|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Shawnee Twin No. 1** | | | | | | | | | | |  | | | | | | |
| **Sample Period** | | | | | **Times**  **Visited** | | | **Sampling Sites** | | |
| November 2018 – September 2019 | | | | | 4 | | | 4 | | |
|  | | | | |  | | | | | |
| **General** | Location | | Pottawatomie County | | | | | | | |
| Impoundment | | 1935 | | | | | | | |
| Area | | 1,336 acres | | | | | | | |
| Capacity | | 22,600 acre-feet | | | | | | | |
| Purposes | | Water Supply, Recreation | | | | | | | |
| **Parameters** |  | **Parameter** [(*Descriptions*)](http://www.owrb.ok.gov/quality/monitoring/bump/pdf_bump/SOPs_for_streams/WaterQualityParameterDefinitions.pdf) | | | | **Result** | | | | | | **Notes/Comments** | | | | | |
| **In**  **-**  **Situ** | Average Turbidity | | | | 12 NTU | | | | | | 100% of values < OWQS of 25 NTU | | | | | |
| Average Secchi Disk Depth | | | | 74.2 cm | | | | | |  | | | | | |
| Water Clarity Rating | | | | Good | | | | | |  | | | | | |
| Chlorophyll-a | | | | 8.93 mg/m3 | | | | | |  | | | | | |
| Trophic State Index | | | | 52 | | | | | | Previous Value = 47 | | | | | |
| Trophic Class | | | | Eutrophic | | | | | |  | | | | | |
|  | | | | | | | | | | | | | | | | |
| **Profile** | Salinity | | | | 0.09 – 0.13 ppt | | | | | |  | | | | | |
| Specific Conductivity | | | | 195.2 – 277.1 µS/cm | | | | | |  | | | | | |
| pH | | | | 7.10 – 8.27 pH units | | | | | | Neutral to slightly alkaline | | | | | |
| Oxidation-Reduction Potential | | | | 45.1 to 468.0 mV | | | | | |  | | | | | |
| Dissolved Oxygen | | | | Up to 30% of water column < 2 mg/L in September | | | | | |  | | | | | |
|  | | | | | | | | | | | | | | | | |
| **Nutrients** | Surface Total Nitrogen | | | | 0.375 mg/L to 0.765 mg/L | | | | | |  | | | | | |
| Surface Total Phosphorus | | | | 0.012 mg/L to 0.026 mg/L | | | | | |  | | | | | |
| Nitrogen to Phosphorus Ratio | | | | 31:1 | | | | | | Phosphorus limited | | | | | |
|  | | | | | | | | | | | | | | | | | |
| **Beneficial Uses** |  | [*Click to learn more about Beneficial Uses*http://www.owrb.ok.gov/quality/monitoring/bump/pdf\_bump/BENEFICIAL\_USES-COMPREHENSIVE.pdf](http://www.owrb.ok.gov/quality/monitoring/bump/pdf_bump/BENEFICIAL_USES-COMPREHENSIVE.pdf) | | | | Turbidity | pH | | Dissolved  Oxygen | Metals | TSI | True  Color | Sulfates | Chlorides | T  otal  Dissolved  Solids | En  terro.    &  E. coli | Chlor  -  a |
| Fish & Wildlife Propagation | | | | | NS | S | | NEI | 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** | | \*Standards revision, true color is for permitting purposes only | | | | | | | | | | | |
| *NTU = nephelometric turbidity units OWQS = Oklahoma Water Quality Standards mg/L = milligrams per liter ppt = parts per thousand µS/cm = microsiemens per centimeter mV = millivolts µS/cm = microsiemens/cm En = Enterococci E. coli = Escherichia coli Chlor-a = Chlorophyll-a* | | | | | | | | | | | | | | | | | |

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Bathy map available[: http://www.owrb.ok.gov/maps/PMG/owrbdata\_Bathy.html](http://www.owrb.ok.gov/maps/PMG/owrbdata_Bathy.html)

