



OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

Response to Public Comments for the Draft Lake Thunderbird Report for Nutrient, Turbidity, and Dissolved Oxygen Total Maximum Daily Loads (TMDL)

November 12, 2013

Comments were received on the [Lake Thunderbird Draft TMDL Report](#) from the following:

- A Norman Developers Council (Represented by Heiple Law Office, Inc), dated 07/23/2013
- B Norman Developers Council (Represented by Heiple Law Office, Inc), Supplemental Comments, dated 07/31/2013
- C Sierra Club (Same as transcript from Public Meeting on 07/23/2013), dated 7/31/2013
- D City of Norman, dated 07/31/2013
- E Satish Dasharathy, email dated 08/01/2013
- F Charles & Lyntha Wesner, email dated 08/01/2013
- G Joy Hampton, email dated 08/01/2013

A. Comments from Norman Developers Council (prepared by Heiple Law Office – 7/23/13)

- A1. Exec. Summary, Pages 1 and 2: The fact that Oklahoma City and Moore contribute more than half of the pollutants going into the lake, but do **NOT** get drinking water from the lake, needs to be apparent to regulators when watershed-specific control actions and management measures are being considered, in order to insure that those cities are **REQUIRED** to take the same actions that Norman will be undertaking (essentially) voluntarily.

Response: *Cities using the lake for a drinking water source are identified in several locations throughout the report. The additional TMDL requirements for Municipal Separate Storm Sewer Systems (MS4) Permits, construction stormwater permits and industrial stormwater permits apply equally to all three cities in the Lake Thunderbird Watershed. No changes were made as a result of this comment.*

- A2. Exec. Summary, Page 2: There are ways to increase the volume of water in the lake. The critically important need is for ODEQ to **promptly develop standards for waste water treated by cities in Oklahoma to be eligible for discharge into water sources like Lake Thunderbird.** With the contemplated improvement in its waste water treatment plant (which currently discharges 10-12 MGD into the South Canadian), Norman could divert much of its treated waste water to Lake Thunderbird. Also, additional water could be discharged from those Norman wells currently off-line because of arsenic levels, flowing through creeks (including wetlands that could be developed) into Lake Thunderbird.

***Response:** Analysis of potential future discharges to the Lake Thunderbird Watershed was not within the scope of this study, and the court-imposed schedule for development of the report did not allow for any expansion of the scope. While there have been some conceptual discussions of such discharge scenarios, there are currently no active, concrete proposals to discharge treated wastewater into Sensitive Water Supply (SWS) lakes¹, like Lake Thunderbird. The Oklahoma Water Resources Board (OWRB) is the agency responsible for proposing changes to the Water Quality Standards. DEQ is not aware of any proposal to make such a change to Water Quality Standards (WQS). This TMDL report is based on the current Water Quality Standards. If any authorization for such a discharge is requested in the future, this TMDL would have to be revised to accommodate the additional pollutant loading. Also, please see the response to comment A.9. No changes were made as a result of this comment.*

- A3. Exec. Summary, Page 3: Utilizing data that covers only one 12-month period seems insufficient. It appears there was ample opportunity to have collected data for additional years.

***Response:** The study plan for Lake Thunderbird included a special stream monitoring program conducted by the Oklahoma Conservation Commission (OCC) in 2008-2009. OCC was responsible for collection of streamflow and water quality data at five stations in the Watershed. OWRB, in conjunction with the Central Oklahoma Master Conservancy District (COMCD), collected water quality data at eight stations in the Lake during the same time period. The monitoring program implemented for the Watershed and Lake was designed to provide the observed data needed to support development of the TMDLs for Lake Thunderbird. A special monitoring program was needed because historical flow and water quality observations did not exist for the Little River Watershed.*

(Response continues on next page)

¹ For information about SWS lakes, refer to Oklahoma's Water Quality Standards (WQS) [Appendix A.5 (for Lake Thunderbird) of Title 785, Chapter 45 of the Oklahoma Administrative Code; 785:45-5-25(c)(4)(A) and 785:45-3-2(c)].

Based on annual precipitation data from the Mesonet² Norman station, the Lake Thunderbird Watershed area experienced annual precipitation of 36.0 inches in 2008 and 35.7 inches in 2009. The annual precipitation in 2008-2009 is very close to the 30-year long-term average of 37.4 inches for the area. The data suggests that, during the model calibration period of 2008-2009, pollutant loadings from the Watershed to the Lake can be considered to represent “average” hydrologic conditions. The data used for this study were more than adequate for model calibration and TMDL development. No changes were made as a result of this comment.

