UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 Renner Boulevard
Lenexa, Kansas 66219

SEP 2 9 2014

Dr. Robert Moser
Secretary
Kansas Department of Health and Environment
1000 S.W. Jackson, Suite 540
Topeka, Kansas 66612-1368

Dear Dr. Moser:

RE: Approval of TMDL Document for Pomona Lake

This letter responds to the submission from the Kansas Department of Health and Environment, originally received by the U.S. Environmental Protection Agency, Region 7, on January 14, 2014, for a Total Maximum Daily Load document which contained a TMDL for Eutrophication and Siltation. Pomona Lake was identified on the 2014 Kansas Section 303(d) List as impaired. This submission fulfills the Clean Water Act statutory requirement to develop TMDLs for impairments listed on a state's § 303(d) list. The specific impairments (water body segment and causes) are:

Water Body Name	WBID	Cause
Pomona Lake	KS-MC-01-L-28000	Eutrophication, Siltation

The EPA has completed its review of the TMDL document with supporting documentation and information. By this letter, the EPA approves the submitted TMDLs. Enclosed with this letter is the Region 7 TMDL Decision document which summarizes the rationale for the EPA's approval of the TMDLs. The EPA believes the separate elements of the TMDLs described in the enclosed document adequately address the pollutant of concern, taking into consideration seasonal variation and a margin of safety.

Although the EPA does not approve the monitoring or implementation plans submitted by the state, the EPA acknowledges the state's efforts. The EPA understands that the state may use the monitoring plan to gauge the effectiveness of the TMDLs and determine if future revisions are necessary or appropriate to meet applicable water quality standards. The EPA recognizes that technical guidance and support are critical to determining the feasibility of and achieving the goals outlined in these TMDLs. Therefore, the implementation plan in this TMDL document provides information regarding implementation efforts to achieve the loading reductions identified.

The EPA is currently in consultation under Section 7 of the Endangered Species Act with the U.S. Fish and Wildlife Service regarding this TMDL document. While we are approving these TMDLs at the present time, we may decide that changes to the TMDL document are warranted based upon the results of the consultation when it is completed.

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The EPA appreciates the thoughtful effort that the KDHE has put into these TMDLs. We will continue to cooperate with and assist, as appropriate, in future efforts by the KDHE to develop remaining TMDLs. If you have questions, please contact Brandy Reed at 913-551-7321, or email her at reed.brandy@epa.gov.

Sincerely,

Karen A. Flournoy
Director
Water, Wetlands and Pesticides Division

Enclosure

cc: Mr. John Mitchell, Director, Division of Environment, KDHE

Mr. Tom Stiles, Chief, Watershed Planning, Monitoring and Assessment Section, KDHE

EPA Region 7 TMDL Review

TMDL ID: KS-MC-01-L-28000 **State:** KS
Document Name: POMONA LAKE

Basin(s): MARAIS DES CYGNES BASIN, UPPER MARAIS DES CYGNES RIVER BASIN
HUC(s): 10290101
Water body(ies): POMONA LAKE
Tributary(ies):
Pollutant(s): EUTROPHICATION, NITROGEN, TOTAL, PHOSPHORUS, TOTAL, SILTATION, TOTAL SUSPENDED SOLIDS (TSS)

Submittal Date: 1/14/2014 **Approved:** Yes

Submittal Letter and Total Maximum Daily Load Revisions

The state submittal letter indicates final TMDL(s) for specific pollutant(s) and water(s) were adopted by the state, and submitted to the EPA for approval under Section 303(d) of the Clean Water Act [40 CFR § 130.7(c)(1)]. Include date submitted letter was received by the EPA, date of receipt of any revisions and the date of original approval if submittal is a revised TMDL document.

The U.S. Environmental Protection Agency received this TMDL document which was submitted from the Kansas Department of Health and Environment by email on January 14, 2014. Revisions to the document were emailed on March 26, August 29 and September 2, 2014.

Pomona Lake TMDL documents were approved by the EPA on August 28, 2001 for siltation and eutrophication. While the KDHE had not indicated that the current Pomona Lake TMDL document written for eutrophication was a revised TMDL document, the EPA will compare the original TMDL documents and this current TMDL document within the sections below.

Water Quality Standards Attainment

The targeted pollutant is validated and identified through assessment and data. The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. The TMDL(s) and associated allocations are set at levels adequate to result in attainment of applicable water quality standards [40 CFR § 130.7(c)(1)]. A statement that the WQS will be attained is made.

The total nitrogen:total phosphorus ratio in Pomona Lake indicates the lake has been co-limited by nitrogen and phosphorus for the period of record with the exception of 2008 when the lake was limited by phosphorus only and 2011 when the lake was moving toward phosphorus limitation. In 2012, the lake returned to a co-limited status.

