



EPA Region 7 TMDL Review

TMDL ID:KS-SO-14-543_1

State: KS

Document Name: LOWER S. FORK SOLOMON RIVER

Basin(s): LOWER S. FORK SOLOMON RIVER, SOLOMON BASIN

HUC(s): 10260014

Water body(ies): SOLOMON R, S FK, SOLOMON RIVER, SOUTH FORK

Tributary(ies): CARR CREEK (21), COVERT CREEK (19), DIBBLE CREEK (363), EAST TWIN CREEK (29), KILL CREEK (18), LOST CREEK (13), MEDICINE CREEK (16), MEDICINE CREEK (17), SOUTH FORK SOLOMON RIVER (1), SOUTH FORK SOLOMON RIVER (10), SOUTH FORK SOLOMON RIVER (3), SOUTH FORK SOLOMON RIVER (4), SOUTH FORK SOLOMON RIVER (5), SOUTH FORK SOLOMON RIVER (6), SOUTH FORK SOLOMON RIVER (7), SOUTH FORK SOLOMON RIVER (8), TWIN CREEK (20), UNNAMED TRIBUTARY

Pollutant(s): E. COLI

Submittal Date:7/16/2010

Approved:Yes

Submittal Letter

State submittal letter indicates final Total Maximum Daily Load(s) (TMDL) for specific pollutant(s)/water(s) were adopted by the state, and submitted to 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 EPA, date of receipt of any revisions, and the date of original approval if submittal is a phase II TMDL.

This TMDL was formally submitted by the Kansas Department of Health and Environment (KDHE) to the U.S. Environmental Protection Agency (EPA) by email on July 16, 2010. Revisions to this document were received by email on September 3, 2010.

Water Quality Standards Attainment

The water body's loading capacity (LC) 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. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards (WQS) [40 CFR § 130.7(c)(1)]. A statement that WQS will be attained is made.

The Lower South Fork Solomon River TMDL was developed to address the impaired Primary Contact Recreation Class B use for Lower South Fork Solomon River segments 1, 3 and 4 and their tributaries lying between the confluence of Kill Creek and the headwaters of Waconda Lake. The headwaters of Waconda Lake are considered segment 1 and Carr Creek (21).

These segments were listed based upon the results of two sets of intensive sampling (five samples taken in a 30-day period) of *Escherichia coli* (*E. coli*) in April and June 2006 at sampling station SC 543. The geometric mean of these *E. coli* samples were 528 colony forming units (CFUs) per 100 milliliters (ml) in April and 1,123 CFUs/100 ml in June. These occurred even with lower flow conditions than normal, i.e., the average stream flow per sample period being 6 and 0.65 cubic feet per second (cfs), respectively. These values were above the *E. coli* WQS criterion of 262 CFUs/100 ml for Primary Contact Recreation Class B use and resulted in the listing of these segments.

Additional analysis of *E. coli* samples at SC 543 from July 2003 to December 2009 resulted in an overall geometric mean of 359 CFUs/100 ml. When data from only the primary contact recreation season (April –

October) was used, the geometric mean for *E. coli* rose to 690 CFUs/100 ml. Plotting *E. coli* counts against the ambient flow at the time of sampling shows high *E. coli* values become prevalent at flows below 10 cfs and over 100 cfs. For samples above 100 cfs, high *E. coli* counts increased with gaining flow. However, at gains in flow less than one cfs, similarly high bacteria levels were also found which may indicate direct loading by adjacent sources close to SC 543.

The TMDL was set to Primary Contact Recreation Use, recreation season (April - October) WQS criteria Class B at SC 543 and Class C at Waconda Lake headwaters. The TMDL was determined by multiplying the calculated stream flow by the WQS criteria and a conversion factor to determine a load duration curve (LDC). The LDC represents the LC in giga-colony forming units of *E. coli* per day (Gc/d) at any percent flow exceedance. Two LDCs were calculated to reflect the two endpoints: Class B of 262 CFUs/100 ml at SC 543 and Class C of 427 CFUs/100 ml at Waconda Lake headwaters.

The resulting LCs for *E. coli* at the 50 percent flow exceedance during the recreation season is 169.4 Gc/d at SC 543 and 297.4 Gc/d at Waconda Lake headwaters.

Achievement of these LCs should result in WQS attainment.