- A4. Sec. 1.1: Note that the federal government says **States** have the obligation and the right to develop and implement controls. If Oklahoma would promptly adopt standards to allow treated waste water to be discharged into sources of drinking water, we could avoid the possibility of federal EPA intervention. Oklahomans are best qualified to address threats to our drinking water.

***Response:** Please see the responses to comments A.2 and A.9. No changes were made as a result of this comment.*

- A5. Sec. 1.1: It seems an extraordinary waste of talent, as well as an unnecessary burden on the “stakeholders who live and work in the watersheds”, if this report by ODEQ does not at least compile a list of various “watershed-specific control actions and management measures” that could be utilized to address specific problems described in the “public Comment” report.

***Response:** This TMDL Report sets the maximum daily loads, reduction goals, and various requirements for permit holders in the Watershed. Additional permit provisions are described in Appendix E along with descriptions and reported efficiencies of various Best Management Practices (BMPs) and references to the technical literature regarding BMP selection and implementation. Other recommendations may be found in Section 5.6, including requirements for Section 404 Permits. Flexibility is allowed for the communities in the Watershed to tailor their own programs and determine their implementation strategy to achieve the required load reduction goals and to meet the required wasteload allocations (WLA). No changes were made as a result of this comment.*

- A6. Sec. 1.2: As stated before, the use of only one 12-month period seems shallow. Would not the impact of years of high and low rainfall (such as the more than 55” in 2007) allow for the better analysis and understanding of whether diverting and discharging additional water into Thunderbird would alleviate some of the identified problems?

***Response:** Please refer to the responses to comments A.2 and A.3. No changes were made as a result of this comment.*

² "Mesonet" is a combination of the words "mesoscale" and "network". In meteorology, "mesoscale" refers to weather events that range in size from about one mile to about 150 miles. Mesoscale events last from several minutes to several hours. A "network" is an interconnected system. Thus, the Oklahoma Mesonet is a system designed to measure the environment at the size and duration of mesoscale weather events.

- A7. Table 1-2: Is it correct that decomposing leaves from trees comprise the biggest source of phosphorous and/or nitrogen in Lake Thunderbird?

Response: *No, it is not correct. There are ten land use categories used in the Lake Thunderbird Watershed Model. The land area in acres, the Total Phosphorus (TP) & Total Nitrogen (TN) unit loadings in pounds per acre per year, and the total pollutant loading in pounds per year for each land use category are summarized in the following table. As can be seen, total pollutant loadings from urban areas exceed those from forest areas by one to two orders of magnitude. Even the loadings from just the commercial areas of the watershed far exceed the loadings from the forested areas. While there is a large portion of the Watershed which is forested, the unit loadings from forested areas are smaller than any other land use category, which leads to a smaller total loading. Therefore, TN and TP loadings from leaves are NOT major sources of pollutants although the area of forest land is a significant portion of the total watershed area. For clarification, the table below along with explanatory text was added to the report in Section 3.3.6. as Table 3-9.*

Table 3-9. Nutrient Loading for Each Land Use Category

Land Use Category	Land Area (acres)	TN (lb/ac/yr)	TN (lbs/yr)	TP (lb/ac/yr)	TP (lbs/yr)
Forest Deciduous	55,010	0.189	10,397	0.009	495
Forest Evergreen	351	0.183	64	0.009	3
Total Forest			10,461		498
Wetland	8	0.324	3	0.046	0
Rangeland	59,765	3.074	183,718	0.607	36,277
Pasture	5,452	4.043	22,042	0.611	3,331
Agriculture	3,341	3.413	11,403	0.913	3,050
Low Density Urban	6,769	9.019	61,050	1.886	12,766
Medium Density Urban	3,102	9.089	28,194	1.895	5,878
Commercial	14,661	9.906	145,232	2.024	29,674
High Density Urban	661	10.34	6,835	2.169	1,434
Total Urban			241,311		49,762

- A8. Sec. 1.3: Adding substantial additional water to Lake Thunderbird would obviously impact a TMDL assessment.

Response: *That is correct. Before any substantial additions of water to Lake Thunderbird occur in the future, this TMDL would have to be revised. Also, please refer to the response to comment A2. No changes were made as a result of this comment.*

- A9. Sec. 2.1: Has ODEQ provided any information to OWRB regarding standards that would allow treated waste water to be deposited into drinking water sources?

Response: Discussions between DEQ and OWRB about any potential future wastewater discharge to the Lake Thunderbird Watershed was not a part of the TMDL development. However for information purposes, DEQ is providing the following: DEQ was required by 2012 Senate Bill 1043 to convene a working group to discuss issues related to water reuse. DEQ has convened the working group as required. The group has met and some preliminary discussions have occurred related to possible discharges to Sensitive Water Supplies such as Lake Thunderbird. DEQ and the OWRB have been included in these meetings. This is an ongoing process and - as of the date of this response - no proposals have been developed. No changes were made as a result of this comment.

