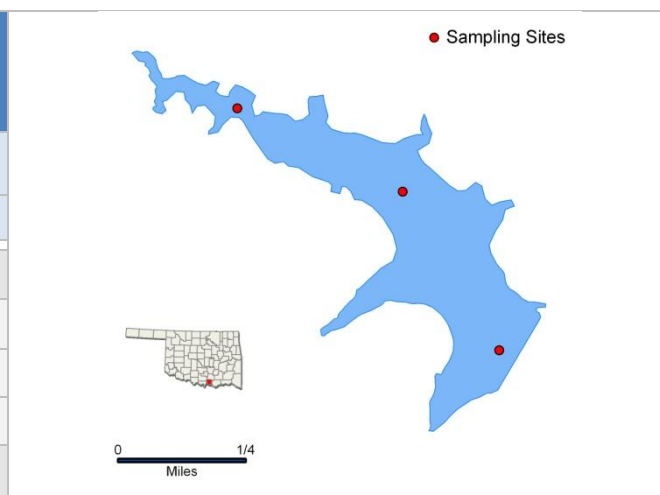
ppt = parts per thousand  
 En = Enterococci



# Carter

Sample Period	Times Visited	Sampling Sites
November 2007 - August 2008	4	3

General	Location	Marshall County	Click map for site data
	Impoundment	1960	
	Area	108 acres	
	Capacity	990 acre-feet	
	Purposes	Water Supply and Recreation	



Parameters	<b>Parameter</b> ( <a href="#">Descriptions</a> )		<b>Result</b>	<b>Notes/Comments</b>
	Average Turbidity		7 nephelometric turbidity units (NTU)	All values < 25 NTU
	Average True Color		25 units	All Values < OWQS of 70
	Average Secchi Disk Depth		121 cm	
	Water Clarity Rating		excellent	
	Trophic State Index		40	Previous value = 40
	Trophic Class		oligotrophic	
	Profile	Salinity	0.10 - 0.20 ppt	
		Specific Conductivity	212 – 325 µS/cm	
		pH	6.98 – 8.33 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	60 to 557 mV	
		Dissolved Oxygen	Up to 44% of water column < 2 mg/L in August	Occurred at site 1, the dam
	Nutrients	Surface Total Nitrogen	0.41 mg/L to 0.54 mg/L	
		Surface Total Phosphorus	0.011 mg/L to 0.018 mg/L	
		Nitrogen to Phosphorus Ratio	37:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	S	S							
	Aesthetics					S	S					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

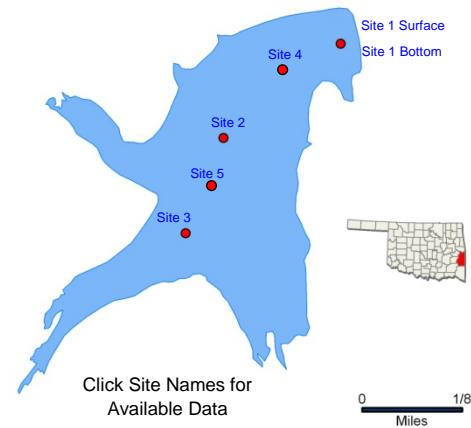
ppt = parts per thousand  
 En = Enterococci

# Cedar

Sample Period	Times Visited	Sampling Sites
February 2011 - July 2011	4	5

General	Location	Le Flore County	Click map for site data
	Impoundment	1937	
	Area	78 acres	
	Capacity	1,000 acre-feet	
	Purposes	Recreation	

● Sampling Sites



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	6 NTU	100% of values < OWQS of 25 NTU
		Average Secchi Disk Depth	99 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	13 mg/m3	
		Trophic State Index	56	Previous Value=53
		Trophic Class	Eutrophic	
	Profile	Salinity	0.0– 0.04 ppt	
		Specific Conductivity	32.8 – 106.4 µS/cm	
		pH	5.6 - 8.94 pH units	51.56% < 6.5
		Oxidation-Reduction Potential	-12 - 509 mV	
		Dissolved Oxygen	Up to 70% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.18 mg/L to 0.97 mg/L	
		Surface Total Phosphorus	0.016 mg/L to 0.057 mg/L	
		Nitrogen to Phosphorus Ratio	18:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterococci & E. coli	Chlor-a
	Fish & Wildlife Propagation	NEI	NS	S	S							
	Aesthetics					S	*					
	Agriculture							*	*	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*Did not collect for these parameters. Although all turbidity values are <25 NTU, The FWP beneficial use cannot be assessed for this sample year as minimum data requirements were not met.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

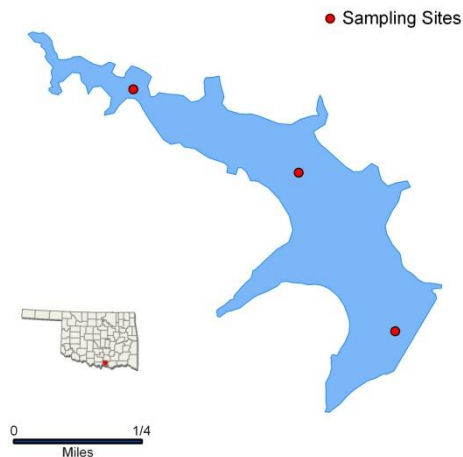
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Chandler

Sample Period	Times Visited	Sampling Sites
October 2007 - July 2008	4	3

General	Location	Lincoln County	Click map for site data
	Impoundment	1960	
	Area	129 acres	
	Capacity	2,778 acre-feet	
	Purposes	Water Supply and Recreation	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		29 nephelometric turbidity units (NTU)	58% of values > 25 NTU
	Average True Color		59 units	25% of values > OWQS of 70
	Average Secchi Disk Depth		39 cm	
	Water Clarity Rating		average	
	Trophic State Index		60	Previous value = 50
	Trophic Class		eutrophic	
	Profile	Salinity	0.10 - 0.18 ppt	
		Specific Conductivity	268 – 365.7 µS/cm	
		pH	7.35 – 8.82 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	23 to 533 mV	
		Dissolved Oxygen	Up to 62% of water column < 2 mg/L in July	Occurred at site 1, the dam
	Nutrients	Surface Total Nitrogen	0.82 mg/L to 1.59 mg/L	
		Surface Total Phosphorus	0.036 mg/L to 0.082 mg/L	
		Nitrogen to Phosphorus Ratio	27:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterococci & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	NS	S							
	Aesthetics					S	NS					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

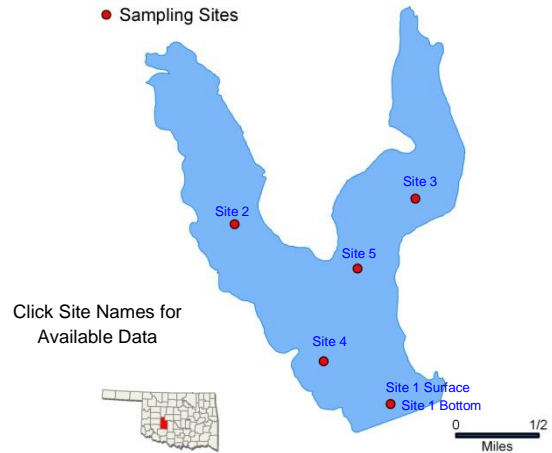
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Chickasha

Sample Period	Times Visited	Sampling Sites
October 2012 - July 2013	4	3

General	Location	Caddo County	Click map for site data
	Impoundment	1958	
	Area	820 acres	
	Capacity	41,080 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	12 NTU	100% of values < OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	60 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	28 mg/m3	
		Trophic State Index	63	Previous Value=63
		Trophic Class	Hypereutrophic	
	Profile	Salinity	1.32 – 1.47 ppt	
		Specific Conductivity	2551 – 2829 µS/cm	
		pH	7.01 – 8.28 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-22 to 396 mV	
		Dissolved Oxygen	Up to 50% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	1.59 mg/L to 2.43 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.037 mg/L	
		Nitrogen to Phosphorus Ratio	117:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	S	S							
	Aesthetics					NS	S					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
<b>S = Fully Supporting</b> <b>NS = Not Supporting</b> <b>NEI = Not Enough Information</b>		<b>Notes</b> The lake is currently listed in the Oklahoma Water Quality Standards (WQS) as a Nutrient Limited Watershed (NLW). This listing means that the lake is considered threatened from nutrients until a more intensive study can confirm the Aesthetics beneficial use non-support status.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

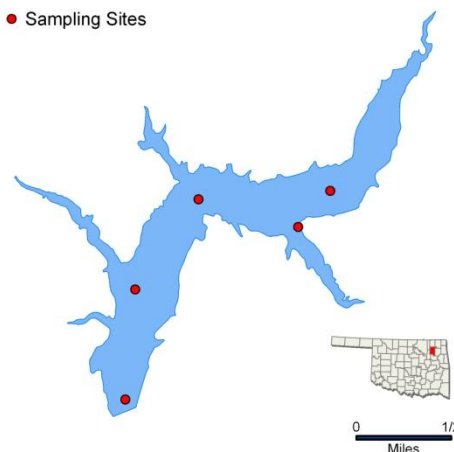
ppt = parts per thousand  
 En = Enterococci

# Claremore

Sample Period	Times Visited	Sampling Sites
November 2005 - August 2006	4	5

General	Location	Rogers County	Click map for site data
	Impoundment	1930	
	Area	470 acres	
	Capacity	7,900 acre-feet	
	Purposes	Water Supply, Recreation	

● Sampling Sites



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	19 NTU	13% of values > OWQS of 25 NTU
		Average True Color	24units	100% of values < OWQS of 70
		Average Secchi Disk Depth	41 cm	
		Water Clarity Rating	good	
		Trophic State Index	67	
		Trophic Class	hypereutrophic	
	Profile	Salinity	0.11– 0.12 ppt	
		Specific Conductivity	242 – 257.4 $\mu$ S/cm	
		pH	7.03– 8.10 pH units	
		Oxidation-Reduction Potential	252- 454 mV	
		Dissolved Oxygen	Up to 29% of water column < 2 mg/L in May	Occurred at site 1, the dam
	Nutrients	Surface Total Nitrogen	0.91 mg/L to 2.00 mg/L	
		Surface Total Phosphorus	0.072 mg/L to 0.193 mg/L	
		Nitrogen to Phosphorus Ratio	12:1	Phosphorus Limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		*	S	S	S							
	Aesthetics						NS**	*					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*An assessment of the Fish & Wildlife Propagation (FWP) and Aesthetics beneficial use based on turbidity and color cannot be made at this time as minimum data requirements were not met for this sample year. **The lake is listed in the WQS as a NLW indicating that the Aesthetics beneficial use is considered threatened by nutrients until studies can be conducted to confirm non-support status									

NTU = nephelometric turbidity units  
 $\mu$ S/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

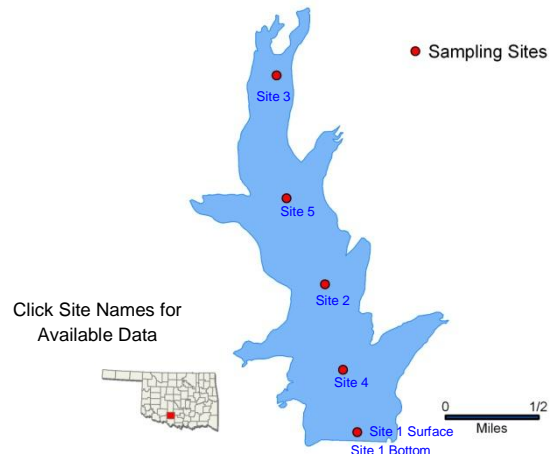
mg/L = milligrams per liter  
 $\mu$ S/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Clear Creek

Sample Period	Times Visited	Sampling Sites
December 2012 - July 2013	4	3

General	Location	Stephens County	Click map for site data
	Impoundment	1948	
	Area	722 acres	
	Capacity	7,711 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	14 NTU	100% of values < OWQS of 25 NTU (n=6)
		Average Secchi Disk Depth	45 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	26 mg/m3	
		Trophic State Index	62	Previous Value=59
		Trophic Class	Hypereutrophic	
	Profile	Salinity	0.41 – 0.45 ppt	
		Specific Conductivity	824 – 900 µS/cm	
		pH	7.66 – 8.35 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-53 to 364 mV	
		Dissolved Oxygen		All data are above screening level of 2 mg/L
	Nutrients	Surface Total Nitrogen	0.97 mg/L to 1.96 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.024 mg/L	
		Nitrogen to Phosphorus Ratio	99:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	S							
	Aesthetics						S	*					
	Agriculture								NS	NS	NS		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	* Did not collect for this parameter.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

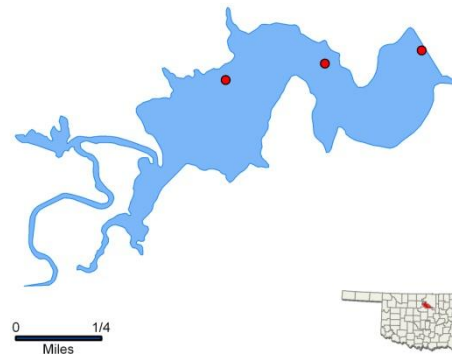
ppt = parts per thousand  
 En = Enterococci

# Cleveland City

Sample Period	Times Visited	Sampling Sites
November 2006 - August 2007	4	3

General	Location	Pawnee County	Click map for site data
	Impoundment	1936	
	Area	159 acres	
	Capacity	2,200 acre-feet	
	Purposes	Water Supply, Recreation	

● Sampling Sites



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		17 NTU	8% of values >OWQS of 25 NTU
	Average True Color		63 units	25% of values > OWQS of 70
	Average Secchi Disk Depth		56 cm	
	Water Clarity Rating		average	
	Trophic State Index		56	
	Trophic Class		eutrophic	
	Profile	Salinity	0.08 – 0.11 ppt	
		Specific Conductivity	173.3 – 235.3 $\mu$ S/cm	
		pH	6.93 – 8.64 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	82 to 438 mV	
		Dissolved Oxygen	Up to 70% of water column < 2 mg/L in May	
	Nutrients	Surface Total Nitrogen	0.85 mg/L to 1.24 mg/L	
		Surface Total Phosphorus	0.021 mg/L to 0.050 mg/L	
		Nitrogen to Phosphorus Ratio	30:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	NS	S							
	Aesthetics						S	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	The PBCR beneficial use cannot be assessed as minimum data requirement were not met due to QA/QC issues for <i>enterococci</i> . The peak reported in color is due to seasonal storm events and the lake is considered the supporting the Aesthetics beneficial use.									

NTU = nephelometric turbidity units  
 $\mu$ S/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 $\mu$ S/cm = microsiemens/cm

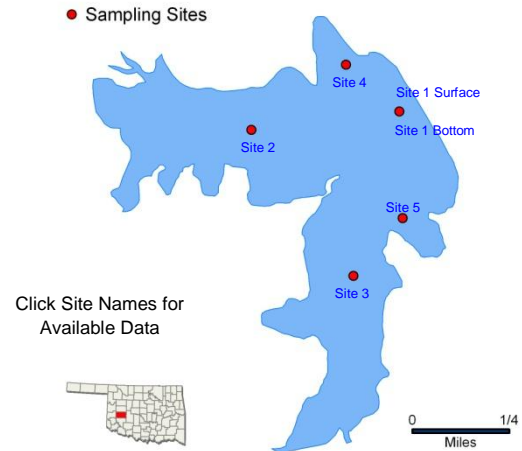
ppt = parts per thousand  
 En = Enterococci



# Clinton

Sample Period	Times Visited	Sampling Sites
October 2009 – July 2010	4	5

General	Location	Washita County	Click map for site data
	Impoundment	1931	
	Area	335 acres	
	Capacity	3,980 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	Profile	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	18 NTU	27% of values > OWQS of 25 NTU
		Average True Color		
		Average Secchi Disk Depth	57 cm	
		Water Clarity Rating	average	
		Trophic State Index	65	Previous = 66
		Trophic Class	hypereutrophic	
	Nutrients	Salinity	0.27 – 0.31 ppt	
		Specific Conductivity	535.2 – 604.5 µS/cm	
		pH	7.52 – 8.23 pH units	Slightly alkaline
		Oxidation-Reduction Potential	-21 – 426 mV	
		Dissolved Oxygen	Up to 43% of water column < 2 mg/L in the summer.	
		Surface Total Nitrogen	0.79 mg/L to 1.38 mg/L	
		Surface Total Phosphorus	0.057 mg/L to 0.104 mg/L	
		Nitrogen to Phosphorus Ratio	16:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	S							
	Aesthetics						NS*	*					
	Agriculture								S	S	S		
	Primary Body Contact Recreation												
	Public & Private Water Supply												NS
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*The lake is listed in the WQS as a NLW indicating that the Aesthetics beneficial use is considered threatened by nutrients until studies can be conducted to confirm non-support status. *No longer collect for this parameter.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

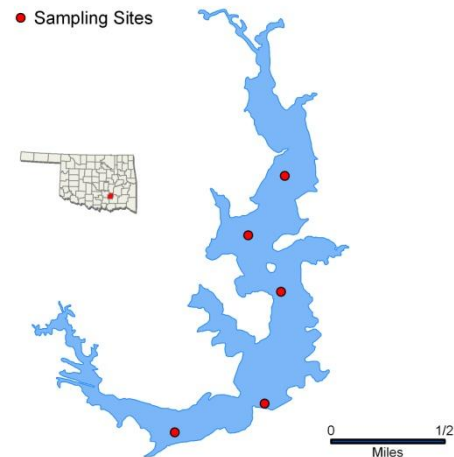
ppt = parts per thousand  
 En = Enterococci



# Coalgate City

Sample Period	Times Visited	Sampling Sites
October 2006 - July 2007	4	5

General	Location	Coal County	Click map for site data
	Impoundment	1965	
	Area	352 acres	
	Capacity	3,437 acre-feet	
	Purposes	Water Supply, Recreation and Flood Control	



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	92 NTU	85% of values > OWQS of 25 NTU
		Average True Color	249 units	100% of values > OWQS of 70
		Average Secchi Disk Depth	26 cm	
		Water Clarity Rating	poor	
		Trophic State Index	47	
		Trophic Class	mesotrophic	
	Profile	Salinity	0.01 – 0.02 ppt	
		Specific Conductivity	47.1 – 72.7 µS/cm	
		pH	6.32– 8.03 pH units	Only 8 (8%) of vales < 6.5 pH units
		Oxidation-Reduction Potential	230 to 445 mV	
		Dissolved Oxygen	Up to 71% of water column < 2 mg/L in July	Occurred at site 2
	Nutrients	Surface Total Nitrogen	0.90 mg/L to 1.43 mg/L	
		Surface Total Phosphorus	0.061 mg/L to 0.155 mg/L	
		Nitrogen to Phosphorus Ratio	13:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	NS	S							
	Aesthetics						S	NS					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	The PBCR beneficial use cannot be assessed as minimum data requirement were not met due to QA/QC issues for fecal coliform.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

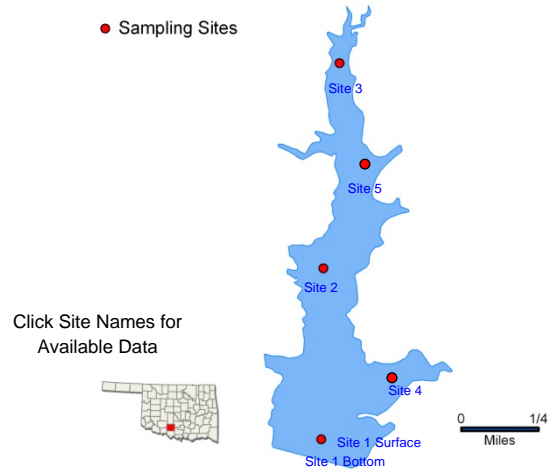
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Comanche

Sample Period	Times Visited	Sampling Sites
December 2010 – August 2011	4	5

General	Location	Stephens County	Click map for site data
	Impoundment	1960	
	Area	184 acres	
	Capacity	2,500 acre-feet	
	Purposes	Water Supply and Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	12 NTU	100% of values < OWQS of 25 NTU
		Average Secchi Disk Depth	86	Did not collect for true color
		Water Clarity Rating	Good	
		Chlorophyll-a	8 mg/m3	
		Trophic State Index	50	Previous value = 58
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.14 - 0.2 ppt	
		Specific Conductivity	284.8 – 398.1 µS/cm	
		pH	6.9 – 8.89 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-47 to 427 mV	
		Dissolved Oxygen	50% of water column < 2.0 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.49 mg/L to 0.72 mg/L	
		Surface Total Phosphorus	0.015 mg/L to 0.031 mg/L	
		Nitrogen to Phosphorus Ratio	28:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	S	S							
	Aesthetics					S	*					
	Agriculture							*	*	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes *Did not collect for these parameters										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

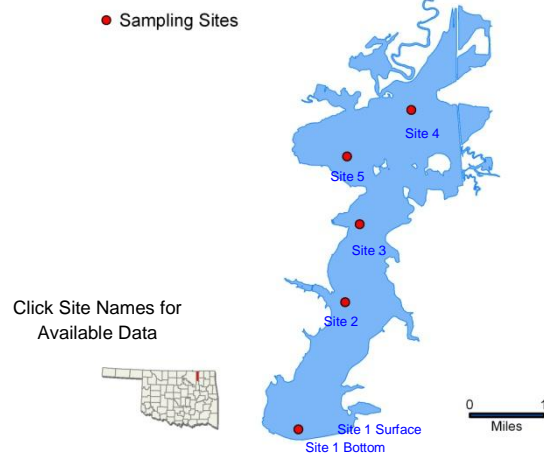
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Copan

Sample Period	Times Visited	Sampling Sites
October 2012 - August 2013	4	5

General	Location	Washington County	Click map for site data
	Impoundment	1983	
	Area	4,850 acres	
	Capacity	43,400 acre-feet	
	Purposes	Flood Control, Water Supply, Water Quality Control, Fish and Wildlife, and Recreation	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		59 nephelometric turbidity units (NTU)	100% of values > 25 NTU (n=20)
	Average Secchi Disk Depth		21 cm	
	Water Clarity Rating		average	
	Chlorophyll-a		16 mg/m3	
	Trophic State Index		58	Previous value = 60
	Trophic Class		Eutrophic	
	Profile	Salinity	0.09 – 0.16 ppt	
		Specific Conductivity	186 – 340 µS/cm	
		pH	6.86 – 8.18 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-71 to 294 mV	
		Dissolved Oxygen	20% of water column < 2 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.74 mg/L to 1.34 mg/L	
		Surface Total Phosphorus	0.046 mg/L to 0.138 mg/L	
		Nitrogen to Phosphorus Ratio	14:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	S							
	Aesthetics						S	*					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												NS
	<div>S = Fully Supporting NS = Not Supporting NEI = Not Enough Information</div>		Notes	*No longer collect for this parameter.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

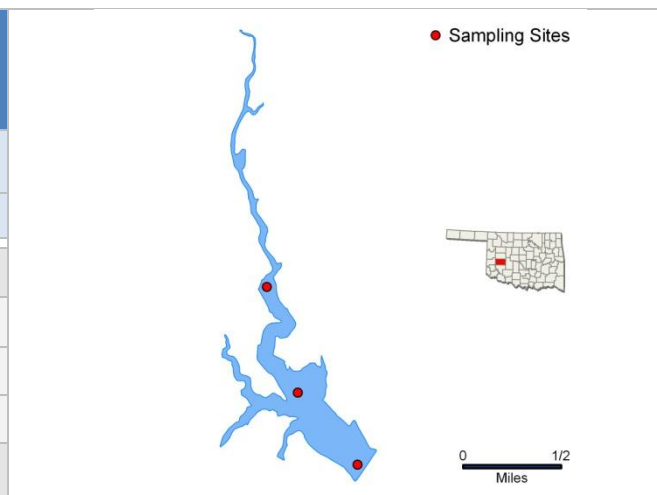
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Crowder

Sample Period	Times Visited	Sampling Sites
November 2005 - August 2006	4	3

General	Location	Washita County	Click map for site data
	Impoundment	1959	
	Area	158 acres	
	Capacity	2,094 acre-feet	
	Purposes	Flood Control, Recreation	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		9 NTU	100% of values < OWQS of 25 NTU
	Average True Color		17 units	100% of values < OWQS of 70
	Average Secchi Disk Depth		65 cm	
	Water Clarity Rating		average	
	Trophic State Index		57	
	Trophic Class		eutrophic	
	Profile	Salinity	0.38– 0.57 ppt	
		Specific Conductivity	744 – 1088 µS/cm	
		pH	7.03– 8.34 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	275- 445 mV	
		Dissolved Oxygen	Up to 37.5% of water column < 2 mg/L in May	Occurred at sites 1 and 2
	Nutrients	Surface Total Nitrogen	0.54 mg/L to 0.93 mg/L	
		Surface Total Phosphorus	0.026 mg/L to 0.053 mg/L	
		Nitrogen to Phosphorus Ratio	21:1	Phosphorus Limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	S							
	Aesthetics						NS*	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*The lake is listed in the WQS as a NLW indicating that the Aesthetics beneficial use is considered threatened by nutrients until studies can be conducted to confirm non-support status									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

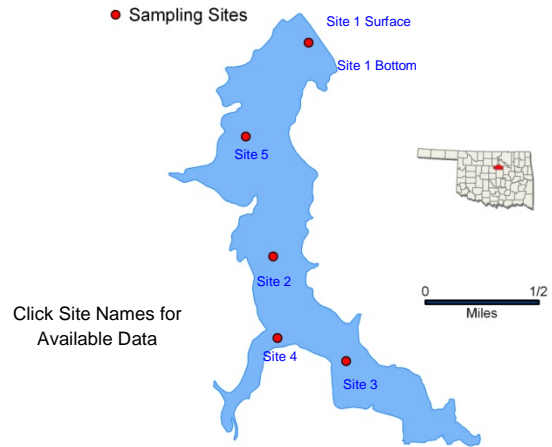
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Cushing Municipal

Sample Period	Times Visited	Sampling Sites
October 2011 - July 2012	4	5

General	Location	Payne County	Click map for site data
	Impoundment	1950	
	Area	591 acres	
	Capacity	3,304 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	44 NTU	92% of values > OWQS of 25 NTU
		Average Secchi Disk Depth	25 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	7 mg/m3	
		Trophic State Index	50	Previous value = 50
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.15 – 0.19 ppt	
		Specific Conductivity	324 – 402 µS/cm	
		pH	7.32– 8.20 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	335 to 613 mV	
		Dissolved Oxygen	Up to 17% of water column < 2 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.56 mg/L to 1.12 mg/L	
		Surface Total Phosphorus	0.038 mg/L to 0.113 mg/L	
		Nitrogen to Phosphorus Ratio	10:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	S							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	<div><div>S = Fully Supporting</div><div>NS = Not Supporting</div><div>NEI = Not Enough Information</div></div>		Notes	<div>*N/A – parameters not collected in current sample year.</div>									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

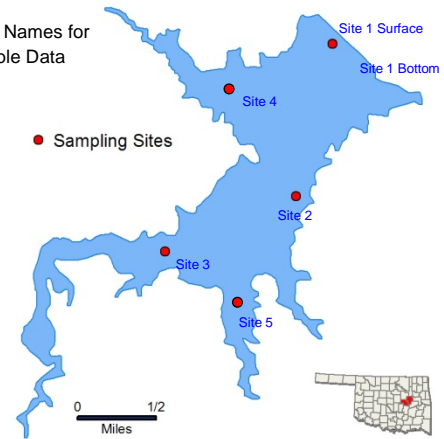
ppt = parts per thousand  
 En = Enterococci

# Dripping Springs

Sample Period	Times Visited	Sampling Sites
October 2011 - July 2012	4	5

General	Location	Okmulgee County	Click map for site data
	Impoundment	1950	
	Area	1,150 acres	
	Capacity	16,200 acre-feet	
	Purposes	Water Supply, Recreation and Flood Control	

Click Site Names for Available Data



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	9 NTU	100% of values < OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	76 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	5 mg/m3	
		Trophic State Index	46	Previous value = 54
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.06 – 0.09 ppt	
		Specific Conductivity	122 – 192µS/cm	
		pH	6.44– 7.99 pH units	Only 3.54% of values below 6.5
		Oxidation-Reduction Potential	90.2 to 633.8 mV	
		Dissolved Oxygen	Up to 57% of water column < 2.0 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.28 mg/L to 0.73 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.005 mg/L	
		Nitrogen to Phosphorus Ratio	107:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	*	*							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											NS	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*N/A – parameters not collected in current sample year. * 50-70% range is undetermined for DO.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

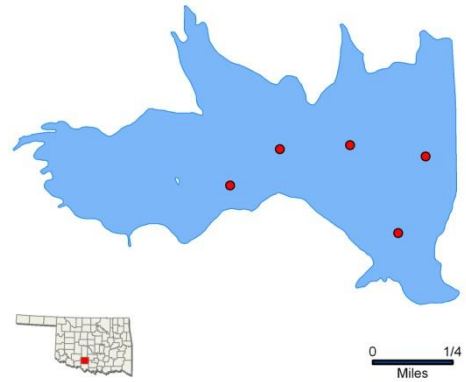
ppt = parts per thousand  
 En = Enterococci

# Duncan

Sample Period	Times Visited	Sampling Sites
November 2006 - August 2007	4	5

General	Location	Stephens County	Click map for site data
	Impoundment	1937	
	Area	500 acres	
	Capacity	7,200 acre-feet	
	Purposes	Water Supply, Recreation	

● Sampling Sites



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	15 NTU	100% of values < OWQS of 25 NTU
		Average True Color	34 units	15% of values > OWQS of 70
		Average Secchi Disk Depth	58 cm	
		Water Clarity Rating	average	
		Trophic State Index	57	
		Trophic Class	eutrophic	
	Profile	Salinity	0.12 – 0.24 ppt	
		Specific Conductivity	244.5 – 472.2 µS/cm	
		pH	7.32– 8.44 pH units	Only 13 (7.8%) of values < 6.5 pH units
		Oxidation-Reduction Potential	95 to 426 mV	
		Dissolved Oxygen	Up to 22% of water column < 2 mg/L in August	Occurred at site 2
	Nutrients	Surface Total Nitrogen	0.59 mg/L to 0.84 mg/L	
		Surface Total Phosphorus	0.016 mg/L to 0.039 mg/L	
		Nitrogen to Phosphorus Ratio	26:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	S	S							
	Aesthetics					S	NS					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>	Notes	The PBCR beneficial use cannot be assessed as minimum data requirement were not met due to QA/QC issues for fecal coliform and enterococci.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

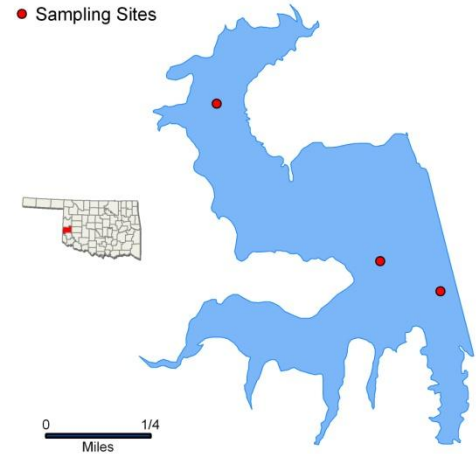
ppt = parts per thousand  
 En = Enterococci



# Elk City

Sample Period	Times Visited	Sampling Sites
November 2005 - August 2006	4	3

General	Location	Beckham County	Click map for site data
	Impoundment	1970	
	Area	240 acres	
	Capacity	2,583 acre-feet	
	Purposes	Flood Control, Recreation	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		15 NTU	100% of values < OWQS of 25 NTU
	Average True Color		26 units	100% of values < OWQS of 70
	Average Secchi Disk Depth		56 cm	
	Water Clarity Rating		Fair to poor	
	Trophic State Index		59	
	Trophic Class		eutrophic	
	Profile	Salinity	0.30– 0.39 ppt	
		Specific Conductivity	593.3 – 749.9 $\mu$ S/cm	
		pH	7.70– 8.49 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	374 - 448 mV	
		Dissolved Oxygen	Up to 22% of water column < 2 mg/L in May	
	Nutrients	Surface Total Nitrogen	0.74 mg/L to 1.08 mg/L	
		Surface Total Phosphorus	0.037 mg/L to 0.067 mg/L	
		Nitrogen to Phosphorus Ratio	17:1	Possibly co-limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	S							
	Aesthetics						NS*	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*The lake is listed in the WQS as a NLW indicating that the Aesthetics beneficial use is considered threatened by nutrients until studies can be conducted to confirm non-support status									

NTU = nephelometric turbidity units  
 $\mu$ S/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 $\mu$ S/cm = microsiemens/cm

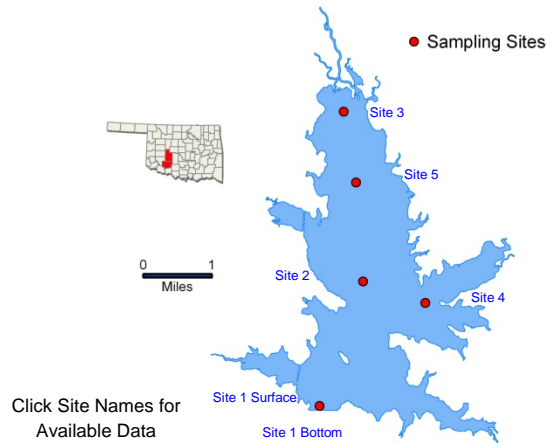
ppt = parts per thousand  
 En = Enterococci