Comparing the trophic state indices for the total phosphorus, chlorophyll *a* and Secchi depth in Pomona Lake reveals the lake reached a fully eutrophic state with respect to chlorophyll *a* once, in 2002, while the Secchi depth TSI values show a hypereutrophic state for the eight to ten years the lake was sampled. The eutrophic state, with respect to total phosphorus, reached a hypereutrophic state in 1990, improved to a very eutrophic state in 2005 and, in 2012, was in a fully eutrophic state. A comparison of the median trophic conditions in Pomona Lake for the 2008 to 2012 time period to the benchmarks established for lakes in Kansas reveals that although both total nitrogen and total phosphorus concentrations in Pomona Lake meet the benchmarks established for federal lakes in Kansas the median chlorophyll *a* concentration and Secchi depth do not.

In order to improve the trophic condition of Pomona Lake from its current slightly eutrophic status, the desired endpoint will be to maintain summer chlorophyll *a* average concentrations below 10 micrograms per liter,

corresponding to a Carlson TSI of 53.2, with the reductions focused on nutrients (total nitrogen and total phosphorus) entering the lake. Reduction in nutrient loading will address the accelerated succession of aquatic biota; and the development of objectionable concentrations of algae and algae by-products as determined by the chlorophyll *a* concentration in the lake. A chlorophyll *a* endpoint of 10 µg/L will also ensure long-term protection to fully support primary contact recreation within the lake.

Based on the sedimentation rates established by the Kansas Water Office, Pomona Lake is losing storage capacity at a faster rate than designed. In order to ensure Pomona Lake maintains the 100 year design capacity, the sedimentation rate must be reduced by at least 22 percent or 77,508 tons per year. Tons of sediment was calculated using the Pomona Lake sediment bulk density as determined in the 2009 Kansas biological survey bathymetric survey (0.77 grams per cubic meter). At the current sedimentation rate, the Secchi depth is 53 centimeters and the total suspended solids average is 15.8 milligrams per liter. The reduction of the sedimentation rate from the current rate of 334 acre-feet per year to 261 AF/yr will allow the lake to meet the 100 year design life, but this reduction will not fully support the designated uses of the lake. Therefore, a water quality based target is used for developing the siltation TMDL. A 70 cm Secchi depth is described in the 2002 KDHE Lake and Wetland report as a "reasonably good threshold criteria for water clarity and turbidity versus recreational and aesthetic use support" thus it has been used to develop the TSS target. A TSS target of 4.66 mg/L will be met by reducing sediment loading in the watershed thereby improving the average transparency of the lake to the endpoint of 70 centimeters, as measured by the Secchi disk depth within the main basin of the lake. A 32 percent increase in Secchi depth will indicate a 71 percent reduction in the TSS in the water column of Pomona Lake. The 71 percent reduction of TSS in the water column will also indicate a similarly fixed reduction in sediment loading to the lake thereby meeting the 22 percent reduction in sediment loading needed to meet the TMDL and restore full support of the designated uses.

Based on the BATHTUB reservoir eutrophication model, the TP and TN entering Pomona Lake must be reduced 56 and 55 percent, respectively. These reductions at the inflow to Pomona Lake will result in a 40 percent reduction of TP, 42 percent reduction of TN and 45 percent reduction of chlorophyll *a* within the lake.

The loading capacities for TP, TN and TSS are 353.58 pound per day, 2,183.31 lb/day and 746 tons/day, respectively. Achievement of the endpoints indicates loads are within the loading capacity of the lake, the water quality standards are attained and full support of the designated uses of the lake has been achieved.

In the original siltation Pomona Lake TMDL document, the LC was 120 acre-feet per year. In order to improve the quality of the water column, the endpoint for Pomona Lake was an increase in average transparency as measured by Secchi depth of 0.85 meter. The CNET model predicted that if the chlorophyll *a* concentration was 12 parts per billion and the phosphorus levels were reduced, then the Secchi disc depth would be 0.85 m. The vast majority of phosphorus going into Pomona Lake was attached to sediment. When the sediment load was reduced, phosphorus concentrations were reduced and water clarity increased. The revised TMDL document uses as Secchi depth of 0.7 m as a clarity target due to improved modeling techniques with current monitoring data. The current revised TMDL document also targets the 100 year design life of the lake. To ensure Pomona Lake maintains the 100 year design capacity, the sedimentation rate must be reduced by 77,508 tons/year.

For the original eutrophication Pomona Lake TMDL document, the desired endpoint was to maintain summer chlorophyll *a* concentrations at or below 12 micrograms per liter. Refined endpoints were scheduled to be developed in 2005 to reflect additional sampling, artificial source assessment and confirmation of impaired status of lake. The current revised TMDL document targets chlorophyll *a* concentrations at or below 10 ug/L and also targets TN reductions.

Designated Use(s), Applicable Water Quality Standard(s) and Numeric Target(s)

The submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria, and a numeric target. If the TMDL(s) is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

The designated uses for Pomona Lake are primary contact recreation class A; expected aquatic life support; domestic water supply; food procurement; ground water recharge; industrial water supply; irrigation and livestock watering.