- A10. Sec. 2.2: In light of the amount of pollution contributed by decomposing leaves and other vegetation, how do you conclude that “**urban development**” is the **primary** cause of excessive nutrient loading from the watershed?

Response: Please refer to the response to comment A7. No changes were made as a result of this comment.

- A11. Table 3-3: This further supports our belief that cities such Moore and Oklahoma, who do **NOT** get drinking water from Thunderbird, must be subjected to mandatory compliance with regulations designed to protect Thunderbird.

Response: [Note: Table 3-3 is a summary of sanitary sewer overflows and bypasses.] The additional TMDL requirements for MS4 permits, construction storm water permits, and industrial storm water permits apply equally to all three cities in the watershed. Non-compliance with these permit requirements will be considered a permit violation subject to enforcement actions. No changes were made as a result of this comment.

- A12. Sec. 3.1.3: Moore and Oklahoma City need **more** than simply an allocation of how much waste load they can discharge into the Lake Thunderbird watershed. Just like Norman, they need established and enforceable punishments, if and when either Moore or Oklahoma City exceeds their established allocation.

Response: Please refer to the response to comment A11. Noncompliance with permit requirements for Norman, Moore, or Oklahoma City would subject them to enforcement actions including possible fines of up to \$10,000 per day. No changes were made as a result of this comment.

- A13. Sec. 3.2.1: “For Lake Thunderbird, wet and dry deposition data was estimated as the average of annual data from 208-2009 for... .. Dry deposition for phosphorus was estimated using the CASTNET and NADP data for nitrogen with annual average N/P ratio for atmospheric deposition of N and P reported for 6 sites located in Iowa.” This does not appear to be sufficient information upon which to contemplate a building moratorium for the Little River Watershed.

Response: Atmospheric deposition data were available for nitrogen for 2008-2009 from the National Atmospheric Deposition Program (NADP) Kessler Field Station (OK17) and the CASTNET Cherokee station (CHE185) in Oklahoma. The Kessler Field station (OK17) is located about 38 km southeast of the dam³ and the Cherokee station (CHE185) is located about 237 km northeast of the dam⁴. These are the nearest atmospheric monitoring sites available. Since phosphate data was not available for these or any other stations in Oklahoma, a literature search identified a comprehensive study of atmospheric deposition data for nitrogen and phosphorus at six locations in Iowa. Estimates of phosphate deposition for Lake Thunderbird were based on the Oklahoma nitrogen deposition rate and the N/P ratio of the data from the Iowa stations. National-scale maps of atmospheric deposition of nitrogen for 2008-2009 from the NADP (<http://nadp.sws.uiuc.edu/>) show that nitrogen deposition rates in the Central Plains states, including Iowa, are comparable to the nitrogen deposition rates measured at the Oklahoma stations. The nitrogen and phosphorus deposition data and the N/P ratio derived from the study in Iowa are, therefore, considered to be representative of the Central Plains region where Lake Thunderbird is located. Section 4.4 of the report and Tables 4-1 and 4-2 provide data characterizing the contributions of each source of nutrients to the lake model. The contributions of the sources of phosphorus from the watershed, atmospheric deposition and internal sediment flux are given in Table 4-1 and the percentage of each source is given in Table 4-2. Atmospheric deposition accounts for only 0.4% of the total phosphorus loading to the Lake, a negligible contribution to the total phosphorus loading to Lake Thunderbird.

The report does not mention any contemplation of a building moratorium for the Little River watershed. No changes were made as a result of this comment.

- A14. Sec. 4.7: Norman **must** get on board, because Lake Thunderbird provides its drinking water. Unless the mitigating measures are made **mandatory** for Moore and Oklahoma City, **with significant fines for non-compliance,** any proposed regulatory action is worthless.

Response: Please refer to the responses to comments A11 and A12. No changes were made as a result of this comment.

B. Supplemental Comments from Norman Developers Council (prepared by Heiple Law Office - 7/31/2013)

- B1. Newspaper accounts of that meeting raised concerns on our part. The following quote is taken from the story, beginning on page 1 and continued on page 3, in the July 24, 2013 edition of ***The Norman Transcript:***

³ Latitude: 34.98 and Longitude -97.5214

⁴ Latitude: 35.7507 and Longitude -94.67

“Under the proposal, construction sites would have to maintain a 100-foot vegetative buffer for all streams, put in sediment basins (detention ponds) for sites five acres and larger, submit to weekly inspections, plant vegetation quickly and test the soil before using fertilizer.”