# Ellsworth

Sample Period	Times Visited	Sampling Sites
November 2011 - August 2012	4	5

General	Location	Comanche County	Click map for site data
	Impoundment	1962	
	Area	5,600 acres	
	Capacity	95,200 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	31 NTU	56% of values > OWQS of 25 NTU (n=20)
		Average Secchi Disk Depth	27 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	20 mg/m3	
		Trophic State Index	60	Previous value = 54
		Trophic Class	Eutrophic	
	Profile	Salinity	0.25 – 0.30 ppt	
		Specific Conductivity	520 – 607 µS/cm	
		pH	7.79 – 8.88 pH units	Slightly alkaline
		Oxidation-Reduction Potential	-129 to 349 mV	
		Dissolved Oxygen	All data are above screening level of 2.0 mg/L	
	Nutrients	Surface Total Nitrogen	0.95 mg/L to 1.47 mg/L	
		Surface Total Phosphorus	0.039 mg/L to 0.098 mg/L	
		Nitrogen to Phosphorus Ratio	20:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	*							
	Aesthetics					S	N/A					
	Agriculture							N/A	N/A	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											NS
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

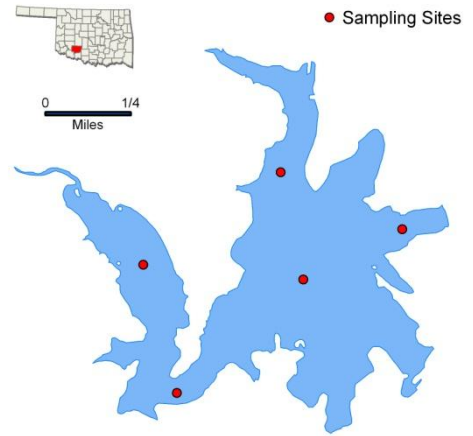
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Elmer Thomas

Sample Period	Times Visited	Sampling Sites
October 2006 - July 2007	4	5

General	Location	Comanche County	Click map for site data
	Impoundment		
	Area	334 acres	
	Capacity	12,000 acre-feet	
	Purposes	Recreation	



Parameters	Profile	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	2 NTU	100% of values < OWQS of 25 NTU
		Average True Color	27 units	100% of values < OWQS of 70
		Average Secchi Disk Depth	175 cm	
		Water Clarity Rating	excellent	
		Trophic State Index	39	
		Trophic Class	oligotrophic	
	Nutrients	Salinity	0.01 – 0.07 ppt	
		Specific Conductivity	36.2 – 150.6 µS/cm	
		pH	5.43 – 8.13 pH units	38 (15.4%) of values < 6.5 pH units
		Oxidation-Reduction Potential	41 to 522mV	
		Dissolved Oxygen	Up to 76% of water column < 2 mg/L in July	Occurred at sites 1 and 2
	Nutrients	Surface Total Nitrogen	0.31 mg/L to 0.63 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.015 mg/L	
		Nitrogen to Phosphorus Ratio	46:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	NS	NS	S							
	Aesthetics						S	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	The PBCR beneficial use cannot be assessed as minimum data requirement were not met due to QA/QC issues for <i>E. coli</i> and fecal coliform.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

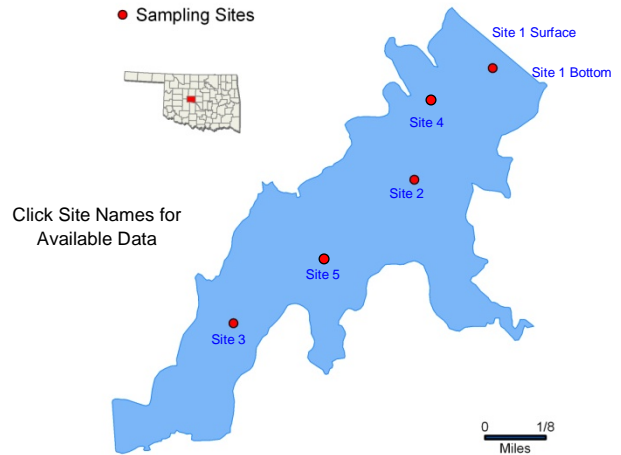
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# El Reno

Sample Period	Times Visited	Sampling Sites
December 2011 - August 2012	4	3

General	Location	Canadian County	Click map for site data
	Impoundment	1937	
	Area	500 acres	
	Capacity	7,200 acre-feet	
	Purposes	Flood Control, Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	36 NTU	50% of values > OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	25 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	20 mg/m3	
		Trophic State Index	78	
		Trophic Class	Hypereutrophic	
	Profile	Salinity	0.55 – 0.81 ppt	
		Specific Conductivity	1108 – 1617 µS/cm	
		pH	7.70 – 9.22 pH units	Slightly alkaline
		Oxidation-Reduction Potential	225 to 544 mV	
		Dissolved Oxygen	All data are above screening level of 2.0 mg/L	
	Nutrients	Surface Total Nitrogen	1.33 mg/L to 2.69 mg/L	
		Surface Total Phosphorus	0.149 mg/L to 0.441 mg/L	
		Nitrogen to Phosphorus Ratio	7:1	Possibly co-limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	S							
	Aesthetics					NS	N/A					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*N/A – parameters not collected in current sample year. * Based on the TSI and chlorophyll-a values, lake will be recommended to be considered and NLW.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

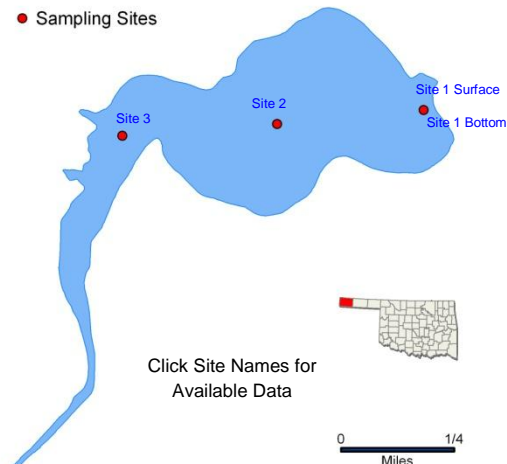
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Carl Etling

Sample Period	Times Visited	Sampling Sites
October 2012 – August 2013	4	3

General	Location	Cimarron County	Click map for site data
	Impoundment	1958	
	Area	159 acres	
	Capacity	1717 acre-feet	
	Purposes	Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	37 NTU	25% of values > OWQS of 25 NTU
		Average Secchi Disk Depth	26 cm	
		Water Clarity Rating	fair	
		Chlorophyll-a	45 mg/m3	
		Trophic State Index	68	Previous value = 72
		Trophic Class	Hypereutrophic	
	Profile	Salinity	0.12 – 0.25 ppt	
		Specific Conductivity	259 – 517 µS/cm	
		pH	6.22 – 8.49 pH units	6% of recorded values < 6.5 pH units
		Oxidation-Reduction Potential	-168 – 194 mV	
		Dissolved Oxygen	Up to 33% < 2mg/L in August	
	Nutrients	Surface Total Nitrogen	1.33 mg/L to 2.33 mg/L	
		Surface Total Phosphorus	0.074 mg/L to 0.18 mg/L	
		Nitrogen to Phosphorus Ratio	18:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	NS	S	S							
	Aesthetics						NS*	*					
	Agriculture								NS	NS	NS		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes: *The lake is listed in the WQS as a NLW indicating that the Aesthetics beneficial use is considered threatened by nutrients until studies can be conducted to confirm non-support status. *No longer collect for this parameter.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

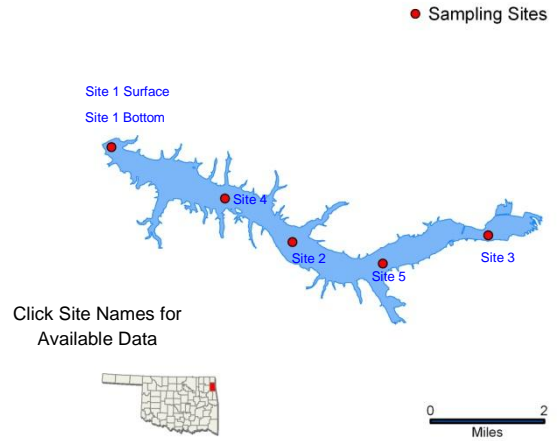
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Eucha

Sample Period	Times Visited	Sampling Sites
December 2012 - August 2013	4	3

General	Location	Delaware County	Click map for site data
	Impoundment	1952	
	Area	2,860 acres	
	Capacity	79,600 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In Situ	Average Turbidity	6 NTU	100% of values < OWQS of 25 NTU
		Average Secchi Disk Depth	117 cm	
		Water Clarity Rating	excellent	
		Chlorophyll-a	12 mg/m3	
		Trophic State Index	55	Previous value = 50
		Trophic Class	Eutrophic	
	Profile	Salinity	0.07 – 0.18 ppt	
		Specific Conductivity	146 – 369 µS/cm	
		pH	6.52 – 8.92 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-42 to 272 mV	
		Dissolved Oxygen	Up to 79% of water column < 2 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.75 mg/L to 4.08 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.021 mg/L	
		Nitrogen to Phosphorus Ratio	205:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	NS	S							
	Aesthetics					NS	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											NS
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		<b>Notes</b> The lake is currently listed as a Nutrient Limited Watershed (NLW) in the Oklahoma Water Quality Standards (WQS) and is considered nutrient threatened. *No longer collect for this parameter.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

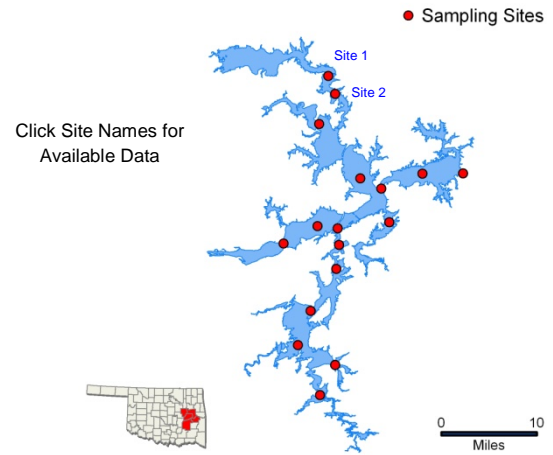
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Eufaula, Deep Fork Arm (1-2)

Sample Period	Times Visited	Sampling Sites
January 2012 – July 2012	3	17

General	Location	Haskell County	Click map for site data
	Impoundment	1964	
	Area	105,000 acres	
	Capacity	2,314,600 acre-feet	
	Purposes	Water Supply, Flood Control, Hydropower, Sediment Control	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	55 NTU	50% of values > OWQS of 25 NTU (n=6)
		Average Secchi Disk Depth	21 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	8 mg/m3	
		Trophic State Index	51	
		Trophic Class	Eutrophic	
	Profile	Salinity	0.10 – 0.19 ppt	
		Specific Conductivity	205 – 411 µS/cm	
		pH	5.61 – 8.02pH units	Only 3.54% of values below 6.5 pH units
		Oxidation-Reduction Potential	292 –492 mV	
		Dissolved Oxygen	All data are above screening level of 2.0 mg/L	
	Nutrients	Surface Total Nitrogen	0.77 mg/L to 1.56 mg/L	
		Surface Total Phosphorus	0.029 mg/L to 0.138 mg/L	
		Nitrogen to Phosphorus Ratio	14:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	*							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	Although 75% of values exceeded the OWQS for turbidity, the minimum data requirements were not met and an assessment of the FWP beneficial use cannot be made for this sample year. *N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

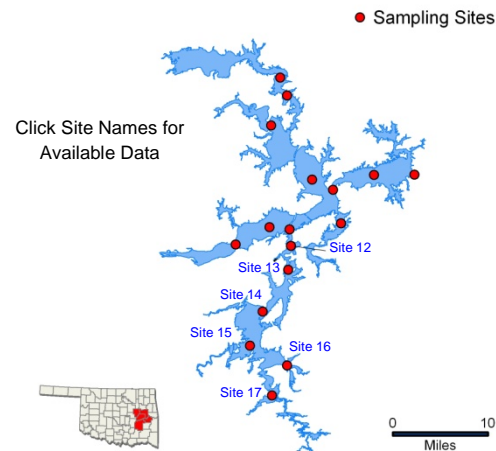
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Eufaula, Gaines Creek Arm (12-17)

Sample Period	Times Visited	Sampling Sites
January 2012 – July 2012	3	17

General	Location	Haskell County	Click map for site data
	Impoundment	1964	
	Area	105,000 acres	
	Capacity	2,314,600 acre-feet	
	Purposes	Water Supply, Flood Control, Hydropower, Sediment Control	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	61 NTU	67% of values > OWQS of 25 NTU (n=18)
		Average Secchi Disk Depth	33 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	7 mg/m3	
		Trophic State Index	50	Previous value = 55
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.03 – 0.21 ppt	
		Specific Conductivity	67 – 432 µS/cm	
		pH	6.71 – 8.12 pH units	
		Oxidation-Reduction Potential	150 – 482 mV	
		Dissolved Oxygen	Up to 50% of water column < 2.0 mg/L in the summer	
	Nutrients	Surface Total Nitrogen	0.46 mg/L to 1.68 mg/L	
		Surface Total Phosphorus	0.009 mg/L to 0.227 mg/L	
		Nitrogen to Phosphorus Ratio	14:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	*							
	Aesthetics					S	N/A					
	Agriculture							N/A	N/A	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>	Notes	*N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

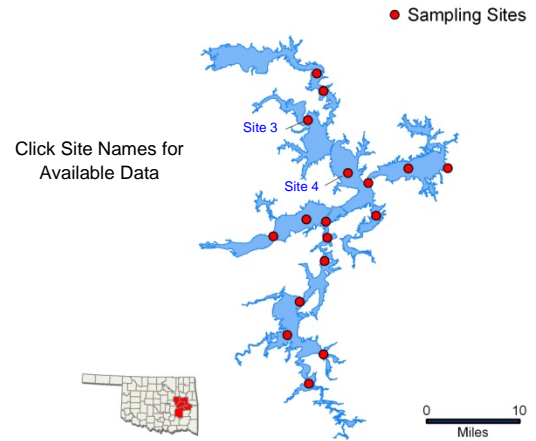
ppt = parts per thousand  
 En = Enterococci



# Eufaula, N. Canadian Arm (3-4)

Sample Period	Times Visited	Sampling Sites
January 2012 – July 2012	3	17

General	Location	Haskell County	Click map for site data
	Impoundment	1964	
	Area	105,000 acres	
	Capacity	2,314,600 acre-feet	
	Purposes	Water Supply, Flood Control, Hydropower, Sediment Control	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	23 NTU	50% of values > OWQS of 25 NTU (n=6)
		Average Secchi Disk Depth	43 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	6 mg/m3	
		Trophic State Index	48	Previous value = 55
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.15 – 0.22 ppt	
		Specific Conductivity	316 – 464 µS/cm	
		pH	5.44 – 8.39 pH units	Only 9.4% of values are below 6.5
		Oxidation-Reduction Potential	121 – 500 mV	
		Dissolved Oxygen	Up to 25% of water column < 2.0 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.66 mg/L to 2.04 mg/L	
		Surface Total Phosphorus	0.017 mg/L to 0.112 mg/L	
		Nitrogen to Phosphorus Ratio	20:1	Phosphorus Limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	*							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	Although 38% of values exceeded the OWQS for turbidity, the minimum data requirements were not met and an assessment of the FWP beneficial use cannot be made for this sample year. *N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

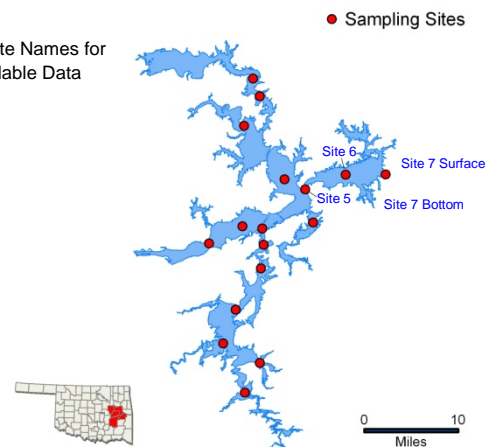


# Eufaula (5-7)

Sample Period	Times Visited	Sampling Sites
January 2012 – July 2012	3	17

General	Location	Haskell County	Click map for site data
	Impoundment	1964	
	Area	105,000 acres	
	Capacity	2,314,600 acre-feet	
	Purposes	Water Supply, Flood Control, Hydropower, Sediment Control	

Click Site Names for Available Data



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	6 NTU	100% of values < OWQS of 25 NTU (n=9)
		Average Secchi Disk Depth	101 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	8 mg/m3	
		Trophic State Index	51	Previous value = 55
		Trophic Class	Eutrophic	
	Profile	Salinity	0.15 – 0.19 ppt	
		Specific Conductivity	317 – 411 µS/cm	
		pH	5.58 – 8.43 pH units	Only 0.54% of values below 6.5 pH units
		Oxidation-Reduction Potential	97 – 461 mV	
		Dissolved Oxygen	Up to 48% of water column < 2.0 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.56 mg/L to 1.00 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.050 mg/L	
		Nitrogen to Phosphorus Ratio	50:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	*							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

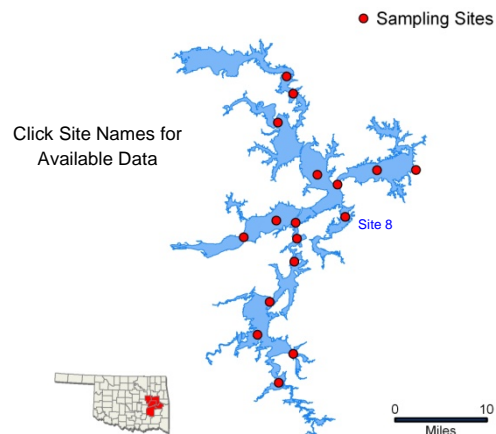
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Eufaula, Longtown Creek Arm (8)

Sample Period	Times Visited	Sampling Sites
January 2012 – July 2012	3	17

General	Location	Haskell County	Click map for site data
	Impoundment	1964	
	Area	105,000 acres	
	Capacity	2,314,600 acre-feet	
	Purposes	Water Supply, Flood Control, Hydropower, Sediment Control	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	6 NTU	100% of values < OWQS of 25 NTU (n=3)
		Average Secchi Disk Depth	85 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	7 mg/m3	
		Trophic State Index	50	Previous value = 58
	Profile	Trophic Class	Mesotrophic	
		Salinity	0.14 – 0.19 ppt	
		Specific Conductivity	285 – 400 µS/cm	
		pH	5.84 – 8.64 pH units	Only 7% of values below 6.5 pH units
		Oxidation-Reduction Potential	197 – 444 mV	
		Dissolved Oxygen	All data above screening level of 2.0 mg/L	
	Nutrients	Surface Total Nitrogen	0.53 mg/L to 0.89 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.014 mg/L	
		Nitrogen to Phosphorus Ratio	75:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	*							
	Aesthetics					S	N/A					
	Agriculture							N/A	N/A	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
<b>S = Fully Supporting</b> <b>NS = Not Supporting</b> <b>NEI = Not Enough Information</b>		<b>Notes</b> Although all values were less than the OWQS for turbidity, the minimum data requirements were not met and an assessment of the FWP beneficial use cannot be made for this sample year. **N/A – parameters not collected in current sample year.										

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

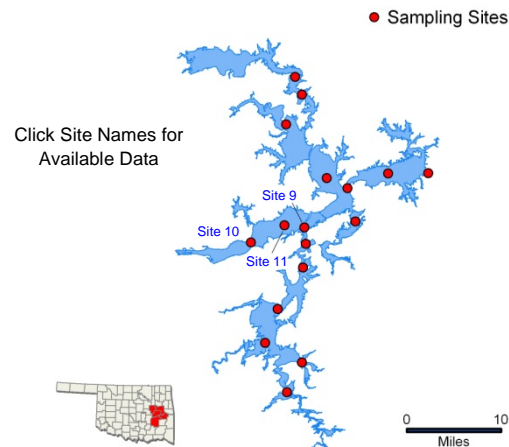
mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci

# Eufaula, Canadian River Arm (9-11)

Sample Period	Times Visited	Sampling Sites
January 2012 – July 2012	3	17

General	Location	Haskell County	Click map for site data
	Impoundment	1964	
	Area	105,000 acres	
	Capacity	2,314,600 acre-feet	
	Purposes	Water Supply, Flood Control, Hydropower, Sediment Control	



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	25 NTU	33% of values > OWQS of 25 NTU (n=9)
		Average Secchi Disk Depth	46 cm	
		Water Clarity Rating	Fair to Poor	
		Chlorophyll-a	8 mg/m3	
		Trophic State Index	50	Previous value = 57
	Profile	Trophic Class	Eutrophic	
		Salinity	0.14 – 0.26 ppt	
		Specific Conductivity	308 – 539 µS/cm	
		pH	5.26 – 8.76 pH units	Only 5.49% of values below 6.5 pH units
		Oxidation-Reduction Potential	128 – 477 mV	
		Dissolved Oxygen	Up to 27% of water column < 2.0 mg/L in the July	
	Nutrients	Surface Total Nitrogen	0.50 mg/L to 1.15 mg/L	
		Surface Total Phosphorus	0.016 mg/L to 0.078 mg/L	
		Nitrogen to Phosphorus Ratio	20:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	*							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	*N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

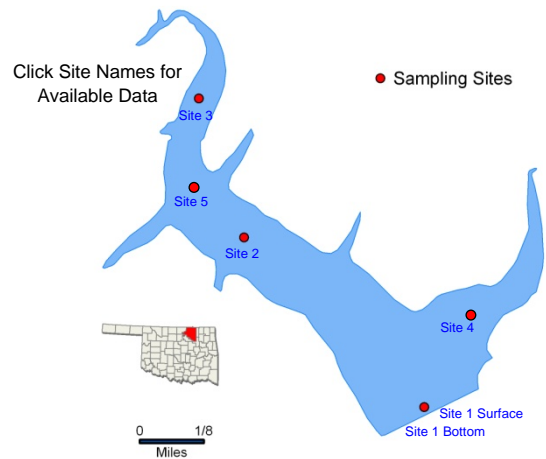
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Fairfax

Sample Period	Times Visited	Sampling Sites
March 2011 – September 2011	4	5

General	Location	Osage County	Click map for site data
	Impoundment	1936	
	Area	111 acres	
	Capacity	1,795 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	11 NTU	100% of values < OWQS of 25 NTU
		Average Secchi Disk Depth	87 cm	
		Water Clarity Rating	good	
		Chlorophyll-a	12 mg/m3	
		Trophic State Index	55	Previous Value= 57
		Trophic Class	Eutrophic	
	Profile	Salinity	0.12– 0.2 ppt	
		Specific Conductivity	243.9 – 400.4 µS/cm	
		pH	7.08 – 8.36 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-23 – 473 mV	
		Dissolved Oxygen	Up to 40% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.46 mg/L to 0.73 mg/L	
		Surface Total Phosphorus	0.025 mg/L to 0.033 mg/L	
		Nitrogen to Phosphorus Ratio	22:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	NEI	S	S	S							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	Notes	*Did not collect for this parameter. Although all turbidity values are <25 NTU, The FWP beneficial use cannot be assessed for this sample year as minimum data requirements were not met. The PBCR use cannot be assessed as minimum data requirements were not met due to QA/QC issue for Enterococci.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

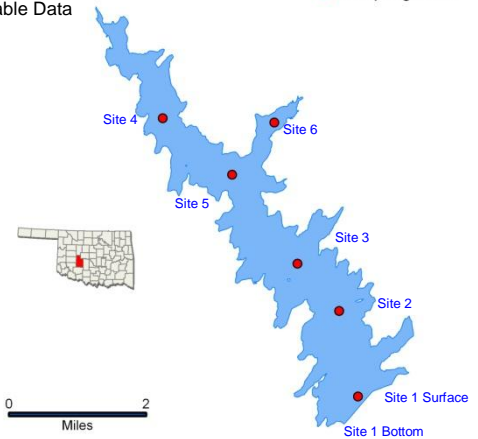
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Fort Cobb

Click Site Names for  
Available Data

● Sampling Sites



Sample Period			Times Visited	Sampling Sites
December 2011 - August 2012			4	6
General	Location	Caddo County		Click map for site data
	Impoundment	1959		
	Area	4,100 acres		
	Capacity	80,010 acre-feet		
	Purposes	Flood Control, Water Supply, Fish & Wildlife, Recreation		

Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In Situ	Average Turbidity	14 NTU	5% of values > OWQS of 25 NTU (n=20)
		Average Secchi Disk Depth	48 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	43 mg/m3	
		Trophic State Index	68	Previous value = 65
		Trophic Class	Hypereutrophic	
	Profile	Salinity	0.25– 0.30 ppt	
		Specific Conductivity	531 – 606 µS/cm	
		pH	7.47– 9.54 pH units	Only 2.76% of values > 9 pH units
		Oxidation-Reduction Potential	151 – 564 mV	
		Dissolved Oxygen	All data above screening level of 2.0 mg/L	
	Nutrients	Surface Total Nitrogen	1.16 mg/L to 2.20 mg/L	
		Surface Total Phosphorus	0.015 mg/L to 0.163 mg/L	
		Nitrogen to Phosphorus Ratio	19:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterococci & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	*							
	Aesthetics						NS*	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												NS
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		<b>Notes</b> *The lake is listed in the WQS as a NLW indicating that the Aesthetics beneficial use is considered threatened by nutrients until studies can be conducted to confirm non-support status. *N/A – parameters not collected in current sample year.										

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

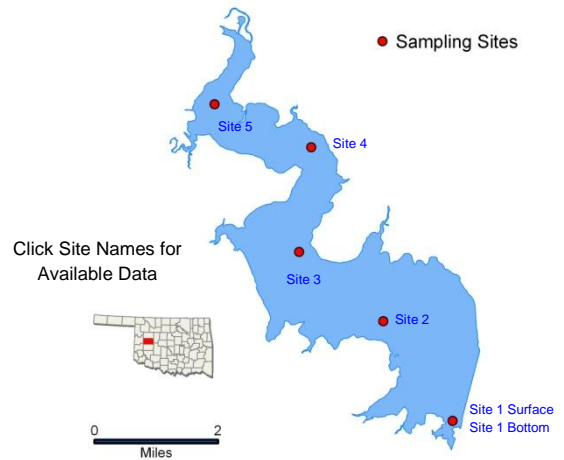
mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci

# Foss

Sample Period	Times Visited	Sampling Sites
October 2012 – August 2013	4	5

General	Location	Custer County	Click map for site data
	Impoundment	1961	
	Area	8,800 acres	
	Capacity	256,220 acre-feet	
	Purposes	Recreation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	25 NTU	37% of values > OWQS of 25 NTU
		Average Secchi Disk Depth	49 cm	
		Water Clarity Rating	Fair	
		Chlorophyll-a	10 mg/m3	
		Trophic State Index	54	Previous Value= 49
		Trophic Class	Eutrophic	
	Profile	Salinity	1.19– 1.4 ppt	
		Specific Conductivity	2307 –2724 µS/cm	
		pH	7.8 – 8.34 pH units	
		Oxidation-Reduction Potential	-73 to 402 mV	
		Dissolved Oxygen		All data for this sample year above screening level of 2 mg/L
	Nutrients	Surface Total Nitrogen	0.67 mg/L to 1.51 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.049 mg/L	
		Nitrogen to Phosphorus Ratio	47:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	S	S							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes: *Did not collect for this parameter. The PBCR beneficial use cannot be assessed as minimum data requirement were not met due to QA/QC issues for <i>E.coli</i> and enterococci.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

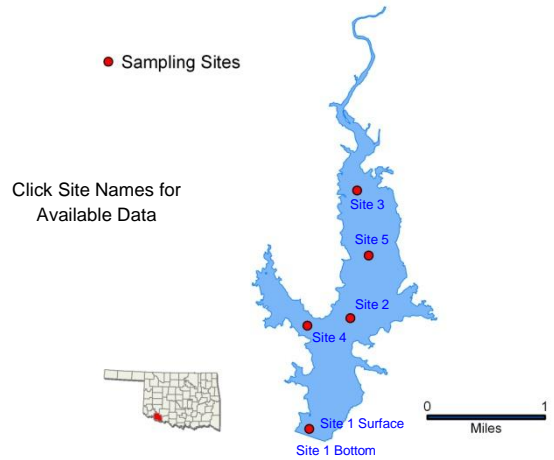
OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Frederick

Sample Period		Times Visited	Sampling Sites
December 2012 -July 2013		4	3
General	Location	Tillman County	Click map for site data
	Impoundment	1974	
	Area	925 acres	
	Capacity	9,526 acre-feet	
	Purposes	Water Supply, Recreation and Flood Control	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In Situ	Average Turbidity	148 NTU	100% of values > OWQS of 25 NTU
		Average Secchi Disk Depth	11 cm	
		Water Clarity Rating	poor	
		Chlorophyll-a	12 mg/m3	
		Trophic State Index	55	Previous Value= 57
		Trophic Class	Eutrophic	
	Profile	Salinity	0.06– 0.27 ppt	
		Specific Conductivity	135 – 570 µS/cm	
		pH	7.53 – 8.57 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	22 – 375 mV	
		Dissolved Oxygen		All data for this sample year above screening level of 2 mg/L
	Nutrients	Surface Total Nitrogen	1.11 mg/L to 1.56 mg/L	
		Surface Total Phosphorus	0.039 mg/L to 0.125 mg/L	
		Nitrogen to Phosphorus Ratio	17:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterococci & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	S							
	Aesthetics						S	*					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes <ul style="list-style-type: none"> <li>No longer collect for this parameter</li> </ul>										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

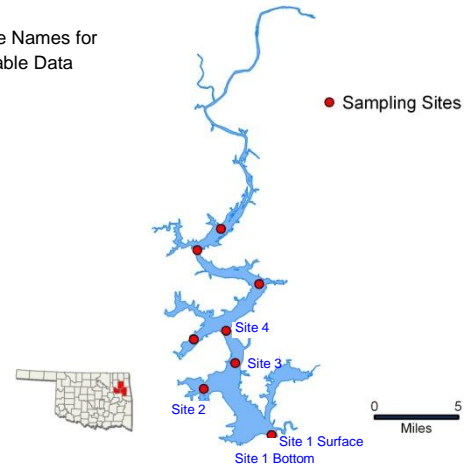
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci



# Ft. Gibson, Lower (1-4)

Click Site Names for  
Available Data



Sample Period		Times Visited	Sampling Sites
November 2012 - August 2013		4	8
General	Location	Cherokee County	Click map for site data
	Impoundment	1953	
	Area	14,900 acres	
	Capacity	355,200 acre-feet	
	Purposes	Hydropower and Flood Control	

Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In Situ	Average Turbidity	7 NTU	100% of values < OWQS of 25 NTU
		Average Secchi Disk Depth	78 cm	
		Water Clarity Rating	good	
		Chlorophyll-a	20 mg/m3	
		Trophic State Index	60	Previous value = 60
		Trophic Class	Eutrophic	
	Profile	Salinity	0.11 – 0.19 ppt	
		Specific Conductivity	229 – 330 µS/cm	
		pH	7.04 – 8.56 pH units	
		Oxidation-Reduction Potential	-33 to 297 mV	
		Dissolved Oxygen		All data for this sample year above screening level of 2 mg/L
	Nutrients	Surface Total Nitrogen	0.62 mg/L to 1.22 mg/L	
		Surface Total Phosphorus	0.028 mg/L to 0.91 mg/L	
		Nitrogen to Phosphorus Ratio	7:1	Possibly co- limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	NS	S							
	Aesthetics						NS	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes The lake is currently listed in the Oklahoma Water Quality Standards (WQS) as a Nutrient Limited Watershed (NLW). This listing means that the lake is considered threatened from nutrients until a more intensive study can confirm the Aesthetics beneficial use non-support status.										