The water quality standards are:

Nutrients - Narrative: The introduction of plant nutrients into streams, lakes or wetlands from artificial sources

shall be controlled to prevent the accelerated succession or replacement of aquatic biota or the production of undesirable quantities or kinds of aquatic life (K.A.R. 28-16-28e(c)(2)(A)).

The introduction of plant nutrients into surface waters designated for domestic water supply use shall be controlled to prevent interference with the production of drinking water (K.A.R. 28-16-28e(c)(3)(D)).

The introduction of plant nutrients into surface waters designated for primary or secondary contact recreational use shall be controlled to prevent the development of objectionable concentrations of algae or algal by-products or nuisance growths of submersed, floating or emergent aquatic vegetation (K.A.R. 28-16-28e(c)(7)(A)).

Suspended Solids – Narrative: Suspended solids added to surface waters by artificial sources shall not interfere with the behavior, reproduction, physical habitat or other factors related to the survival and propagation of aquatic or semi-aquatic or terrestrial wildlife (K.A.R. 28-16-28e(c)(2)(B)).

In order to improve the trophic condition of Pomona Lake from its current slightly eutrophic status, the desired endpoint will be to maintain summer chlorophyll *a* average concentrations below 10 microgram per liters, corresponding to a Carlson trophic state index of 53.2, with the reductions focused on nutrients (total nitrogen and total phosphorus) entering the lake. Reduction in nutrient loading will address the accelerated succession of aquatic biota and the development of objectionable concentrations of algae and algae by-products as determined by the chlorophyll *a* concentration in the lake. A chlorophyll *a* endpoint of 10 µg/L will also ensure long-term protection to fully support all designated uses.

Based on the sedimentation rates established by the Kansas Water Office, Pomona Lake is losing storage capacity at a faster rate than designed. In order to ensure Pomona Lake maintains the 100 year design capacity, the sedimentation rate must be reduced by at least 22 percent or 77,508 tons per year to 261 acre-feet per year, or 101,408 tons/yr. Reductions in sediment loading from the watershed will achieve the 4.66 milligrams per liter total suspended solids target thereby improving the average transparency of the lake to the endpoint of 70 centimeters, as measured by the Secchi depth within the main basin of the lake.

Based on the BATHTUB reservoir eutrophication model, the TP and TN entering Pomona Lake must be reduced 56 and 55 percent, respectively. These reductions at the inflow to Pomona Lake will result in a 42 percent reduction of TP, 40 percent reduction of TN and 45 percent reduction of chlorophyll *a* within the lake.

All uses have been considered and are protected when chlorophyll *a* and nutrient endpoints are met.

Pollutant(s) of Concern

A statement that the relationship is either directly related to a numeric water quality standard, or established using surrogates and translations to a narrative WQS is included. An explanation and analytical basis for expressing the TMDL(s) through surrogate measures, or by translating a narrative water quality standard to a numeric target is provided (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae). For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and a margin of safety that do not exceed the loading capacity. If the submittal is a revised TMDL document, there are refined relationships linking the load to water quality standard attainment. If there is an increase in the TMDL(s), there is a refined relationship specified to validate that increase (either load allocation or wasteload allocation). This section will compare and validate the change in targeted load between the versions.

There is an established link between the narrative water quality standards for nutrients and numeric total nitrogen and total phosphorus targets. In eutrophication impairments, chlorophyll *a* concentrations are used as a translator in measuring algal growth and as a parameter for WQS. When excess phosphorus enters surface waters it stimulates blooms of algae and undesirable weeds, accelerating the natural aging of lakes, a condition commonly referred to as eutrophication.

The pollutants of concern to address the lake's eutrophication impairment are TP, TN and total suspended solids. The TMDL document identifies the lake's trophic state as very eutrophic based on Carlson's trophic state index. The BATHTUB model was used to identify the nutrient concentrations which lead to a chlorophyll *a* concentration of 10 micrograms per liter which is the translator to address the eutrophication impairment. These empirical relationships relate an in-lake concentration of TP to a resulting concentration of chlorophyll *a*. The targeted 10 µg/L of chlorophyll *a* correspond to a Carlson TSI of 53.2. The reductions are focused on nutrients: TP and TN. The loading capacity for TP 353.58 is pounds per day and the LC for TN is 2,183.31 lb/day.

The BATHTUB model is an empirical receiving water quality model developed by the U.S. Army Corps of Engineers that has been commonly applied to address TMDLs relating to issues associated with morphometrically complex lakes and reservoirs. Atmospheric TN was obtained from the Clean Air Status and Trends Network. The CASTNET station from the Konza Prairie in Kansas was used to estimate the atmospheric TN concentration for the model. Total phosphorus atmospheric loading was estimated using the 1983 study of Rast and Lee. Water quality data for the main basin segment was averaged using the 1993, 1998, 2002, 2006, 2009 and 2012 data from the KDHE. Model input data for the tributary Cedar Creek was estimated by adjusting tributary nutrient inputs in the BATHTUB model until the current condition in the lake was generated upon running the model.