The newspaper quote appears to conflict with the following statement in the June 13, 2013 draft of the Lake Thunderbird TMDL Report:

Exec. Summary, Page 1: *“This report does not identify specific control actions (regulatory controls) or management measures (voluntary best management practices) necessary to reduce pollutant loading from the watershed. Watershed-specific control actions and management measures will be identified, selected, and implemented under a separate process involving stakeholders who live and work in the watershed, along with local, state, and federal government agencies.”*

Response: *Please refer to the response to comment A5. No changes were made as a result of this comment.*

- B2. Our first concern is that an ODEQ Report that suggests a **single** management practice that applies to **all** lands (e.g., **100-FOOT VEGETATIVE BUFFER FOR ALL STREAMS**) could result in an EPA pronouncement that **mandates** such a single solution for **all** lands in the Little River watershed. Compare the experience of the City of Norman.

More than two years ago, following months of study and deliberations by a large committee of City officials and citizens, the City of Norman adopted Ordinance O-1011-52, which include the following standard:

“Sec. 19-411. Water Quality Protection Zone design standards.

A. *The Water Quality Protection Zone (WQPZ) for a stream system shall consist of a vegetated strip of land, preferably undisturbed and natural, extending along both sides of a stream and its adjacent wetlands, floodplains, or slopes. The width shall be adjusted to include contiguous sensitive areas, such as steep slopes, where development or disturbance may adversely affect water quality, streams, wetlands, or other water bodies.*

B. *The required base width for all WQPZs shall be equal to:*

1. *The greater of the following:*
 - a. *One hundred (100) feet in width, measured from the top of the bank, on either side of the stream; or*
 - b. *The designated Stream Planning Corridor as delineated on Exhibit 4-4 to the Storm Water Master Plan, dated October 2009, and accepted by City Council on November 10, 2009, and as available on the appropriate scale through the Public*

Works Department, or as indicated by the applicant's independent engineering analysis; or

- c. The FEMA floodplain; or
2. An alternative width equal to twenty-five (25) feet in width, measured from the top of the bank, on either side of the stream when a reduction in nitrogen of at least seventy-five (75) percent and a reduction in phosphorus of at least fifty-eight (58) percent is achieved through the use of an engineered process that is certified by a licensed Professional Engineer. A development plan using an alternative width less than the SPC shall also document protection against flooding and bank erosion that would be anticipated during the one-percent-chance flood event in any given year assuming full build-out watershed conditions in those areas with forty (40) or more acres of drainage area in the Lake Thunderbird watershed. For the purpose of determining the applicable reduction in the base width of the buffer, the table below (**not included in this excerpt, but see next page**) may be utilized to determine pollutant removal for a particular structural control, as long as such control is constructed in accordance with the specifications for said control contained in Wichita/Sedgwick County Stormwater Manual...

The alternative provided in Section B.(2) is the recognition by the City of Norman, its officials and its citizens, that **a “One-Size-Fits-All” standard is NOT the most effective way to treat the edges of all streams.**

Response: The stream buffer is ONE additional requirement for construction storm water permits, but is not the SINGLE management practice that applies to these permits. All additional permit provisions are discussed in Appendix E of the report. Oklahoma’s permit for construction storm water discharges allows for alternatives to the buffer zone where site conditions preclude the establishment of a buffer, similar to the Norman ordinance. This is noted on page 7 of Appendix E. No changes were made as a result of this comment.

- B3. A second concern is that an ODEQ Report that suggests a **single** management practice that applies to **all** sites five acres and larger could result in an EPA pronouncement that **mandates** a sediment basin (detention pond) in the Little River watershed for **all** sites five acres and larger.

Many years ago, the City of Norman mandated that, in **rural** East and West Norman, a single-family residence could be built **only** on a tract of **ten acres or larger**. In the past two years, there have been examples of how imposition of the requirements of the new Norman **WATER QUALITY PROTECTION ZONE** ordinance, on tracts no larger than ten acres, would render such tracts essentially useless. (**SUGGESTION: Limit TMDL report to tracts of 40 acres or more.**)

Response: The sediment basin is ONE additional requirement for construction storm water permits, but is not the SINGLE management

practice that applies to these permits. All additional permit provisions are discussed in Appendix E of the report. Limiting the TMDL requirements to tracts of 40 acres or more is not practical since there are very few construction projects of that magnitude. Pollutant loading from construction sites of 5 – 40 acres would be substantial. It is not likely that the reduction targets could be met under those circumstances. No changes were made as a result of this comment.