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

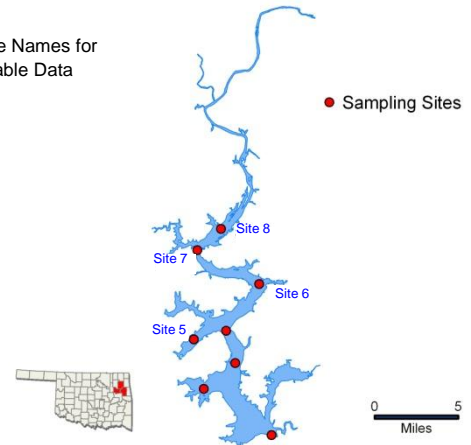
mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci



# Ft. Gibson, Lower (5-8)

Click Site Names for  
Available Data



Sample Period		Times Visited	Sampling Sites
November 2012 - August 2013		4	8
General	Location	Cherokee County	Click map for site data
	Impoundment	1953	
	Area	14,900 acres	
	Capacity	355,200 acre-feet	
	Purposes	Hydropower and Flood Control	

Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In Situ	Average Turbidity	9 NTU	100% of values < OWQS of 25 NTU
		Average Secchi Disk Depth	69 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	23 mg/m3	
		Trophic State Index	61	Previous value = 61
		Trophic Class	Hypereutrophic	
	Profile	Salinity	0.11– 0.20 ppt	
		Specific Conductivity	228 – 424 µS/cm	
		pH	7.01 – 9.19 pH units	2% of values > 9.0 pH units
		Oxidation-Reduction Potential	-46 to 307 mV	
		Dissolved Oxygen		All data for this sample year above screening level of 2 mg/L
	Nutrients	Surface Total Nitrogen	0.65 mg/L to 1.55 mg/L	
		Surface Total Phosphorus	0.023 mg/L to 0.604 mg/L	
		Nitrogen to Phosphorus Ratio	7:1	Possibly co- limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	NS	S							
	Aesthetics						NS	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<i>S = Fully Supporting</i> <i>NS = Not Supporting</i> <i>NEI = Not Enough Information</i>		<b>Notes</b> The lake is currently listed in the Oklahoma Water Quality Standards (WQS) as a Nutrient Limited Watershed (NLW). This listing means that the lake is considered threatened from nutrients until a more intensive study can confirm the Aesthetics beneficial use non-support status.										

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

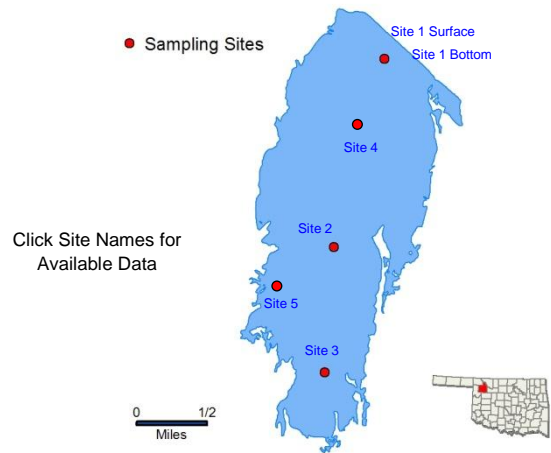
OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci

# Ft. Supply

Sample Period		Times Visited	Sampling Sites
October 2012 - August 2013		4	3
General	Location	Woodward County	Click map for site data
	Impoundment	1942	
	Area	1,820 acres	
	Capacity	13,900 acre-feet	
	Purposes	Flood Control, Conservation Purposes	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In-Situ	Average Turbidity	61 NTU	100% of values > OWQS of 25 NTU
		Average Secchi Disk Depth	23 cm	
		Water Clarity Rating	Fair to Poor	
		Chlorophyll-a	20 mg/m3	
		Trophic State Index	60	Previous value = 59
		Trophic Class	Eutrophic	
	Profile	Salinity	0.70 – 0.76 ppt	
		Specific Conductivity	1392 – 1510 µS/cm	
		pH	7.91 – 8.59 pH units	
		Oxidation-Reduction Potential	-93 to 220 mV	
		Dissolved Oxygen		All data are above screening level of 2.0 mg/L
	Nutrients	Surface Total Nitrogen	1.15 mg/L to 1.75 mg/L	
		Surface Total Phosphorus	0.026 mg/L to 0.229 mg/L	
		Nitrogen to Phosphorus Ratio	17:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	S							
	Aesthetics					NS*	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											NS
	<i>S = Fully Supporting</i> <i>NS = Not Supporting</i> <i>NEI = Not Enough Information</i>	Notes	*Did not collect for these parameters. *The lake is listed in the WQS as a NLW indicating that the Aesthetics beneficial use is considered threatened by nutrients until studies can be conducted to confirm non-support status. The PBCR beneficial use cannot be assessed as minimum data requirement were not met due to QA/QC issues for <i>E.coli</i> and enterococci.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

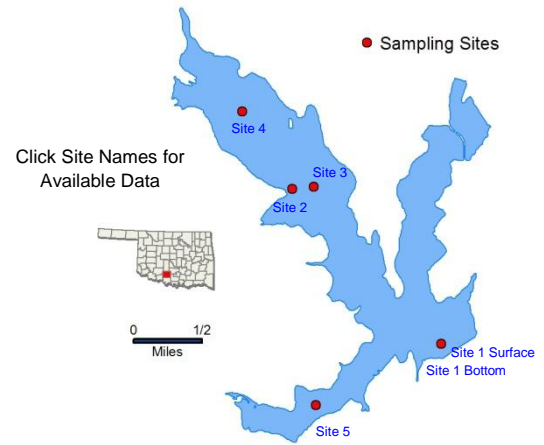
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Fuqua

Sample Period	Times Visited	Sampling Sites
November 2012 - July 2013	4	5

General	Location	Stephens County	Click map for site data
	Impoundment	1953	
	Area	1,500 acres	
	Capacity	21,100 acre-feet	
	Purposes	Water Supply, Recreation and Flood Control	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In-Situ	Average Turbidity	16 NTU	15% of values > OWQS of 25 NTU (n=20)
		Average Secchi Disk Depth	61 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	9 mg/m3	
		Trophic State Index	52	Previous Value= 57
		Trophic Class	Eutrophic	
	Profile	Salinity	0.30– 0.35 ppt	
		Specific Conductivity	612 – 724 µS/cm	
		pH	7.54 – 8.62 pH units	
		Oxidation-Reduction Potential	-151 to 320 mV	
		Dissolved Oxygen	Up to 33% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.65 mg/L to 1.18 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.033 mg/L	
		Nitrogen to Phosphorus Ratio	112:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	S							
	Aesthetics						S	*					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	<i>S = Fully Supporting</i> <i>NS = Not Supporting</i> <i>NEI = Not Enough Information</i>		<b>Notes</b> * did not collect for these parameters.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

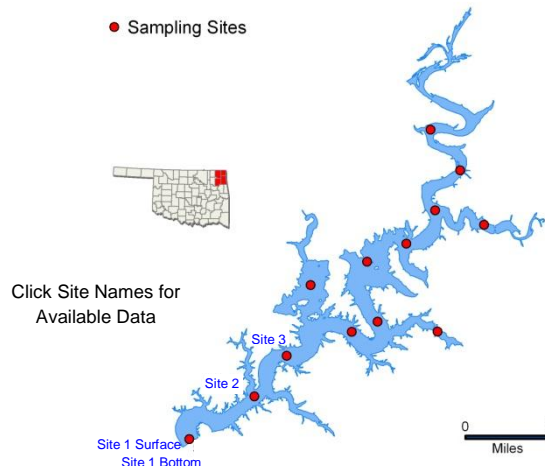
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Grand, Lower Lake (1-3)

Sample Period	Times Visited	Sampling Sites
November 2012 - August 2013	4	13

General	Location	Mayes County	Click map for site data
	Impoundment	1940	
	Area	1,820 acres	
	Capacity	13,900 acre-feet	
	Purposes	Flood Control, Hydropower	



Parameters		Parameter ( <i><a href="#">Descriptions</a></i> )	Result	Notes/Comments
	In Situ	Average Turbidity	7 NTU	100% of values < OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	109 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	14 mg/m3	
		Trophic State Index	56	Previous value = 56
		Trophic Class	Eutrophic	
	Profile	Salinity	0.09 – 0.17 ppt	
		Specific Conductivity	187 – 354 µS/cm	
		pH	6.35 – 8.49 pH units	3% of vales < 6.5 pH units
		Oxidation-Reduction Potential	-78 to 327 mV	
		Dissolved Oxygen	Up to 71% of water column in < 2.0 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.70 mg/L to 1.35 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.124 mg/L	
		Nitrogen to Phosphorus Ratio	20:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	NS	*							
	Aesthetics					S	*					
	Agriculture							*	*	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>	Notes	*Did not collect for these parameters									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

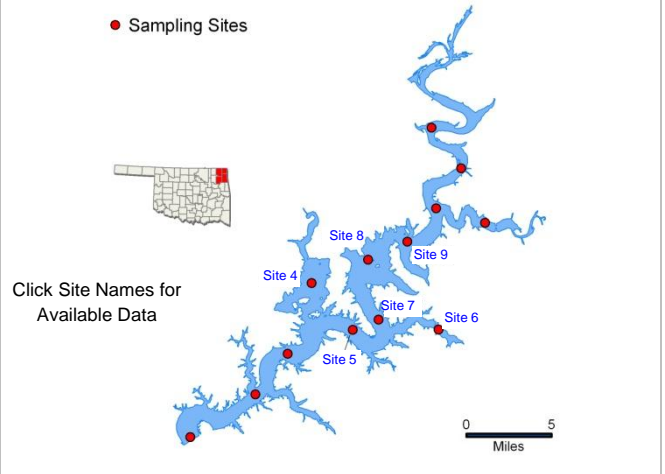
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Grand, Mid Lake (4-9)

Sample Period	Times Visited	Sampling Sites
November 2012 - August 2013	4	13

General	Location	Mayes County	Click map for site data
	Impoundment	1940	
	Area	1,820 acres	
	Capacity	13,900 acre-feet	
	Purposes	Flood Control, Hydropower	



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
	In Situ	Average Turbidity	14 NTU	13% of values > OWQS of 25 NTU (n=24)
		Average Secchi Disk Depth	77 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	11 mg/m3	
		Trophic State Index	54	Previous value = 60
		Trophic Class	Eutrophic	
	Profile	Salinity	0.09 – 0.20 ppt	
		Specific Conductivity	184 – 407 µS/cm	
		pH	6.55 – 8.82 pH units	
		Oxidation-Reduction Potential	-81 to 332 mV	
		Dissolved Oxygen	Up to 76% of water column < 2.0 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.66 mg/L to 3.59 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.187 mg/L	
		Nitrogen to Phosphorus Ratio	22:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	NS	*							
	Aesthetics						S	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<i>S = Fully Supporting</i> <i>NS = Not Supporting</i> <i>NEI = Not Enough Information</i>		Notes	*Did not collect for these parameters									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

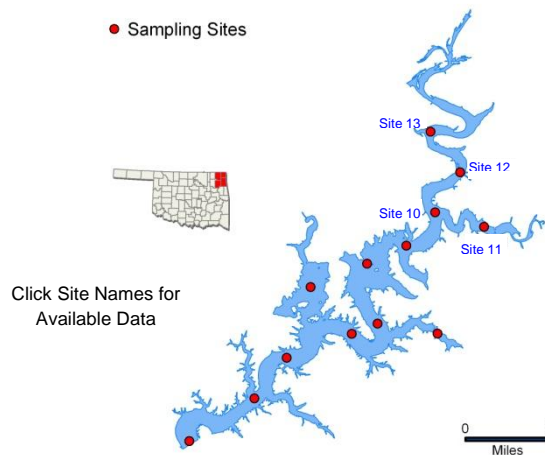
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Grand, Upper Lake (10-13)

Sample Period	Times Visited	Sampling Sites
November 2012 - August 2013	4	13

General	Location	Mayes County	Click map for site data
	Impoundment	1940	
	Area	1,820 acres	
	Capacity	13,900 acre-feet	
	Purposes	Flood Control, Hydropower	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	38 NTU	38% of values > OWQS of 25 NTU (n=16)
		Average Secchi Disk Depth	47 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	13 mg/m3	
		Trophic State Index	56	Previous value = 59
		Trophic Class	Eutrophic	
	Profile	Salinity	0.09 – 0.25 ppt	
		Specific Conductivity	189 – 518 µS/cm	
		pH	6.88 – 8.68 pH units	
		Oxidation-Reduction Potential	-73 to 368 mV	
		Dissolved Oxygen		All data for this sample year are below the screening level of 2 mg/L
	Nutrients	Surface Total Nitrogen	1.24 mg/L to 3.32 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.192 mg/L	
		Nitrogen to Phosphorus Ratio	22:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	*							
	Aesthetics						S	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<i>S = Fully Supporting</i> <i>NS = Not Supporting</i> <i>NEI = Not Enough Information</i>		<b>Notes</b> *Did not collect for these parameters										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

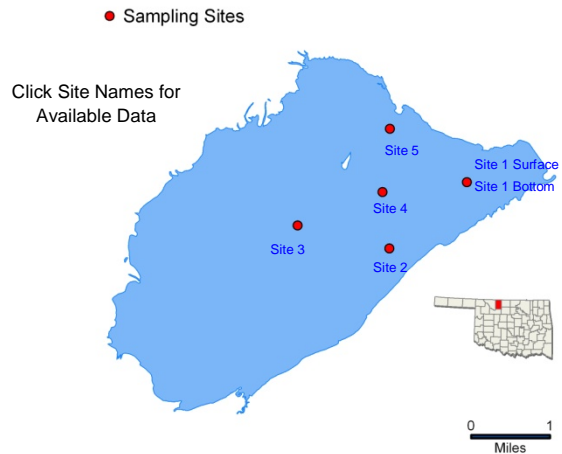
OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Great Salt Plains

Sample Period		Times Visited	Sampling Sites
February 2012 – May 2012		2	5
General	Location	Alfalfa County	Click map for site data
	Impoundment	1941	
	Area	8,690 acres	
	Capacity	31,240 acre-feet	
	Purposes	Flood Control, Conservation	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In Situ	Average Turbidity	289 NTU	100% of values > OWQS of 25 NTU (n=4)
		Average Secchi Disk Depth	13 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	15 mg/m3	
		Trophic State Index	57	Previous value = 71
		Trophic Class	Eutrophic	
	Profile	Salinity	3.57– 10.08 ppt	
		Specific Conductivity	6543 – 17,185 µS/cm	
		pH	8.03 – 8.35 pH units	
		Oxidation-Reduction Potential	93 – 490 mV	
		Dissolved Oxygen		Not stratified at any sampling event
	Nutrients	Surface Total Nitrogen	1.56 mg/L to 3.75 mg/L	
		Surface Total Phosphorus	0.091 mg/L to 0.676 mg/L	
		Nitrogen to Phosphorus Ratio	7:1	possibly co-limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS*	S	S	S							
	Aesthetics					NS*	N/A	N/A	N/A			
	Agriculture											
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	Notes	*The lake is listed in the WQS as a NLW indicating that the Aesthetics beneficial use is considered threatened by nutrients until studies can be conducted to confirm non-support status. ** Due to low water conditions the lake was only sampled twice during the current sample year. *N/A – parameters not collected in current sample year. * Min. data requirements not met for turbidity.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

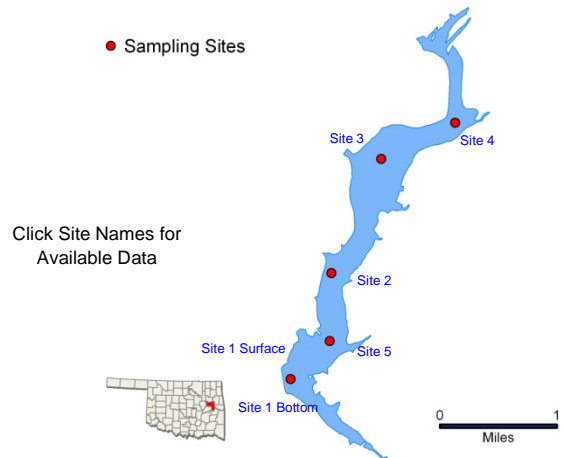
ppt = parts per thousand  
 En = Enterococci



# Greenleaf

Sample Period	Times Visited	Sampling Sites
November 2011 – August, 2012	4	5

General	Location	Muskogee County	Click map for site data
	Impoundment	1939	
	Area	920 acres	
	Capacity	14,720 acre-feet	
	Purposes	Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	12 NTU	8% of values > OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	67 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	11 mg/m3	
		Trophic State Index	54	Previous value = 52
		Trophic Class	Eutrophic	
	Profile	Salinity	0.06– 0.12 ppt	
		Specific Conductivity	146 – 243 µS/cm	
		pH	6.89 – 8.65 pH units	
		Oxidation-Reduction Potential	22 – 427 mV	
		Dissolved Oxygen	Up to 57% of water column < 2 mg/L in May	
	Nutrients	Surface Total Nitrogen	0.45 mg/L to 1.28 mg/L	
		Surface Total Phosphorus	0.006 mg/L to 0.030 mg/L	
		Nitrogen to Phosphorus Ratio	42:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	•	S							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												NS
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*N/A – parameters not collected in current sample year. *50-70% range is undetermined for DO.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

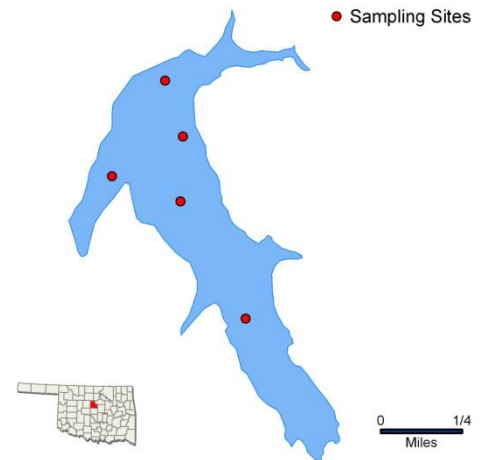
ppt = parts per thousand  
 En = Enterococci



# Guthrie

Sample Period	Times Visited	Sampling Sites
October 2005 – July 2006	4	5

General	Location	Logan County	Click map for site data
	Impoundment	1919	
	Area	274 acres	
	Capacity	3,875 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		19 NTU	20% of values > OWQS of 25 NTU
	Average True Color		21 units	100% of values < OWQS of 70
	Average Secchi Disk Depth		52 cm	
	Water Clarity Rating		Average to good	
	Trophic State Index		61	
	Trophic Class		hypereutrophic	
	Profile	Salinity	0.32– 0.43 ppt	
		Specific Conductivity	623.1 – 821 µS/cm	
		pH	7.78 – 8.21 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	357 – 470 mV	
		Dissolved Oxygen		Not stratified during any sampling interval
	Nutrients	Surface Total Nitrogen	0.61 mg/L to 1.33 mg/L	
		Surface Total Phosphorus	0.041mg/L to 0.103 mg/L	
		Nitrogen to Phosphorus Ratio	15:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S*	S	S	S							
	Aesthetics						S	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		<b>Notes</b> * Although 20% of the collected turbidity values exceeded the WQS of 25 NTU, available flow and rainfall data suggest that the peak in turbidity, which occurred in October, is likely due to seasonal storm events; therefore the lake will be listed as supporting its FWP use.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

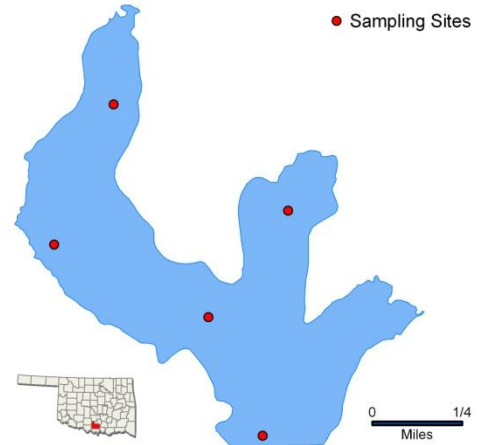
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Healdton

Sample Period	Times Visited	Sampling Sites
November 2005 – August 2006	4	5

General	Location	Carter County	Click map for site data
	Impoundment	1979	
	Area	370 acres	
	Capacity	3,766 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	48 NTU	100% of values > OWQS of 25 NTU
		Average True Color	159 units	100% of values > OWQS of 70
		Average Secchi Disk Depth	34 cm	
		Water Clarity Rating	poor	
		Trophic State Index	49	
		Trophic Class	mesotrophic	
	Profile	Salinity	0.13– 0.19 ppt	
		Specific Conductivity	275.6 – 378.5 µS/cm	
		pH	7.05 – 7.86 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	304 – 450 mV	
		Dissolved Oxygen	Up to 33% of water column < 2 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.59 mg/L to 0.94 mg/L	
		Surface Total Phosphorus	0.043 mg/L to 0.100 mg/L	
		Nitrogen to Phosphorus Ratio	11:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NEI*	S	S	S							
	Aesthetics						S	NEI*					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI*	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	* Due to inclement weather conditions all sites could not be sample in May, therefore an assessment cannot be made for turbidity, true color or bacteria as minimum data requirements were not met.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

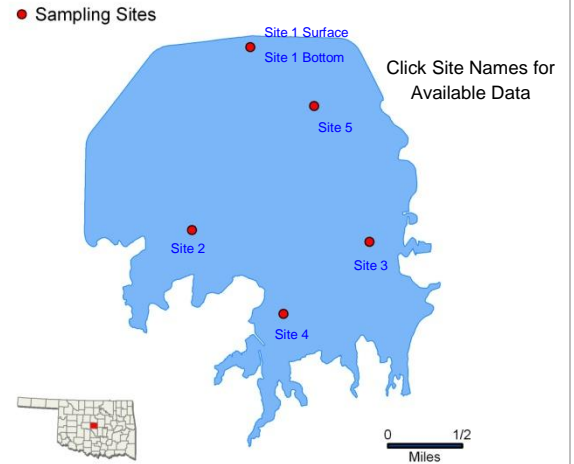
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Hefner

Sample Period	Times Visited	Sampling Sites
March 2013 – August 2013	4	3

General	Location	Oklahoma County	Click map for site data
	Impoundment	1947	
	Area	2,500 acres	
	Capacity	75,000 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	9 NTU	100% of values < OWQS of 25 NTU (n=6)
		Average Secchi Disk Depth	57 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	25 mg/m3	
		Trophic State Index	62	Previous Value= 63
		Trophic Class	Hypereutrophic	
	Profile	Salinity	0.55– 0.69 ppt	
		Specific Conductivity	1116 – 1376 µS/cm	
		pH	7.41 – 9 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-114 to 411 mV	
		Dissolved Oxygen	Up to 54% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	1.26 mg/L to 1.58 mg/L	
		Surface Total Phosphorus	0.084mg/L to 0.114 mg/L	
		Nitrogen to Phosphorus Ratio	14:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	NS	S							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		<b>Notes</b> * This parameter not collected for. Due to low water levels staff was unable to access lake during the Fall and Winter quarters.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

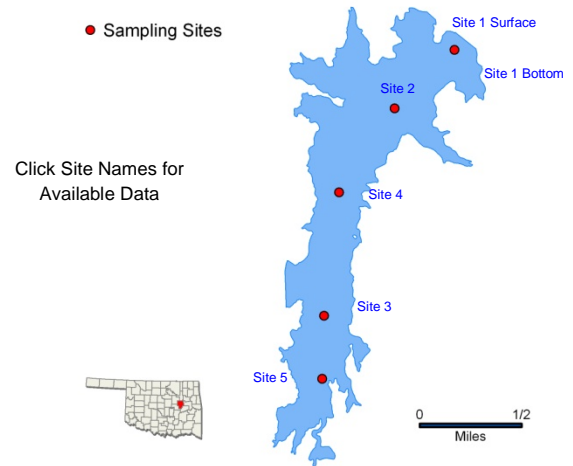
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Jim Hall (Henryetta)

Sample Period	Times Visited	Sampling Sites
2012	4	5

General	Location	Okmulgee County	Click map for site data
	Impoundment	1928	
	Area	450 acres	
	Capacity	6,600 acre-feet	
	Purposes	Water Supply and Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	132 NTU	100% of values > OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	8 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	3 mg/m3	
		Trophic State Index	43	Previous Value = 45
	Profile	Trophic Class	Mesotrophic	
		Salinity	0.04 - 0.05 ppt	
		Specific Conductivity	87 – 111 µS/cm	
		pH	6.50 – 8.04 pH units	
		Oxidation-Reduction Potential	298 to 637 mV	
		Dissolved Oxygen	Up to 11% of water column < 2 mg/L in July	
	Nutrients	Surface Total Nitrogen	1.19 mg/L to 1.36 mg/L	
		Surface Total Phosphorus	0.088 mg/L to 0.192 mg/L	
		Nitrogen to Phosphorus Ratio	10:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S								
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											NEI**	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	**The PBCR cannot be assessed as minimum data requirements were not met due to QA/QC issues for all parameters *N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

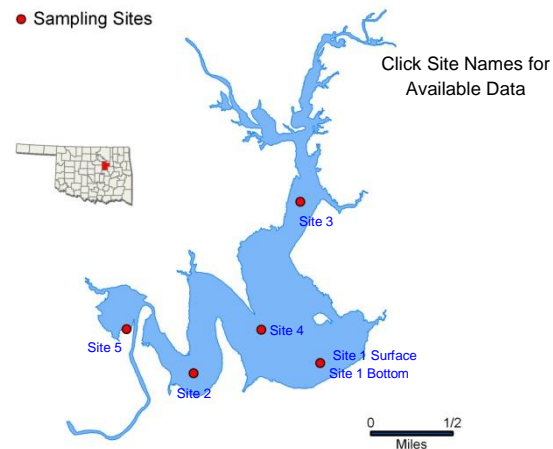
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Heyburn

Sample Period	Times Visited	Sampling Sites
October 2012 - August 2013	4	4

General	Location	Creek County	Click map for site data
	Impoundment	1950	
	Area	880 acres	
	Capacity	7,105 acre-feet	
	Purposes	Flood Control and Conservation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	142 NTU	100% of values > 25 NTU (n=15)
		Average Secchi Disk Depth	12 cm	75% of values > OWQS of 70
		Water Clarity Rating	Poor	
		Chlorophyll-a	6 mg/m3	
		Trophic State Index	48	Previous value = 49
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.10 – 0.15 ppt	
		Specific Conductivity	214 – 324 µS/cm	
		pH	6.68 – 8.51 pH units	
		Oxidation-Reduction Potential	-115 to 211 mV	
		Dissolved Oxygen	Up to 13% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.79 mg/L to 2.79 mg/L	
		Surface Total Phosphorus	0.029 mg/L to 0.273 mg/L	
		Nitrogen to Phosphorus Ratio	16:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterococci & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	NS	S							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	* Did not collect for this parameter. The PBCR beneficial use cannot be assessed as minimum data requirement were not met due to QA/QC issues for enterococci.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

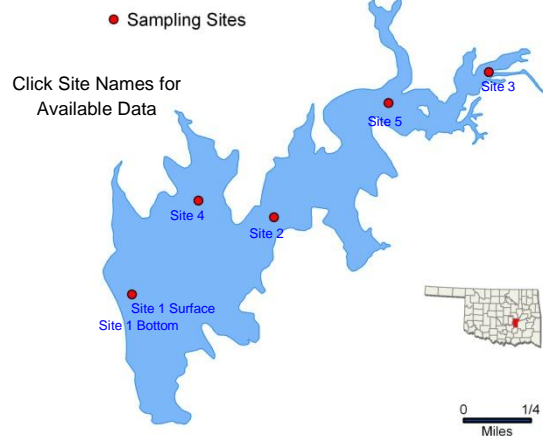
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Holdenville

Sample Period	Times Visited	Sampling Sites
October 2012 - August 2013	4	3

General	Location	Hughes County	Click map for site data
	Impoundment	1931	
	Area	550 acres	
	Capacity	11,000 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	17 NTU	27% of values > OWQS of 25 NTU (n=11)
		Average Secchi Disk Depth	48 cm	
		Water Clarity Rating	Fair	
		Chlorophyll-a	17 mg/m3	
		Trophic State Index	58	Previous value = 60
		Trophic Class	Eutrophic	
	Profile	Salinity	0.14 – 0.19 ppt	
		Specific Conductivity	294 – 398 µS/cm	
		pH	6.51 – 8.37 pH units	
		Oxidation-Reduction Potential	-19 to 351 mV	
		Dissolved Oxygen	Up to 71% of water column < 2 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.72 mg/L to 1.37 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.036 mg/L	
		Nitrogen to Phosphorus Ratio	88:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterococci & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	NS	S							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											NS
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes <ul style="list-style-type: none"> <li>No longer collect for this parameter</li> </ul>										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

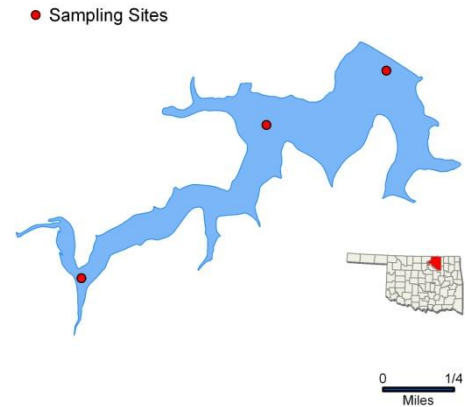
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Hominy Municipal

Sample Period	Times Visited	Sampling Sites
November 2006 - August 2007	3	3

General	Location	Osage County	Click map for site data
	Impoundment	1940	
	Area	165 acres	
	Capacity	5,000 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	<b>Parameter</b> ( <a href="#">Descriptions</a> )		<b>Result</b>	<b>Notes/Comments</b>
	Average Turbidity		9 NTU	100% of values < OWQS of 25 NTU
	Average True Color		35 units	100% of values < OWQS of 70
	Average Secchi Disk Depth		101 cm	
	Water Clarity Rating		excellent	
	Trophic State Index		56	
	Trophic Class		eutrophic	
	Profile	Salinity	0.10– 0.14 ppt	
		Specific Conductivity	224 – 297.7 µS/cm	
		pH	7.12 – 8.66 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-22 - 430 mV	
		Dissolved Oxygen	Up to 62% of water column < 2 mg/L in August	Occurred at sites 1 and 2
	Nutrients	Surface Total Nitrogen	0.45 mg/L to 0.98 mg/L	
		Surface Total Phosphorus	0.010 mg/L to 0.028 mg/L	
		Nitrogen to Phosphorus Ratio	34:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	NEI	S	NS	S							
	Aesthetics					S	NEI					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
<b>S = Fully Supporting</b> <b>NS = Not Supporting</b> <b>NEI = Not Enough Information</b>		Notes	Although 100% of the turbidity and color samples were below the standard, the Fish & Wildlife Propagation (FWP) and Aesthetics beneficial use cannot be assessed as minimum data requirements were not met.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

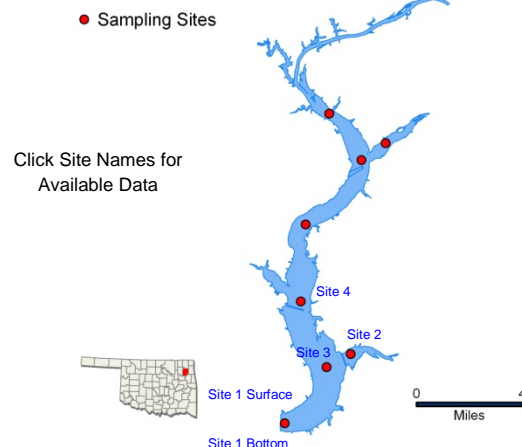
ppt = parts per thousand  
 En = Enterococci



# Hudson, Lower (1-4)

Sample Period	Times Visited	Sampling Sites
October 2011 - July 2012	4	8

General	Location	Mayes County	Click map for site data
	Impoundment	1964	
	Area	10,900 acres	
	Capacity	200,300 acre-feet	
	Purposes	Flood Control, Hydropower	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	10 NTU	6% of values < OWQS of 25 NTU (n=16)
		Average Secchi Disk Depth	89 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	10 mg/m <sup>3</sup>	
		Trophic State Index	53	Previous value = 54
		Trophic Class	Eutrophic	
	Profile	Salinity	0.06 – 0.13 ppt	
		Specific Conductivity	137 – 279 µS/cm	
		pH	6.99 – 8.63 pH units	
		Oxidation-Reduction Potential	110 – 458mV	
		Dissolved Oxygen	Up to 90% of water column < 2.0 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.45 mg/L to 2.01 mg/L	
		Surface Total Phosphorus	0.010 mg/L to 0.126 mg/L	
		Nitrogen to Phosphorus Ratio	17:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	NS	*							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes: *N/A – parameters not collected in current sample year.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

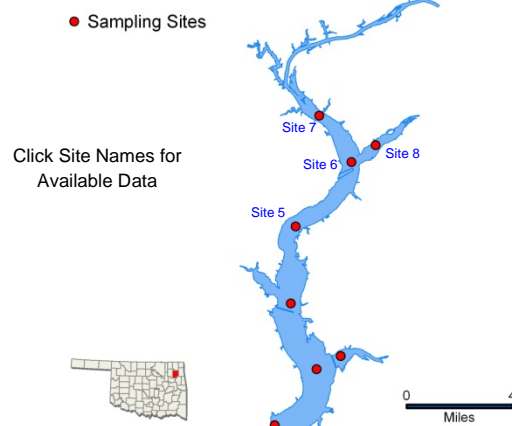
ppt = parts per thousand  
 En = Enterococci



# Hudson, Upper (5-8)

Sample Period	Times Visited	Sampling Sites
October 2011 - July 2012	4	8

General	Location	Mayes County	Click map for site data
	Impoundment	1964	
	Area	10,900 acres	
	Capacity	200,300 acre-feet	
	Purposes	Flood Control, Hydropower	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	26 NTU	25% of values < OWQS of 25 NTU (n=16)
		Average Secchi Disk Depth	50 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	14 mg/m <sup>3</sup>	
		Trophic State Index	56	Previous value = 54
		Trophic Class	Eutrophic	
	Profile	Salinity	0.10 – 0.12 ppt	
		Specific Conductivity	212 – 257 µS/cm	
		pH	7.21 – 8.78 pH units	
		Oxidation-Reduction Potential	237 – 460mV	
		Dissolved Oxygen	Up to 36% of water column < 2.0 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.47 mg/L to 2.07 mg/L	
		Surface Total Phosphorus	0.034 mg/L to 0.143 mg/L	
		Nitrogen to Phosphorus Ratio	15:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	*							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