Numeric Target(s)

Submittal describes applicable WQS, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL 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 beneficial uses for the South Fork Solomon River and its tributaries include:

Lower South Fork Solomon River (1 and 3)

- Primary Contact Recreation Class C
- Expected Aquatic Life
- Domestic Water Supply
- Food Procurement
- Ground Water Recharge
- Industrial Water Supply
- Irrigation
- Livestock Watering

Lower South Fork Solomon River (4 and 10)

- Primary Contact Recreation Class B
- Expected Aquatic Life
- Domestic Water Supply
- Food Procurement
- Ground Water Recharge
- Industrial Water Supply
- Irrigation
- Livestock Watering

Lower South Fork Solomon River (5, 6, 7 and 8)

- Secondary Contact Recreation Class b
- Expected Aquatic Life
- Domestic Water Supply
- Food Procurement
- Ground Water Recharge
- Industrial Water Supply
- Irrigation
- Livestock Watering

Carr Creek (21)

- Secondary Contact Recreation Class b
- Expected Aquatic Life
- Domestic Water Supply
- Food Procurement

Twin Creek (20), Covert Creek (19) and Kill Creek (18)

- Secondary Contact Recreation Class b
- Expected Aquatic Life

- Food Procurement
- East Twin Creek (29), Lost Creek (13), Medicine Creek (16) and Medicine Creek (17)
- Secondary Contact Recreation Class b
 - Expected Aquatic Life
- Dibble Creek (363)
- Secondary Contact Recreation Class a
 - Expected Aquatic Life

The applicable numeric criteria used in this TMDL include K.A.R. 28-16-28e(c)(7)

- (D) Primary contact recreation for classified stream segments. At least five samples shall be collected during separate 24-hour periods within a 30-day period. A geometric mean analysis of these samples shall not exceed the criteria in table 1i, as adopted in subsection (d) of this regulation, beyond the mixing zone.
- (E) Secondary contact recreation for classified stream segments. The following criteria shall be in effect from January 1 through December 31 of each year. At least five samples shall be collected during separate 24-hour periods within a 30-day period. A geometric mean analysis of these samples shall not exceed the criteria in table 1i, as adopted in subsection (d) of this regulation, beyond the mixing zone.
- (F) Wastewater effluent shall be disinfected if it is determined by the department [KDHE] that the discharge of non-disinfected wastewater constitutes an actual or potential threat to public health. Situations that constitute an actual or potential threat to public health shall include instances in which there is a reasonable potential for the discharge to exceed the applicable criteria supporting the assigned recreational use designation or if a water body is known or likely to be used for either of the following:
 - Primary or secondary contact recreation; or
 - any domestic water supply

Table 1i. *E. coli* Criteria for Classified Stream Segments

Primary Contact Recreation Use	Geometric Mean April 1 - October 31 [Recreation Season] (CFUs/100 ml)	Geometric Mean November 1- March 31 [Non-Recreation Season] (CFUs/100 ml)
Class A	160	2,358
Class B	262	2,358
Class C	427	3,843
Secondary Contact Recreation Use		
Class a	2,358	2,358
Class b	3,843	3,843

The above listed Lower South Fork Solomon River segments and tributaries impaired use is Primary Contact Recreation as a result of the pollutant *E. coli*.

Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety (MOS) that do not exceed the LC. If submittal is a phase II TMDL there are refined relationships linking the load to WQS attainment. If there is an increase in the TMDL there is a refined relationship specified to validate the increase in TMDL (either load allocation (LA) or waste load allocation (WLA)). This section will compare and validate the change in targeted load between the versions.

The link between the *E. coli* impairment and the TMDL is direct by using the strictest numeric criterion for *E. coli* within the area contributing to the LDC point and using this to calculate to the TMDL. This provides for the protection of all recreation uses for all segments included in the TMDL. The TMDL was set at monitoring site SC 543 and Waconda Lake headwaters by multiplying calculated stream flow by the WQS Primary Contact Recreation Use criteria and a conversion factor. This determined the LDCs which represent the LC in Gc/d of *E.*

coli at any percent flow exceedance. The TMDL was set to meet Primary Contact Recreation Use during the recreation season (April - October) using the recreation season WQS criteria.

Two LDCs were calculated using the applicable segment's *E. coli* WQS to reflect the two endpoints: Class B of 262 CFUs/100 ml at SC 543 and Class C of 427 CFUs/100 ml at the Waconda Lake headwaters.