- B4. For a third point, we suggest that, rather than have any EPA-approved TMDL Report on Lake Thunderbird mandate particular Management Practices to be utilized in the Little River watershed, regulators could implement Pollutant Removal percentages required for different Structural Controls for specified pollutants, such as the following table from Section 19-411 of Norman City Code:

Table of Design Pollutant Removal Efficiencies for Stormwater Controls (%)				
Structural Control	Total Suspended Solids	Total Phosphorus	Total Nitrogen	Metals
Stormwater Pond	80	55	30	50
Dry Extended Detention Pond	60	35	25	25
Enhanced Dry Swales	90	50	50	40
Grass Channel	50	25	20	30
Infiltration Trench	90	60	60	90
Soaking Trench	90	60	60	90
Vegetative Filter Strips	50	20	20	40
Surface Sand Filters	80	50	30	50

In closing, Norman developers are ready, willing and able to support, and help implement, a reasonable and flexible plan for improving the water quality of Lake Thunderbird. We appreciate the opportunity for input.

Response: *EPA recommends, and DEQ agrees, that the permitting approach for storm water discharges should be based on appropriate BMPs rather than numeric effluent limits in terms of concentration, mass or percent reductions as the Developers recommend. Vegetative buffers and sediment basins are among the most effective and reliable sediment and nutrient control BMPs for construction sites. Without these requirements for construction storm water permits, it is not likely that the overall load reduction goals for the Lake Thunderbird watershed will be achieved. The need for any additional controls or numeric limits will be re-evaluated in the future as implementation plans are developed. No changes were made as a result of this comment.*

C. Comments from Sierra Club (7/24/2013)

- C1. The report requires more background information on other major pollutant runoff that is not phosphate and nitrate based such as chemicals, cleaning products, or petroleum based pollutants swept into storm water drains and waterways after being deposited on streets, driveways, and parking lots.

Response: *The scope of this report is limited to documented water quality impairments. Water quality constituents that relate to the impairments of Lake Thunderbird are suspended sediment, phosphorus, nitrogen, and carbonaceous biochemical oxygen demand (CBOD). Section 303(d) of the Clean Water Act requires that TMDLs be determined for the pollutants that are related to the impairments identified for Lake Thunderbird. There are no known impairments for Lake Thunderbird related to chemicals, cleaning products or petroleum based pollutants. No changes were made as a result of this comment.*

- C2. Section 5, page 7, makes an assumption of 35% removal and not a higher percentage. Why have scenarios for a higher removal percentage not been included including their temporal/time impact on reducing water pollution in Lake Thunderbird?

Response: *Removal percentages higher than 35% were considered and simulated for the modeling study. As discussed in Section 4.5 on page 4-7 and 4-8 of the report, the calibrated lake model was used to evaluate the water quality response to reductions in watershed loading of sediment, nutrients and CBOD. Load reduction scenario simulation runs were performed to determine if water quality targets for turbidity, chlorophyll and dissolved oxygen could be attained with watershed-based load reductions of 25%, 35%, 50%, and 75%. Based on an evaluation of the load reduction scenario results the 35% removal alternative was selected for a detailed “spin-up” analysis of the long-term water quality response of the Lake to changes in watershed loads. The 35% removal scenario was then used to simulate eight years of sequential “spin-up” runs to evaluate the long-term response of water quality conditions in the lake to the 35% removal change in external loads from the watershed. The modeling results indicate that water quality standards should be attained within a reasonable time if pollutant loads are reduced by 35%. Larger removal rates are not required to attain the standards. No changes were made as a result of this comment.*

- C3. In Section 5, page 9, the report needs to include other sources of water pollution including: urban storm water runoff, impermeable surfaces, construction areas, erosion control, of stream banks, destruction of in-stream and riparian habitat, and sewer runoffs.

Response: *With the exception of destruction of in-stream and riparian habitat, all the other sources noted in the comment, including an explicit representation of urban stormwater runoff and impermeable surfaces, are incorporated in the pollutant loading rates for sediment and nutrients that are*

assigned to each land use in the watershed model. Existing land management practices, including pollutant reducing best management practices for different land uses, are implicitly simulated in the watershed model. The calibrated pollutant loading rates used in the watershed model are considered to be reasonable representations of the pollutants generated for each land use category because the watershed model results are shown to be in good agreement with observed water quality data for sediment and nutrients. Destruction of in-stream and riparian habitat is not considered to be a pollution source within the context of a TMDL. No changes were made as a result of this comment.

- C4. Section, page 10 needs to include cattle, agriculture, and failing septic systems as primary non-source pollution sources.

