

2016 KANSAS ENVIRONMENTAL CONFERENCE

Wednesday August 10, 2016



Our Mission: To protect and improve the health and environment of all Kansans.

WATER USE/REUSE – Freshwater, Stormwater, Graywater & Wastewater

**“Water should not be judged by
its history, but by its quality.”**

Dr. Lucas Van Vuuren

Topics for Today

- **Use & Reuse Applications**
- **New Ammonia Criteria**
- **Lagoons & Potential for Increased Reuse of Effluent**
- **Public Health Protection**
- **Funding**

Various Use & Reuse Applications

- **Urban – Golf Courses, Recreational Fields, and Landscape**
- **Agricultural**
- **Impoundments**
- **Environmental – Wetlands, River/Stream Augmentation**
- **Industrial – Cooling, Fire Protection, Process Water**

Various Reuse Applications (cont.)

- **Groundwater Recharge**
- **Potable Reuse – Indirect and Direct**

Facilities Implementing Effluent Reuse

Based on a 2013 review of wastewater treatment permits in Kansas, both KWPC permits and NPDES permits 167 facilities use effluent for some reuse function other than internal plant use or environmental use.

WWTP Permit Totals

- **Municipal = 455**
- **Commercial = 32**
- **Industrial = 312**

- **Total Municipal, Commercial and Industrial WWTP discharging (NPDES) permits in Kansas = 799**

Examples

Golf course irrigation with municipal and commercial effluent is practiced in Kansas utilizing effluent from lagoon WWTPs (chlorine disinfection) or from mechanical WWTPs (typically ultraviolet disinfection, chlorine in some cases). Of the 167 facilities 15% irrigate any of the following public sites, golf courses, parks, and cemeteries.

Examples (cont.)

Hays WWTP (design flow 2.5 MGD) is a mechanical plant with chlorine disinfection and irrigates sites including a Park, Soccer Fields, Baseball Fields, and a Golf Course. Present planned improvements will replace chlorine disinfection with ultraviolet disinfection.

Hays WWTP



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Examples (cont.)

Dodge City south WWTP [design flow 7.2 MGD (4.0 MGD municipal and 3.2 MGD industrial – meet packing)] sends all effluent to agricultural irrigation. Natural disinfection associated with the lagoon treatment process no supplemental disinfection of effluent.

Examples (cont.)

Dodge City north WWTP (design flow 1.25 MGD municipal and commercial wastewater) sends a majority of effluent to urban irrigation.

This MBR treatment plant utilizes ultraviolet disinfection of the effluent.

Dodge City WWTP North



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Dodge City WWTP South



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Conveyance of Effluent to Use Locations Hays



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SATELLITE PHOTO

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Pawnee Rock Lagoon & Wetland



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EPA New “2013” Ammonia Criterion

- **As Proposed by EPA, and Expected to be Adopted by Kansas Regulations, now also Considers Toxicity to Mussels and Snails**
- **Overall Impact is Much More Stringent Numeric Criteria for Ammonia**

EPA New “2013” Ammonia Criterion (cont.)

- **Expect NPDES Permit Effluent Limitations for Ammonia Concentration Reduced by 60%**
- **And many Permits Now With “Monitoring Only” for Ammonia will have Limits for Ammonia**

Kansas Facts

- **Kansas Population (2010) About 2,850,000**
- **About 80% of Kansas Population Served by Sewer Systems**
- **Kansas Mechanical WWTPs Serve 86% of Population on Sewers, About 2,000,000 People, about 120 WWTPs, 75 Serve 3,000 or Larger Population**

Kansas Facts (cont.)

- **Most Mechanical WWTPs Can Meet These New Ammonia Limitations From the EPA 2013 Ammonia Criterion**
- **KDHE Estimates – 16 Mechanical WWTPs Major Expense Upgrades, 21 Mechanical WWTPs Operator Training & Minor Expense Improvements (Computer Controls)**