Source Analysis

Important assumptions made in developing the TMDL, 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. Submittal demonstrates all significant sources have been considered. If this is a phase II TMDL any new sources or removed sources will be specified and explained.

There are several National Pollution Discharge Elimination System (NPDES) permitted facilities in the sub-basin (Table 1). Some facilities, including industrial users discharging process water, concrete plants, quarries, non-discharging municipalities and commercial entities, do not contribute bacteria from their wastewater. There are no municipal separate storm sewer (MS4) storm water permits.

There are three NPDES permitted wastewater treatment plants (WWTP) within the Lower South Fork Solomon Sub-basin (HUC 10260014).

The city of Stockton (KS0117625) has a mechanical-activated sludge plant that discharges into Dibble Creek. The plant uses ultraviolet irradiation to disinfect their wastewater and conducts weekly bacteria monitoring. Since July 2008, the plant has had an average of 2,830 CFUs/100 ml bacteria in its effluent with numerous exceedances over their permit limit of 2,358 CFUs/100 ml. This may be a cause for the elevated bacteria levels downstream, although SC 737 is below the city of Stockton and typically does not have consistently high bacteria counts.

The city of Osborne (KS0092398) treats wastewater with a four-cell lagoon system. Disinfection occurs naturally with 120-day retention before discharge. Reuse is used to irrigate surrounding croplands and grasslands; samples are taken quarterly. From August 2008 to September 2009, only three samples have been obtained ranging from 219 to 1,730 CFUs/100 ml. The final sample from December 2009 had 9 CFUs/100 ml.

The city of Tipton (KS0085219) uses a three-cell lagoon that discharges to Carr Creek, a tributary that enters Lower South Fork Solomon Branch below SC 543. While the NPDES permit allows a design flow of 0.0228 million gallons per day (MGD), they have rarely discharged since 2004. The city of Tipton does not have limits for bacteria and monitors quarterly.

Table 1: NPDES Facilities in Lower South Fork Solomon River Sub-basin

Facility	NPDES #	Type	Receiving Stream	Design Flow (MGD)*
city of Stockton WWTP	KS0117625	Activated Sludge	Dibble Creek to South Fork	0.275
city of Osborne WWTP	KS0092398	4-Cell Lagoon	South Fork Solomon River	0.286
city of Tipton WWTP	KS0085219	3-Cell Lagoon	Carr Creek to South Fork	0.0228
B & B Redimix Stockton	KSG110068	Concrete Batch Plant	Unnamed Trib to South Fork	0.0
Stockton Industrial Park	KSJ000207	Non-discharging	N/A	0.0
city of Woodston	KSJ000286	Non-discharging	N/A	0.0
city of Alton	KSJ000301	Non-discharging	N/A	0.0
Shaw-Davis-Shaw (Osborne)	KSG110152	Concrete Batch Plant	Unnamed Trib to South Fork	0.0

*MGD - million gallons per day

There are 28 registered, certified or permitted concentrated animal feeding operation (CAFO) facilities above SC 543: 21 beef, 5 swine and 2 dairy animal feeding operations (AFOs). Four are NPDES permitted, non-discharging facilities with 17,000 animal units: KS0097551, KS0080888, KS0085847 and KS0097420. Within state permitted facilities above SC543 there are about 27,700 total animal units of which 25,400 are beef cows, almost 200 are dairy and swine facilities containing the remaining 2,100 animal units. The state permitted facilities are listed in the TMDL document in Table 4. Below SC 543 there are another 8,656.5 total animal units permitted with about 8,130 of those in beef operations. Though the total potential number of animals in the watershed can be estimated, the actual number of animals at the feedlot operations is typically less than the allowable permitted number.

Waste management systems are present in all permitted livestock facilities that are designed to minimize runoff entering their operations or detaining runoff emanating from their areas. These systems are designed to retain 25 year, 24 hour rainfall/runoff event and an anticipated two weeks of normal wastewater from their operations. Requirements for maintaining the water level of the waste lagoons at a certain distance below the lagoon berms ensures retention of the runoff from the intense, local storm events.

Any CAFO that does not obtain a NPDES permit must operate as a no discharge operation. Any discharge from an unpermitted CAFO is a violation of Section 301. It is EPA's position that all CAFOs should obtain a 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 are part of the assigned WLA. AFOs and unpermitted CAFOs are considered under the LA because there is currently not enough detailed information to know whether these facilities are required to obtain NPDES permits. This TMDL does not reflect a determination by 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 as approved.