There is an established link between the narrative water quality standard for total suspended solids and numeric total suspended solids target. According to the 2002 report from the KDHE's Lake and Wetland Monitoring Program, 70 centimeters of Secchi depth is considered full support for primary contact recreation use and aesthetics for a lake that is impaired by soil derived inorganic turbidity, which is the most stringent criterion for all the designated uses. Regressions were used to relate Secchi depth and turbidity. Another regression relationship was developed using annual average turbidity values versus TSS. The lake area weighted average TSS concentration endpoint is 4.66 milligrams per liter which will improve the lake transparency to meet the Secchi depth endpoint for this lake of 0.7 meters.

The LC for TSS is 746 tons/day. In order to ensure Pomona Lake maintains the 100 year design capacity, the sedimentation rate must be reduced by at least 22 percent or 77,508 tons per year. The amount of sediment was calculated using the Pomona Lake sediment bulk density as determined in the 2009 Kansas Biological Survey. At the current sedimentation rate, the Secchi depth is 53 centimeters and the total TSS average 15.8 milligrams per liter. Reduction of the sedimentation rate from the current rate of 334 acre-feet per year to 261 AF/yr will not allow the lake to meet the 100 year design life but the reduction in sediment entering the lake will also lead to a reduction in TSS in the water column and an improved Secchi depth condition. According to the 2002 report from the KDHE's Lake and Wetland Monitoring Program, 70 centimeters of Secchi depth is considered full support for primary contact recreation use and aesthetics for a lake that is impaired by soil derived inorganic turbidity, which is the most stringent criterion for all the designated uses. Regressions were used to relate Secchi depth and turbidity. A TSS target of 4.66 mg/L will be met by reducing sediment loading in the watershed thereby improving the average transparency of the lake to the endpoint of 70 centimeters, as measured by the Secchi disk depth within the main basin of the lake. A 32 percent increase in Secchi depth will indicate a 71 percent reduction in the TSS in the water column of Pomona Lake. The 71 percent reduction of TSS in the water column will also indicate a similarly fixed reduction in sediment loading to the lake thereby meeting the 22 percent reduction in sediment loading needed to meet the TMDL and restore full support of the designated uses.

In the original siltation Pomona Lake TMDL document, the LC was 120 acre-feet per year. In order to improve the quality of the water column, the endpoint for Pomona Lake was an increase in average transparency as measured by Secchi depth of 0.85 meter. The CNET model predicted that if the chlorophyll *a* concentration was 12 parts per billion and the phosphorus levels were reduced, then the Secchi disc depth would be 0.85 m. The vast majority of phosphorus going into Pomona Lake was attached to sediment. When the sediment load was reduced, phosphorus concentrations were reduced and water clarity increased. The revised TMDL document uses as Secchi depth of 0.7 m as a clarity target due to improved modeling techniques with current monitoring data. The current revised TMDL document also targets the 100 year design life of the lake. To ensure Pomona Lake maintains the 100 year design capacity, the sedimentation rate must be reduced by 77,508 tons/year.

For the original eutrophication Pomona Lake TMDL document, the desired endpoint was to maintain summer chlorophyll *a* concentrations at or below 12 micrograms per liter. Refined endpoints were scheduled to be developed in 2005 to reflect additional sampling, artificial source assessment and confirmation of impaired status of lake. The current revised TMDL document targets chlorophyll *a* concentrations at or below 10 ug/L and also targets TN reductions.

Source Analysis

Important assumptions made in developing the TMDL document, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, nonpoint and background sources of pollutants of concern are described, including magnitude and location of the sources. The submittal demonstrates all significant sources have been considered. If this is a revised TMDL document any new sources or removed sources will be specified and explained.

In the absence of a national pollutant discharge elimination system permit, the discharges associated with sources were applied to the load allocation, as opposed to the wasteload allocation for purposes of this TMDL document. The decision to allocate these sources to the LA does not reflect any determination by the EPA as to whether these discharges are, in fact, unpermitted point source discharges within this watershed. In addition, by establishing these TMDL(s) with some sources treated as LAs, the EPA is not determining that these discharges are exempt from NPDES permitting requirements. If sources of the allocated pollutant in this TMDL document are found to be, or become, NPDES-regulated discharges, their loads must be considered as part of the calculated sum of the WLAs in this TMDL document. Any WLA in addition to that allocated here is not available.

The predominant land uses in the Pomona Lake watershed are grassland (66 percent) and cultivated crops (18 percent). The remaining land area consists of forest (7 percent), developed land (6 percent), open water (2 percent) and wetlands (1 percent). During precipitation runoff events, the cultivated cropland in the watershed may contribute to the nutrient and sediment loads in the lake. Grasslands can also contribute to the nutrient load during high flow events, particularly on livestock grazing lands located in the riparian areas of the watershed. The watershed is 6 percent developed, which is equivalent to five small cities with a population under 3,000 people. It is stated that these urbanized areas may generate substantial nutrient loading from lawn fertilizers, domestic pet waste and other toxics found in the urban development particularly during storm runoff events.