Response: *Agricultural land uses and appropriate nonpoint source pollutant loading rates for sediments and nutrients are considered in the watershed model. Existing land management practices, including pollutant reducing best management practices for agricultural land uses, are implicitly simulated in the watershed model. Although inventories of cattle and failing septic systems in the watershed were not explicitly included in the watershed model, the land use-dependent pollutant loading rates that were simulated did result in a good calibration of the watershed model in comparison to observed sediment and nutrient data. Failing septic systems were not likely to be a significant factor in this watershed due to the low density of septic systems. No changes were made as a result of this comment.*

- C5. Section 5, pages 10-11—an additional source of non-point source pollution that needs to be added to the report is non-existent or weak local government regulations. Just one example of this among many (sic) including those documented in numbers 6-9 below is the exemption by the City of Norman of on August 12, 2012 of Milligan Trucking of pollutant discharges into the Little River that flows into Lake Thunderbird, see also:

<http://normantranscript.com/local/x1301511255/Dirt-flies-at-city-hall/print>

Response: *The presence or absence of local regulations is not considered a pollutant source within the context of a TMDL. The purpose of the TMDL is to establish wasteload allocations and load reduction goals for the cities so that the water quality in Lake Thunderbird can be restored. The TMDL report also establishes additional requirements for State issued MS4 permits, construction permits and MSGP permits in Lake Thunderbird watershed. The Plan or strategy for each city to achieve the WLAs is beyond the scope of this TMDL report. Flexibility is allowed for the Cities to decide what measures to take and what local ordinances/regulations will work best for the community. Progress in meeting the pollutant reduction goals must be documented. No changes were made as a result of this comment.*

- C6. In Norman, Lake Thunderbird pollution control efforts includes a storm water master plan with a 100 foot buffer or a 25 foot engineered buffer zone around waterways and numerous platted property adjacent to waterways exempt

from Norman storm water master plan regulations. The 25 foot buffer allows for significant phosphate and nitrate and runoff (Appendix A)⁵. In addition the Norman storm water master plan has a grandfather clause that allows already platted properties to be exempt from the storm water master plan. There are numerous examples of this (Appendix B)⁶. Neither the engineered 25 foot buffer zone nor the grandfathered platted property meet current requirements and standards for a vigorous removal of nitrate and phosphate pollution. This needs to be noted in the report.

Response: *Please refer to the response to comment C5. No changes were made as a result of this comment.*

- C7. Norman also has adopted a purported street sweeping program that is not based on best practices (Appendix C)⁷ and <http://normantranscript.com/government-beat/x1100993249/Norman-streets-aren-t-being-swept-at-the-moment/print> [sic]⁸ by not using air vacuum street sweepers at least once a week on major roads in the spring, summer, and fall and at least once a month on secondary roads. This effort should not be credited as a scientifically certified and viable approach for phosphate and nitrate removal. This needs to be noted in the report.

Response: *All three cities within the watershed will be required to develop an implementation plan designed to achieve the reduction goals and WLAs. Flexibility is allowed in choosing the particular measures to be included in those plans but progress toward achieving the reduction goals must be demonstrated. Also, please refer to the response to comment C5. No changes were made as a result of this comment.*

- C8. Norman also has adopted (Appendix D) a phosphate ban ordinance that is weak and is primarily voluntary and education oriented rather than bans phosphates in fertilizers. This effort should not be credited as a scientifically certified and viable approach for phosphate and nitrate removal. This needs to be noted in the report.

Response: *Please refer to the responses to comments C5 and C7. No changes were made as a result of this comment.*

⁵ This references an appendix to their comments. "Appendix A" refers to Sec. 19-411 (Water Quality Protection Zone" that was outlined in B2's comment.

⁶ "Appendix B" is a map from City of Norman (entitled LakeThunderbirdDrainage_FBF.pdf), March 31, 2011 of platted properties in exempt from the Norman stormwater ordinance.

⁷ "Appendix C" is a reference to one of the appendices to their comments. In this case, the commenter was referencing: "[Evaluation of Street Sweeping as a Stormwater-Quality-Management Tool in Three Residential Basins in Madison, Wisconsin](#)" by William R. Selbig and Roger T. Bannerman.

⁸ Bad link. DEQ notified the commenter who responded with the correct link which is: <http://normantranscript.com/headlines/x1100993249/Norman-streets-aren-t-being-swept-at-the-moment/>

- C9. In Moore and OKC the report should note there are no water quality ordinances related to Lake Thunderbird other than anti-soil erosion requirements.