The Lower South Fork Solomon River watershed is comprised of 44.6 percent cropland, 48.7 percent grassland and 1.2 percent developed land. The cropland is primarily located in the alluvial valleys of South Fork Solomon River, its tributaries, the irrigation district service areas and in the headwaters of Waconda Lake. In the southern portions of the sub-basin, grassland is prevalent. Livestock may be grazed on the grassland or harvested cropland areas.

Runoff is primarily generated when soil profiles become saturated and excess overland flow is produced. About 90.3 percent of the watershed produces runoff even under relatively low (1.5 inches/hour) potential runoff conditions. Generally, storms producing less than 0.5 inches/hour of rain will generate runoff from 4.5 percent of this watershed, chiefly along the stream channels.

Within Rooks and Osborne counties, 25 to 30 percent of the population uses septic systems. Since 2000, indications are that rural and urban populations are declining. Unincorporated areas in the watershed will use on-site waste systems but these will decline in time. Also, the number of failing septic systems will likely diminish through the efforts of the Local Environment Protection Program. By their low volume, only those failing systems closer to streams will impact ambient stream water quality.

Background contributions include wildlife such as deer but the animal density is fairly dispersed across the watershed. This will result in minimal loading to the streams.

In the absence of an NPDES permit, the discharges associated with sources were applied to the LA, as opposed to the WLA for purposes of this TMDL. The decision to allocate these sources to the LA does not reflect any determination by EPA as to whether these discharges are, in fact, unpermitted point source discharges within this watershed. In addition, by establishing these TMDLs with some sources treated as LAs, EPA is not determining that these discharges are exempt from NPDES permitting requirements. If sources of the allocated pollutant in this TMDL 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. WLA in addition to that allocated here is not available.

All known sources have been considered.

Allocation - Loading Capacity

Submittal identifies appropriate WLA for point, 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 phase II TMDL the change in LC will be documented in this section.

The TMDL was set to Primary Contact Recreation Use, recreation season (April - October) WQS criteria Class B for SC 543 and Class C for Waconda Lake headwaters. The TMDL was determined by multiplying the calculated stream flow by the WQS criteria and a conversion factor to determine a LDC. The LDC represents the LC in Gc/d of *E. coli* at any percent flow exceedance. Two LDCs were calculated to reflect the two endpoints: Class B of 262 CFUs/100 ml at SC 543 and Class C of 427 CFUs/ 100 ml at the Waconda Lake headwaters. The resulting LCs for *E. coli* at the 50 percent flow exceedance during the recreation season is 169.4 Gc/d at SC 543 and 297.4 Gc/d at Waconda Lake headwaters.

The calculated stream flow used were those recorded at the Osborn United States Geological Service (USGS) gage #06874000 with data primarily from 1987-2008 added to the design flow of the Osborne WWTP of 0.286 MGD or 0.44 cfs. This flow was then multiplied by the WQS criteria of 262 CFUs/100 ml and a conversion factor to derive the LC at SC 543.

Below SC 543 (which is near Osborne), the added flow was determined as the difference in estimated flow between the reach below SC 543 and the reach entering Waconda Lake. Therefore, the calculated stream flow for Waconda Lake headwaters was the sum of the added flow, the flow below SC 543 and the city of Tipton's design flow of 0.0228 MGD or 0.04 cfs. This flow was then multiplied by the WQS criteria of 427 CFUs/100 ml and conversion factor to derive the LC for Waconda Lake headwaters.

WLA Comment

Submittal lists individual WLAs 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 WQS excursions, the source is contained in a general permit addressed by the TMDL, or extenuating circumstances exist which prevent assignment of individual WLAs. 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 phase II TMDL any differences in phase I and phase II WLAs will be documented in this section.

The WLAs reflect either applicable permit limits of CFUs/100 ml or expected levels of *E. coli* discharged by lagoons. The city of Stockton has a current limit of 2,358 CFU/100 ml *E. coli*. Lagoon systems, i.e., city of Osborne and city of Tipton, do not have permit limits for *E. coli*. WLAs for these lagoon systems will assume they need to have monthly geometric means of 262 CFUs/100 ml and 3,843 CFUs/100 ml, respectively. These WLAs reflect the recreation designation of the stream segments to which the facilities discharge.