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Stanley Draper** | | | | | | | | |  | | | | | | |
| **Sample Period** | | | | **Times**  **Visited** | | **Sampling Sites** | | |
| October 2015 – August 2016 | | | | 4 | | 5 | | |
|  | | | |  | | | | |
| **General** | Location | | Cleveland County | | | | | |
| Impoundment | | 1962 | | | | | |
| Area | | 2,900 acres | | | | | |
| Capacity | | 100,000 acre-feet | | | | | |
| Purposes | | Water Supply, Recreation | | | | | |
| **Parameters** |  | **Parameter** [(*Descriptions*)](http://www.owrb.ok.gov/quality/monitoring/bump/pdf_bump/SOPs_for_streams/WaterQualityParameterDefinitions.pdf) | | | **Result** | | | | | **Notes/Comments** | | | | | |
| **In Situ** | Average Turbidity | | | 8 NTU | | | | | 100% of values < OWQS of 25 NTU | | | | | |
| Average Secchi Disk Depth | | | 104 cm | | | | |  | | | | | |
| Water Clarity Rating | | | Excellent | | | | |  | | | | | |
| Chlorophyll-a | | | 2.7 mg/m3 | | | | |  | | | | | |
| Trophic State Index | | | 40 | | | | | Previous value = 36 | | | | | |
| Trophic Class | | | Oligotrophic | | | | |  | | | | | |
|  | | | | | | | | | | | | | | |
| **Profile** | Salinity | | | 0.05 – 0.06 ppt | | | | |  | | | | | |
| Specific Conductivity | | | 108.7 – 132.7 µS/cm | | | | |  | | | | | |
| pH | | | 6.81 – 8.34 pH units | | | | |  | | | | | |
| Oxidation-Reduction Potential | | | 176.1 – 463.7 mV | | | | |  | | | | | |
| Dissolved Oxygen | | | Up to 62% of water column < 2 mg/L in August | | | | |  | | | | | |
|  | | | | | | | | | | | | | | |
| **Nutrients** | Surface Total Nitrogen | | | 0.26 mg/L to 0.55 mg/L | | | | |  | | | | | |
| Surface Total Phosphorus | | | 0.010 mg/L to 0.015 mg/L | | | | |  | | | | | |
| Nitrogen to Phosphorus Ratio | | | 31:1 | | | | | Phosphorus limited | | | | | |
|  | | | | | | | | | | | | | | | |
| **Beneficial Uses** |  | [*Click to learn more about Beneficial Uses*http://www.owrb.ok.gov/quality/monitoring/bump/pdf\_bump/BENEFICIAL\_USES-COMPREHENSIVE.pdf](http://www.owrb.ok.gov/quality/monitoring/bump/pdf_bump/BENEFICIAL_USES-COMPREHENSIVE.pdf) | | | Turbidity | pH | Dissolved  Oxygen | Metals | TSI | True  Color | Sulfates | Chlorides | T  otal  Dissolved  Solids | En  terro.    &  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** | \*Standards revision, true color is for permitting purposes only | | | | | | | | | | |
| *NTU = nephelometric turbidity units OWQS = Oklahoma Water Quality Standards mg/L = milligrams per liter ppt = parts per thousand µS/cm = microsiemens per centimeter mV = millivolts µS/cm = microsiemens/cm En = Enterococci E. coli = Escherichia coli Chlor-a = Chlorophyll-a* | | | | | | | | | | | | | | | |

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Bathy map available[: http://www.owrb.ok.gov/maps/PMG/owrbdata\_Bathy.html](http://www.owrb.ok.gov/maps/PMG/owrbdata_Bathy.html)

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| **Tecumseh** | | | | | | | | |  | | | | | | |
| **Sample Period** | | | | **Times**  **Visited** | | **Sampling Sites** | | |
| October 2007 – July 2008 | | | | 4 | | 5 | | |
|  | | | |  | | | | |
| **General** | Location | | Pottawatomie County | | | | | |
| Impoundment | | 1934 | | | | | |
| Area | | 127 acres | | | | | |
| Capacity | | 1,118 acre feet | | | | | |
| Purposes | | Waters Supply, and Recreation | | | | | |
| **Parameters** |  | **Parameter** [(*Descriptions*)](http://www.owrb.ok.gov/quality/monitoring/bump/pdf_bump/SOPs_for_streams/WaterQualityParameterDefinitions.pdf) | | | **Result** | | | | | **Notes/Comments** | | | | | |
| **In Situ** | Average Turbidity | | | 132 NTU | | | | | All values > 25 NTU | | | | | |
| Average Secchi Disk Depth | | | 11 cm | | | | | All values > OWQS of 70 | | | | | |
| Water Clarity Rating | | | poor | | | | |  | | | | | |
| Chlorophyll-a | | | 6.52 mg/m3 | | | | |  | | | | | |
| 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** |  | [*Click to learn more about Beneficial Uses*http://www.owrb.ok.gov/quality/monitoring/bump/pdf\_bump/BENEFICIAL\_USES-COMPREHENSIVE.pdf](http://www.owrb.ok.gov/quality/monitoring/bump/pdf_bump/BENEFICIAL_USES-COMPREHENSIVE.pdf) | | | Turbidity | pH | Dissolved  Oxygen | Metals | TSI | True  Color | Sulfates | Chlorides | T  otal  Dissolved  Solids | En  terro.    &  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** | \*Standards revision, true color is for permitting purposes only | | | | | | | | | | |
| *NTU = nephelometric turbidity units OWQS = Oklahoma Water Quality Standards mg/L = milligrams per liter ppt = parts per thousand µS/cm = microsiemens per centimeter mV = millivolts µS/cm = microsiemens/cm En = Enterococci E. coli = Escherichia coli Chlor-a = Chlorophyll-a* | | | | | | | | | | | | | | | |