***Response:** Both Oklahoma City and Moore are currently required to implement various programs to reduce pollutants from storm water discharges, including necessary ordinances. Also, please refer to responses to comments C5 and C7. No changes were made as a result of this comment.*

D. Comments from the City of Norman (7/31/2013)

- D1. The report primarily targets Norman, Oklahoma City, and Moore as the largest contributors of storm water runoff to Lake Thunderbird. Table ES-1 in the Executive Summary provides the loading contributions of Moore, Norman, Oklahoma City, and Other Areas for nitrogen, phosphorus, oxygen demand and sediment (as measured from April 2008 – April 2009). Table 5-4 allocates the waste load allocations among the cities based on loading contribution measured during April 2008 – April 2009. The City is concerned that setting waste load allocations based on the loadings measured in 2008 and 2009 without consideration of expected future development won't encourage an equitable level of effort and investment by the cities over the long term. Will the waste load allocations be re-evaluated throughout the time period in which the TMDL is effective?

***Response:** There are no specific plans at this time to re-evaluate the waste load allocations and there are no requirements to do so. If conditions change or other new discharges are proposed, the TMDL may need to be revised in the future. For example, see the responses to comments A2 and A8. No changes were made as a result of this comment.*

- D2. The TMDL proposes to set Waste Load Allocations based on the total existing watershed load as estimated by the loads contributed by each MS4 city during collection of the 2008-2009 data. Moore makes up about 8% of the Lake Thunderbird watershed by land area, yet Moore was responsible for 25% of the total nitrogen, 28% of the total phosphorus, 31% of the COBD, and 21% of the suspended solids based on the data collected in 2008-2009. Do the WLA's proposed by the TMDL account for the relative contribution of each pollutant by each city or by its size as it relates to the total watershed?

***Response:** The proposed WLAs are based on the percentage of the existing loadings generated from each city, not by the size of the city relative to the watershed. No changes were made as a result of this comment.*

- D3. The TMDL study indicates that long-term modeling indicates that compliance with water quality criteria for turbidity, dissolved oxygen, and chlorophyll could be met within a reasonable time frame. Will updates be made periodically by DEQ and in what time frame will the updates be made (every 10 years)?

***Response:** Lake Thunderbird will be monitored to see if the water quality of the lake is improving. However, there is no specific plan to update TMDLs at*

this time. Also please see the response to comment D1. No changes were made as a result of this comment.

- D4. Appendix E (II)(2) of the TMDL requires that each MS4 Stormwater Permittee develop or participate in a Pollutant Monitoring and Tracking Program. The City believes a coordinated water sampling program between Norman, Oklahoma City, and Moore is important to achieving this mandate and asks that such coordination be required in the TMDL.

Response: *DEQ recognizes that there could be advantages and efficiencies with a coordinated regional monitoring program and that approach is allowed as an option. The decision whether to participate in a regional monitoring program is left to the individual communities and therefore is not a requirement of the TMDL. No changes were made as a result of this comment.*

- D5. The TMDL Study states that “to ensure compliance with the TMDL requirements under the permit, MS4 permittees must develop strategies designed to achieve progress toward meeting the reduction goals established in the TMDL.” The Study goes on to encourage the permittees to use Best Management Practices (BMPs) to meet the reduction goals. The City of Norman has already undertaken several of the suggested BMPs found in Appendix E to the TMDL study. We believed the programs that the City proactively instituted should be considered by ODEQ when it evaluates the City for compliance and efforts as outlined in the TMDL

Response: *Each community will be required to develop a comprehensive TMDL Compliance Plan, as described in Appendix E of the report. Continuing existing programs and considering enhancement and/or expansion of those programs, as well as new programs, could be part of the Plan. The ultimate goal is to achieve the loading reductions and restore the water quality of Lake Thunderbird. Each community is given the flexibility to design a Plan that best suits the community’s needs and results in progress toward those goals. No changes were made as a result of this comment.*

- D6. The City of Norman has undertaken a study to determine potential water sources to supply Norman’s water needs for the next 50 years. Paralleling Norman’s study, COMCD (Central Oklahoma Master Conservancy District) has also completed a study to determine the viability of augmenting Lake Thunderbird with highly treated wastewater effluent (reuse) to be a viable option. We realize that augmenting Lake Thunderbird with reuse water was not a part of the current TMDL, but strongly believe reuse to be realistic and valuable option for the future. We would like to TMDL to acknowledge best management plans, future monitoring and future TMDL’s may include reuse as a water source for augmenting Lake Thunderbird.