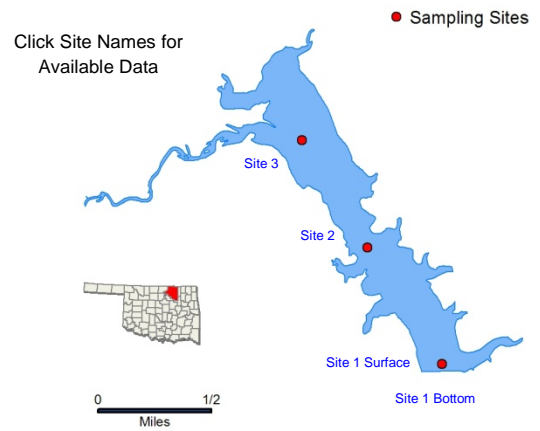
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Hudson (Bartlesville)

Sample Period	Times Visited	Sampling Sites
November 2011 – July 2012	4	3

General	Location	Osage County	Click map for site data
	Impoundment	1949	
	Area	268 acres	
	Capacity	2,776 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	11 NTU	100% of values < OWQS of 25 NTU (n=8)
		Average Secchi Disk Depth	66 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	8 mg/m3	
		Trophic State Index	51	Previous value = 58
		Trophic Class	Eutrophic	
	Profile	Salinity	0.08 – 0.15 ppt	
		Specific Conductivity	172 – 313 µS/cm	
		pH	5.99 – 8.22 pH units	Only 5.22% of values < 6.5 pH units
		Oxidation-Reduction Potential	75 – 495 mV	
		Dissolved Oxygen	Up to 50% of water column < 2.0 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.62 mg/L to 0.98 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.021 mg/L	
		Nitrogen to Phosphorus Ratio	60:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	*							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

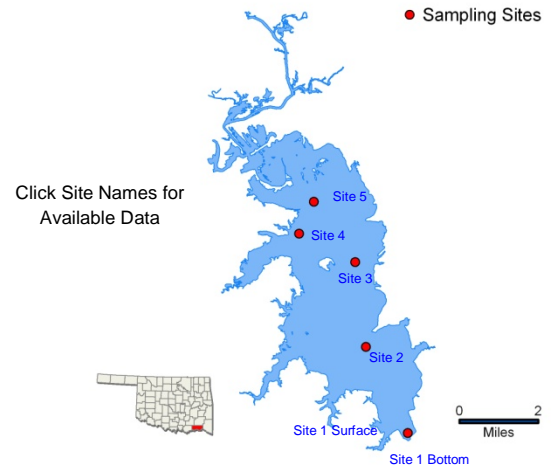
OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Hugo

Sample Period		Times Visited	Sampling Sites
December 2011 - August 2012		4	5
General	Location	Choctaw County	Click map for site data
	Impoundment	1974	
	Area	13,250 acres	
	Capacity	157,600 acre-feet	
	Purposes	Flood Control, Water Supply, Water Quality Control, Fish and Wildlife, and Recreation	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In Situ	Average Turbidity	61 NTU	90% of values > OWQS of 25 NTU (n=20)
		Average Secchi Disk Depth	25 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	11 mg/m3	
		Trophic State Index	54	Previous value = 54
		Trophic Class	Eutrophic	
	Profile	Salinity	0.02 - 0.05 ppt	
		Specific Conductivity	37 – 114 µS/cm	
		pH	6.59 – 8.21 pH units	Neutral
		Oxidation-Reduction Potential	191 to 456 mV	
		Dissolved Oxygen	All data are above screening level of 2.0 mg/L	
	Nutrients	Surface Total Nitrogen	0.68 mg/L to 1.54 mg/L	
		Surface Total Phosphorus	0.016 mg/L to 0.127 mg/L	
		Nitrogen to Phosphorus Ratio	14:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	S							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	* The PBCR cannot be assessed as minimum data requirements were not met due to QA/QC issues *N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

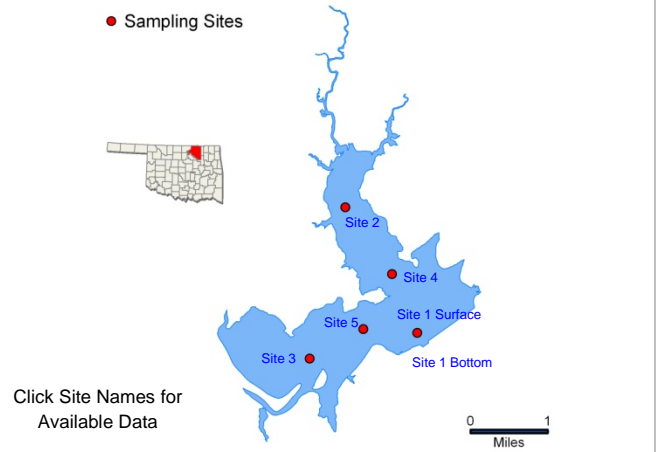
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Hulah

Sample Period	Times Visited	Sampling Sites
November 2011 – July 2012	4	5

General	Location	Osage County	Click map for site data
	Impoundment	1951	
	Area	3,570 acres	
	Capacity	31,160 acre-feet	
	Purposes	Flood Control, Water Supply, Low-flow Regulation, and Conservation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	78 NTU	100% of values > OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	17 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	9 mg/m3	
		Trophic State Index	52	Previous value = 55
	Profile	Trophic Class	Eutrophic	
		Salinity	0.10 - 0.16 ppt	
		Specific Conductivity	202 – 347 µS/cm	
		pH	7.41 – 8.29 pH units	
		Oxidation-Reduction Potential	269 to 514 mV	
		Dissolved Oxygen	All data are above screening level of 2.0 mg/L	
	Nutrients	Surface Total Nitrogen	0.66 mg/L to 1.12 mg/L	
		Surface Total Phosphorus	0.018 mg/L to 0.132 mg/L	
		Nitrogen to Phosphorus Ratio	13:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterococci & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	S							
	Aesthetics					NS	N/A					
	Agriculture							N/A	N/A	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	Currently, this lake is listed as a Nutrient Limited Watershed (NLW) in the Oklahoma Water Quality Standards (WQS). This means that the lake is considered threatened from nutrients until a more intensive study can confirm the Aesthetics beneficial use non-support status. N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

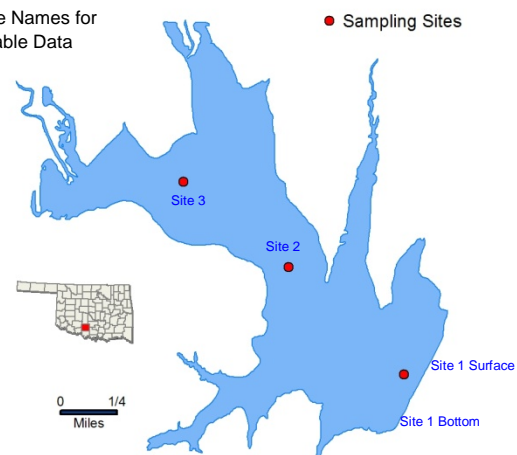
OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Humphreys

Click Site Names for  
Available Data



Sample Period			Times Visited	Sampling Sites
October 2011 – August 2012			4	3
General	Location	Stephens County		Click map for site data
	Impoundment	1958		
	Area	10,900 acres		
	Capacity	200,300 acre-feet		
	Purposes	Water Supply, Flood Control, Recreation		

Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In Situ	Average Turbidity	10 NTU	100% of values < OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	49 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	32 mg/m3	
		Trophic State Index	65	Previous value = 63
		Trophic Class	Hypereutrophic	
	Profile	Salinity	0.29 – 0.38 ppt	
		Specific Conductivity	602 – 775 µS/cm	
		pH	5.44 – 8.68 pH units	
		Oxidation-Reduction Potential	-54 – 536 mV	
		Dissolved Oxygen	Up to 30% of water column < 2.0 mg/L in August	
	Nutrients	Surface Total Nitrogen	1.23 mg/L to 1.62 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.061 mg/L	
		Nitrogen to Phosphorus Ratio	51:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	*							
	Aesthetics						NS	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												NS
	<i>S = Fully Supporting</i> <i>NS = Not Supporting</i> <i>NEI = Not Enough Information</i>		<b>Notes</b> N/A – parameters not collected in current sample year. *With a TSI of 63 this lake will be further reviewed to determine the need to be considered as an NLW water body.										

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
µS/cm = microsiemens/cm

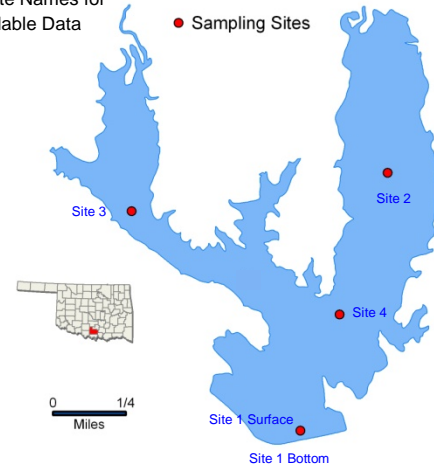
ppt = parts per thousand  
En = Enterococci

# Jean Neustadt

Sample Period	Times Visited	Sampling Sites
November 2011 - July 2012	4	5

General	Location	Carter County	Click map for site data
	Impoundment	1969	
	Area	462 acres	
	Capacity	6,106 acre-feet	
	Purposes	Recreation	

Click Site Names for Available Data



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	17 NTU	8% of values > OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	44 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	23 mg/m3	
		Trophic State Index	61	Previous value = 58
		Trophic Class	Eutrophic	
	Profile	Salinity	0.13– 0.20 ppt	
		Specific Conductivity	271 – 406 µS/cm	
		pH	6.70 – 9 pH units	
		Oxidation-Reduction Potential	-27 - 538 mV	
		Dissolved Oxygen	Up to 67% of water column < 2 mg/L in July	Occurred at site 1, the dam
	Nutrients	Surface Total Nitrogen	0.69 mg/L to 1.59 mg/L	
		Surface Total Phosphorus	0.005mg/L to 0.039 mg/L	
		Nitrogen to Phosphorus Ratio	61:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	*	S							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	N/A – parameters not collected in current sample year.  * 50-70% range is undetermined for DO.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

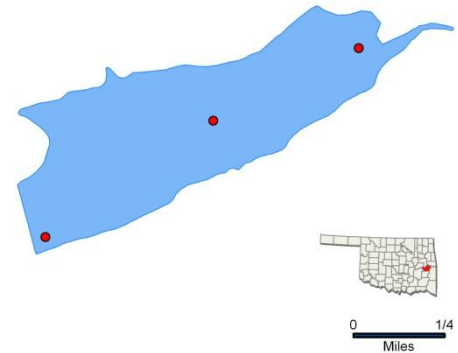
ppt = parts per thousand  
 En = Enterococci

# John Wells

Sample Period	Times Visited	Sampling Sites
October 2008 – July 2009	4	3

General	Location	Haskell County	Click map for site data
	Impoundment	1936	
	Area	194 acres	
	Capacity	1,352 acre-feet	
	Purposes	Water Supply, Recreation	

● Sampling Sites



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		3 NTU	100% of values < OWQS of 25 NTU (n=12)
	Average True Color			Did not collect for true color
	Average Secchi Disk Depth		180 cm	
	Water Clarity Rating		Excellent	
	Trophic State Index		45	Previous value = 46
	Trophic Class		Mesotrophic	
	Profile	Salinity	0.02 – 0.10 ppt	
		Specific Conductivity	73 – 207.5 µS/cm	
		pH	6.3 – 9.13 pH units	1% of values < 6.50 and 2.38% > 9.00 pH units
		Oxidation-Reduction Potential	-35 – 503 mV	
		Dissolved Oxygen	Up to 50% of water column < 2.0 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.30 mg/L to 0.54 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.014 mg/L	
		Nitrogen to Phosphorus Ratio	43:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	*							
	Aesthetics						S	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	<div>S = Fully Supporting NS = Not Supporting NEI = Not Enough Information</div>		Notes	*Did not collect for these parameters									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

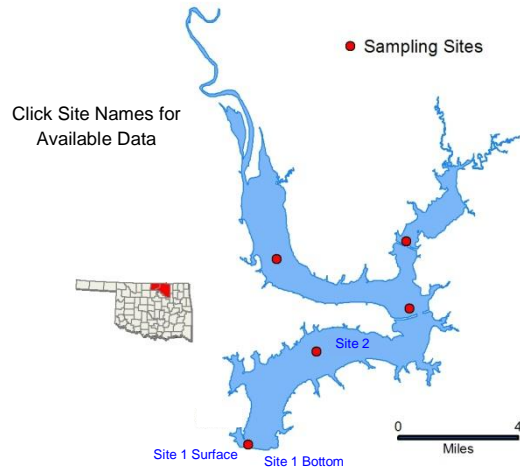
ppt = parts per thousand  
 En = Enterococci



# Kaw (Lower)

Sample Period	Times Visited	Sampling Sites
October 2012 – July 2013	4	5

General	Location	Osage County	Click map for site data
	Impoundment	1976	
	Area	17,040 acres	
	Capacity	428,600 acre-feet	
	Purposes	Flood Control, Water Supply, Water Quality Control, and Conservation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	9 NTU	100% of values < 25 NTU
		Average Secchi Disk Depth	72 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	9 mg/m3	
		Trophic State Index	52	Previous value = 42
		Trophic Class	Eutrophic	
	Profile	Salinity	0.41 – 0.53 ppt	
		Specific Conductivity	841 – 1070 µS/cm	
		pH	7.34 – 8.62 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-148 to 212 mV	
		Dissolved Oxygen	Up to 35% of water column < 2 mg/L in the summer	
	Nutrients	Surface Total Nitrogen	0.94 mg/L to 1.58 mg/L	
		Surface Total Phosphorus	0.068 mg/L to 0.116 mg/L	
		Nitrogen to Phosphorus Ratio	15:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	S							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

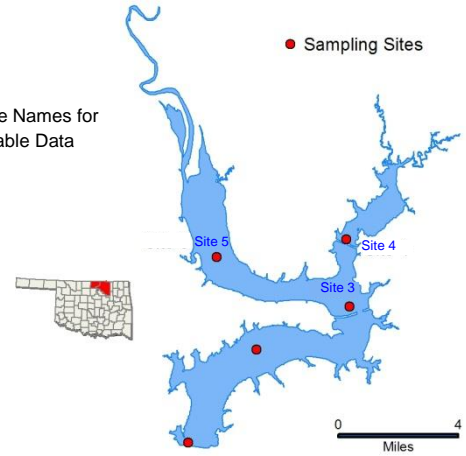


# Kaw (Upper)

Sample Period	Times Visited	Sampling Sites
October 2012 – July 2013	4	5

General	Location	Osage County	Click map for site data
	Impoundment	1976	
	Area	17,040 acres	
	Capacity	428,600 acre-feet	
	Purposes	Flood Control, Water Supply, Water Quality Control, and Conservation	

Click Site Names for Available Data



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	26 NTU	42% of values > 25 NTU
		Average Secchi Disk Depth	34 cm	
		Water Clarity Rating	Fair	
		Chlorophyll-a	19 mg/m3	
		Trophic State Index	60	Previous value = 53
		Trophic Class	Eutrophic	
	Profile	Salinity	0.36 – 0.66 ppt	
		Specific Conductivity	749 – 1311 µS/cm	
		pH	7.69 – 8.65 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-136 to 165 mV	
		Dissolved Oxygen	Up to 10% of water column < 2 mg/L in July	
	Nutrients	Surface Total Nitrogen	1.23 mg/L to 2.49 mg/L	
		Surface Total Phosphorus	0.067 mg/L to 0.266 mg/L	
		Nitrogen to Phosphorus Ratio	12:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	S							
	Aesthetics						S	*					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes <ul style="list-style-type: none"> <li>No longer collect for this parameter</li> </ul>										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

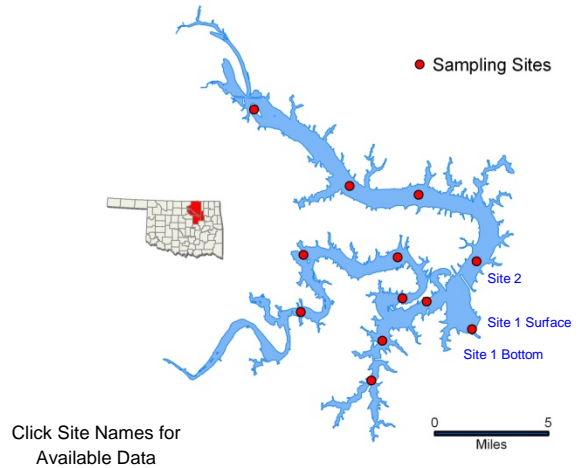
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Keystone (1-2)

Sample Period	Times Visited	Sampling Sites
November 2011 – August 2012	4	12

General	Location	Tulsa County	Click map for site data
	Impoundment	1964	
	Area	23,610 acres	
	Capacity	557,600 acre-feet	
	Purposes	Flood Control, Water Supply, Hydropower, Navigation, Fish & Wildlife	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	29 NTU	25% of values > OWQS of 25 NTU (n=8)
		Average Secchi Disk Depth	50 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	7 mg/m3	
		Trophic State Index	49	Previous value = 57
		Trophic Class	Mesotrophic	
	Profile	Salinity	021 – 1.42 ppt	
		Specific Conductivity	434 – 2734 µS/cm	
		pH	7.38 – 8.42 pH units	
		Oxidation-Reduction Potential	59 – 545mV	
		Dissolved Oxygen	Up to 47% of water column < 2.0 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.83 mg/L to 1.4 mg/L	
		Surface Total Phosphorus	0.085 mg/L to 0.207 mg/L	
		Nitrogen to Phosphorus Ratio	8:1	Possibly co-limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	*							
	Aesthetics						S	N/A					
	Agriculture								NEI	NEI	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	N/A – parameters not collected in current sample year. Although 50% of the values exceeded 25 NTU, an assessment of the Fish & Wildlife Propagation (FWP) beneficial use cannot be made as minimum data requirements are not being met.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

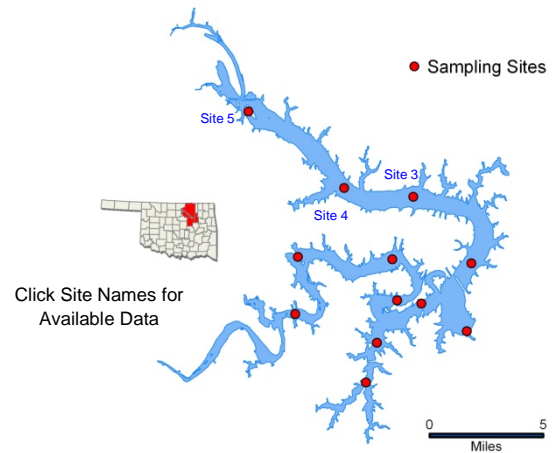
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Keystone, Arkansas River Arm (3-5)

Sample Period	Times Visited	Sampling Sites
November 2011 – August 2012	4	12

General	Location	Tulsa County	Click map for site data
	Impoundment	1964	
	Area	23,610 acres	
	Capacity	557,600 acre-feet	
	Purposes	Flood Control, Water Supply, Hydropower, Navigation, Fish & Wildlife	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	125 NTU	75% of values > OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	24 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	18 mg/m3	
		Trophic State Index	59	Previous value = 61
	Profile	Trophic Class	Eutrophic	
		Salinity	0.26 – 0.88 ppt	
		Specific Conductivity	551 – 1743 µS/cm	
		pH	7.60 – 8.46 pH units	
		Oxidation-Reduction Potential	206 – 525 mV	
		Dissolved Oxygen	Up to 22% of water column < 2.0 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.93 mg/L to 3.99 mg/L	
		Surface Total Phosphorus	0.107 mg/L to 0.480 mg/L	
		Nitrogen to Phosphorus Ratio	8:1	Possibly co-limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	*							
	Aesthetics					S	N/A					
	Agriculture							NEI	NEI	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
	<i>S = Fully Supporting</i> <i>NS = Not Supporting</i> <i>NEI = Not Enough Information</i>	Notes	N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

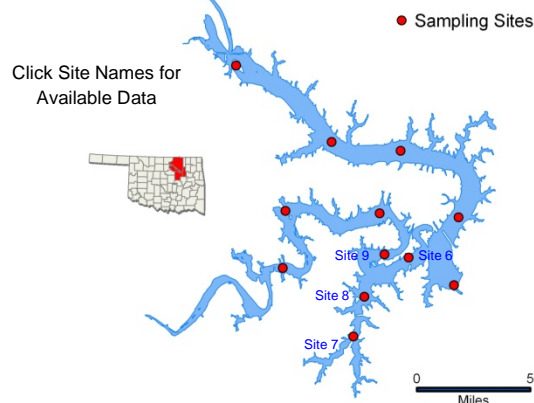
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Keystone, Lower Cimarron River Arm (6-9)

Sample Period	Times Visited	Sampling Sites
November 2011 – August 2012	4	12

General	Location	Tulsa County	Click map for site data
	Impoundment	1964	
	Area	23,610 acres	
	Capacity	557,600 acre-feet	
	Purposes	Flood Control, Water Supply, Hydropower, Navigation, Fish & Wildlife	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	28 NTU	31% of values > OWQS of 25 NTU (n=14)
		Average Secchi Disk Depth	47 cm	
		Water Clarity Rating	Fair	
		Chlorophyll-a	11 mg/m <sup>3</sup>	
		Trophic State Index	54	Previous value = 57
	Profile	Trophic Class	Eutrophic	
		Salinity	0.24 – 1.22 ppt	
		Specific Conductivity	507 – 2394 µS/cm	
		pH	7.60 – 8.74 pH units	
		Oxidation-Reduction Potential	188 – 445 mV	
		Dissolved Oxygen	Up to 8% of water column < 2.0 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.67 mg/L to 1.72 mg/L	
		Surface Total Phosphorus	0.067 mg/L to 0.204 mg/L	
		Nitrogen to Phosphorus Ratio	10:1	Phosphorus limited or Possibly co-limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterococci & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	*							
	Aesthetics					S	N/A					
	Agriculture							NEI	NEI	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*Did not collect for these parameters.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

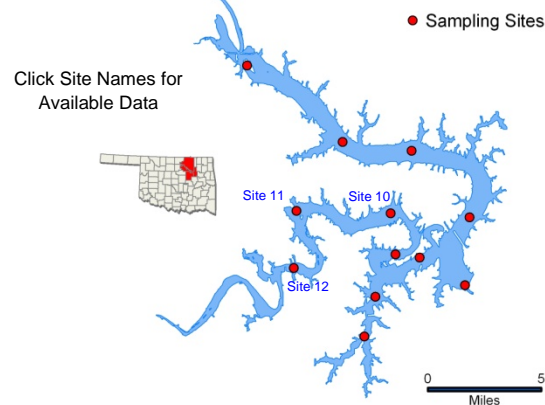
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Keystone, Upper Cimarron River Arm (10-12)

Sample Period	Times Visited	Sampling Sites
November 2011 – August 2012	4	12

General	Location	Tulsa County	Click map for site data
	Impoundment	1964	
	Area	23,610 acres	
	Capacity	557,600 acre-feet	
	Purposes	Flood Control, Water Supply, Hydropower, Navigation, Fish & Wildlife	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	306 NTU	67% of values > OWQS of 25 NTU (n=9)
		Average Secchi Disk Depth	16 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	34 mg/m3	
		Trophic State Index	65	Previous value = 60
	Profile	Trophic Class	Hypereutrophic	
		Salinity	028 – 3.68 ppt	
		Specific Conductivity	576 – 6762 µS/cm	
		pH	7.56 – 8.82 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	66 – 405 mV	
	Nutrients	Dissolved Oxygen	Up to 64% of water column < 2.0 mg/L in August	
		Surface Total Nitrogen	1.14 mg/L to 3.74 mg/L	
		Surface Total Phosphorus	0.098 mg/L to 0.696 mg/L	
		Nitrogen to Phosphorus Ratio	7:1	Possibly co-limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	*	*							
	Aesthetics						S	N/A					
	Agriculture								NEI	NEI	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	Although 67% of the values exceeded 25 NTU an assessment of the Fish & Wildlife Propagation (FWP) beneficial use cannot be made, as minimum data requirements are not being met. *Did not collect for these parameters. * 50-70% range is undetermined for DO.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

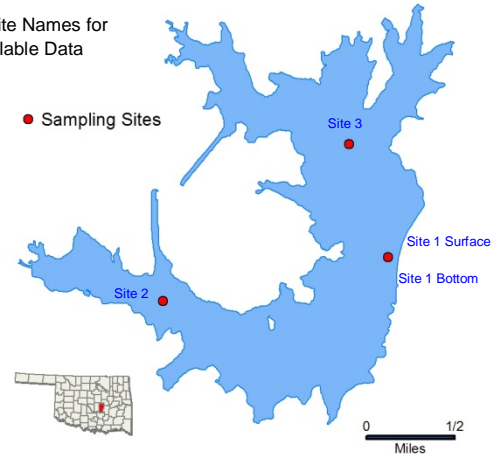
OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Konawa

Click Site Names for  
Available Data



Sample Period	Times Visited	Sampling Sites
November 2011 – August 2012	4	3

General	Location	Seminole County	Click map for site data
	Impoundment	1968	
	Area	1,350 acres	
	Capacity	23,000 acre-feet	
	Purposes	Cooling Water	

Parameters		Parameter ( <i>Descriptions</i> )	Result	Notes/Comments
	In Situ	Average Turbidity	7 NTU	100% of values < OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	75 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	24 mg/m3	
		Trophic State Index	62	Previous value = 54
		Trophic Class	Hypereutrophic	
	Profile	Salinity	0.57 – 0.64 ppt	
		Specific Conductivity	1144 – 1297 µS/cm	
		pH	8.02 – 8.77 pH units	
		Oxidation-Reduction Potential	-49 to 552 mV	
		Dissolved Oxygen	Up to 33% of water column < 2.0 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.85 mg/L to 1.45 mg/L	
		Surface Total Phosphorus	0.007 mg/L to 0.037 mg/L	
		Nitrogen to Phosphorus Ratio	42:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	S	*							
	Aesthetics					S	N/A					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>	Notes	*Did not collect for these parameters The PBCR beneficial use is considered not supporting for enterococci as 1 (10%) of the values exceeded the screening levels of 61.									

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

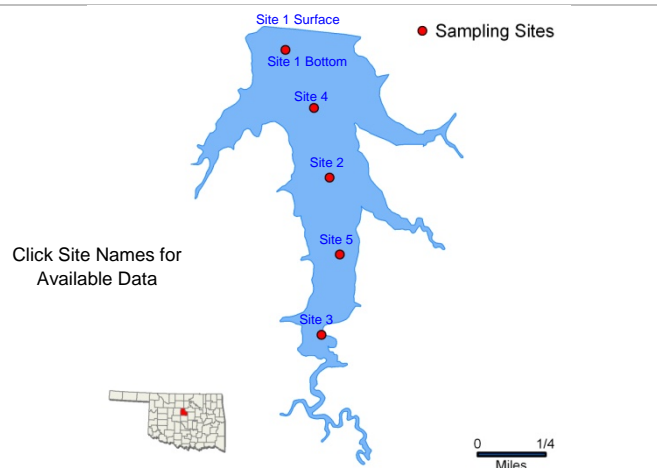
mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci

# Langston

Sample Period	Times Visited	Sampling Sites
November 2010 – July 2011	4	5

General	Location	Logan County	Click map for site data
	Impoundment	1966	
	Area	304 acres	
	Capacity	5,792 acre-feet	
	Purposes	Water Supply, Flood Control, and Recreation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	13 NTU	5% of values > 25
		Average Secchi Disk Depth	73 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	4 mg/m3	
		Trophic State Index	45	Previous value = 44
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.16 – 0.19 ppt	
		Specific Conductivity	325.2 – 384.3 µS/cm	
		pH	6.49 – 8.54 pH units	Only 0.97% of values < 6.5 pH units
		Oxidation-Reduction Potential	-104 to 518 mV	
		Dissolved Oxygen	Up to 46% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.27 mg/L to 0.64 mg/L	
		Surface Total Phosphorus	0.011 mg/L to 0.014 mg/L	
		Nitrogen to Phosphorus Ratio	41:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	S	S							
	Aesthetics					S	S					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

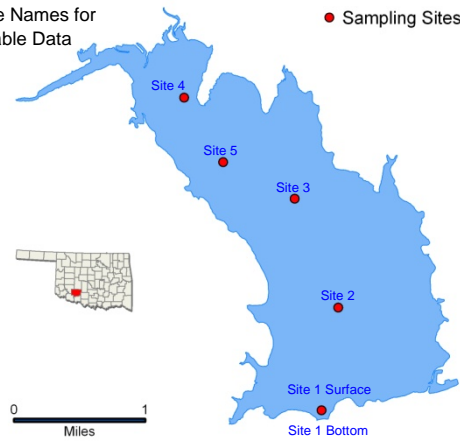
ppt = parts per thousand  
 En = Enterococci



# Lawtonka

Click Site Names for  
Available Data

● Sampling Sites



Sample Period		Times Visited	Sampling Sites
December 2010 – August 2011		4	5
General	Location	Comanche County	Click map for site data
	Impoundment	1905	
	Area	2,398 acres	
	Capacity	56,574 acre-feet	
	Purposes	Water Supply, Recreation	

Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In-Situ	Average Turbidity	7 NTU	100% of values <OWQS of 25 NTU
		Average Secchi Disk Depth	130 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	13 mg/m3	
		Trophic State Index	56	Previous Value= 60
		Trophic Class	Eutrophic	
	Profile	Salinity	0.16– 0.21 ppt	
		Specific Conductivity	326.9 – 422.1 µS/cm	
		pH	6.55 – 8.73 pH units	
		Oxidation-Reduction Potential	-123 - 456 mV	
		Dissolved Oxygen	Up to 66% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.35 mg/L to 0.88 mg/L	
		Surface Total Phosphorus	0.015mg/L to 0.030 mg/L	
		Nitrogen to Phosphorus Ratio	22:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	S							
	Aesthetics						S	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												NS
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes *Did not collect for these parameters										

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci

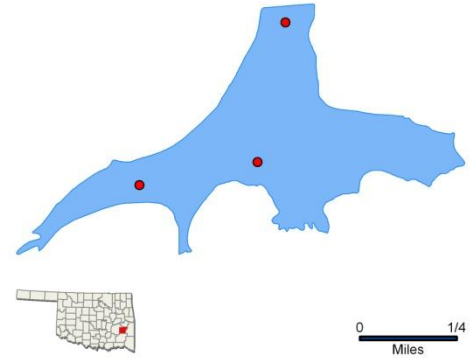


# Lloyd Church (Wilburton)

Sample Period	Times Visited	Sampling Sites
November 2005 – August 2006	4	3

General	Location	Latimer County	Click map for site data
	Impoundment	1964	
	Area	160 acres	
	Capacity	3,060 acre-feet	
	Purposes	Water Supply, Recreation, Flood Control	

● Sampling Sites



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	14 NTU	25% of values > OWQS of 25 NTU
		Average True Color	79 units	75% of values > OWQS of 70
		Average Secchi Disk Depth	64 cm	
		Water Clarity Rating	good	
		Trophic State Index	45	
		Trophic Class	mesotrophic	
	Profile	Salinity	0.0 – 0.01 ppt	
		Specific Conductivity	25.4 – 71.9 µS/cm	
		pH	5.9 – 7.51 pH units	26% of values < 6.5 pH units
		Oxidation-Reduction Potential	79 -503 mV	
		Dissolved Oxygen	Up to 62% of water column < 2 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.15 mg/L to 0.57 mg/L	
		Surface Total Phosphorus	0.020 mg/L to 0.043 mg/L	
		Nitrogen to Phosphorus Ratio	12:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	NS	NS	S							
	Aesthetics						S	NS					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	Available flow and rainfall data suggest that the peak in turbidity, which occurred in March is likely due to seasonal storm events, therefore Lloyd Church Lake will be listed as supporting its Fish & Wildlife Propagation (FWP) beneficial use									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

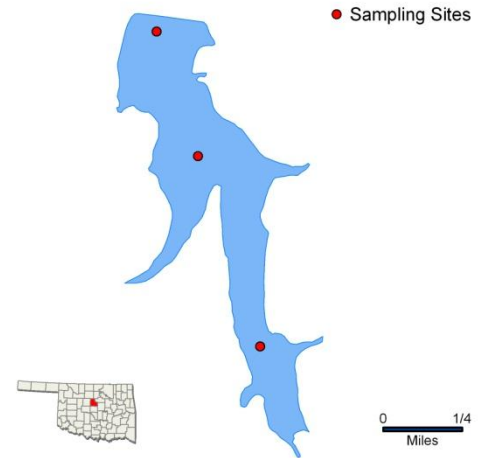
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Liberty