There are thirty-two unique points of diversion that are made up of a water right and point of diversion combination, and in this case, twelve points are tied to surface water rights in the watershed. There are four points that lie within Wabunsee County with two designated for irrigation use, one for municipal use and one for industrial use. The remaining twenty-eight points are located in Osage County with one point for domestic use, one point for industrial use, three points for recreational use, nine points for municipal use and the remaining fourteen unique points of diversion designated for use in irrigation.

There are fourteen National Pollutant Discharge Elimination System permitted facilities in the Pomona Lake watershed. Seven facilities operate non-flowing lagoon systems that are prohibited from discharging and would only contribute total suspended solids or nutrient loads under extreme precipitation or flooding events. One facility is an un-manned pumping facility where storm water running from a concrete pad used to mount gas powered turbines is collected in an underground storage tank until it can be properly disposed of; therefore, there is no contribution to the sediment or nutrient load from this facility. Another facility is a limestone quarrying and crushing operation where treated wash water is recycled and would not contribute a sediment or nutrient load except under extreme precipitation or flooding events. The remaining five NPDES permitted facilities are municipal lagoon facilities that are permitted to discharge to the watershed and are assigned wasteload allocations for total suspended solids, total nitrogen and total phosphorus under this TMDL document. The city of Eskridge operates a three-cell stabilization lagoon system with a 120 day retention time and a permitted flow of 0.0815 million gallons per day that discharges into the headwaters of Dragoon Creek. The three-cell stabilization lagoon operated by the city of Harveyville has a permitted flow of 0.06 MGD and discharges downstream from the city of Eskridge to Dragoon Creek below its confluence with Batch Creek. Nutrient and sediment contributions from these facilities may be seen at the KDHE monitoring station SC577 located on Dargoon Creek below its confluence with Mud Creek. The city of Burlingame operates as a three-cell stabilization lagoon sysem that is permitted discharge to Switzler Creek up to 0.121 MGD. Nutrient and sediment contributions from this facility may be seen at the KDHE monitoring station SC687 located on Switzler Creek just above its confluence with Dragoon Creek. The city of Scranton is permitted to operate a four-cell stabilization lagoon system with permitted flow of 0.08 MGD that discharges via an unnamed tributary to Dragoon Creek. The city of Overbrook operates a four-cell stabilization lagoon system that is permitted to discharge at a rate of 0.128 MGD to Pomona Lake via Valley Brook Creek. Discharges from the Scranton and Overbrook facilities enter the watershed below the KDHE stream monitoring stations; hence, nutrient and sediment contributions from their facilities are seen only in the characterization of Pomona Lake. Information on these NPDES permitted facilities can be found in Table 12 of the TMDL document.

NPDES Permitted Facilities in the Pomona Lake Watershed

Name	NPDES Permit #
Crossroads RV Park	KSJ000200
Lamont Hill Resort	KSJ000550
Lamont Hill Resort	KSJ000140
Osage County SD No.1	KSJ000356
Pomona State Park	KSJ000360
Unified SD #434	KSJ000363

Four Corners	KSJ000612
Mid States Materials	KS0093106
Mid America Pipeline	KSJ000639
Eskridge WWTF	KS0046400
Harveyville WWTF	KS0046418
Burlingame WWTF	KS0024694
Scranton WWTF	KS0031283
Overbrook WWTF	KS0046451

There were 59,000, 29,500 and 36,500 head of cattle (including calves) in Lyon, Osage and Wabaunsee counties, respectively. There were 3,800, 1,200 and 1,100 head of hogs in Lyon, Osage and Wabaunsee counties and at the conclusion of December 2007 there were 357, 275 and 3,633 head of sheep in Lyon, Osage and Wabaunsee counties.

In the Pomona Lake watershed, there are eleven certified or permitted concentrated animal feeding operations. These permitted or certified livestock facilities have waste management systems designed to minimize runoff entering their operation or detaining runoff emanating from their facilities. In addition, they are designed to retain a 25-year, 24-hour rainfall/runoff event as well as an anticipated two weeks of normal wastewater from their operations. Typically, this rainfall event coincides with stream flow occurring less than 1-5 percent of the time. There is a possibility there are some smaller, unregistered livestock operations in the area and depending on their proximity to the streams in the watershed, runoff from feedlots and grazing lands may be contributing to the nutrient and siltation impairment in Pomona Lake. There are no federally permitted CAFOs in the watershed. Detailed information on the eleven registered, certified CAFOs in the Pomona Lake watershed can be found in Table 13 of the TMDL document.

Any CAFO that does not obtain an NPDES permit must operate as a no discharge facility. Any discharge from an unpermitted CAFO is a violation of Section 301. It is the EPA's position that all CAFOs should obtain an NPDES permit because it provides clarity of compliance requirements, authorization to discharge when the discharges are the result of large precipitation events (e.g., in excess of 25-year and 24-hour frequency/duration) or are from a man-made conveyance.