Response: *Please see the responses to comments A2, A8 and A9. No changes were made as a result of this comment.*

E. Comments from Satish Dasharathy (08/01/2013)

- E1. Appendix D, Page 64; Figure D-2 OWRB Water Quality Monitoring Stations for Streams in Lake Thunderbird Watershed; Samples were collected by Oklahoma Conservation Commission and analyzed by DEQ lab.

Response: *The caption of Figure D-2 was revised. "OWRB" was changed to "OCC".*

- E2. It would be helpful to include stream flow data for the six stations.

Response: *The stream flow data for the five stations was not included in the report due to size considerations since the data comprise about 290 pages. All of the stream flow data will be made available as an appendix to the report under "Appendix H".*

- E3. See attached data for Station L17 from Appendix D; It appears that data is incomplete for more than 3 months of the reported 1 year period for this particular station. I am not sure why another sampling station downstream in this segment of the watershed was not additionally selected to provide water quality data confirmation for Station L17. Allocating almost 30 percent of the proposed 35% reduction in the waste load from Moore based on less than 9 months of data from this area may not be sufficient to confirm the existing conditions in this area of the watershed. It would have been much more helpful to have included the stakeholders early on in the study to provide input in selecting the stream sampling stations.

Response: *The missing data at station L17 were added in Appendix D. Figures A-41 through A-46 in Appendix A were also updated. Due to some database issues, some of the collected data were not displayed in the Appendices and figures. However, a full year of data was collected and all data were used in the HSPF model calibration. Also, please see the response to comment A3.*

F. Comments from Charles & Lyntha Wesner (08/01/2013)

- F1. There is a need for political boundaries to be clearly shown in order to help the general public understand where pollutants originate. Specifically, on the two shaded maps which show where pollutants originate, it would be very useful to overlay individual city boundaries for Moore, Norman and Oklahoma City.

Response: *City boundaries for Moore, Norman and Oklahoma City were overlaid to the loading maps (Figure 3-10 – 3-14).*

- F2. There is a need for a definite schedule to determine progress in cleaning up our drinking water supply. Please state the definite timeline at which each city's preliminary plan is ready for review by DEQ, when review will be completed, when revisions, if needed, should be completed, reviewed,

implemented and progress measured. Then a time when measured progress should be checked by DEQ to determine if progress is actually being accomplished. If progress is not being made, a timeline should be established for plan revision, review by DEQ, implementation with measuring, and again review to determine progress or suggest changes by DEQ.

Response: *As detailed in Appendix E, the initial TMDL Compliance Plans are to be submitted to DEQ within 24 months of EPA approval of the TMDL. To address the tracking of progress toward achieving reduction goals, the following new provision was added as Section 4 of Part II in Appendix E, Specific Requirements for MS4 Stormwater Permits:*

4. Evaluating Progress

Compliance with this TMDL and progress toward achieving the wasteload allocations and load reduction goals will be evaluated at each renewal of the MS4 permit for each entity, generally every five years. Consideration will be given to:

- Water quality data and results from the pollutant monitoring and tracking program*
- The status of achieving milestones and accomplishing items in the current compliance plan*
- Any revisions that have been made to or proposed for the compliance plan*
- Any proposed enhancements to the compliance plan for the next permit term*

If sufficient progress is not demonstrated, an updated compliance plan and implementation schedule will be required to be submitted within six months. Noncompliance may subject the permittee to enforcement action.

G. Comments from Joy Hampton (08/01/2013)

- G1. The map showing hot zones for high loads of pollution did NOT include boundaries of where those areas were Moore, OKC or Norman. I think it is vital that people know if some of the worst pollution is coming from some other entities such as Moore and what enforcement efforts will be made.

Response: *Figure 3-10 through Figure 3-14 were updated to include City boundaries for Moore, Norman and Oklahoma City. Regarding enforcement, please the responses to comments A11 and A12.*

- G2. Norman's drinking water is at stake so Norman is invested. I am concerned, particularly considering tornado damage and rebuilding, if we have heavy pollution from Moore and South OKC... they can rebuild and we can be supportive, but they also need to be held to the standards for keeping our drinking water safe. Norman residents have a right to know how much of our lake's pollution is coming from other entities including both sediment and nutrients.

Response: *Table ES-1 shows the percentage of TP, TN, BOD and Sediments from Moore, Norman and Oklahoma City to Lake Thunderbird. Table 5-5 shows the wasteload allocation for each City. Moore, Norman and Oklahoma City are all required to develop plans (please see requirements in Appendix E) to meet these wasteload allocations. These requirements apply equally to all three cities. No changes were made as a result of this comment.*

- G3. Please send me maps with the city boundaries included on the hot zones lists for those pollutants. I believe sediment and nutrients were mapped separately

Response: *The requested maps were emailed.*