Sample Period	Times Visited	Sampling Sites
October 2005 – July 2006	4	3

General	Location	Logan County	Click map for site data
	Impoundment	1948	
	Area	167 acres	
	Capacity	2,740 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	<b>Parameter</b> ( <a href="#">Descriptions</a> )		<b>Result</b>	<b>Notes/Comments</b>
	Average Turbidity		21 NTU	16.7% of values > OWQS of 25 NTU
	Average True Color		20 units	100% of values < OWQS of 70
	Average Secchi Disk Depth		42 cm	
	Water Clarity Rating		good	
	Trophic State Index		67	
	Trophic Class		hypereutrophic	
	Profile	Salinity	0.22 – 0.30 ppt	
		Specific Conductivity	439.1 – 580.5 µS/cm	
		pH	7.94 – 8.48 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	404-544 mV	
		Dissolved Oxygen		
	Nutrients	Surface Total Nitrogen	0.82 mg/L to 1.19mg/L	
		Surface Total Phosphorus	0.056 mg/L to 0.110 mg/L	
		Nitrogen to Phosphorus Ratio	16:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	S							
	Aesthetics						S	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes										

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

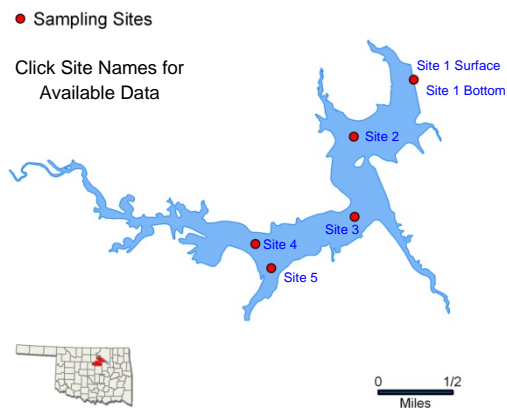
mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci

# Lone Chimney

Sample Period	Times Visited	Sampling Sites
November 2010 – June 2011	4	5

General	Location	Pawnee County	Click map for site data
	Impoundment	1984	
	Area	550 acres	
	Capacity	6,200 acre-feet	
	Purposes	Water Supply, Recreation and Flood Control	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	15 NTU	1% of values >OWQS of 25 NTU
		Average Secchi Disk Depth	67 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	10 mg/m3	
		Trophic State Index	53	Previous Value=53
		Trophic Class	Eutrophic	
	Profile	Salinity	0.1– 0.14 ppt	
		Specific Conductivity	223.2 – 290.9 µS/cm	TDS= 152 g/L
		pH	6.78 – 8.24 pH units	
		Oxidation-Reduction Potential	64 - 449 mV	
		Dissolved Oxygen	Up to 50% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.59 mg/L to 0.74 mg/L	
		Surface Total Phosphorus	0.018 mg/L to 0.034 mg/L	
		Nitrogen to Phosphorus Ratio	19:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	S								
	Aesthetics					S	S					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	Notes										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

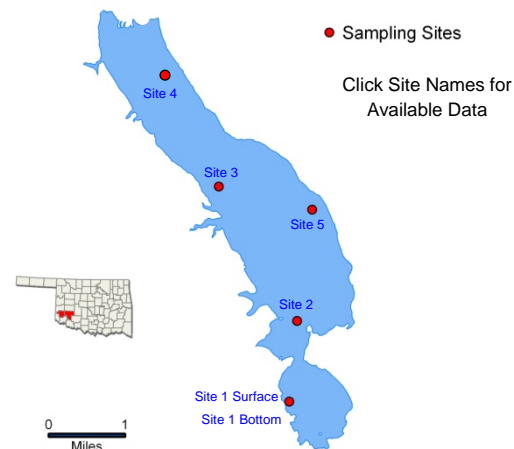
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Lugert-Altus

Sample Period	Times Visited	Sampling Sites
December 2010 – August 2011	4	5

General	Location	Greer County	Click map for site data
	Impoundment	1947	
	Area	6,260 acres	
	Capacity	132,830 acre-feet	
	Purposes	Water Supply, Flood Control, Irrigation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	21 NTU	11% of values >OWQS of 25 NTU
		Average Secchi Depth	64 cm	
		Water Clarity Rating	Fair	
		Chlorophyll-a	16 mg/m3	
		Trophic State Index	58	Previous Value= 59
		Trophic Class	Eutrophic	
	Profile	Salinity	1.23 – 1.64 ppt	
		Specific Conductivity	2295 –3037 µS/cm	
		pH	7.65 – 8.43 pH units	
		Oxidation-Reduction Potential	257 - 443 mV	
		Dissolved Oxygen	All data are above screening level	
	Nutrients	Surface Total Nitrogen	0.1mg/L to 0.99 mg/L	
		Surface Total Phosphorus	0.025 mg/L to 0.080 mg/L	
		Nitrogen to Phosphorus Ratio	17:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S								
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	Notes	*This parameter not collected for.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

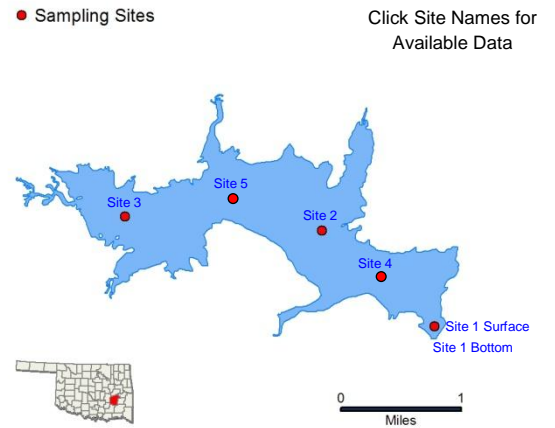
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# McAlester

Sample Period	Times Visited	Sampling Sites
December 2012 – August 2013	4	3

General	Location	Pittsburg County	Click map for site data
	Impoundment	1930	
	Area	1,521 acres	
	Capacity	13,398 acre feet	
	Purposes	Water Supply and Recreation	



Parameters		Parameter ( <i><a href="#">Descriptions</a></i> )	Result	Notes/Comments
	In Situ	Average Turbidity	110 NTU	100% of values > OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	9 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	6 mg/m3	
		Trophic State Index	48	Previous value = 54
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.04 – 0.06 ppt	
		Specific Conductivity	89 – 118 µS/cm	
		pH	6.38 – 8.11 pH units	8% of values < 6.5 pH units
		Oxidation-Reduction Potential	33 to 575 mV	
		Dissolved Oxygen	Up to 54% of water column < 2.0 mg/L in July	
	Nutrients	Surface Total Nitrogen	1.02 mg/L to 1.57 mg/L	
		Surface Total Phosphorus	0.070 mg/L to 0.164 mg/L	
		Nitrogen to Phosphorus Ratio	11:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	S							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>	Notes	<div>*Did not collect for these parameters</div> <div>The PBCR beneficial use cannot be assessed as minimum data requirement were not met due to QA/QC issues for <i>E.coli</i>.</div>									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

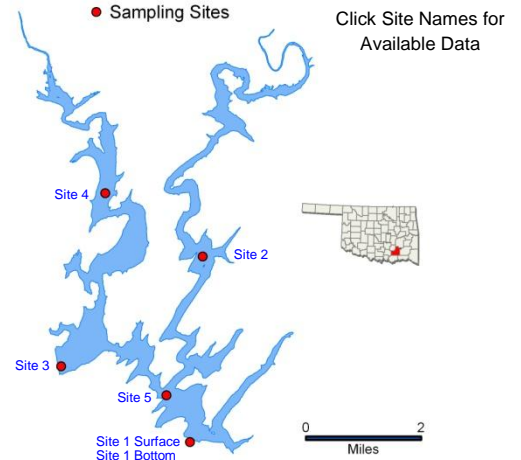
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# McGee Creek

Sample Period	Times Visited	Sampling Sites
December 2012 – July 2013	4	5

General	Location	Atoka County	Click map for site data
	Impoundment	1987	
	Area	3,810 acres	
	Capacity	113,930 acre-feet	
	Purposes	Water Supply, Recreation, Water Quality Control, Flood Control, Fish & Wildlife	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	12 NTU	10% of values < OWQS of 25 NTU (n=20)
		Average Secchi Disk Depth	128 cm	Did not collect for true color
		Water Clarity Rating	Excellent	
		Chlorophyll-a	6 mg/m3	
		Trophic State Index	49	Previous value = 46
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.02 – 0.04 ppt	
		Specific Conductivity	51 – 93 µS/cm	
		pH	5.23 – 8.21 pH units	32% of values < 6.5 pH units
		Oxidation-Reduction Potential	-38 to 402 mV	
		Dissolved Oxygen	Up to 83% of water column < 2.0 mg/L in August	Occurred at site 1, the dam
	Nutrients	Surface Total Nitrogen	0.50 mg/L to 1.33 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.046 mg/L	
		Nitrogen to Phosphorus Ratio	89:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	NS*	NS	NEI							
	Aesthetics						S	*					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	<div>*Slightly acidic conditions are not unusual in this part of the state due to relatively low soil pH and lack of soluble bedrock. Because of these conditions it is likely that the low pH values may be due to natural causes; therefore the Water Board is looking at the applicability of developing site-specific criteria for waters in the southeastern portion of the state</div> <div>*Did not collect for these parameters</div>									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

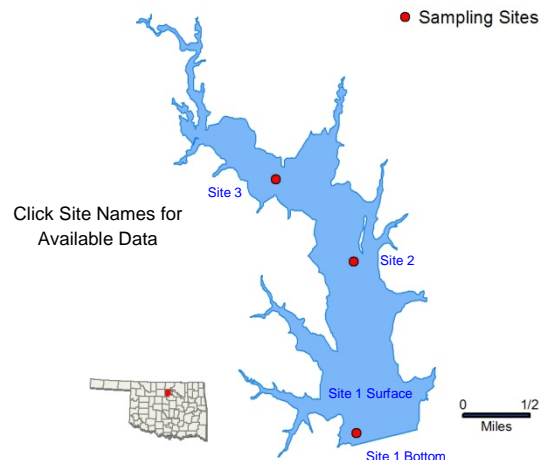
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# McMurtry

Sample Period	Times Visited	Sampling Sites
October 2011 – July 2012	4	3

General	Location	Noble County	Click map for site data
	Impoundment	1971	
	Area	1,155 acres	
	Capacity	19,733 acre feet	
	Purposes	Water Supply, Flood Control, and Recreation	



Parameters		Parameter ( <i>Descriptions</i> )	Result	Notes/Comments
	In Situ	Average Turbidity	20 NTU	42% of values > OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	52 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	8 mg/m3	
		Trophic State Index	51	Previous value = 55
		Trophic Class	Eutrophic	
	Profile	Salinity	0.17 – 0.23 ppt	
		Specific Conductivity	354 – 479 µS/cm	
		pH	7.18 – 8.41 pH units	
		Oxidation-Reduction Potential	55 to 67 mV	
		Dissolved Oxygen	Up to 50% of water column < 2.0 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.57 mg/L to 0.78 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.030 mg/L	
		Nitrogen to Phosphorus Ratio	49:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	S							
	Aesthetics					S	N/A					
	Agriculture							N/A	N/A	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>	Notes	* N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

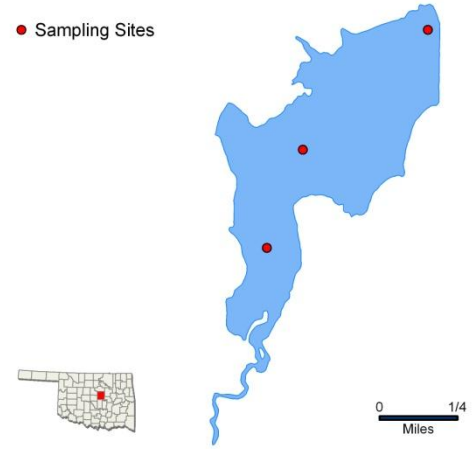


# Meeker

Sample Period	Times Visited	Sampling Sites
October 2008 – July 2009	4	3

General	Location	Lincoln County	Click map for site data
	Impoundment	1970	
	Area	250 acres	
	Capacity	1,818 acre-feet	
	Purposes	Water Supply, Recreation, Flood Control	

● Sampling Sites



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	143 NTU	100% of values > OWQS of 25 NTU (n=12)
		Average True Color		Did not collect for true color
		Average Secchi Disk Depth	10 cm	
		Water Clarity Rating	Poor	
		Trophic State Index	50	Previous value = 50
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.10 – 0.11 ppt	
		Specific Conductivity	208.9 – 231.5 µS/cm	
		pH	7.33 – 8.37 pH units	
		Oxidation-Reduction Potential	213 to 468 mV	
		Dissolved Oxygen	All data are above screening level of 2.0 mg/L	
	Nutrients	Surface Total Nitrogen	0.73 mg/L to 1.07 mg/L	
		Surface Total Phosphorus	0.062 mg/L to 0.105 mg/L	
		Nitrogen to Phosphorus Ratio	11:1	Phosphorus limited, possibly co-limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	*							
	Aesthetics						S	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*Did not collect for these parameters									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

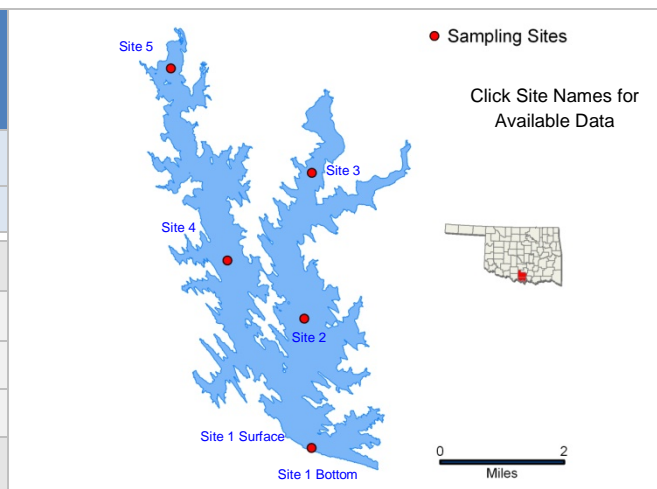
ppt = parts per thousand  
 En = Enterococci



# Murray

Sample Period	Times Visited	Sampling Sites
November 2011 – July 2012	4	5

General	Location	Love County	Click map for site data
	Impoundment	1937	
	Area	5,728 acres	
	Capacity	153,250 acre-feet	
	Purposes	Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	6 NTU	100% of values < OWQS of 25 NTU (n=20)
		Average Secchi Disk Depth	141 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	2 mg/m3	
		Trophic State Index	37	Previous value = 37
		Trophic Class	Oligotrophic	
	Profile	Salinity	0.14 – 0.18 ppt	
		Specific Conductivity	299 – 368 µS/cm	
		pH	7.54 – 9.53 pH units	Only 8% of values > 9 pH units
		Oxidation-Reduction Potential	121 to 549 mV	
		Dissolved Oxygen	Up to 48% of water column < 2.0 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.28 mg/L to 0.61 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.005 mg/L	
		Nitrogen to Phosphorus Ratio	79:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	*							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes										
	* N/A – parameters not collected in current sample year.												

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

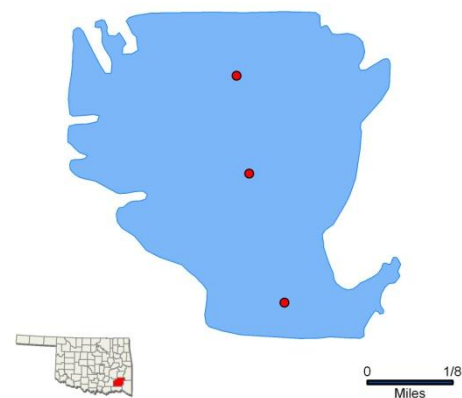
ppt = parts per thousand  
 En = Enterococci

# Nanhi Waiya

Sample Period	Times Visited	Sampling Sites
December 2007 – July 2008	4	3

General	Location	Pushmataha County	Click map for site data
	Impoundment	1958	
	Area	131 acres	
	Capacity	1,064 acre feet	
	Purposes	Recreation	

● Sampling Sites



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	9 nephelometric turbidity units (NTU)	All values < 25 NTU
		Average True Color	45 units	25% of values > OWQS of 70
		Average Secchi Disk Depth	98 cm	
		Water Clarity Rating	average	
		Trophic State Index	45	Previous value = 45
		Trophic Class	mesotrophic	
	Profile	Salinity	0.0 – 0.10 ppt	
		Specific Conductivity	63 – 262 µS/cm	
		pH	6.31 – 8.22 pH units	4 values (6.5%) < 6.5 pH units
		Oxidation-Reduction Potential	5 to 576 mV	
		Dissolved Oxygen	Up to 42% of water column < 2 mg/L in August	Occurred at site 1
	Nutrients	Surface Total Nitrogen	0.32 mg/L to 0.70 mg/L	
		Surface Total Phosphorus	0.018 mg/L to 0.032 mg/L	
		Nitrogen to Phosphorus Ratio	18:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	S							
	Aesthetics						S	NS					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

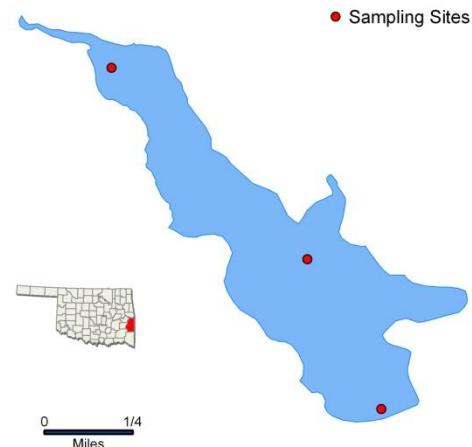
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# New Spiro

Sample Period	Times Visited	Sampling Sites
October 2005 – July 2006	4	3

General	Location	Le Flore County	Click map for site data
	Impoundment	1960	
	Area	254 acres	
	Capacity	2,160 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		18 NTU	8% of values >OWQS of 25 NTU
	Average True Color		26 units	100% of values < OWQS of 70
	Average Secchi Disk Depth		47 cm	
	Water Clarity Rating		good	
	Trophic State Index		68	
	Trophic Class		hypereutrophic	
	Profile	Salinity	0.04 – 0.09 ppt	
		Specific Conductivity	106.8 – 155.4 µS/cm	
		pH	7.09 – 9.24 pH units	10% of values > 9.0 pH units
		Oxidation-Reduction Potential	121 - 483 mV	
		Dissolved Oxygen	Up to 33% of water column < 2 mg/L in August	Occurred at site 2
	Nutrients	Surface Total Nitrogen	0.98 mg/L to 1.68 mg/L	
		Surface Total Phosphorus	0.076 mg/L to 0.170 mg/L	
		Nitrogen to Phosphorus Ratio	11:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterococci & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	NS	S	S							
	Aesthetics						NS*	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*The lake is listed in the WQS as a NLW indicating that the Aesthetics beneficial use is considered threatened by nutrients until studies can be conducted to confirm non-support status									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

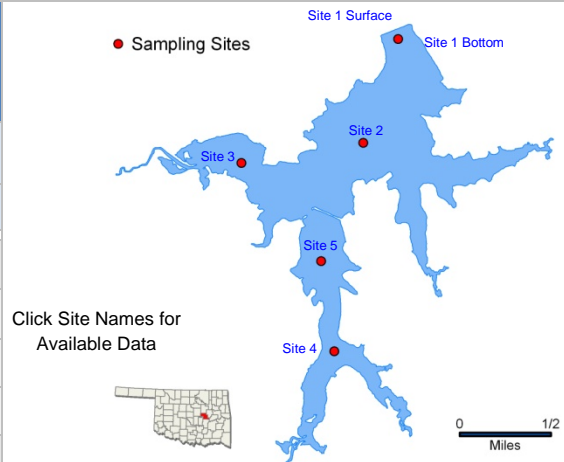
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Okemah

Sample Period	Times Visited	Sampling Sites
October 2011 - July 2012	4	5

General	Location	Okfuskee County	Click map for site data
	Impoundment		
	Area	13,100 acre-feet	
	Capacity	Water Supply, Recreation	
	Purposes	761 acres	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	10 NTU	100% of values < OWQS of 25 NTU (n=15)
		Average Secchi Disk Depth	72 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	5 mg/m3	
		Trophic State Index	46	Previous value = 46
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.10– 0.14ppt	
		Specific Conductivity	209 –307 µS/cm	
		pH	6.79 – 8.08 pH units	
		Oxidation-Reduction Potential	138.5 - 565 mV	
		Dissolved Oxygen	Up to 40% of water column < 2 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.46 mg/L to 0.70 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.013 mg/L	
		Nitrogen to Phosphorus Ratio	91:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	S							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	• N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

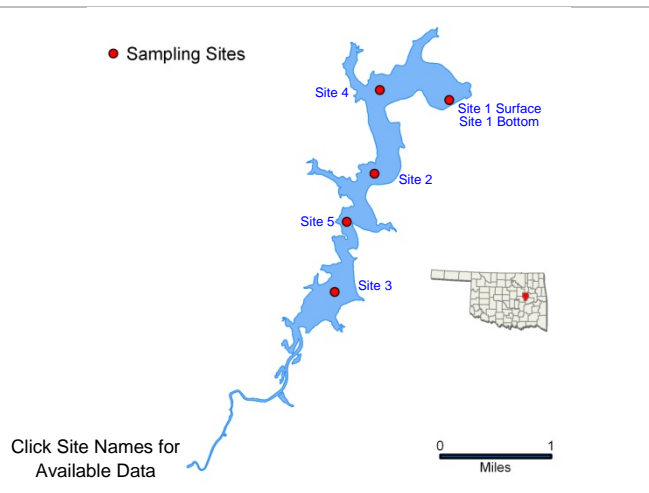
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Okmulgee

Sample Period	Times Visited	Sampling Sites
November 2010 – June 2011	4	5

General	Location	Okmulgee County	Click map for site data
	Impoundment	1928	
	Area	668 acres	
	Capacity	14,170 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	8 NTU	100% of values < OWQS of 25 NTU
		Average Secchi Disk Depth	116	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	6 mg/m3	
		Trophic State Index	48	Previous Value= 46
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.05– 0.06 ppt	
		Specific Conductivity	118.6 – 136.9 µS/cm	
		pH	6.18– 7.62 pH units	12% of values < 6.5 pH units
		Oxidation-Reduction Potential	270 - 441 mV	
		Dissolved Oxygen	Up to 54% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.29 mg/L to 0.56 mg/L	
		Surface Total Phosphorus	0.010 mg/L to 0.030 mg/L	
		Nitrogen to Phosphorus Ratio	25:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	NS	S	S							
	Aesthetics						S	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes *Did not collect for this parameter										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

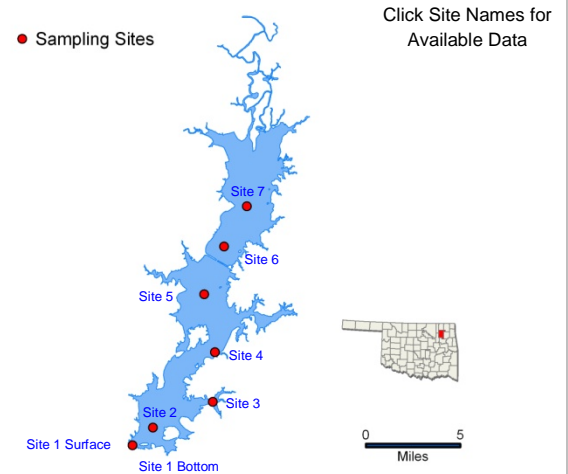
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Oologah

Sample Period	Times Visited	Sampling Sites
February 2012 – August 2012	4	7

General	Location	Rogers County	Click map for site data
	Impoundment	1963	
	Area	29,460 acres	
	Capacity	553,400 acre feet	
	Purposes	Water Supply, Flood Control, and Navigation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	39 NTU	57% of values > OWQS of 25 NTU (n=21)
		Average Secchi Disk Depth	33 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	8 mg/m3	
		Trophic State Index	51	Previous value = 54
		Trophic Class	Eutrophic	
	Profile	Salinity	0.12 – 0.21 ppt	
		Specific Conductivity	254- 434 µS/cm	
		pH	7.44 – 8.73 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	134 to 582 mV	
		Dissolved Oxygen	All data are above the screening level of 2 mg/L	
	Nutrients	Surface Total Nitrogen	0.22 mg/L to 1.46 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.132 mg/L	
		Nitrogen to Phosphorus Ratio	14:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	S							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	* N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

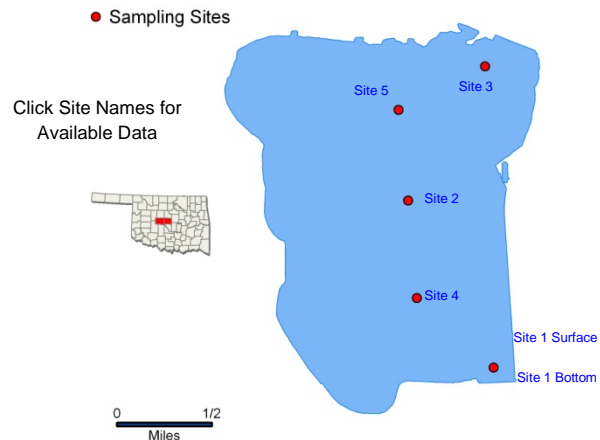
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Overholser

Sample Period	Times Visited	Sampling Sites
December 2011 – August 2012	4	5

General	Location	Oklahoma County	Click map for site data
	Impoundment	1919	
	Area	1,500 acres	
	Capacity	15,000 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	42 NTU	91% of values > OWQS of 25 NTU (n=11)
		Average Secchi Disk Depth	19 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	49 mg/m3	
		Trophic State Index	69	Previous value = 67
		Trophic Class	Hypereutrophic	
	Profile	Salinity	0.52 – 0.72 ppt	
		Specific Conductivity	1051 – 1449 µS/cm	
		pH	8.14– 8.88 pH units	
		Oxidation-Reduction Potential	225 - 482 mV	
		Dissolved Oxygen		Not stratified during any sampling interval
	Nutrients	Surface Total Nitrogen	1.2 mg/L to 2.14 mg/L	
		Surface Total Phosphorus	0.152 mg/L to 0.427 mg/L	
		Nitrogen to Phosphorus Ratio	6:1	Possibly co- limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	S							
	Aesthetics					NS*	N/A					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*The lake is listed in the WQS as a NLW indicating that the Aesthetics beneficial use is considered threatened by nutrients until studies can be conducted to confirm non-support status * N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

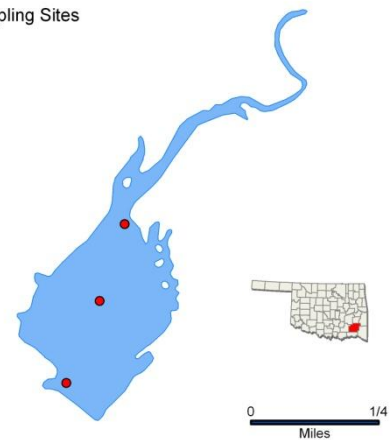


# Ozzie Cobb

Sample Period	Times Visited	Sampling Sites
November 2007 – August 2008	4	3

General	Location	Pushmataha County	Click map for site data
	Impoundment	1958	
	Area	116 acres	
	Capacity	833 acre feet	
	Purposes	Recreation	

● Sampling Sites



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		12 nephelometric turbidity units (NTU)	All values < 25 NTU
	Average True Color		51 units	25% of values > OWQS of 70
	Average Secchi Disk Depth		56 cm	
	Water Clarity Rating		average	
	Trophic State Index		59	Previous value = 55
	Trophic Class		eutrophic	
	Profile	Salinity	0.00 – 0.20 ppt	
		Specific Conductivity	50.6 - 311 µS/cm	
		pH	6.32 – 7.96 pH units	7 (13%) of values < 6.5
		Oxidation-Reduction Potential	15 to 543 mV	
		Dissolved Oxygen	Up to 50% of water column < 2 mg/L in August	Occurred at site 1
	Nutrients	Surface Total Nitrogen	0.47 mg/L to 0.94 mg/L	
		Surface Total Phosphorus	0.034 mg/L to 0.072 mg/L	
		Nitrogen to Phosphorus Ratio	17:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	NS	S	S							
	Aesthetics						NS*	NS					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	Slightly acidic conditions are not unusual in this part of the state due to relatively low soil pH and lack of soluble bedrock. Because of these conditions it is likely that the low pH values may be due to natural causes; therefore the Water Board is looking at the applicability of developing site-specific criteria for waters in the southeastern portion of the state. **This is an NLW waterbody in the OWQS.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

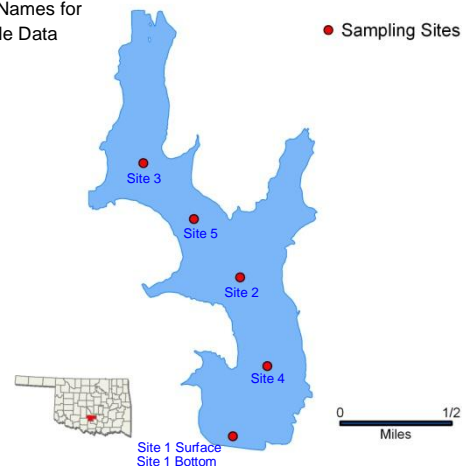
OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Pauls Valley City

Click Site Names for  
Available Data



Sample Period	Times Visited	Sampling Sites
October 2012 – August 2013	4	3

General	Location	Garvin County	Click map for site data
	Impoundment	1954	
	Area	750 acres	
	Capacity	8,730 acre feet	
	Purposes	Water Supply and Recreation	

Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	30 NTU	75% of values > 25 NTU
		Average Secchi Disk Depth	47 cm	
		Water Clarity Rating	Fair	
		Chlorophyll-a	4 mg/m3	
		Trophic State Index	44	Previous value = 50
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.13 – 0.20 ppt	
		Specific Conductivity	283 – 417 µS/cm	
		pH	6.77 – 8.31 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	60 to 317 mV	
		Dissolved Oxygen	Up to 56% of water column < 2 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.59 mg/L to 1.01 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.036 mg/L	
		Nitrogen to Phosphorus Ratio	64:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	S							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	<ul style="list-style-type: none"> <li>No longer collect for this parameter</li> </ul>									

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

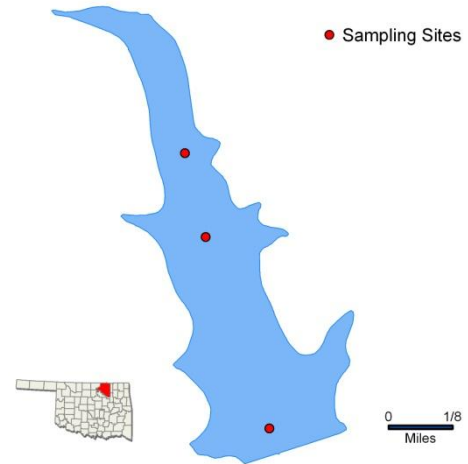
mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci

# Pawhuska

Sample Period	Times Visited	Sampling Sites
October 2007 – July 2008	4	3

General	Location	Osage County	Click map for site data
	Impoundment	1936	
	Area	96 acres	
	Capacity	3,600 acre feet	
	Purposes	Water Supply and Recreation	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		3 nephelometric turbidity units (NTU)	All values < 25 NTU
	Average True Color		21 units	All values < OWQS of 70
	Average Secchi Disk Depth		195 cm	
	Water Clarity Rating		excellent	
	Trophic State Index		41	Previous value = 39
	Trophic Class		mesotrophic	
	Profile	Salinity	0.15 – 0.27 ppt	
		Specific Conductivity	311.1 – 523.1 µS/cm	
		pH	6.91 – 8.66 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-114 to 485 mV	
		Dissolved Oxygen	Up to 54% of water column < 2 mg/L in July	Occurred at site 1
	Nutrients	Surface Total Nitrogen	0.24 mg/L to 0.46 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.009 mg/L	
		Nitrogen to Phosphorus Ratio	51:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	NS	S							
	Aesthetics						S	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	The PBCR cannot be assessed as minimum data requirements were not met due to QA/QC issues for E. coli and fecal coliform.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

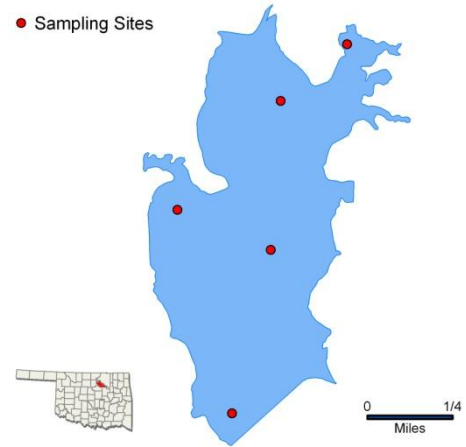
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Pawnee