Permitted CAFOs identified in this TMDL document are part of the assigned wasteload allocation. Animal feeding operations and unpermitted CAFOs are considered under the load allocation because there is currently not enough detailed information to know whether these facilities are required to obtain NPDES permits. This TMDL document does not reflect a determination by the EPA that such facility does not meet the definition of a CAFO nor that the facility does not need to obtain a permit. To the contrary, a CAFO that discharges has a duty to obtain a permit. If it is determined that any such operation is a CAFO that discharges, any future WLA assigned to the facility must not result in an exceedance of the sum of the WLAs in this TMDL document as approved.

Atmospheric TN was obtained from the Clean Air Status and Trends Network, which is available at http://www.epa.gov/castnet. The CASTNET station from the Konza Prairie (Kansas) was used to estimate the atmospheric TN concentration for the model. Total phosphorus atmospheric loading was estimated using the 1983 study of Rast and Lee.

The Pomona Lake watershed is a mixture of rural agricultural areas and small cities that lie primarily in Osage and Wabaunsee counties. According to the Spreadsheet Tool for Estimating Pollutant Load, there are 1,069 septic systems in the watershed with a 0.93 percent failure rate. It is assumed that all of the rural residences in the watershed are not connected to public sewer systems. Failing septic systems are a potential source of nutrient loading into the watershed.

There are several small cities in the Pomona Lake watershed resulting in approximately 6 percent of the watershed being designated as developed. During storm runoff events, these urban areas may contribute nutrient loads from lawn fertilizers and domestic pet waste along with sediment loads and other toxics found in the urban environment to Pomona Lake.

Geological formations such as soil and bedrock, along with deciduous forest make up about 7 percent of the land cover in the watershed. Leaf litter and wastes derived from natural wildlife are also likely to add to the nutrient and total suspended solids load in Pomona lake.

The original siltation Pomona Lake TMDL document did not include point sources. The siltation impairment is most likely due to nonpoint source, cropland. Land use coverage analysis indicated that 35.4 percent of the watershed was cropland, 56.6 percent grassland and 1 percent urban land. Carp were also stated to possibly cause resuspension of sediment in the lake. The original eutrophication Pomona Lake TMDL document listed twelve NPDES permitted facilities in the Pomona Lake watershed. These point sources contributed an estimated 0.52 percent of total annual phosphorus loads. Phosphorus sources included runoff from agricultural lands from fertilizer and animal waste from CAFOs. Potential pollutant sources such as septic systems, urban storm water runoff, urban fertilizer applications, leaf litter atmospheric phosphorus and geological formations were included in the original TMDL document.

All known sources have been considered.

Allocation - Loading Capacity

The submittal identifies appropriate loading capacities, wasteload allocations for point sources and load allocations for nonpoint sources. If no point sources are present, the WLA is stated as zero. If no nonpoint sources are present, the LA is stated as zero [40 CFR § 130.2(i)]. If this is a revised TMDL document the change in loading capacity will be documented in this section. All TMDLs must give a daily number. Establishing TMDL "daily" loads consistent with the U.S. Court of Appeals for the D.C. circuit decision in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015, (April 25, 2006).

In order to improve the trophic condition of Pomona Lake from its current slightly eutrophic status, reductions will be focused on nutrients, total phosphorus and total nitrogen, entering the lake. To achieve the Kansas water quality standards and loading capacity, summer chlorophyll *a* average concentrations must be maintained. The LC for TP, TN and total suspended solids are 353.58 pounds per day, 2,183.31 lb/day and 746 tons per day, respectively. The target for chlorophyll *a* is an average concentration below 10 micrograms per liter, corresponding to a Carlson Trophic State Index of 53.2.

In the original siltation Pomona Lake TMDL document, the LC was 120 acre-feet per year. In order to improve the quality of the water column, the endpoint for Pomona Lake was an increase in average transparency as measured by Secchi depth of 0.85 meter. The CNET model predicted that if the chlorophyll *a* concentration was 12 parts per billion and the phosphorus levels were reduced, then the Secchi disc depth would be 0.85 m. The vast majority of phosphorus going into Pomona Lake was attached to sediment. When the sediment load was reduced, phosphorus concentrations were reduced and water clarity increased. The revised TMDL document uses as Secchi depth of 0.7 m as a clarity target due to improved modeling techniques with current monitoring data. The current revised TMDL document also targets the 100 year design life of the lake. To ensure Pomona Lake maintains the 100 year design capacity, the sedimentation rate must be reduced by 77,508 tons/year.

For the original eutrophication Pomona Lake TMDL document, the desired endpoint was to maintain summer chlorophyll *a* concentrations at or below 12 micrograms per liter. Refined endpoints were scheduled to be developed in 2005 to reflect additional sampling, artificial source assessment and confirmation of impaired status of lake. The current revised TMDL document targets chlorophyll *a* concentrations at or below 10 ug/L and also targets TN reductions.