Both the city of Stockton and the city of Osborne have sporadic discharges of high *E. coli* that may need to be reduced to achieve the goals and endpoints of this TMDL. Therefore, their WLAs will be based initially on their existing permit limits or expected performance. If any discharger is shown to be causing the high *E. coli* levels at SC 543, subsequent adjustment and more stringent permit requirements will be made to their NPDES permit.

The WLAs for non-discharging facilities, i.e., city of Alton and city of Woodston, industrial dischargers with no bacteria in their wastewater and CAFOs are zero because these facilities do not discharge into a water body.

The total WLA of 27.4 Gc/d *E. coli* at SC 543 is the sum of the individual city of Stockton and city of Osborne WWTP WLAs which are the same at all flows. The total WLA of 30.7 Gc/d *E. coli* at the Waconda Lake headwaters is the sum of the individual city of Stockton, city of Osborne and city of Tipton WWTP WLAs which are the same at all flows.

Table 2: Individual *E. coli* WLAs for Wastewater Permits in the South Fork Solomon River Sub-basin

Facility	NPDES #	Design Flow (MGD)	Existing or Expected <i>E. coli</i> Permit Limit (CFUs/100 ml)	WLA (Gc/d)
city of Stockton WWTP	KS0117625	0.275	2358	24.5
city of Osborne WWTP	KS0092398	0.286	262	2.8
city of Tipton WWTP	KS0085219	0.0228	3843	3.3

LA Comment

Includes all nonpoint sources loads, natural background, and potential for future growth. If no nonpoint sources are identified the LA must be given as zero [40 CFR § 130.2(g)]. If this is a phase II TMDL any differences in

phase I and phase II LAs will be documented in this section.

The LA at SC 543 and the Waconda Lake headwaters was determined by the difference between the LC and the total WLA calculated for that location. The resulting LAs at the 50 percent flow exceedance for SC 543 and Waconda Lake headwaters is 142.0 Gc/d and 266.7 Gc/d, respectively.

Margin of Safety

Submittal describes explicit and/or implicit MOS 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 phase II TMDL any differences in MOS will be documented in this section.

The MOS is implicit relying on the conservative assumption that the city of Stockton and the city of Osborne WWTPs will discharge at design flows although demographic trends imply a decrease in future loading. Also, the primary criteria for the lower reaches, which are lower than those upstream for *E. coli*, will be applied as endpoints for this TMDL at any flow condition throughout the recreation season of April - October.

Seasonal Variation and Critical Conditions

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 WQS. If this is a phase II TMDL any differences in conditions will be documented in this section.

This TMDL takes into account critical conditions and seasonal variation since the endpoints are applied during the recreation season of April - October as defined by Kansas WQS. Also, using a LDC represents flow under all possible stream conditions and seasons and avoids the constraints associated with using a single-flow critical condition.

Public Participation

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

A public hearing was held for the Lower South Fork Solomon River TMDL in Phillipsburg on February 10, 2010. The Solomon River Basin Advisory Committee met to discuss the TMDLs in the basin on July 7 and September 30, 2009 in Stockton, and March 2, 2010 in Beloit. Also, the Waconda Lake Watershed Restoration and Protection Strategy (WRAPS) group reviewed the TMDL in February 2010. The TMDL was posted on the KDHE TMDL Website, <http://www.kdhe.state.ks.us/TMDL/>, on January 25, 2010, to convey information to the public on the general establishment of TMDLs and specific TMDLs for the Solomon Basin. KDHE received two comments, including EPA Region 7, and responded by making clarifications in the TMDL.

Monitoring Plan for TMDL(s) Under 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 WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used) [40 CFR § 130.7].

Quarterly to bimonthly samples every year will continue to be collected at SC 543 and SC 737. Sampling can be expected at the rotational tributary stations between 2011 – 2020. Based on the sampling data, the priority status of the 303(d) listing will be evaluated in 2014. If necessary, supplemental intra-watershed monitoring for bacteria may occur between Stockton and Osborne to isolate possible sources of bacteria seen at Osborne. Additional monitoring of the lower reaches below Osborne may be necessary to ascertain support status for recreation above Waconda Lake.