Sample Period	Times Visited	Sampling Sites
November 2006 - August 2007	4	5

General	Location	Pawnee County	Click map for site data
	Impoundment	1932	
	Area	257 acres	
	Capacity	3,855 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	22 NTU	30% of values > OWQS of 25 NTU
		Average True Color	66 units	50% of values > OWQS of 70
		Average Secchi Disk Depth	44 cm	
		Water Clarity Rating	average	
		Trophic State Index	59	
		Trophic Class	eutrophic	
	Profile	Salinity	0.09– 0.16 ppt	
		Specific Conductivity	205.9 – 331 µS/cm	
		pH	7.25 – 8.69 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	73 - 506 mV	
		Dissolved Oxygen	Up to 38% of water column < 2 mg/L in August	Occurred at sites 1 & 2
	Nutrients	Surface Total Nitrogen	0.80 mg/L to 1.25 mg/L	
		Surface Total Phosphorus	0.023 mg/L to 0.060 mg/L	
		Nitrogen to Phosphorus Ratio	24:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterococci & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	S							
	Aesthetics						S	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes Available flow and rainfall data suggest that the peak in turbidity and color, which occurred in May is likely due to seasonal storm events, therefore Pawnee Lake will be listed as supporting its Fish & Wildlife Propagation (FWP) and Aesthetics beneficial uses.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

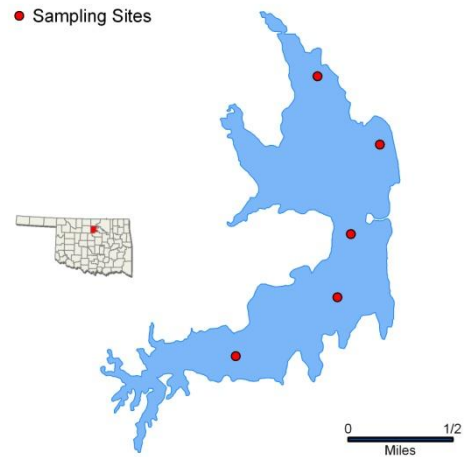
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Perry

Sample Period	Times Visited	Sampling Sites
November 2006 - August 2007	4	5

General	Location	Noble County	Click map for site data
	Impoundment	1937	
	Area	614 acres	
	Capacity	6,892 acre-feet	
	Purposes	Water Supply, Recreation and Flood Control	



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	75 NTU	100% of values > OWQS of 25 NTU
		Average True Color	143 units	50% of values > OWQS of 70
		Average Secchi Disk Depth	22 cm	
		Water Clarity Rating	poor	
		Trophic State Index	48	
		Trophic Class	mesotrophic	
	Profile	Salinity	0.08– 0.21 ppt	
		Specific Conductivity	181.9 – 415 µS/cm	
		pH	6.90 – 8.19 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	339 - 435mV	
		Dissolved Oxygen	Up to 36% of water column < 2 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.50 mg/L to 1.35 mg/L	
		Surface Total Phosphorus	0.027 mg/L to 0.253 mg/L	
		Nitrogen to Phosphorus Ratio	9:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterococci & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	S							
	Aesthetics						S	NS					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	<i>S = Fully Supporting</i> <i>NS = Not Supporting</i> <i>NEI = Not Enough Information</i>		<b>Notes</b> Available flow and rainfall data suggest that the peak in turbidity and color, which occurred in May is likely due to seasonal storm events, therefore Pawnee Lake will be listed as supporting its Fish & Wildlife Propagation (FWP) and Aesthetics beneficial uses.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

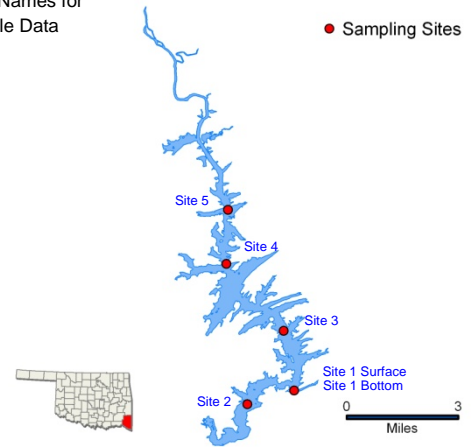
OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Pine Creek

Click Site Names for  
Available Data



Sample Period		Times Visited	Sampling Sites
November 2010 – July 2011		4	5
General	Location	Mc Curtain County	Click map for site data
	Impoundment	1969	
	Area	3,750 acres	
	Capacity	53,750 acre feet	
	Purposes	Water Supply, Flood Control, Water quality Control, Fish and Wildlife, and Recreation	

Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In-Situ	Average Turbidity	13 NTU	100% of Values < OWQS of 25
		Average Secchi Disk Depth	67 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	16 mg/m3	
		Trophic State Index	58	Previous value = 53
		Trophic Class	Eutrophic	
	Profile	Salinity	0.0 – 0.03 ppt	
		Specific Conductivity	34.4 – 190.8 µS/cm	
		pH	5.34 – 8.49 pH units	67.7% of values < 6.5
		Oxidation-Reduction Potential	-23 to 500 mV	
		Dissolved Oxygen	Up to 71% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.27 mg/L to 0.73 mg/L	
		Surface Total Phosphorus	0.021 mg/L to 0.060 mg/L	
		Nitrogen to Phosphorus Ratio	16:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterococci & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	NS	NS	S							
	Aesthetics						S	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		<b>Notes</b> Slightly acidic conditions are common in this part of the state, due to relatively low soil pH and lack of soluble bedrock. Due to these conditions it is likely that the low pH values may be due to natural causes; therefore the Water Board is looking at the applicability of developing site-specific criteria for waters in the southeastern portion of the state. * Did not collect for this parameter.										

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

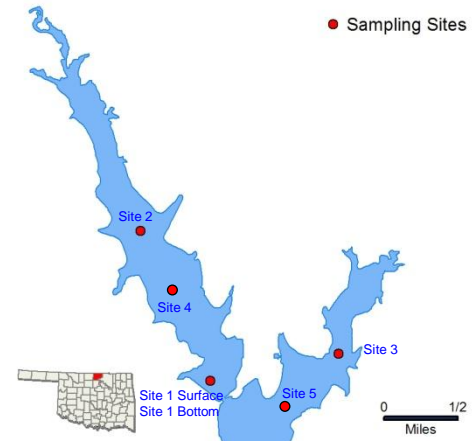
mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci

# Ponca

Sample Period	Times Visited	Sampling Sites
October 2012 – July 2013	4	5

General	Location	Kay County	Click map for site data
	Impoundment	1935	
	Area	805 acres	
	Capacity	14,440 acre feet	
	Purposes	Water Supply and Recreation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	10 NTU	100% of values < OWQS of 25 NTU
		Average Secchi Disk Depth	57 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	14 mg/m3	
		Trophic State Index	56	Previous value = 57
		Trophic Class	Eutrophic	
	Profile	Salinity	0.15 – 0.20 ppt	
		Specific Conductivity	317 – 412 µS/cm	
		pH	7.40 – 8.67 pH units	
		Oxidation-Reduction Potential	-124 to 186 mV	
		Dissolved Oxygen	Up to 47% of water column < 2.0 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.73 mg/L to 1.16 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.037 mg/L	
		Nitrogen to Phosphorus Ratio	54:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	NS	*							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											NS
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	<b>Notes</b> *Did not collect for these parameters The PBCR beneficial use cannot be assessed as minimum data requirement were not met due to QA/QC issues for <i>E.coli</i> and enterococci.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

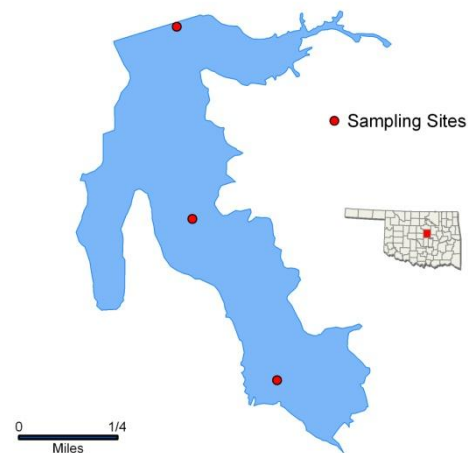
ppt = parts per thousand  
 En = Enterococci



# Prague City

Sample Period	Times Visited	Sampling Sites
November 2007 – August 2008	4	3

General	Location	Lincoln County	Click map for site data
	Impoundment	84	
	Area	225 acres	
	Capacity	2,415 acre feet	
	Purposes	Water Supply and Recreation	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		12 nephelometric turbidity units (NTU)	All values < 25 NTU
	Average True Color		46 units	10% of values > OWQS of 70
	Average Secchi Disk Depth		74 cm	
	Water Clarity Rating		good	
	Trophic State Index		48	Previous value = 52
	Trophic Class		mesotrophic	
	Profile	Salinity	0.0 – 0.20 ppt	
		Specific Conductivity	112 – 362 µS/cm	
		pH	6.78 – 8.65 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-51 to 543 mV	
		Dissolved Oxygen	57 - 63% of water column < 2 mg/L in August	Occurred at sites 1, 4 & 5
	Nutrients	Surface Total Nitrogen	0.51 mg/L to 1.17 mg/L	
		Surface Total Phosphorus	0.024 mg/L to 0.057 mg/L	
		Nitrogen to Phosphorus Ratio	25:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	NS	S							
	Aesthetics						S	NS					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		<b>Notes</b> The PBCR cannot be assessed as minimum data requirements were not met due to QA/QC issues for E. coli.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

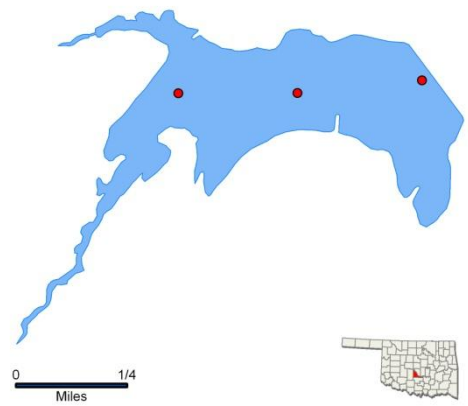
ppt = parts per thousand  
 En = Enterococci

# Purcell

Sample Period	Times Visited	Sampling Sites
November 2007 – August 2008	4	3

General	Location	McClain County	Click map for site data
	Impoundment	1930	
	Area	150 acres	
	Capacity	2,600 acre feet	
	Purposes	Water Supply and Recreation	

● Sampling Sites



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	14 nephelometric turbidity units (NTU)	All values < 25 NTU
		Average True Color	25 units	All values < OWQS of 70
		Average Secchi Disk Depth	57 cm	
		Water Clarity Rating	good	
		Trophic State Index	51	Previous value = 50
		Trophic Class	eutrophic	
	Profile	Salinity	0.19 – 0.23 ppt	
		Specific Conductivity	374 – 462.8 µS/cm	
		pH	7.17 – 8.37 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	18 to 645 mV	
		Dissolved Oxygen	Up to 50% of water column < 2 mg/L in August	Occurred at site 1 & 2
	Nutrients	Surface Total Nitrogen	0.60 mg/L to 0.83 mg/L	
		Surface Total Phosphorus	0.018 mg/L to 0.041 mg/L	
		Nitrogen to Phosphorus Ratio	24:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	NS	S							
	Aesthetics						S	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	The PBCR cannot be assessed as minimum data requirements were not met due to QA/QC issues for E. coli and fecal coliform.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

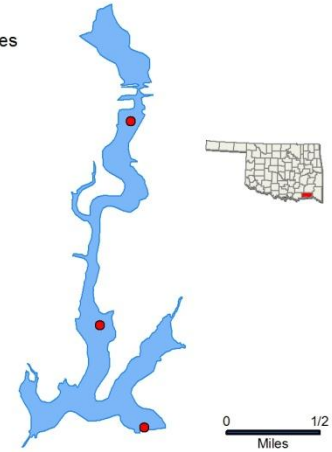
ppt = parts per thousand  
 En = Enterococci

# Raymond Gary

Sample Period	Times Visited	Sampling Sites
November 2008 – August 2009	4	3

General	Location	Choctaw County	Click map for site data
	Impoundment	1956	
	Area	263 acres	
	Capacity	1,681 acre feet	
	Purposes	Recreation	

● Sampling Sites



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	11 NTU	100% of values < OWQS of 25 NTU (n=11)
		Average True Color		Did not collect for true color
		Average Secchi Disk Depth	55 cm	
		Water Clarity Rating	Average	
		Trophic State Index	55	Previous value = 55
		Trophic Class	Eutrophic	
	Profile	Salinity	0.00 – 0.49 ppt	
		Specific Conductivity	69.3 – 936.2 µS/cm	
		pH	6.61 – 7.83 pH units	
		Oxidation-Reduction Potential	83 to 521 mV	
		Dissolved Oxygen	Up to 67% of water column < 2.0 mg/L in June	Occurred at site 1, the dam
	Nutrients	Surface Total Nitrogen	0.30 mg/L to 0.82 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.048 mg/L	
		Nitrogen to Phosphorus Ratio	17:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	NS	*							
	Aesthetics						S	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*Did not collect for these parameters The PBCR beneficial use cannot be assessed as minimum data requirement were not met due to QA/QC issues for <i>E.coli</i> .									

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

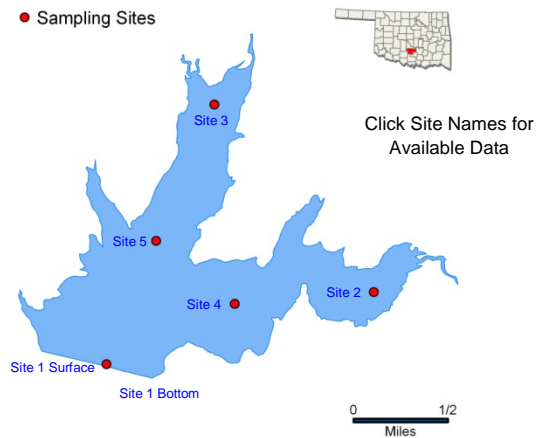
mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci

# R.C. Longmire

Sample Period	Times Visited	Sampling Sites
November 2011 – August 2012	4	5

General	Location	Garvin County	Click map for site data
	Impoundment	1989	
	Area	935 acres	
	Capacity	13,162 acre feet	
	Purposes	Navigation, Hydropower, and Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	28 NTU	42% of values > OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	31 cm	All values < OWQS of 70
		Water Clarity Rating	Poor	
		Chlorophyll-a	28 mg/m3	
		Trophic State Index	63	Previous value = 57
		Trophic Class	Hypereutrophic	
	Profile	Salinity	0.14 – 018 ppt	
		Specific Conductivity	305 – 389 µS/cm	
		pH	7.41 – 8.51 pH units	
		Oxidation-Reduction Potential	65 to 545 mV	
		Dissolved Oxygen	Up to 11% of water column < 2mg/L in August	Occurred at site 1
	Nutrients	Surface Total Nitrogen	1.04 mg/L to 1.82 mg/L	
		Surface Total Phosphorus	0.006 mg/L to 0.060 mg/L	
		Nitrogen to Phosphorus Ratio	49:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	S							
	Aesthetics						S	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<i>S = Fully Supporting</i> <i>NS = Not Supporting</i> <i>NEI = Not Enough Information</i>		<b>Notes</b> * N/A – parameters not collected in current sample year.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

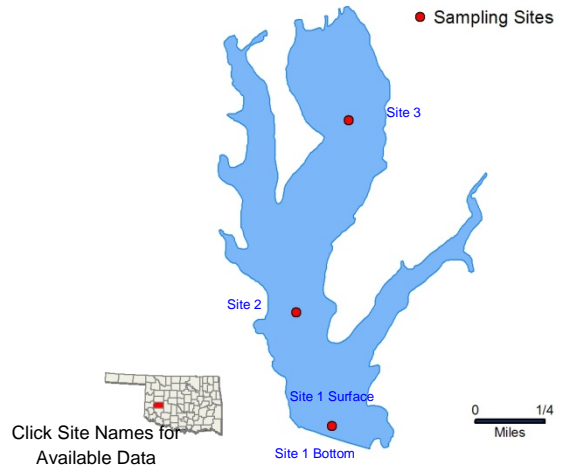
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Rocky (Hobart)

Sample Period	Times Visited	Sampling Sites
November 2011 –September 2012	4	3

General	Location	Washita County	Click map for site data
	Impoundment	1933	
	Area	347 acres	
	Capacity	4,210 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	83 NTU	58% of values > OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	25 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	46 mg/m3	
		Trophic State Index	68	Previous value = 73
		Trophic Class	Hypereutrophic	
	Profile	Salinity	0.22 – 0.31 ppt	
		Specific Conductivity	448 – 631 µS/cm	
		pH	7.87 – 8.98 pH units	
		Oxidation-Reduction Potential	360 to 523 mV	
		Dissolved Oxygen	All data are above screening level of 2.0 mg/L	
	Nutrients	Surface Total Nitrogen	1.59 mg/L to 3.66 mg/L	
		Surface Total Phosphorus	0171 mg/L to 0.316 mg/L	
		Nitrogen to Phosphorus Ratio	11:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	*							
	Aesthetics					NS*	N/A					
	Agriculture							N/A	N/A	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											NS
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	Notes	* N/A – parameters not collected in current sample year. *Currently, the lake is listed as a Nutrient Limited Watershed (NLW) in the Oklahoma Water Quality Standards (WQS). This listing means that the lake is considered threatened from nutrients until a more intensive study can confirm the Aesthetics beneficial use non-support status.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

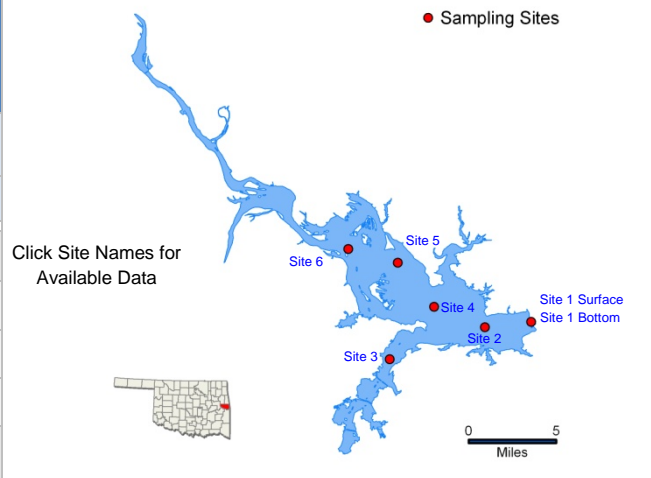
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Robert S. Kerr

Sample Period	Times Visited	Sampling Sites
November 2010 – June 2011	4	6

General	Location	Sequoyah County	Click map for site data
	Impoundment	1970	
	Area	43,800 acres	
	Capacity	525,700 acre feet	
	Purposes	Navigation, Hydropower, and Recreation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	30 NTU	63% of values > 25 NTU (n=24)
		Average Secchi Depth	57 cm	All values > OWQS of 70
		Water Clarity Rating	Fair	
		Chlorophyll-a	11 mg/m3	
		Trophic State Index	54	Previous value = 50
		Trophic Class	Eutrophic	
	Profile	Salinity	0.09– 0.93 ppt	
		Specific Conductivity	190.2 – 1754 µS/cm	
		pH	7.25 – 8.52 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	301 to 448 mV	
		Dissolved Oxygen	All data are above screening level of 2.0 mg/L	
	Nutrients	Surface Total Nitrogen	0.26 mg/L to 1.12 mg/L	
		Surface Total Phosphorus	0.048 mg/L to 0.124mg/L	
		Nitrogen to Phosphorus Ratio	9:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	S							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	Notes	*Did not collect for this parameter. The PBCR cannot be assessed as minimum data requirements were not met due to QA/QC issues for E. coli and fecal coliform.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

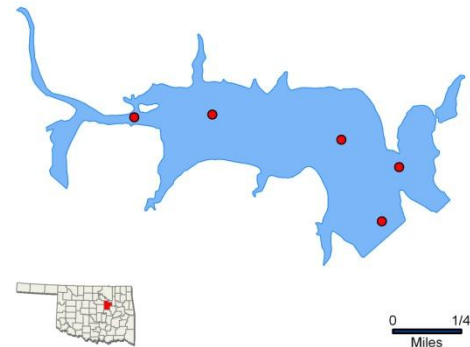
ppt = parts per thousand  
 En = Enterococci

# Sahoma

Sample Period	Times Visited	Sampling Sites
November 2005 – August 2006	4	5

General	Location	Creek County	Click map for site data
	Impoundment	1947	
	Area	312 acres	
	Capacity	4,850 acre-feet	
	Purposes	Water Supply, Recreation	

● Sampling Sites



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	9 NTU	100% of values < OWQS of 25 NTU
		Average True Color	30 units	100% of values < OWQS of 70
		Average Secchi Disk Depth	73 cm	
		Water Clarity Rating	Fair	
		Trophic State Index	51	
		Trophic Class	eutrophic	
	Profile	Salinity	0.08 – 0.09 ppt	
		Specific Conductivity	184.1 – 203.1 µS/cm	
		pH	7.02– 7.80 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	125 - 451 mV	
		Dissolved Oxygen	Up to 69% of water column < 2 mg/L in May	Occurred at site 1, the dam
	Nutrients	Surface Total Nitrogen	0.58 mg/L to 0.74 mg/L	
		Surface Total Phosphorus	0.023 mg/L to 0.039 mg/L	
		Nitrogen to Phosphorus Ratio	22:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	NS	S							
	Aesthetics						S	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

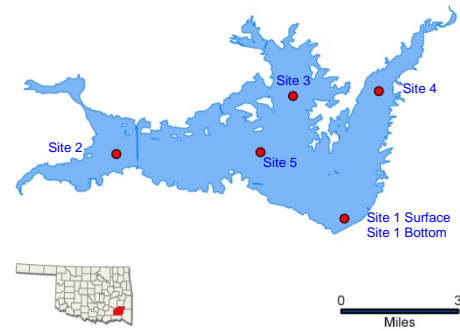
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci



# Sardis

Click Site Names for  
Available Data



Sample Period		Times Visited	Sampling Sites
November 2010 – July 2011		4	5
General	Location	Pushmataha County	Click map for site data
	Impoundment	1970	
	Area	13,610 acres	
	Capacity	274,330 acre feet	
	Purposes	Flood Control, Waters Supply, Fish and Wildlife, and Recreation	

Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	16 NTU	21% of values > 25 NTU (n=20)
		Average Secchi Disk Depth	81 cm	30% of values > OWQS of 70
		Water Clarity Rating	Average	
		Chlorophyll-a	9 mg/m3	
		Trophic State Index	52	Previous value = 46
		Trophic Class	Eutrophic	
	Profile	Salinity	0.01 – 0.02 ppt	
		Specific Conductivity	49.4 – 71.8 µS/cm	
		pH	5.5 – 7.77 pH units	35.7% of values < 6.5 pH units
		Oxidation-Reduction Potential	288 to 570 mV	
		Dissolved Oxygen	Up to 44% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.16 mg/L to 0.47 mg/L	
		Surface Total Phosphorus	0.012 mg/L to 0.04 mg/L	
		Nitrogen to Phosphorus Ratio	16:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	NS	S	S							
	Aesthetics						S	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		<b>Notes</b> Available rainfall data suggest that the peak in turbidity and true color, which occurred in May is likely due to seasonal storm events, therefore Sardis Lake will be listed as supporting its Fish & Wildlife Propagation (FWP) and Aesthetics beneficial use for these parameters. * Did not collect for these parameters.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

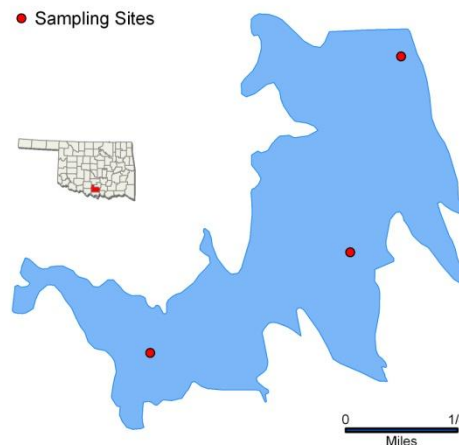
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Scott King (Rock Creek)

Sample Period	Times Visited	Sampling Sites
October 2008 – July 2009	4	3

General	Location	Carter County	Click map for site data
	Impoundment	1979	
	Area	248 acres	
	Capacity	3,588 acre-feet	
	Purposes	Recreation	



Parameters	Profile	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	9 NTU	100% of values < OWQS of 25 NTU (n=12)
		Average True Color		Did not collect for true color
		Average Secchi Disk Depth	80 cm	
		Water Clarity Rating	Good	
		Trophic State Index	51	Previous value = 48
		Trophic Class	Eutrophic	
	Nutrients	Salinity	0.10 – 0.15 ppt	
		Specific Conductivity	278.8 – 307 µS/cm	
		pH	6.96 – 8.53 pH units	
		Oxidation-Reduction Potential	-10 to 461 mV	
		Dissolved Oxygen	Up to 50% of water column < 2.0 mg/L in July	
		Surface Total Nitrogen	0.55 mg/L to 0.80 mg/L	
		Surface Total Phosphorus	0.009 mg/L to 0.026 mg/L	
		Nitrogen to Phosphorus Ratio	39:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	S	*							
	Aesthetics					S	*					
	Agriculture							*	*	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*Did not collect for these parameters The PBCR beneficial use cannot be assessed as minimum data requirement were not met due to QA/QC issues for <i>Enterococci</i> .									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = *Escherichia coli*

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

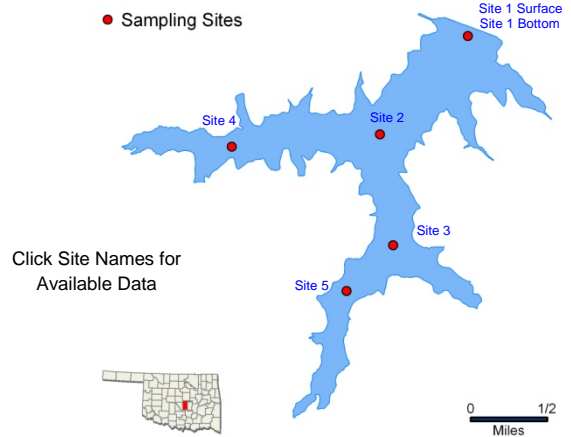
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = *Enterococci*

# Shawnee Twin No. 1

Sample Period	Times Visited	Sampling Sites
November 2010 – July 2011	4	5

General	Location	Pottawatomie County	Click map for site data
	Impoundment	1935	
	Area	1,336 acres	
	Capacity	22,600 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	13 NTU	100% of value < OWQS of 25 NTU
		Average Secchi Disk Depth	103 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	5 mg/m3	
		Trophic State Index	46	Previous Value=41
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.11 – 0.13 ppt	
		Specific Conductivity	161.7 – 268.2 µS/cm	
		pH	7.32 – 8.57 pH units	
		Oxidation-Reduction Potential	180 to 402 mV	
		Dissolved Oxygen	Up to 31% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.26 mg/L to 0.5 mg/L	
		Surface Total Phosphorus	0.008 mg/L to 0.014 mg/L	
		Nitrogen to Phosphorus Ratio	30:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	S							
	Aesthetics						S	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	*Did not collect for these parameters.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

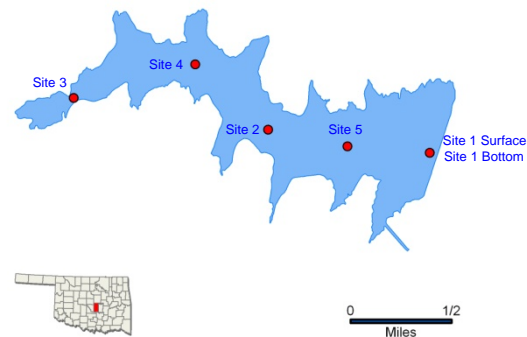
OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Shawnee Twin No. 2

Click Site Names for  
Available Data



Sample Period		Times Visited	Sampling Sites
November 2010 – July 2011		4	5
General	Location	Pottawatomie County	Click map for site data
	Impoundment	1960	
	Area	1,100 acres	
	Capacity	11,400 acre feet	
	Purposes	Waters Supply and Recreation	

Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In-Situ	Average Turbidity	12 NTU	11% of values > OWQS of 25 NTU
		Average Secchi Disk Depth	80 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	9 mg/m3	
		Trophic State Index	52	Previous value = 43
		Trophic Class	Eutrophic	
	Profile	Salinity	0.1 – 0.15 ppt	
		Specific Conductivity	224.6 – 301.6 µS/cm	TDS= 160 g/L
		pH	7.21 – 8.69 pH units	Neutral
		Oxidation-Reduction Potential	-67 to 451 mV	
		Dissolved Oxygen	Up to 45% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.35 mg/L to 2.00 mg/L	
		Surface Total Phosphorus	0.010 mg/L to 0.026 mg/L	
		Nitrogen to Phosphorus Ratio	36:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	S							
	Aesthetics						S	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes *Did not collect for these parameters.										