Wasteload Allocation Comment

The submittal lists individual wasteload allocations for each identified point source [40 CFR § 130.2(h)]. If a WLA is not assigned it must be shown that the discharge does not cause or contribute to a water quality standard excursion, the source is contained in a general permit addressed by the TMDL, or extenuating circumstances exist which prevent assignment of individual WLA. Any such exceptions must be explained to a satisfactory degree. If a WLA of zero is assigned to any facility it must be stated as such [40 CFR § 130.2(i)]. If this is a revised TMDL document, any differences between the original TMDL(s) WLA and the revised WLA will be documented in this section.

The wasteload allocation for total phosphorus is 2,865.25 pounds per year, or 7.85 pounds per day. The WLA for total nitrogen is 11,468.30 lb/yr, or 31.42 lb/day. The WLA for total suspended solids is 24.86 tons per year, or 0.068 tons per day.

Wasteload allocations are established for the five discharging wastewater treatment facilities permitted within the watershed. All five National Pollutant Discharge Elimination System dischargers are lagoon systems that have not monitored for nutrients, hence, nutrient concentrations that are typical of those observed in the effluent of lagoon systems in Kansas (8 mg/L TN and 2 milligrams per liter TP) and the facilities' design flow were used to

develop the nutrient wasteloads. Please see Table 15 of the TMDL document.

Wasteload Allocations for NPDES dischargers in the Pomona Lake watershed

Facility	TP WLA	TN WLA	**Sediment WLA
Eskridge WWTF	1.36 lb/day	5.44 lb/day	28.6 lb/day
Harveyville WWTF	1.00 lb/day	4.01 lb/day	10.7 lb/day
Burlingame WWTF	2.02 lb/day	8.08 lb/day	34.5 lb/day
Scranton WWTF	1.33 lb/day	5.34 lb/day	17.9 lb/day
Overbrook WWTF	2.14 lb/day	8.55 lb/day	44.5 lb/day

**The total WLA for sediment was converted to tons per day, 0.068 tons/day TSS.

The eleven certified confined animal feeding operations within the Pomona Lake watershed do not have enough animals to warrant a federal discharge permit. There are no federally permitted CAFOs in the watershed.

In the original Pomona Lake TMDL document for siltation, the WLA was zero due to lack of point sources in the watershed. In the original TMDL document, TN was not allocated. The revised TMDL document uses improved modeling techniques with current monitoring data and also targets TN and TSS.

In the original eutrophication Pomona Lake TMDL document, there were twelve NPDES permitted facilities listed. These point sources contributed an estimated 0.52 percent of the total annual phosphorus loads. The WLA was 1,385 lb/yr, a decrease of 64.2 percent that would also result in a decrease in available phosphorus.

Load Allocation Comment

All nonpoint source loads, natural background and potential for future growth are included. If no nonpoint sources are identified, the load allocation must be given as zero [40 CFR § 130.2(g)]. If this is a revised TMDL document, any differences between the original TMDL(s) LA and the revised LA will be documented in this section.

The load allocation for total phosphorus is 46,132.54 pounds per year, or 308.21 pounds per day. The LA for total nitrogen is 335,937.92 lb/yr, or 1,807.73 lb/day. The LA for total suspended solids is 91,242.1 tons per year, or 671.432 tons per day.

In the original eutrophication Pomona Lake TMDL document, the LA was 264,983 lb/yr TP, which lead to a 62.4 percent reduction that was necessary to achieve the endpoint.

In the original siltation Pomona Lake TMDL document, the LA was a 54.5 percent reduction in average sediment load or 120 acre per feet per year. The reduction was 45.5 percent of the annual sediment deposition rate of 263 acre-feet.

The original Pomona Lake TMDL documents did not allocate for TN.

Margin of Safety

The submittal describes explicit and/or implicit margins of safety for each pollutant [40 CFR § 130.7(c)(1)]. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided. If this is a revised TMDL document, any differences in the MOS will be documented in this section.

The explicit margin of safety for total phosphorus is 5,481.46 pounds per year, or 35.36 pounds per day. The MOS for total nitrogen is 41,241.61 lb/yr, or 218.33 lb/day.

The MOS for total suspended solids is 10,141 tons per year, or 74.5 tons per day.

The original TMDL documents did not allocate for TN. In the original siltation Pomona Lake TMDL document, the MOS accounted for the uncertainty in suspended solids reaching the conservation pool and its resulting transparency, hence, the MOS was refined as a maximum suspended solid concentration in the lake water column of 100 milligrams per liter.

In the original eutrophication Pomona Lake TMDL, the MOS was 29,597 lb/yr TP.

Seasonal Variation and Critical Conditions

The submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s) [40 CFR § 130.7(c)(1)]. Critical conditions are factors such as flow or temperature which may lead to the excursion of the WQS. If this is a revised TMDL document, any differences in conditions will be documented in this section.

Seasonal variation and critical conditions were incorporated into this TMDL document by targeting the attainment of water quality standards during the summer months when the peaks of algal growth and chlorophyll *a* concentrations are most likely to occur. The BATHTUB model uses relationships between phosphorus and chlorophyll *a* based on the growing season. These empirical relationships relate an in-lake concentration of total phosphorus to a resulting concentration of chlorophyll *a*.