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Modified for "Clear as Phytoplankton: A Tale of Two Lakes." Calculated Chlorophyll-a from Trophic State Index and formula from report's parameter descriptions. Replaced "True Color value."

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Thunderbird** | | | | | | | | |  | | | | | | |
| **Sample Period** | | | | **Times**  **Visited** | | **Sampling Sites** | | |
| October 2014 – July 2015 | | | | 4 | | 7 | | |
|  | | | |  | | | | |
| **General** | Location | | Cleveland County | | | | | |
| Impoundment | | 1965 | | | | | |
| Area | | 6,070 acres | | | | | |
| Capacity | | 119,600 acre-feet | | | | | |
| Purposes | | Flood Control, Water Supply, Recreation, Fish & Wildlife | | | | | |
| **Parameters** |  | **Parameter** [(*Descriptions*)](http://www.owrb.ok.gov/quality/monitoring/bump/pdf_bump/SOPs_for_streams/WaterQualityParameterDefinitions.pdf) | | | **Result** | | | | | **Notes/Comments** | | | | | |
| **In Situ** | Average Turbidity | | | 14 NTU | | | | | 4% of values > OWQS of 25 NTU | | | | | |
| Average Secchi Disk Depth | | | 59 cm | | | | |  | | | | | |
| Water Clarity Rating | | | Average | | | | |  | | | | | |
| Chlorophyll-a | | | 21 mg/m3 | | | | |  | | | | | |
| Trophic State Index | | | 61 | | | | | Previous value = 56 | | | | | |
| Trophic Class | | | Hypereutrophic | | | | |  | | | | | |
|  | | | | | | | | | | | | | | |
| **Profile** | Salinity | | | 0.13 – 0.26 ppt | | | | |  | | | | | |
| Specific Conductivity | | | 281.5 – 530 µS/cm | | | | |  | | | | | |
| pH | | | 7.14 – 8.68 pH units | | | | | Neutral to slightly alkaline | | | | | |
| Oxidation-Reduction Potential | | | 90.2 to 454 mV | | | | |  | | | | | |
| Dissolved Oxygen | | | Up to 67% of water column < 2 mg/L in July | | | | | Occurred at sites 1, the dam | | | | | |
|  | | | | | | | | | | | | | | |
| **Nutrients** | Surface Total Nitrogen | | | 0.80 mg/L to 1.27 mg/L | | | | |  | | | | | |
| Surface Total Phosphorus | | | 0.018 mg/L to 0.064 mg/L | | | | |  | | | | | |
| Nitrogen to Phosphorus Ratio | | | 23:1 | | | | | Phosphorus limited | | | | | |
|  | | | | | | | | | | | | | | | |
| **Beneficial Uses** |  | [*Click to learn more about Beneficial Uses*http://www.owrb.ok.gov/quality/monitoring/bump/pdf\_bump/BENEFICIAL\_USES-COMPREHENSIVE.pdf](http://www.owrb.ok.gov/quality/monitoring/bump/pdf_bump/BENEFICIAL_USES-COMPREHENSIVE.pdf) | | | Turbidity | pH | Dissolved  Oxygen | Metals | TSI | True  Color | Sulfates | Chlorides | T  otal  Dissolved  Solids | En  terro.    &  E. coli | Chlor  -  a |
| Fish & Wildlife Propagation | | | | NS | S | NS | S |  |  |  |  |  |  |  |
| Aesthetics | | | |  |  |  |  | NEI\* | 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** | \*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 OWQS = Oklahoma Water Quality Standards mg/L = milligrams per liter ppt = parts per thousand µS/cm = microsiemens per centimeter mV = millivolts µS/cm = microsiemens/cm En = Enterococci E. coli = Escherichia coli Chlor-a = Chlorophyll-a* | | | | | | | | | | | | | | | |

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