Kansas Nutrient Reduction Strategy

Kansas Nutrient Reduction Strategy is to implement specific controls for large sewage treatment plants along with targeted activities for nonpoint sources of nutrients.
Kansas Nutrient Reduction Framework

• Use best available information to estimate nutrient loadings on a HUC 8 basis

• Identify the major watersheds that contribute a substantial portion of nutrient loadings

• Within each major watershed, identify targeted subwatersheds to implement specific nutrient load reduction activities

• Emphasis on reduction rather than establishing numeric criteria for total phosphorus or total nitrogen

• **Point Source** reductions via updated treatment technologies & operations

• **Non-Point Source** reductions via targeted application of best management practices (BMPs) and collaboration with WRAPS groups
TMDL = \sum WLA + LA + MOS

• TMDL is the maximum amount of pollutant that a body of water can receive while still meeting water quality standards
• TMDLs are expressed in terms of pounds of pollutant/day
  • Flow x Concentration x Unit Conversion Factor

• WLA = Wasteload allocation (Point Sources)
• LA = Load allocation (Non-Point Sources)
• MOS = Margin of Safety
Kansas TMDL Vision

- Between 2014 – 2022, the focus is on streams impaired for phosphorus in 16 priority HUC 8s
- Streams are listed as impaired on the Kansas 303(d) List for total phosphorus (TP) when the long term median TP > 0.201 mg/L
- Factors considered when identifying the priority HUC 8s
  - Historic Condition
  - Stressors
  - Relative Value of Water
  - Implementation Potential
Protect and improve the health and environment of all Kansans

Division of Environment

<table>
<thead>
<tr>
<th>Code</th>
<th>Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>10270102</td>
<td>Middle Kansas</td>
</tr>
<tr>
<td>11030012</td>
<td>Little Arkansas</td>
</tr>
<tr>
<td>10270104</td>
<td>Lower Kansas</td>
</tr>
<tr>
<td>11030013</td>
<td>Middle Arkansas-Slate</td>
</tr>
<tr>
<td>11070205</td>
<td>Middle Neosho</td>
</tr>
<tr>
<td>10260008</td>
<td>Lower Smoky Hill</td>
</tr>
<tr>
<td>10270103</td>
<td>Delaware</td>
</tr>
<tr>
<td>11070207</td>
<td>Spring</td>
</tr>
<tr>
<td>11030018</td>
<td>Lower Walnut River</td>
</tr>
<tr>
<td>10260007</td>
<td>Big</td>
</tr>
<tr>
<td>11030017</td>
<td>Upper Walnut River</td>
</tr>
<tr>
<td>10270205</td>
<td>Lower Big Blue</td>
</tr>
<tr>
<td>10290101</td>
<td>Upper Marais des Cygnes</td>
</tr>
<tr>
<td>11070201</td>
<td>Neosho Headwaters</td>
</tr>
<tr>
<td>10250017</td>
<td>Lower Republican</td>
</tr>
<tr>
<td>11070204</td>
<td>Upper Neosho</td>
</tr>
</tbody>
</table>

TMDL Vision: Sweet 16 HUC 8s
Division of Environment

Protect and improve the health and environment of all Kansans
Marion Lake Eutro TMDL Watershed
Memorial Park Lake
Eutro TMDL Watershed
Reflecting Total Phosphorus (TP) TMDL Wasteload Allocations in NPDES Permits

• TP goals are introduced in the first permit after TMDL approval
  • Concentration
  • Pounds/Year as rolling annual average

• It is expected that mass **goals** will be met by the end of the first permit cycle where wasteload allocation was introduced

• Permit can include a schedule of compliance to insure adequate progress toward meeting the TP goals

• TP mass **limits** are established in second permit after TMDL approval
2012-Present Status of Total Phosphorus TMDLs

Approved

- Big Creek – Hays
- Prairie Dog Creek – Colby
- Sand Creek – Newton
- Turkey Creek – McPherson
- Walnut River – El Dorado
- Whitewater River – Augusta
- Fourmile Creek – Wichita, Andover
- Neosho River Headwaters – Emporia
- Labette Creek – Parsons
- Shoal/Short Creek – Joplin
- Cow Creek – Pittsburg
- Kansas River – Junction City, Manhattan, Topeka, Lawrence, Johnson County, Olathe
- Arkansas River – South Hutchinson
2012-Present Status of Total Phosphorus TMDLs

Awaiting Approval

Lower Arkansas River Basin
   – Arkansas River – Wichita, Derby, Arkansas City

Smoky Hill – Saline River Basin
   – Smoky Hill River – Abilene, Salina, Junction City Southwest
   – Mud Creek, Sharps Creek, Mulberry Creek, Saline River – Nonpoint TMDLs

Documents in Process

Kansas – Lower Republican River Basin
   – Delaware River above Perry Lake – Nonpoint TMDLs
   – Republican River above Milford Lake – Nonpoint TMDLs

Documents Scheduled for 2020

Kansas – Lower Republican River Basin
   – Big Blue River, Little Blue River and Black Vermillion Creek watersheds above Tuttle Creek Lake
Addressing nutrient enrichment and HABs via TMDL Implementation

- TMDLs serve as planning documents and provide guidance to reduce nutrients and external loads to any downstream lakes
  - Establish WQ Baseline and TP concentration milestones

- Watersheds hold the key to addressing HABs in the long run & TMDLs are watershed based

- Implementation helps support long-term objectives around reducing nutrient loads and HABs and the associated watershed work
  - Point Source Implementation

- Implementation with non-point sources
  - Interface with KDHE Watershed Management Section and WRAPS to translate and interpret