These TMDLs also apply across all flow conditions including high flow events, especially during the spring season when increased nutrient and sediment loading occur at higher rates.

Public Participation

The submittal describes required public notice and public comment opportunities, and explains how the public comments were considered in the final TMDL(s) [40 CFR § 130.7(c)(1)(ii)].

An active internet website was established at www.kdheks.gov/tmdl/ to convey information to the public on the general establishment of TMDLs and specific TMDLs for the Marais des Cygnes Basin.

A public hearing on the Marais des Cygnes TMDLs was held on December 10, 2013, in Ottawa to receive comments on this TMDL document. The Marais des Cygnes Advisory Committee met to discuss TMDLs in the basin on October 15, 2013, in Paola. There were no comments received for this TMDL document.

Monitoring Plan for TMDL(s) Under a Phased Approach

The TMDL identifies a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of water quality standards, and a schedule for considering revisions to the TMDL(s) (where a phased approach is used) [40 CFR § 130.7]. If this is a revised TMDL document, monitoring to support the revision will be documented in this section. Although the EPA does not approve the monitoring plan submitted by the state, the EPA acknowledges the state's efforts. The EPA understands that the state may use the monitoring plan to gauge the effectiveness of the TMDLs and determine if future revisions are necessary or appropriate to meet applicable water quality standards.

The KDHE will continue its 3-year sampling schedule in order to assess the trophic state of Pomona Lake. In 2022, the 303(d) list will be evaluated based on the these sampling results. Should impairment status continue, the desired endpoints under this TMDL document may be refined and sampling conducted over the period 2022-2026 will be used to assess progress in this implementation.

As stated in the original siltation and eutrophication TMDL documents, sampling and evaluation occurred once before 2005 and twice between 2005 and 2009.

Reasonable Assurance

Reasonable assurance only applies when less stringent wasteload allocation are assigned based on the assumption that nonpoint source reductions in the load allocation will be met [40 CFR § 130.2(i)]. This section can also contain statements made by the state concerning the state's authority to control pollutant loads. States are not required under Section 303(d) of the Clean Water Act to develop TMDL implementation plans and the EPA does not approve or disapprove them. However, this TMDL document provides information regarding how point and nonpoint sources can or should be controlled to ensure implementation efforts achieve the loading reductions identified in this TMDL document. The EPA recognizes that technical guidance and support are critical to determining the feasibility of and achieving the goals outlined in this TMDL document. Therefore, the discussion of reduction efforts relating to point and nonpoint sources can be found in the implementation section of the TMDL document, and are briefly described below.

The states have the authority to issue and enforce state operating permits. Inclusion of effluent limits into a state operating permit and requiring that effluent and instream monitoring be reported to the state should provide reasonable assurance that instream water quality standards will be met. Section 301(b)(1)(C) requires that point source permits have effluent limits as stringent as necessary to meet WQS. However, for wasteload allocations to serve that purpose, they must themselves be stringent enough so that (in conjunction with the water body's other loadings) they meet WQS. This generally occurs when the TMDL(s)' combined nonpoint source load allocations

and point source WLAs do not exceed the WQS-based loading capacity and there is reasonable assurance that the TMDL(s)' allocations can be achieved. Discussion of reduction efforts relating to nonpoint sources can be found in the implementation section of the TMDL document.

The State Water Plan Fund annually generates $16 to 18 million and is the primary funding mechanism for implementing water quality protection and pollutant reduction activities in the state through the Kansas Water Plan. The state water planning process, overseen by the Kansas Water Office, coordinates and directs programs and funding toward watersheds and water resources of highest priority. Typically, the state allocates at least 50 percent of the fund to programs supporting water quality protection. Additionally, $2 million has been allocated between the State Water Plan Fund and the EPA 319 funds to support implementation of Watershed Restoration and Protection Strategies. This watershed and its TMDL document are a high priority consideration and should receive funding for implementation.

Primary participants for implementation will be agricultural producers within the Pomona Lake watershed. A detailed assessment of sources conducted over 2014-2015 should include local assessments by conservation district personnel and city and county public works to survey, locate and assess the following within the lake drainage area:

1. Total row crop acreage and fertilizer application rates,
2. Cultivation alongside lake,
3. Livestock use of riparian areas,
4. Fields with manure applications.

Nutrient control has been proven effective through conservation tillage, contour farming and use of grass waterways and buffer strips. In addition, the proper implementation of comprehensive livestock waste management plans has proven effective at reducing nutrient runoff associated with livestock facilities. The key to success will be widespread utilization of conservation farming and proper livestock waste management along with addressing storm water runoff in urban areas within the watershed cited in this TMDL document. Under the current version of the Continuing Planning Process, the next anticipated revision would come in 2014, which will emphasize implementation of WRAPS activities. At that time, incorporation of this TMDL document will be made into the WRAPS. Recommendations of this TMDL document will be considered in the Kansas Water Plan implementation decisions under the State Water Planning Process for Fiscal Years 2014-2022.