Progress will be monitored through individual samples taken during the primary recreation season such that cumulative frequency, duration and magnitude of individual digressions are reduced. The index is calculated from samples taken during the primary recreation season (April - October) by taking the natural log of each sample's bacteria count and dividing by the natural log of the applicable criteria, in this case 262 *E. coli* CFUs/100 ml for SC 543. An index value of 1 symbolizes the nominal 262 *E. coli* CFUs/100 ml criterion and having at least 90 percent of samples below this indicates water quality conditions are near meeting the criterion. A reduction in the SC 543 *E. coli* index profile is expected to first approach the SC 737 profile and then the desired TMDL profile or milestone indicated in the TMDL (Figure 13), which is a little less than the current SC 543 profile. Once the profiles decline, intensive sampling during the primary contact recreation season should

ensue to assess whether the WQS are now being achieved.

The South Fork Solomon River will be evaluated for delisting under Section 303(d), based on the monitoring data over 2010-2019. Therefore, the decision for delisting will come about in the preparation of the 2020 Kansas 303(d) list. Should modifications be made to the applicable WQS during the implementation period, consideration for delisting, desired endpoints of this TMDL and implementation activities might be adjusted accordingly.

Reasonable Assurance

Reasonable assurance only applies when less stringent WLAs are assigned based on the assumption of nonpoint source reductions in the LA 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 CWA to develop TMDL implementation plans and EPA does not approve or disapprove them. However, KDHE included an implementation plan in this TMDL to provide information regarding how point and nonpoint sources can or should be controlled to ensure implementation efforts achieve the loading reductions identified in this TMDL. EPA recognizes that technical guidance and support are critical to determining the feasibility of and achieving the goals outlined in this TMDL. Therefore, discussion of reduction efforts relating to point and nonpoint sources can be found in the implementation section of the TMDL, and are briefly described below.

The TMDL states that effluent limits on NPDES permits will remain in force and any municipal wastewater systems will be expected to comply with permit conditions and operate such that no bacteria impairment is contributed to the South Fork Solomon River.

KDHE has 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 KDHE should provide reasonable assurance that instream WQS 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 WLAs 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 LAs and point source WLAs do not exceed the WQS-based LC and there is reasonable assurance that the TMDL's allocations can be achieved.

Kansas has also identified several federal, state, local and non-government organizations that may be included in the implementation process, as well as enforcement and compliance measures as needed for NPDES permits.

Listed NPDES and state permit implementation actions:

- Monitor effluent from the discharging permitted wastewater treatment facilities, continue to encourage wastewater reuse and ensure compliance and proper operation to control bacteria in wastewater discharges.
- Inspect and verify that non-discharging facilities at the city of Alton and the city of Woodston do not contribute wastewater to the South Fork of the Solomon River.
- Maintain permit limits after 2014 and operation of disinfection techniques.
- Inspect permitted livestock facilities to ensure compliance.
- New livestock permitted facilities will be inspected for integrity of applied pollution prevention technologies.
- New registered livestock facilities with less than 300 animal units will apply pollution prevention technologies.
- Manure management plans will be implemented, to include proper land application rates and practices that will prevent runoff of applied manure.

In accordance with the Surface Water Quality Standards at K.A.R. 28-16-28e(c)(7)(F), "Wastewater effluent shall be disinfected if it is determined by the department that the discharge of non-disinfected wastewater constitutes an actual or potential threat to public health." Therefore, wastewater discharged by the city of Stockton will be disinfected, while the two lagoon systems at the city of Osborne and city of Tipton should have sufficient retention time prior to discharge to ensure bacteria die-off. The TMDL states that both the city of Stockton and city of Osborne have sporadic discharges of high *E. coli* that may need to be reduced to achieve the goals and endpoints of this TMDL. Therefore, their individual WLAs were based initially on adherence to their existing permit limits or expected performance. If any discharger is shown to be causing the high *E. coli* levels at SC 543, subsequent adjustment and more stringent permit requirements will be made to their NPDES permit.

Additionally, this TMDL will be incorporated into the WRAPS in the Continuing Planning Process for Kansas in 2010. Recommendations of this TMDL will be considered in the Kansas Water Plan implementation decisions under the State Water Planning process after Fiscal Years 2010-2019. The State Water Plan Fund annually generates \$16-18 million and is the primary funding mechanism for implementing water quality protection and pollution reduction activities in the state through the Kansas Water Plan. This state water planning process coordinates and directs programs and funding toward watersheds and water resources of highest priority and typically the state allocates at least 50 percent of the funds to WRAPS programs. This watershed and TMDL are within a High Priority WRAPS area and should receive support for pollution abatement practices.