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

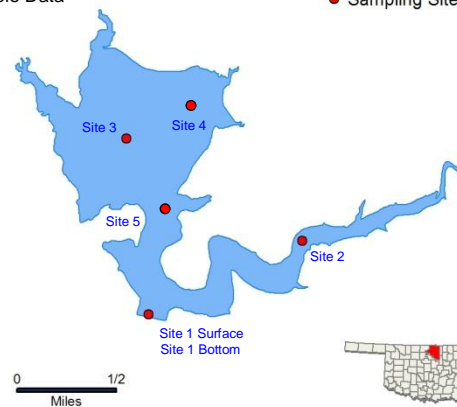
mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci

# Shell

Click Site Names for  
Available Data

● Sampling Sites



Sample Period	Times Visited	Sampling Sites
October 2012 – August 2013	4	3

General	Location	Osage County	Click map for site data
	Impoundment	1922	
	Area	573 acres	
	Capacity	9,500 acre-feet	
	Purposes	Water Supply, Recreation	

Parameters		Parameter ( <i>Descriptions</i> )	Result	Notes/Comments
	In Situ	Average Turbidity	8 NTU	100% of values < OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	73 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	10 mg/m3	
		Trophic State Index	54	Previous value = 55
		Trophic Class	Eutrophic	
	Profile	Salinity	0.10 – 0.16 ppt	
		Specific Conductivity	204 – 334 µS/cm	
		pH	6.59 – 8.39 pH units	
		Oxidation-Reduction Potential	-96 to 223 mV	
		Dissolved Oxygen	Up to 59% of water column < 2.0 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.89 mg/L to 1.21 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.036 mg/L	
		Nitrogen to Phosphorus Ratio	66:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	NS	NEI							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>	Notes	*Did not collect for these parameters									

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

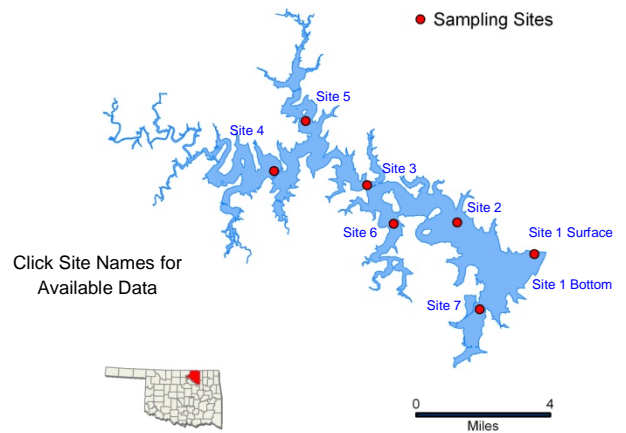
mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci

# Skiatook

Sample Period	Times Visited	Sampling Sites
October 2011 – July 2012	4	7

General	Location	Osage County	Click map for site data
	Impoundment	1984	
	Area	10,190 acres	
	Capacity	322,700 acre-feet	
	Purposes	Flood Control, Water Supply, Water Quality Control, Recreation and Fish & Wildlife	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	21 NTU	14% of values > OWQS of 25 NTU (n=28)
		Average Secchi Disk Depth	82 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	5 mg/m3	
		Trophic State Index	47	Previous value = 48
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.09 – 0.24 ppt	
		Specific Conductivity	192 – 486 µS/cm	
		pH	6.72– 8.61 pH units	
		Oxidation-Reduction Potential	100 to 520 mV	
		Dissolved Oxygen	Up to 65% of water column < 2.0 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.28 mg/L to 1.31 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.114 mg/L	
		Nitrogen to Phosphorus Ratio	39:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	*	*							
	Aesthetics					S	N/A					
	Agriculture							N/A	N/A	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	Notes	* N/A – parameters not collected in current sample year. * 50-70% range is undetermined for DO.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

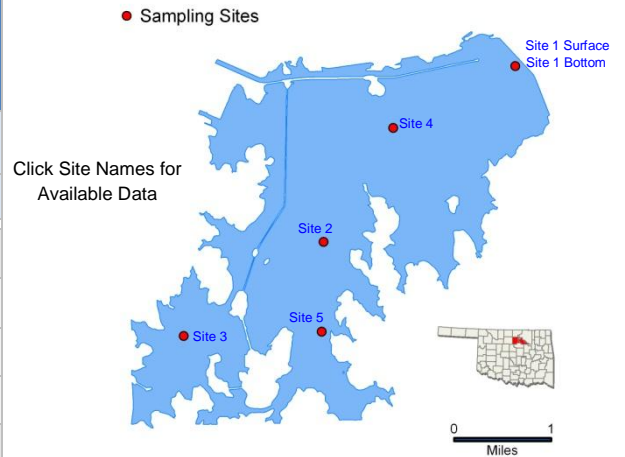
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Sooner

Sample Period	Times Visited	Sampling Sites
October 2012 - July 2013	4	3

General	Location	Pawnee County	Click map for site data
	Impoundment	1972	
	Area	5,400 acres	
	Capacity	149,000 acre-feet	
	Purposes	Cooling Water	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	5 NTU	100% of values < OWQS of 25 NTU
		Average Secchi Disk Depth	150 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	3 mg/m3	
		Trophic State Index	41	Previous value = 46
		Trophic Class	Mesotrophic	
	Profile	Salinity	1.00 – 1.07 ppt	
		Specific Conductivity	1980 – 2074 µS/cm	
		pH	7.43 – 8.59 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-90 to 382 mV	
		Dissolved Oxygen		All data for this sample year below the screening level of 2 mg/L
	Nutrients	Surface Total Nitrogen	0.61 mg/L to 0.85 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.009 mg/L	
		Nitrogen to Phosphorus Ratio	132:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	S							
	Aesthetics						S	*					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes: * No longer collect for this parameter										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

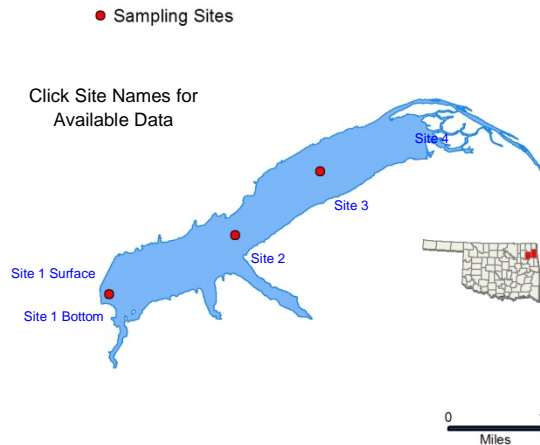
ppt = parts per thousand  
 En = Enterococci



# Spavinaw

Sample Period	Times Visited	Sampling Sites
October 2011 – July 2012	4	3

General	Location	Mayes County	Click map for site data
	Impoundment	1924	
	Area	1,584 acres	
	Capacity	38,000 acre-feet	
	Purposes	Water Supply, Recreation, Fish & Wildlife	



Parameters		Parameter ( <i>Descriptions</i> )	Result	Notes/Comments
	In Situ	Average Turbidity	8 NTU	100% of values < OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	65 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	19 mg/m3	
		Trophic State Index	59	Previous value = 57
		Trophic Class	Eutrophic	
	Profile	Salinity	0.06 – 0.12 ppt	
		Specific Conductivity	141 – 257 μS/cm	
		pH	6.33 – 8.83 pH units	Only 4.34% of values below 6.5 pH units
		Oxidation-Reduction Potential	53 to 531 mV	
		Dissolved Oxygen	Up to 67% of water column < 2.0 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.61 mg/L to 1.29 mg/L	
Surface Total Phosphorus		0.005 mg/L to 0.013 mg/L		
Nitrogen to Phosphorus Ratio		67:1	Phosphorus limited	

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	*	*							
	Aesthetics					NS*	N/A					
	Agriculture							N/A	N/A	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											NS
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>	Notes	<div>*Did not collect for these parameters</div> <div>*Currently, the lake is listed as a Nutrient Limited Watershed (NLW) in the Oklahoma Water Quality Standards (WQS). This listing means that the lake is considered threatened.</div> <div>*50-70% range is undetermined for DO.</div>									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

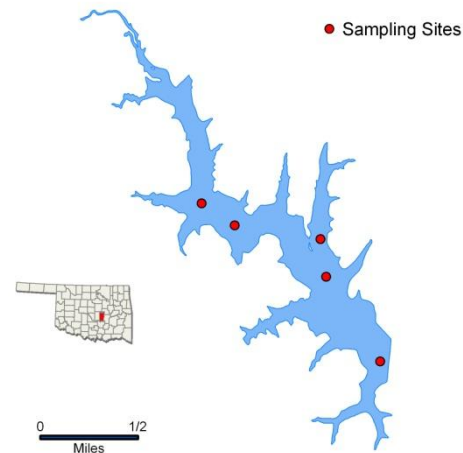
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Sportsman

Sample Period	Times Visited	Sampling Sites
October 2007 – July 2008	4	5

General	Location	Seminole County	Click map for site data
	Impoundment	1958	
	Area	354 acres	
	Capacity	5,349 acre feet	
	Purposes	Waters Supply and Recreation	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		23 nephelometric turbidity units (NTU)	25% of values > 25 NTU
	Average True Color		82 units	25% of values > OWQS of 70
	Average Secchi Disk Depth		76 cm	
	Water Clarity Rating		average	
	Trophic State Index		43	Previous value = 40
	Trophic Class		mesotrophic	
	Profile	Salinity	0.06 – 0.12 ppt	
		Specific Conductivity	148.3 – 251.2 µS/cm	
		pH	6.6 – 7.93 pH units	Neutral
		Oxidation-Reduction Potential	37 to 504 mV	
		Dissolved Oxygen	Up to 60% of water column < 2 mg/L in July	Occurred at site 1
	Nutrients	Surface Total Nitrogen	0.43 mg/L to 0.71 mg/L	
		Surface Total Phosphorus	0.010 mg/L to 0.062 mg/L	
		Nitrogen to Phosphorus Ratio	23:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	NS	S							
	Aesthetics						S	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<div>S = Fully Supporting NS = Not Supporting NEI = Not Enough Information</div>		Notes	Precipitation data suggest that the peaks in turbidity and true color, which occurred in May are likely due to seasonal storm events, therefore Sportsman Lake will be listed as supporting its Fish & Wildlife Propagation (FWP) and Aesthetics beneficial use for these parameters. The PBCR cannot be assessed due to QA/QC issues for fecal coliform and enterococci.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

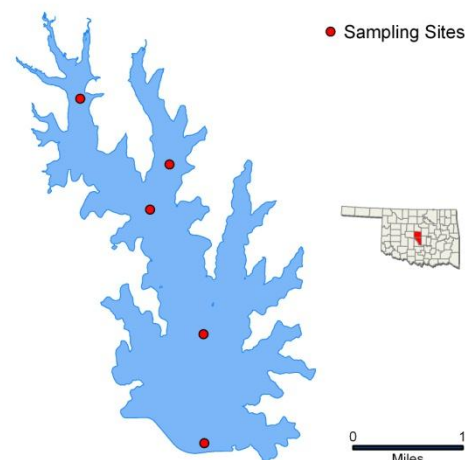
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Stanley Draper

Sample Period	Times Visited	Sampling Sites
November 2005 – August 2006	4	5

General	Location	Cleveland County	Click map for site data
	Impoundment	1962	
	Area	2,900 acres	
	Capacity	100,000 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	General	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	7 NTU	100% of values < OWQS of 25 NTU
		Average True Color	28 units	100% of values < OWQS of 70
		Average Secchi Disk Depth	133 cm	
		Water Clarity Rating	good	
		Trophic State Index	40	
		Trophic Class	oligotrophic	
	Profile	Salinity	0.03 – 0.09 ppt	
		Specific Conductivity	95 – 191.5 µS/cm	
		pH	6.90 – 8.18 pH units	
		Oxidation-Reduction Potential	356 - 445 mV	
		Dissolved Oxygen	Up to 52% of water column < 2 mg/L in August	Occurred at site 1, the dam
	Nutrients	Surface Total Nitrogen	0.16 mg/L to 0.33 mg/L	
		Surface Total Phosphorus	0.010 mg/L to 0.015 mg/L	
		Nitrogen to Phosphorus Ratio	20:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a	
	Fish & Wildlife Propagation		S	S	NS	S								
	Aesthetics						S	S						
	Agriculture								S	S	S			
	Primary Body Contact Recreation											S		
	Public & Private Water Supply													
	<div>S = Fully Supporting NS = Not Supporting NEI = Not Enough Information</div>		Notes											

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

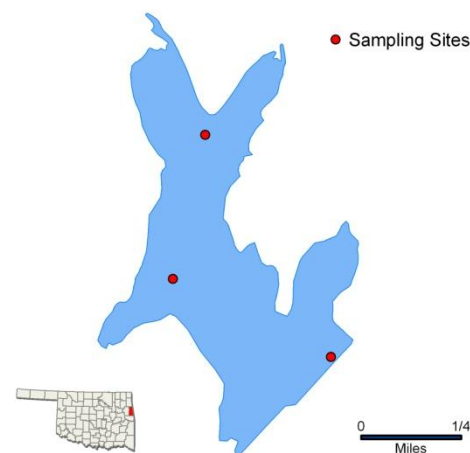
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Stilwell City

Sample Period	Times Visited	Sampling Sites
October 2005 – August 2006	3	3

General	Location	Adair County	Click map for site data
	Impoundment	1965	
	Area	188 acres	
	Capacity	3,110 acre-feet	
	Purposes	Water Supply, Recreation, Flood Control	



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	6 NTU	100% of values < OWQS of 25 NTU
		Average True Color	14 units	100% of values < OWQS of 70
		Average Secchi Disk Depth	161 cm	
		Water Clarity Rating	excellent	
		Trophic State Index	54	
		Trophic Class	eutrophic	
	Profile	Salinity	0.07 – 0.14 ppt	
		Specific Conductivity	159.1 – 297.2 µS/cm	
		pH	6.87 – 8.53 pH units	
		Oxidation-Reduction Potential	88 – 452 mV	
		Dissolved Oxygen	Up to 64% of water column < 2 mg/L in August	Occurred at site 1, the dam
	Nutrients	Surface Total Nitrogen	0.32 mg/L to 0.88 mg/L	
		Surface Total Phosphorus	0.019 mg/L to 0.044 mg/L	
		Nitrogen to Phosphorus Ratio	20:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	NS	S							
	Aesthetics						S	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

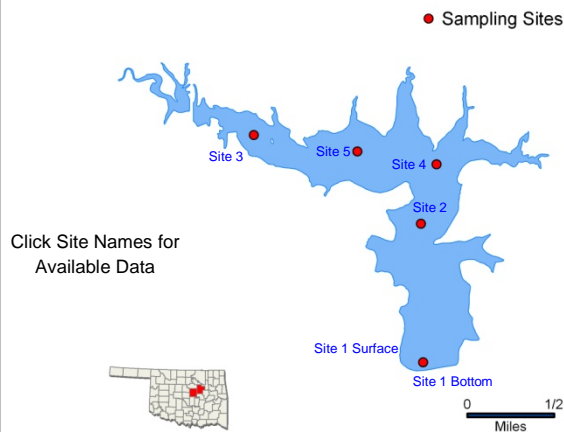
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Stroud

Sample Period	Times Visited	Sampling Sites
December 2011 – Sept. 2012	4	5

General	Location	Creek County	Click map for site data
	Impoundment	1968	
	Area	600 acres	
	Capacity	8,800 acre-feet	
	Purposes	Water Supply, Recreation, Flood Control	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	6 NTU	100% of values < OWQS of 25 NTU (n=12)
		Average Secchi Disk Depth	101 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	5 mg/m3	
		Trophic State Index	46	Previous value = 41
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.12 – 0.13 ppt	
		Specific Conductivity	251 – 279 µS/cm	
		pH	7.18 – 8.40 pH units	
		Oxidation-Reduction Potential	118 – 438 mV	
		Dissolved Oxygen	Up to 18% of water column < 2 mg/L in September	
	Nutrients	Surface Total Nitrogen	0.44 mg/L to 0.67 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.008 mg/L	
		Nitrogen to Phosphorus Ratio	104:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	S	S							
	Aesthetics					S	S					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes * This page reflects the current sample year only.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

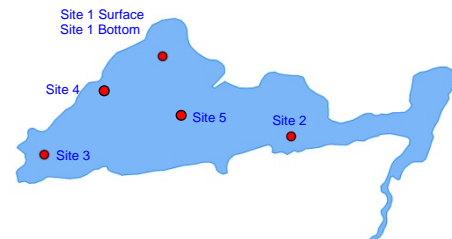
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Talawanda No. 1

Click Site Names for  
Available Data

● Sampling Sites



0 1/4  
Miles

Sample Period		Times Visited	Sampling Sites
December 2010 – July 2011		4	5
General	Location	Pittsburg County	Click map for site data
	Impoundment	1902	
	Area	91 acres	
	Capacity	12,000 acre feet	
	Purposes	Waters Supply and Recreation	

Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In-Situ	Average Turbidity	3 NTU	100% of Values < OWQS of 25 NTU
		Average Secchi Disk Depth	153 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	5 mg/m3	
		Trophic State Index	47	Previous value = 42
		Trophic Class	Mesotrophic	
	Profile	Salinity	0.03 – 0.07 ppt	
		Specific Conductivity	90.4 – 152.1 µS/cm	
		pH	6.22 – 7.75 pH units	10.53% of values < 6.5 pH units
		Oxidation-Reduction Potential	-34 to 434 mV	
		Dissolved Oxygen	Up to 44% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.41 mg/L to 0.65 mg/L	
		Surface Total Phosphorus	0.009 mg/L to 0.016 mg/L	
		Nitrogen to Phosphorus Ratio	39:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	NS	S	S							
	Aesthetics					S	*					
	Agriculture							*	*	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	Notes										

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

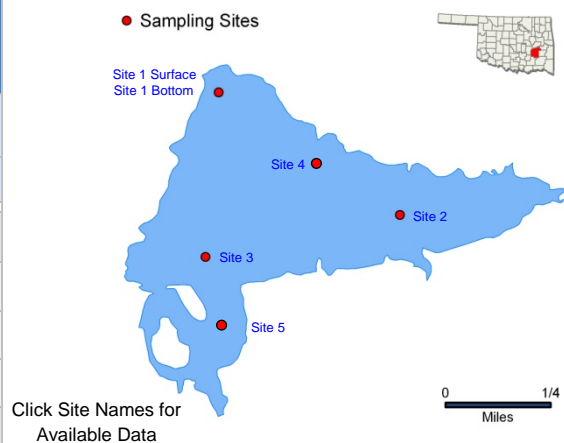
mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci

# Talawanda No. 2

Sample Period	Times Visited	Sampling Sites
December 2010 – July 2011	4	5

General	Location	Pittsburg County	Click map for site data
	Impoundment	1924	
	Area	195 acres	
	Capacity	2,750 acre feet	
	Purposes	Waters Supply and Recreation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	6 NTU	100% of Values < OWQS of 25 NTU
		Average Secchi Disk Depth	123 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	4 mg/m3	
		Trophic State Index	44	Previous value = 45
	Profile	Trophic Class	Mesotrophic	
		Salinity	0.04 – 0.06 ppt	
		Specific Conductivity	99.7 – 141.2 µS/cm	
		pH	6.42 – 8.06 pH units	6.82% of values < 6.5 pH units
		Oxidation-Reduction Potential	-48 to 486 mV	
		Dissolved Oxygen	Up to 50% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.19 mg/L to 0.37 mg/L	
		Surface Total Phosphorus	0.006 mg/L to 0.013 mg/L	
		Nitrogen to Phosphorus Ratio	31:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	S	S							
	Aesthetics					S	S					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>	Notes	The PBCR beneficial use cannot be assessed for this sample year as minimum data requirement were not met due to QA/QC issues for <i>E. coli</i> .									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

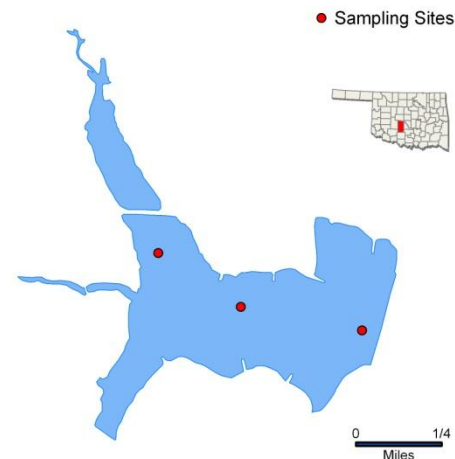
ppt = parts per thousand  
 En = Enterococci



# Taylor

Sample Period	Times Visited	Sampling Sites
October 2008 – July 2009	4	3

General	Location	Grady County	Click map for site data
	Impoundment	1960	
	Area	227 acres	
	Capacity	1,877 acre feet	
	Purposes	Waters Supply, Flood Control, and Recreation	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		14 NTU	8% of values > OWQS of 25 NTU (n=12)
	Average True Color			Did not collect for true color
	Average Secchi Disk Depth		48 cm	
	Water Clarity Rating		Average	
	Trophic State Index		68	Previous value = 64
	Trophic Class		Hypereutrophic	
	Profile	Salinity	0.23 – 0.30 ppt	
		Specific Conductivity	461.2 – 553 µS/cm	
		pH	8.05 – 8.51 pH units	
		Oxidation-Reduction Potential	315 to 583 mV	
		Dissolved Oxygen	All data are above screening level of 2.0 mg/L	
	Nutrients	Surface Total Nitrogen	0.85 mg/L to 1.56 mg/L	
		Surface Total Phosphorus	0.067 mg/L to 0.223 mg/L	
		Nitrogen to Phosphorus Ratio	10:1	Phosphorus limited, possibly co-limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	*							
	Aesthetics						NS*	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	<div>S = Fully Supporting NS = Not Supporting NEI = Not Enough Information</div>		Notes	*Did not collect for these parameters. *Currently, the lake is listed as a Nutrient Limited Watershed (NLW) in the Oklahoma Water Quality Standards (WQS). This listing means that the lake is considered threatened from nutrients until a more intensive study can confirm the Aesthetics beneficial use non-support status.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

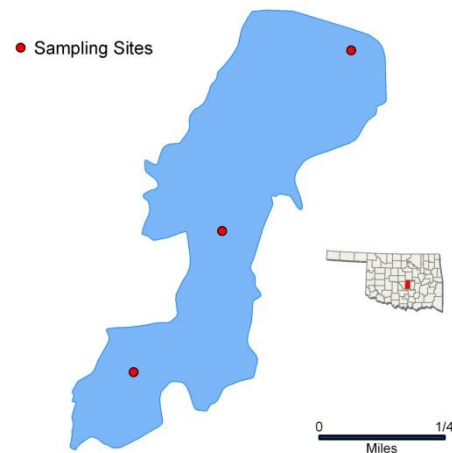
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Tecumseh

Sample Period	Times Visited	Sampling Sites
October 2007 – July 2008	4	3

General	Location	Pottawatomie County	Click map for site data
	Impoundment	1934	
	Area	127 acres	
	Capacity	1,118 acre feet	
	Purposes	Waters Supply, and Recreation	



Parameters	<b>Parameter</b> ( <a href="#">Descriptions</a> )		<b>Result</b>	<b>Notes/Comments</b>
	Average Turbidity		132 nephelometric turbidity units (NTU)	All values > 25 NTU
	Average True Color		244 units	All values > OWQS of 70
	Average Secchi Disk Depth		11 cm	
	Water Clarity Rating		poor	
	Trophic State Index		49	Previous value = 57
	Trophic Class		mesotrophic	
	Profile	Salinity	0.00 – 0.10 ppt	
		Specific Conductivity	105.6 – 141 µS/cm	
		pH	7.08 – 7.60 pH units	Neutral
		Oxidation-Reduction Potential	337 to 537 mV	
		Dissolved Oxygen		D.O. always > 5.0 mg/L
	Nutrients	Surface Total Nitrogen	1.01 mg/L to 1.55 mg/L	
		Surface Total Phosphorus	0.066 mg/L to 0.131 mg/L	
		Nitrogen to Phosphorus Ratio	12:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	*							
	Aesthetics					S	NS					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										NEI**	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*Not supporting for lead as chronic criteria was exceeded. All other toxicants are fully supporting. **The PBCR cannot be assessed as minimum data requirements were not met due to QA/QC issues for E. coli and enterococci.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

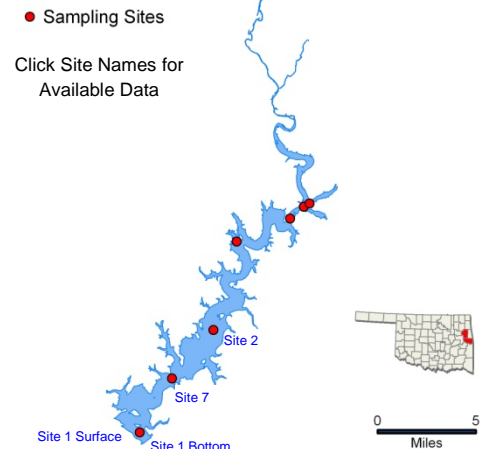
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Tenkiller (1,2,7)

Sample Period	Times Visited	Sampling Sites
November 2011 – August 2012	4	7

General	Location	Sequoyah County	Click map for site data
	Impoundment	1953	
	Area	12,900 acres	
	Capacity	654,100 acre-feet	
	Purposes	Flood Control, Hydropower	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	5 NTU	100% of values < OWQS of 25 NTU (n=11)
		Average Secchi Disk Depth	138 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	8 mg/m3	
		Trophic State Index	51	Previous value = 53
	Profile	Trophic Class	Eutrophic	
		Salinity	0.08 – 0.13 ppt	
		Specific Conductivity	177 – 278 µS/cm	
		pH	6.56 – 9.02 pH units	Only 0.54% of recorded values > 9 pH units
		Oxidation-Reduction Potential	124-574mV	
		Dissolved Oxygen	Up to 73% of water column < 2 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.40 mg/L to 1.46 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.016 mg/L	
		Nitrogen to Phosphorus Ratio	124:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	NS	S							
	Aesthetics					NS	N/A					
	Agriculture							N/A	N/A	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											S
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*The lake is listed in the WQS as a NLW indicating that the Aesthetics beneficial use is considered threatened by nutrients until studies can be conducted to confirm non-support status. *N/A – parameters not collected in current sample year.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

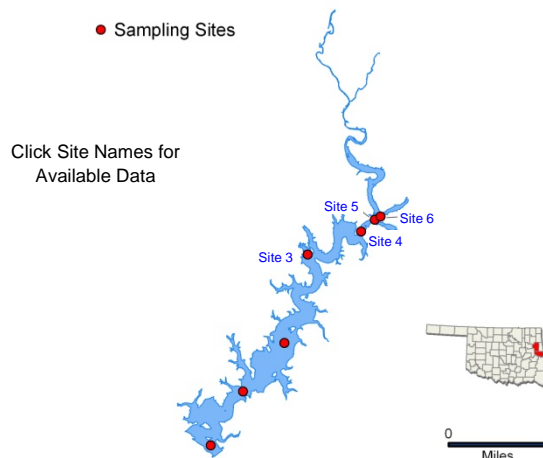
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Tenkiller, Illinois River Arm (3-6)

Sample Period	Times Visited	Sampling Sites
November 2011 – August 2012	4	7

General	Location	Sequoyah County	Click map for site data
	Impoundment	1953	
	Area	12,900 acres	
	Capacity	654,100 acre-feet	
	Purposes	Flood Control, Hydropower	



Parameters	Profile	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	14 NTU	14% of values < OWQS of 25 NTU (n=16)
		Average Secchi Disk Depth	56 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	16 mg/m3	
		Trophic State Index	58	Previous value = 59
		Trophic Class	Eutrophic	
	Nutrients	Salinity	0.09 – 0.13 ppt	
		Specific Conductivity	197 – 275 µS/cm	
		pH	7.47 – 9.01 pH units	Only 0.66% of recorded values are > 9 pH units
		Oxidation-Reduction Potential	86-567mV	
		Dissolved Oxygen	Up to 50% of water column < 2 mg/L in August	
		Surface Total Nitrogen	0.50 mg/L to 3.43 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.097 mg/L	
		Nitrogen to Phosphorus Ratio	51:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterococci & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	S							
	Aesthetics						NS	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												NS
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	*The lake is listed in the WQS as a NLW indicating that the Aesthetics beneficial use is considered threatened by nutrients until studies can be conducted to confirm non-support status.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

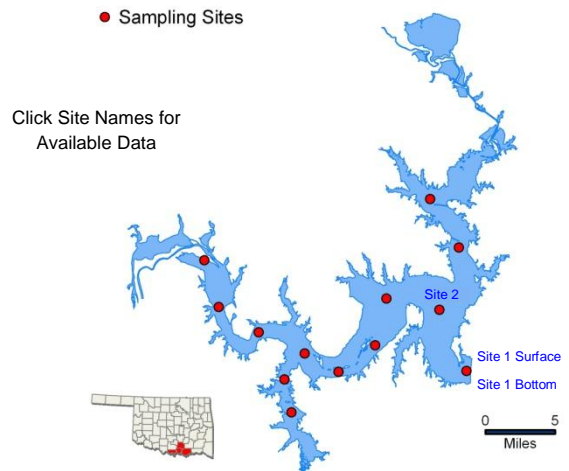
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Texoma (1-2)

Sample Period	Times Visited	Sampling Sites
October 2012 – August 2013	4	13

General	Location	Bryan County	Click map for site data
	Impoundment	1944	
	Area	88,000 acres	
	Capacity	2,643,000 acre-feet	
	Purposes	Flood Control, Waters Supply, Hydropower, Low-flow Regulation, and Recreation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	3 NTU	100% of values < OWQS of 25 NTU
		Average Secchi Disk Depth	142 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	10 mg/m3	
		Trophic State Index	53	Previous value = 51
	Profile	Trophic Class	Eutrophic	
		Salinity	0.79 – 0.90 ppt	
		Specific Conductivity	1585 – 1769 µS/cm	
		pH	7.10 – 8.39 pH units	
		Oxidation-Reduction Potential	-122 to 419 mV	
	Nutrients	Dissolved Oxygen	Up to 60% of water column < 2.0 mg/L in summer	
		Surface Total Nitrogen	0.79 mg/L to 0.96 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.026 mg/L	
		Nitrogen to Phosphorus Ratio	80:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	NS	NEI							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	Notes										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

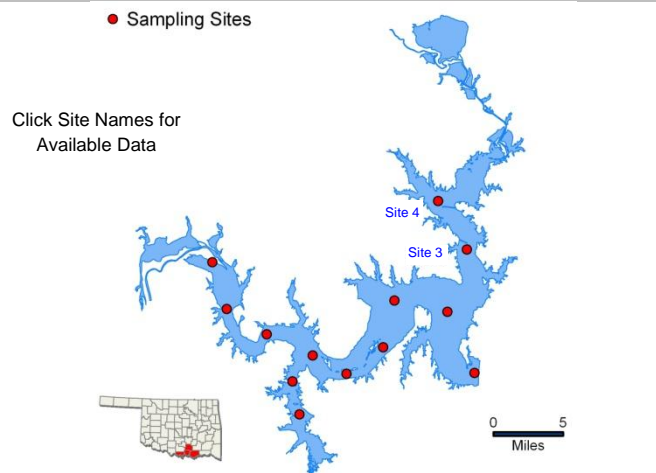
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Texoma Lower Washita River Arm (3-4)

Sample Period	Times Visited	Sampling Sites
October 2012 – August 2013	4	13

General	Location	Bryan County	Click map for site data
	Impoundment	1944	
	Area	88,000 acres	
	Capacity	2,643,000 acre-feet	
	Purposes	Flood Control, Waters Supply, Hydropower, Low-flow Regulation, and Recreation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	5 NTU	100% of values < OWQS of 25 NTU
		Average Secchi Disk Depth	85 cm	Did not collect for true color
		Water Clarity Rating	Good	
		Chlorophyll-a	13 mg/m3	
		Trophic State Index	56	Previous value = 56
		Trophic Class	Eutrophic	
	Profile	Salinity	0.69 – 0.90 ppt	
		Specific Conductivity	1395 - 1756 µS/cm	
		pH	7.19 – 8.55 pH units	
		Oxidation-Reduction Potential	-87 to 311 mV	
		Dissolved Oxygen	Up to 50% of water column < 2.0 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.82 mg/L to 0.96 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.026 mg/L	
		Nitrogen to Phosphorus Ratio	77:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	NS	NEI							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

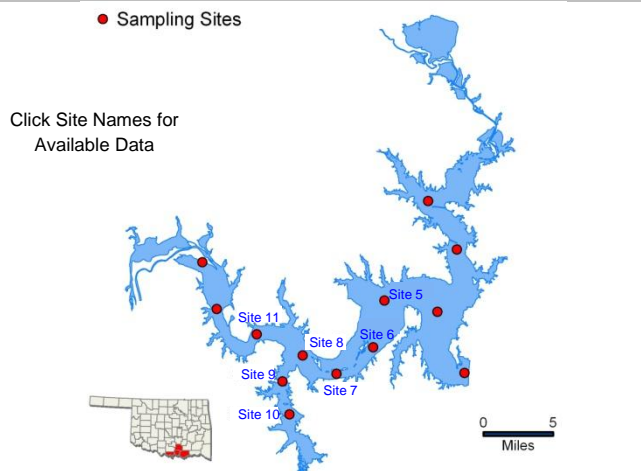
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Texoma Lower Red River Arm (5-11)

Sample Period	Times Visited	Sampling Sites
October 2012 – August 2013	4	13

General	Location	Bryan County	Click map for site data
	Impoundment	1944	
	Area	88,000 acres	
	Capacity	2,643,000 acre-feet	
	Purposes	Flood Control, Waters Supply, Hydropower, Low-flow Regulation, and Recreation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	8 NTU	100% of Values < OWQS of 25 NTU
		Average Secchi Disk Depth	63 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	21 mg/m3	
		Trophic State Index	60	Previous value = 59
	Profile	Trophic Class	Eutrophic	
		Salinity	0.80 – 1.11 ppt	
		Specific Conductivity	1595 – 2151 µS/cm	
		pH	7.01 – 8.54 pH units	
		Oxidation-Reduction Potential	-142 to 367 mV	
	Nutrients	Dissolved Oxygen	Up to 52% of water column < 2.0 mg/L in summer	
		Surface Total Nitrogen	0.70 mg/L to 1.21 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.091 mg/L	
		Nitrogen to Phosphorus Ratio	47:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	NS	NEI							
	Aesthetics						S	*					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<i>S = Fully Supporting</i> <i>NS = Not Supporting</i> <i>NEI = Not Enough Information</i>		Notes	*Did not collect for these parameters									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

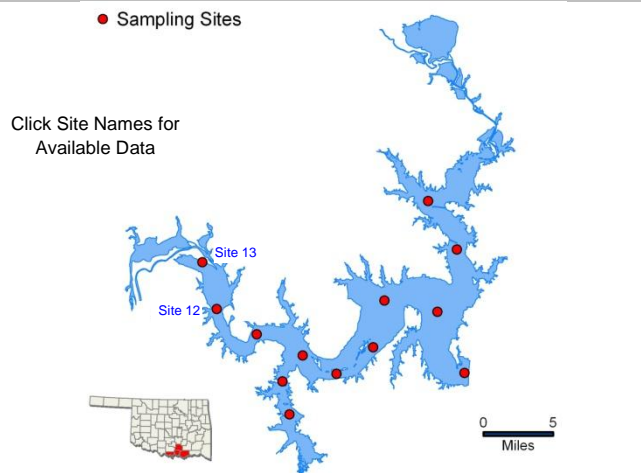
ppt = parts per thousand  
 En = Enterococci



# Texoma Upper Red River Arm (12-13)

Sample Period	Times Visited	Sampling Sites
October 2012 – August 2013	4	13

General	Location	Bryan County	Click map for site data
	Impoundment	1944	
	Area	88,000 acres	
	Capacity	2,643,000 acre-feet	
	Purposes	Flood Control, Waters Supply, Hydropower, Low-flow Regulation, and Recreation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	27 NTU	33% of values > OWQS of 25 NTU
		Average Secchi Disk Depth	25 cm	
		Water Clarity Rating	Fair to Poor	
		Chlorophyll-a	49 mg/m3	
		Trophic State Index	69	Previous value = 66
	Profile	Trophic Class	Hypereutrophic	
		Salinity	0.99 – 2.13 ppt	
		Specific Conductivity	1966 - 4055 µS/cm	
		pH	7.61 – 8.67 pH units	
		Oxidation-Reduction Potential	44 to 158 mV	
	Nutrients	Dissolved Oxygen	Up to 13% of water column < 2 mg/L in summer	
		Surface Total Nitrogen	0.66 mg/L to 1.50 mg/L	
		Surface Total Phosphorus	0.041 mg/L to 0.104 mg/L	
		Nitrogen to Phosphorus Ratio	18:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	NS	NEI							
	Aesthetics					S*	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	Notes										

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

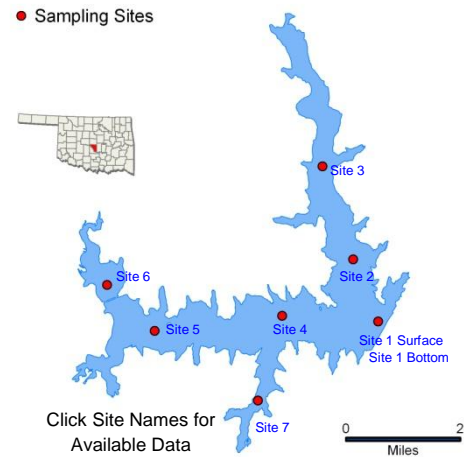
mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci

# Thunderbird

Sample Period	Times Visited	Sampling Sites
November 2012 - August 2013	4	7

General	Location	Cleveland County	Click map for site data
	Impoundment	1965	
	Area	6,070 acres	
	Capacity	119,600 acre-feet	
	Purposes	Flood Control, Water Supply, Recreation, Fish & Wildlife	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	22 NTU	15% of values > OWQS of 25 NTU
		Average Secchi Disk Depth	37 cm	
		Water Clarity Rating	average	
		Chlorophyll-a	13 mg/m3	
		Trophic State Index	56	Previous value = 57
	Profile	Trophic Class	Eutrophic	
		Salinity	0.18 – 0.23 ppt	
		Specific Conductivity	380 – 483 µS/cm	
		pH	7.23 – 8.83 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-51 to 390 mV	
		Dissolved Oxygen	Up to 47% of water column < 2 mg/L in June	Occurred at sites 1, the dam
	Nutrients	Surface Total Nitrogen	0.79 mg/L to 1.44 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.038 mg/L	
		Nitrogen to Phosphorus Ratio	26:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	NS	S							
	Aesthetics					NS*	S					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											NS
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		<b>Notes</b> * The lake is listed in the Oklahoma Water Quality Standards (WQS) as a Nutrient Limited watershed (NLW). This listing means that the lake is considered threatened from nutrients until a more intensive study can confirm the Aesthetics beneficial use non-support status.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

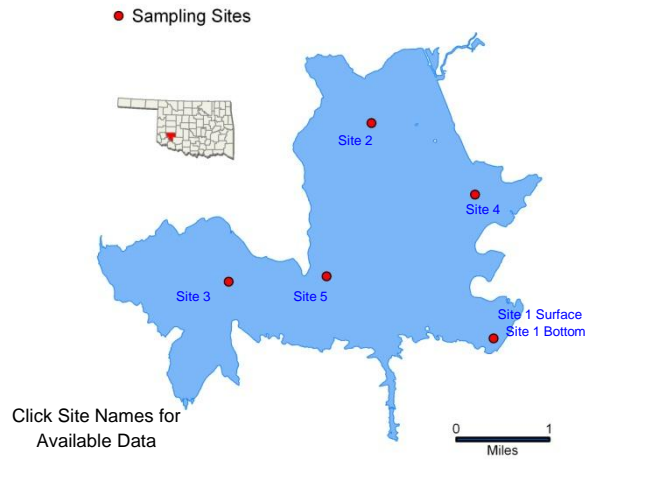
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Tom Steed

Sample Period	Times Visited	Sampling Sites
December 2012 - July 2013	4	3

General	Location	Kiowa County	Click map for site data
	Impoundment	1975	
	Area	6,400 acres	
	Capacity	88,970 acre-feet	
	Purposes	Flood Control, Water Supply, Recreation, Fish & Wildlife	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	54 NTU	92% of values > OWQS of 25 NTU
		Average Secchi Disk Depth	25 cm	
		Water Clarity Rating	poor	
		Chlorophyll-a	16 mg/m3	
		Trophic State Index	58	Previous value = 55
	Profile	Trophic Class	Eutrophic	
		Salinity	0.51 – 0.61 ppt	
		Specific Conductivity	1023 – 1226 µS/cm	
		pH	8.14 – 8.74 pH units	
		Oxidation-Reduction Potential	65 to 270 mV	
		Dissolved Oxygen		All data for this sample year below the screening level of 2 mg/L
	Nutrients	Surface Total Nitrogen	0.81 mg/L to 1.76 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.117 mg/L	
		Nitrogen to Phosphorus Ratio	18:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	S							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											NS
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	<ul style="list-style-type: none"> <li>No longer collect for this parameter</li> </ul>									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

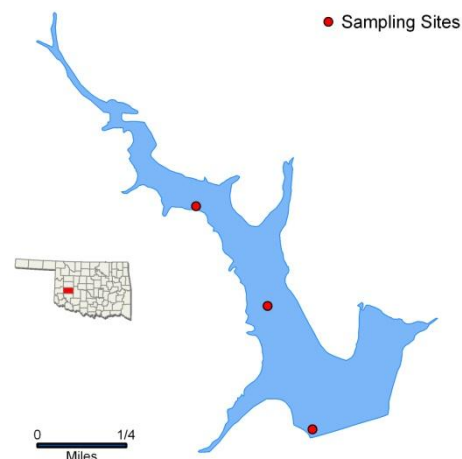
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Vanderwork

Sample Period	Times Visited	Sampling Sites
October 2007 – July 2008	4	3

General	Location	Washita County	Click map for site data
	Impoundment	1968	
	Area	135 acres	
	Capacity	1,578 acre feet	
	Purposes	Recreation	



Parameters	<b>Parameter</b> ( <a href="#">Descriptions</a> )		<b>Result</b>	<b>Notes/Comments</b>
	Average Turbidity		9 nephelometric turbidity units (NTU)	All values < 25 NTU
	Average True Color		17 units	All values < OWQS of 70
	Average Secchi Disk Depth		59 cm	
	Water Clarity Rating		good	
	Trophic State Index		64	Previous value = 60
	Trophic Class		hypereutrophic	
	Profile	Salinity	0.83 - 1.01 ppt	
		Specific Conductivity	1568 – 1896 µS/cm	
		pH	7.2 – 8.18 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-116 to 530 mV	
		Dissolved Oxygen	Up to 50% of water column < 2 mg/L in June	Occurred at site 1
	Nutrients	Surface Total Nitrogen	0.87 mg/L to 1.75 mg/L	
		Surface Total Phosphorus	0.041 mg/L to 0.100 mg/L	
		Nitrogen to Phosphorus Ratio	18:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	S							
	Aesthetics						NS	S					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<b>S = Fully Supporting</b> <b>NS = Not Supporting</b> <b>NEI = Not Enough Information</b>		<b>Notes</b> The lake is listed as a Nutrient Limited Watershed (NLW) in the Oklahoma Water Quality Standards (WQS). This listing means that the lake is considered threatened from nutrients until a more intensive study can confirm the Aesthetics beneficial use non-support status.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

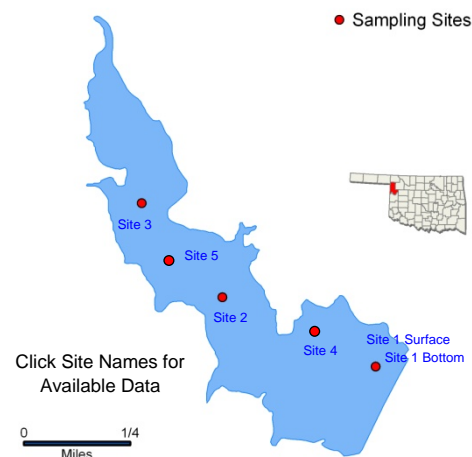
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Vincent

Sample Period	Times Visited	Sampling Sites
November 2010 – July 2011	4	5

General	Location	Ellis County	Click map for site data
	Impoundment	1961	
	Area	160 acres	
	Capacity	2,579 acre feet	
	Purposes	Recreation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	14 NTU	100% of Values < OWQS of 25 NTU
		Average Secchi Disk Depth	63 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	8 mg/m3	
		Trophic State Index	51	Previous value = 46
		Trophic Class	Eutrophic	
	Profile	Salinity	0.43 – 0.48 ppt	
		Specific Conductivity	833.1 - 928 µS/cm	
		pH	7.14 – 8.19 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	-50 to 490 mV	
		Dissolved Oxygen	Up to 45 % < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.27 mg/L to 0.55 mg/L	
		Surface Total Phosphorus	0.015 mg/L to 0.028 mg/L	
		Nitrogen to Phosphorus Ratio	21:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S	S	S	S							
	Aesthetics					S	S					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	<b>Notes</b> The PBCR cannot be assessed as minimum data requirements were not met due QA/QC issue with enterococci.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

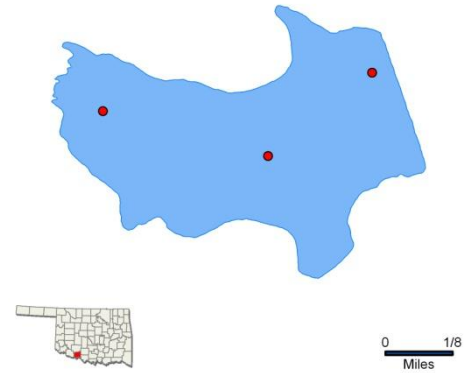
ppt = parts per thousand  
 En = Enterococci

# Dave Boyer (Walters)

Sample Period	Times Visited	Sampling Sites
October 2007 – July 2008	4	3

General	Location	Cotton County	Click map for site data
	Impoundment	1936	
	Area	148 acres	
	Capacity	861 acre feet	
	Purposes	Water Supply, and Recreation	

● Sampling Sites



Parameters	<b>Parameter</b> ( <a href="#">Descriptions</a> )		<b>Result</b>	<b>Notes/Comments</b>
	Average Turbidity		98 nephelometric turbidity units (NTU)	75% of values > 25 NTU
	Average True Color		166 units	75% of values > OWQS of 70
	Average Secchi Disk Depth		21 cm	
	Water Clarity Rating		poor	
	Trophic State Index		51	Previous value = 52
	Trophic Class		eutrophic	
	Profile	Salinity	0.12 – 0.17 ppt	
		Specific Conductivity	253.8 – 353 µS/cm	
		pH	7.92 – 8.34 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	376 to 520 mV	
		Dissolved Oxygen		All values >7 mg/L
	Nutrients	Surface Total Nitrogen	0.47 mg/L to 1.19 mg/L	
		Surface Total Phosphorus	0.029 mg/L to 0.138 mg/L	
		Nitrogen to Phosphorus Ratio	10:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	S							
	Aesthetics						S	NS					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

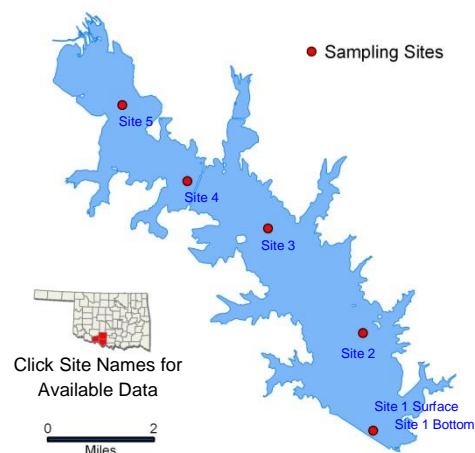
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Waurika

Sample Period	Times Visited	Sampling Sites
December 2012 - July 2013	4	5

General	Location	Jefferson County	Click map for site data
	Impoundment	1977	
	Area	10,100 acres	
	Capacity	203,100 acre feet	
	Purposes	Flood Control, Irrigation, Water Supply, Water Quality Control, Fish and Wildlife, and	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	57 NTU	56% of values > 25 NTU
		Average Secchi Disk Depth	31 cm	
		Water Clarity Rating	Fair	
		Chlorophyll-a	22 mg/m3	
		Trophic State Index	61	Previous value = 54
	Profile	Trophic Class	Hypereutrophic	
		Salinity	0.30 – 0.35 ppt	
		Specific Conductivity	621 – 722 µS/cm	
		pH	8.10 – 8.63 pH units	
		Oxidation-Reduction Potential	11 to 380 mV	
		Dissolved Oxygen		All data for this sample year below the screening level of 2 mg/L
	Nutrients	Surface Total Nitrogen	0.90 mg/L to 1.89 mg/L	
		Surface Total Phosphorus	0.028 mg/L to 0.281 mg/L	
		Nitrogen to Phosphorus Ratio	13:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	NS	S	S	S							
	Aesthetics					*	S					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										S	
	Public & Private Water Supply											NS
S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes: *No longer collect for this parameter										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

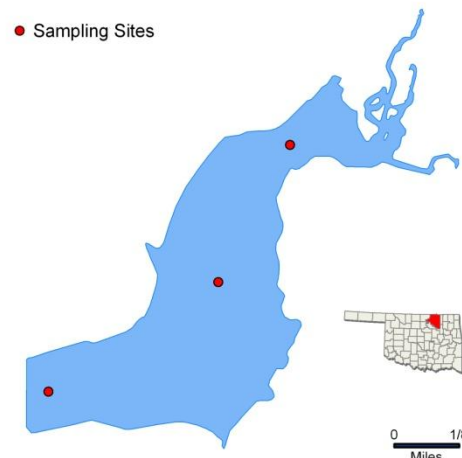
ppt = parts per thousand  
 En = Enterococci



# Waxhoma

Sample Period	Times Visited	Sampling Sites
October 2005 – August 2006	4	3

General	Location	Osage County	Click map for site data
	Impoundment	1955	
	Area	197 acres	
	Capacity	2,100 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	Average Turbidity		5 NTU	100% of values < OWQS of 25 NTU
	Average True Color		18 units	100% of values < OWQS of 70
	Average Secchi Disk Depth		153 cm	
	Water Clarity Rating		excellent	
	Trophic State Index		45	
	Trophic Class		mesotrophic	
	Profile	Salinity	0.09 – 0.11 ppt	
		Specific Conductivity	187.6 – 231.6 µS/cm	
		pH	6.77 – 8.77 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	135 – 438 mV	
		Dissolved Oxygen	Up to 62% of water column < 2 mg/L in July	
	Nutrients	Surface Total Nitrogen	0.15 mg/L to 0.49 mg/L	
		Surface Total Phosphorus	0.011mg/L to 0.023 mg/L	
		Nitrogen to Phosphorus Ratio	14:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	NS	S							
	Aesthetics						S	S					
	Agriculture								NS *	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes: *Sampling in 2005-2006 found the Agriculture beneficial use not supported based on numerical criteria for sulfates located in OAC 785:45 – Appendix F.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

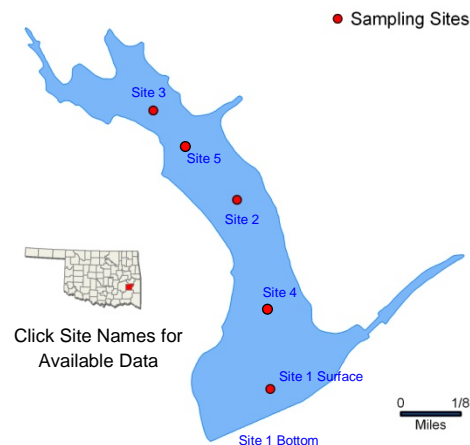
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Wayne Wallace

Sample Period	Times Visited	Sampling Sites
February 2012 – August 2012	4	5

General	Location	Latimer County	Click map for site data
	Impoundment	1969	
	Area	94 acres	
	Capacity	1,746 acre feet	
	Purposes	Flood Control and Recreation	



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	6 NTU	100% of values < OWQS of 25 NTU (n=6)
		Average Secchi Disk Depth	115 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	27 mg/m3	
		Trophic State Index	63	Previous value = 48
		Trophic Class	Hypereutrophic	
	Profile	Salinity	0.02 – 0.07 ppt	
		Specific Conductivity	56 – 153.5 µS/cm	
		pH	6.11 – 9.4 pH units	14.5% of recorded values are < 6.5 pH units
		Oxidation-Reduction Potential	51 to 484 mV	
		Dissolved Oxygen	Up to 60% of water column < 2 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.48 mg/L to 0.59 mg/L	
		Surface Total Phosphorus	0.005 mg/L to 0.014 mg/L	
		Nitrogen to Phosphorus Ratio	74:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	NS	*	S							
	Aesthetics						NS	N/A					
	Agriculture								N/A	N/A	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	Slightly acidic conditions are common in this part of the state, due to relatively low soil pH and lack of soluble bedrock. Due to these conditions it is likely that the low pH values may be due to natural causes; therefore the Water Board is looking at the applicability of developing site-specific criteria for waters in the southeastern portion of the state. *50-70% range is undetermined for DO.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

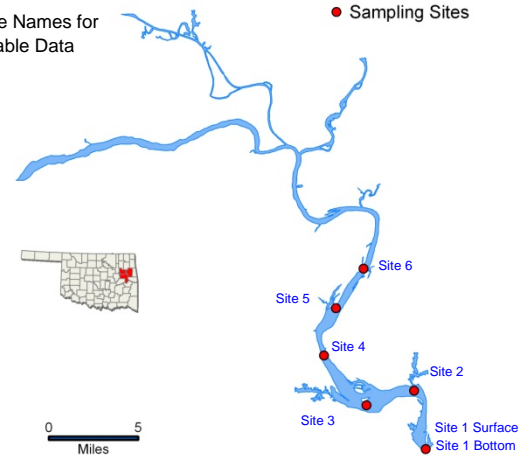
ppt = parts per thousand  
 En = Enterococci

# Webbers Falls

Sample Period	Times Visited	Sampling Sites
November 2010 – August 2011	4	6

General	Location	Muskogee County	Click map for site data
	Impoundment	170	
	Area	11,600 acres	
	Capacity	170,100 acre-feet	
	Purposes	Navigation, Hydropower	

Click Site Names for Available Data



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	13 NTU	100% of values < OWQS of 25 NTU (n=17)
		Average Secchi Disk Depth	63 cm	
		Water Clarity Rating	Average	
		Chlorophyll-a	27 mg/m3	
		Trophic State Index	63	Previous value = 55
	Profile	Trophic Class	Hypereutrophic	
		Salinity	0.21 – 0.79 ppt	
		Specific Conductivity	422.1 - 1490 $\mu$ S/cm	
		pH	7.52 – 9.07 pH units	0.45% of Values > 9 pH units
		Oxidation-Reduction Potential	276 - 458 mV	
	Nutrients	Dissolved Oxygen	All data are above screening level of 2.0 mg/L	
		Surface Total Nitrogen	0.38 mg/L to 1.3 mg/L	
		Surface Total Phosphorus	0.101 mg/L to 0.166 mg/L	
		Nitrogen to Phosphorus Ratio	7:1	Phosphorus limited, possibly co-limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation	NEI	S	S	S							
	Aesthetics					S	*					
	Agriculture							S	S	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
	<div>S = Fully Supporting NS = Not Supporting NEI = Not Enough Information</div>	Notes	Although 100% of the turbidity values are < 25 NTU, an assessment of the FWP beneficial use cannot be made for this sample year as minimum data requirements were not met.									

NTU = nephelometric turbidity units  
 $\mu$ S/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

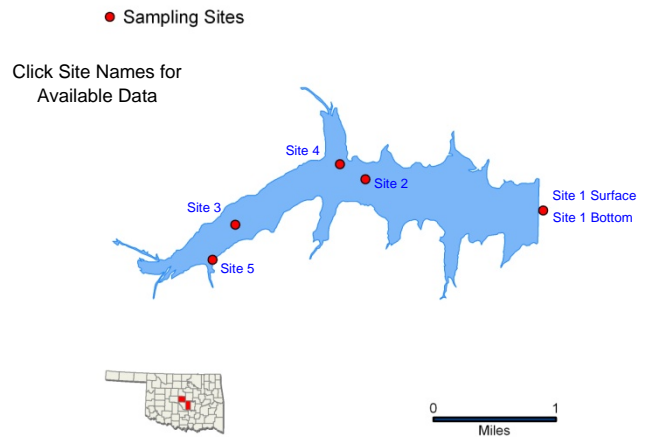
mg/L = milligrams per liter  
 $\mu$ S/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Wes Watkins

Sample Period	Times Visited	Sampling Sites
November 2010 – June 2011	3	5

General	Location	Pottawatomie County	Click map for site data
	Impoundment	1997	
	Area	1,142 acres	
	Capacity	14,065 acre-feet	
	Purposes	Water Supply, Recreation, Flood Control	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	18 NTU	16% of values > OWQS of 25 NTU
		Average Secchi Disk Depth	65 cm	
		Water Clarity Rating	Good	
		Chlorophyll-a	13 mg/m3	
		Trophic State Index	56	Previous Values= 53
		Trophic Class	Eutrophic	
	Profile	Salinity	0.11 – 0.16 ppt	
		Specific Conductivity	231.5 – 336.1 µS/cm	
		pH	6.91 – 8.83 pH units	
		Oxidation-Reduction Potential	18 - 459 mV	
		Dissolved Oxygen	Up to 45 % < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.69 mg/L to 1.12 mg/L	
		Surface Total Phosphorus	0.033 mg/L to 0.050 mg/L	
		Nitrogen to Phosphorus Ratio	25:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation	S*	S	S	S							
	Aesthetics					S	*					
	Agriculture							*	*	S		
	Primary Body Contact Recreation										NEI	
	Public & Private Water Supply											
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information	<b>Notes</b> *Although 16% of the values exceeded 25 NTU, available rainfall data suggests this is likely due to seasonal rain events. The lake is therefore considered supporting the FWP beneficial use for this sample year.										

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

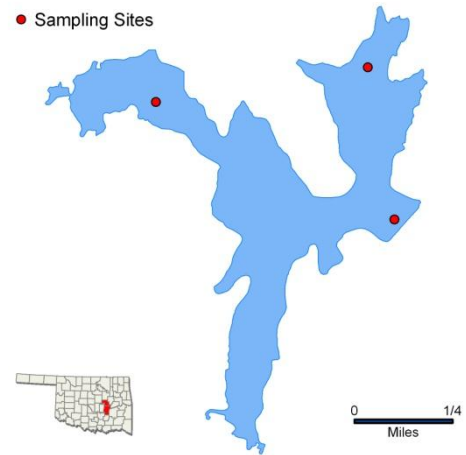
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Wetumka

Sample Period	Times Visited	Sampling Sites
October 2006 - July 2007	4	3

General	Location	Hughes County	Click map for site data
	Impoundment	1939	
	Area	169 acres	
	Capacity	1839 acre-feet	
	Purposes	Water Supply, Recreation	



Parameters		Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	18 NTU	8% of values >OWQS of 25 NTU
		Average True Color	58 units	58% of values > OWQS of 70
		Average Secchi Disk Depth	59 cm	
		Water Clarity Rating	fair	
		Trophic State Index	53	
		Trophic Class	eutrophic	
	Profile	Salinity	0.03 – 0.08 ppt	
		Specific Conductivity	92.4 – 173.3 µS/cm	
		pH	6.49 – 7.90 pH units	Only 2 values < 6.5 pH units
		Oxidation-Reduction Potential	298 - 461 mV	
		Dissolved Oxygen	Up to 67% of water column < 2 mg/L in July	Occurred at site 1, the dam
	Nutrients	Surface Total Nitrogen	0.52 mg/L to 1.35 mg/L	
		Surface Total Phosphorus	0.022 mg/L to 0.088 mg/L	
		Nitrogen to Phosphorus Ratio	13:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	NS	S							
	Aesthetics						S	NS					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	<div>S = Fully Supporting</div> <div>NS = Not Supporting</div> <div>NEI = Not Enough Information</div>		Notes	The PBCR cannot be assessed as minimum data requirements were not met due to QA/QC issues for fecal coliform and enterococci.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

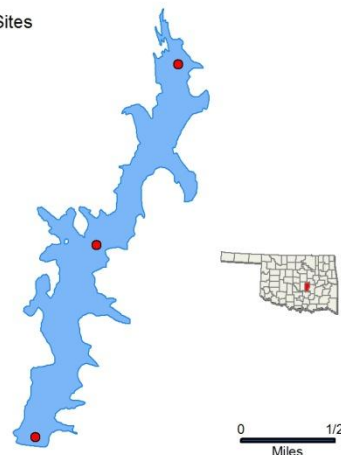
ppt = parts per thousand  
 En = Enterococci

# Wewoka

Sample Period	Times Visited	Sampling Sites
November 2008 - August 2009	4	3

General	Location	Seminole County	Click map for site data
	Impoundment	1925	
	Area	371 acres	
	Capacity	3,301 acre-feet	
	Purposes	Water Supply, Recreation	

● Sampling Sites



Parameters	<b>Parameter</b> ( <a href="#">Descriptions</a> )		<b>Result</b>	<b>Notes/Comments</b>
	Average Turbidity		31 NTU	58% of values > OWQS of 25 NTU (n=12)
	Average True Color			Did not collect for true color
	Average Secchi Disk Depth		33 cm	
	Water Clarity Rating		Average	
	Trophic State Index		56	Previous value = 55
	Trophic Class		Eutrophic	
	Profile	Salinity	0.08 – 0.12 ppt	
		Specific Conductivity	135 – 254.1 µS/cm	
		pH	6.64 – 7.90 pH units	
		Oxidation-Reduction Potential	20 - 477 mV	
		Dissolved Oxygen	Up to 25% of water column < 2.0 mg/L in August	
	Nutrients	Surface Total Nitrogen	0.58 mg/L to 0.88 mg/L	
		Surface Total Phosphorus	0.016 mg/L to 0.078 mg/L	
		Nitrogen to Phosphorus Ratio	16:1	Phosphorus limited

Beneficial Uses		<a href="#">Click to learn more about Beneficial Uses</a>	Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	*							
	Aesthetics						S	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	<div>S = Fully Supporting NS = Not Supporting NEI = Not Enough Information</div>		Notes	*Did not collect for these parameters									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

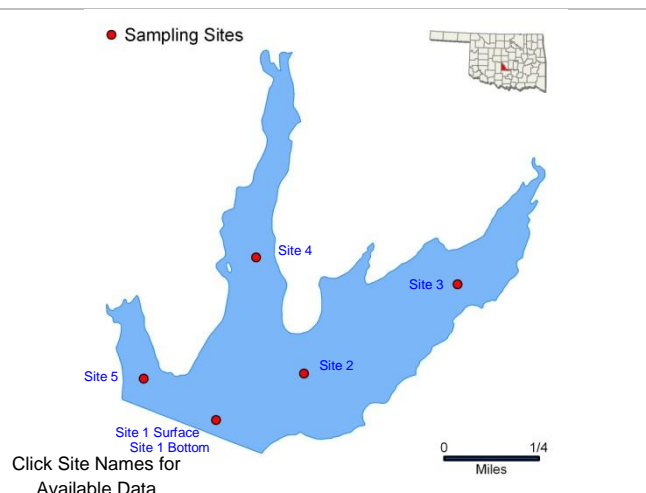
mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# Wiley Post Memorial (Maysville)

Sample Period	Times Visited	Sampling Sites
October 2012 – August 2013	4	4

General	Location	McClain County	Click map for site data
	Impoundment	1971	
	Area	302 acres	
	Capacity	2,086 acre feet	
	Purposes	Water Supply, Flood Control, and Recreation	



Parameters	In Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	36 NTU	54% of values > 25 NTU
		Average Secchi Disk Depth	27 cm	
		Water Clarity Rating	Poor	
		Chlorophyll-a	17 mg/m3	
		Trophic State Index	58	Previous value = 51
	Profile	Trophic Class	Eutrophic	
		Salinity	0.16 – 0.26 ppt	
		Specific Conductivity	347 – 533 µS/cm	
		pH	6.88 – 8.58 pH units	Neutral to slightly alkaline
		Oxidation-Reduction Potential	86 to 320 mV	
		Dissolved Oxygen	Up to 40% of water column < 2 mg/L in August	Occurred at site 4
	Nutrients	Surface Total Nitrogen	0.85 mg/L to 1.62 mg/L	
		Surface Total Phosphorus	0.074 mg/L to 0.176 mg/L	
		Nitrogen to Phosphorus Ratio	12:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enteroc. & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	S	S	S							
	Aesthetics						S	*					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											S	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	• No longer collect for this parameter									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

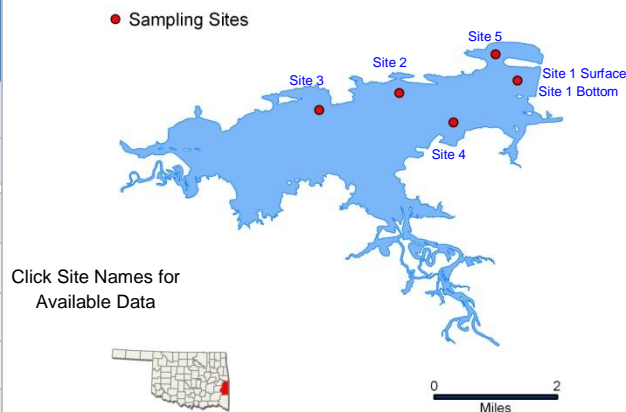
ppt = parts per thousand  
 En = Enterococci



# Wister

Sample Period	Times Visited	Sampling Sites
November 2012 – July 2013	4	5

General	Location	LeFlore County	Click map for site data
	Impoundment	1949	
	Area	7,333 acres	
	Capacity	62,360 acre feet	
	Purposes	Flood Control, Water Supply, Low flow Regulation, and Conservation	



Parameters	In-Situ	Parameter ( <a href="#">Descriptions</a> )	Result	Notes/Comments
		Average Turbidity	23 NTU	50% of values < OWQS 25 NTU
		Average Secchi Disk Depth	39 cm	
		Water Clarity Rating	Fair	
		Chlorophyll-a	19 mg/m3	
		Trophic State Index	60	Previous value = 57
		Trophic Class	Eutrophic	
	Profile	Salinity	0.04 – 0.09 ppt	
		Specific Conductivity	94 – 191 µS/cm	
		pH	5.80 – 8.63 pH units	24.1 % of Values < 6.5 pH units
		Oxidation-Reduction Potential	15 to 450 mV	
		Dissolved Oxygen	Up to 50% of water column < 2.0 mg/L in spring	
	Nutrients	Surface Total Nitrogen	0.45 mg/L to 1.24 mg/L	
		Surface Total Phosphorus	0.008 mg/L to 0.065 mg/L	
		Nitrogen to Phosphorus Ratio	24:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	En & E. coli	Chlor-a
	Fish & Wildlife Propagation		NS	NS	NS	S							
	Aesthetics						NS*	*					
	Agriculture								S	S	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												NS
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*Did not collect for these parameters. *Currently, the lake is listed as a Nutrient Limited Watershed (NLW) in the Oklahoma Water Quality Standards (WQS). This listing means that the lake is considered threatened from nutrients until a more intensive study can confirm the Aesthetics beneficial use non-support status.									

NTU = nephelometric turbidity units  
 µS/cm = microsiemens per centimeter  
 E. coli = Escherichia coli

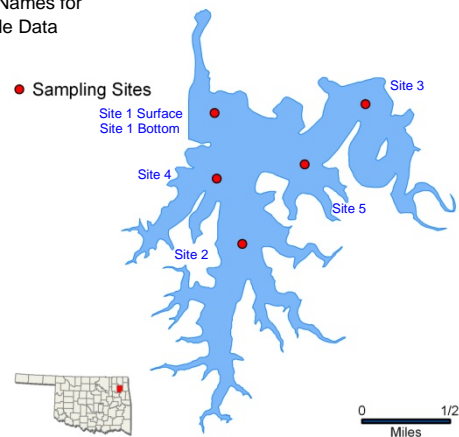
OWQS = Oklahoma Water Quality Standards  
 mV = millivolts  
 Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
 µS/cm = microsiemens/cm

ppt = parts per thousand  
 En = Enterococci

# W.R. Holway

Click Site Names for  
Available Data



Sample Period			Times Visited	Sampling Sites
March 2011 – September 2011			4	5
General	Location	Mayes County		Click map for site data
	Impoundment	1968		
	Area	712 acres		
	Capacity	48,000 acre-feet		
	Purposes	Water Supply, Hydropower, Recreation		

Parameters	Parameter ( <a href="#">Descriptions</a> )		Result	Notes/Comments
	In-Situ	Average Turbidity	4 NTU	100% of Values < OWQS of 25
		Average Secchi Disk Depth	198 cm	
		Water Clarity Rating	Excellent	
		Chlorophyll-a	13 mg/m3	
		Trophic State Index	56	Previous Value= 58
		Trophic Class	Eutrophic	
	Profile	Salinity	0.10 – 0.14 ppt	
		Specific Conductivity	215.4 - 283 µS/cm	
		pH	7.10 – 9.01 pH units	0.30% of Values > 9 pH units
		Oxidation-Reduction Potential	308 to 600 mV	
		Dissolved Oxygen	Up to 45% of water column < 2 mg/L in summer	
	Nutrients	Surface Total Nitrogen	0.45 mg/L to 1.18 mg/L	
		Surface Total Phosphorus	0.051 mg/L to 0.066 mg/L	
		Nitrogen to Phosphorus Ratio	14:1	Phosphorus limited

Beneficial Uses	<a href="#">Click to learn more about Beneficial Uses</a>		Turbidity	pH	Dissolved Oxygen	Metals	TSI	True Color	Sulfates	Chlorides	Total Dissolved Solids	Enterro. & E. coli	Chlor-a
	Fish & Wildlife Propagation		S	S	S	S							
	Aesthetics						S	*					
	Agriculture								*	*	S		
	Primary Body Contact Recreation											NEI	
	Public & Private Water Supply												
	S = Fully Supporting NS = Not Supporting NEI = Not Enough Information		Notes	*Did not collect for these parameters									

NTU = nephelometric turbidity units  
µS/cm = microsiemens per centimeter  
E. coli = Escherichia coli

OWQS = Oklahoma Water Quality Standards  
mV = millivolts  
Chlor-a = Chlorophyll-a

mg/L = milligrams per liter  
µS/cm = microsiemens/cm

ppt = parts per thousand  
En = Enterococci