Lagoons

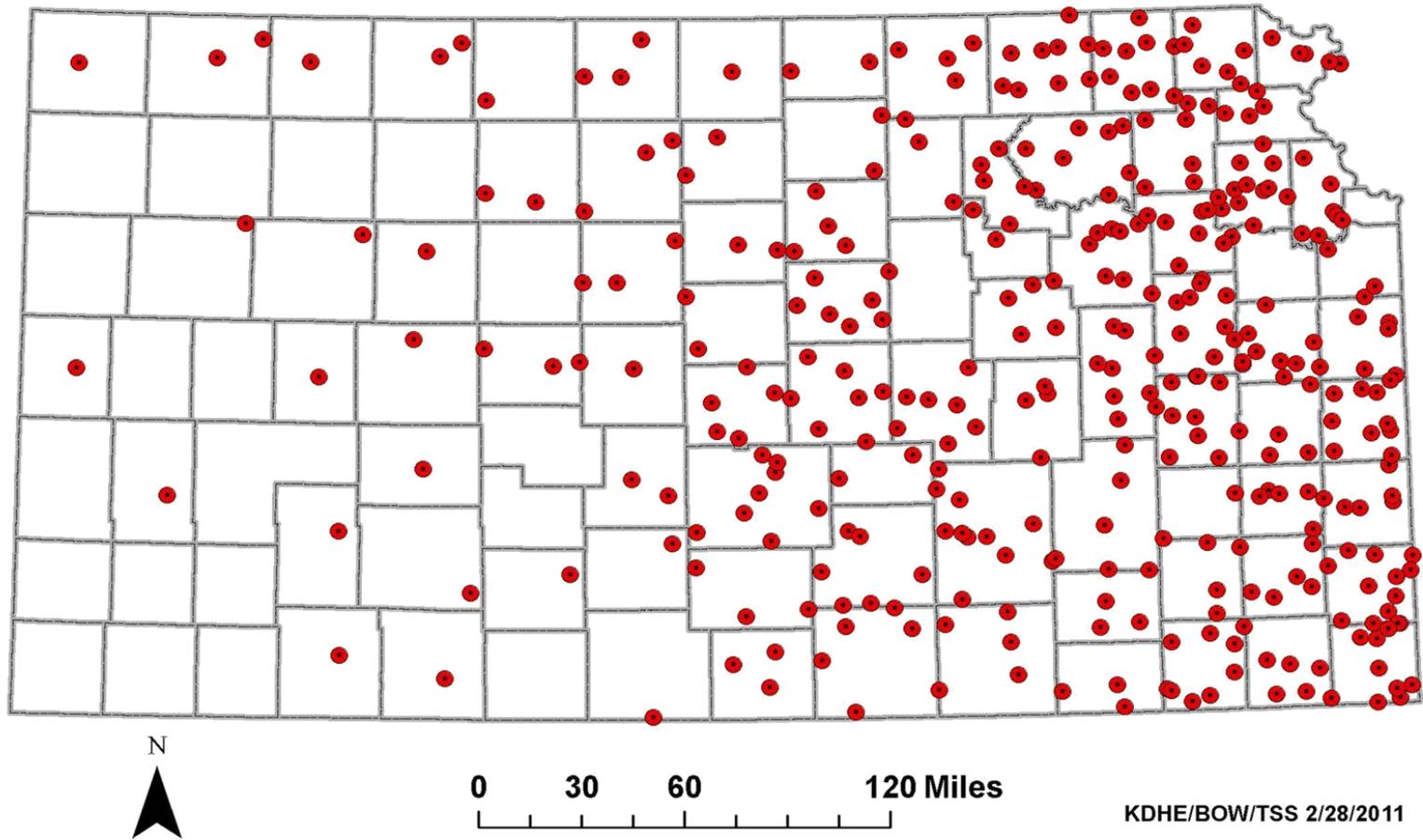
- **Kansas Has 325 NPDES Permits Issued to Municipal Discharging Lagoons, More to Commercial Facilities**
- **Small Towns, Small Populations, Small Flows, and Even Smaller Discharge Amounts due to Evaporation and Seepage**

Lagoons (cont.)

- **Kansas Municipal Discharging Lagoons Serve about 227,400 Population, About 8% of Total Population, About 10% of Population Served by Sewer Systems**
- **About 3 Dozen Lagoon Facilities Serve 2,000 or Larger Population**
- **About 1 Dozen Lagoon Facilities Serve 3,000 or Larger Population**

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Municipal Discharge Lagoons



KDHE/BOW/TSS 2/28/2011

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Protect Public Health

Permits with Agricultural Irrigation typically have three standard conditions

- Permittee shall control tailwater to prevent runoff to surface waters of the State**
- Permittee shall draw water from only the final cell in the treatment process**
- Permittee shall not irrigate crops produced for direct human consumption**

Protect Public Health (cont.)

Urban irrigation may have several additional conditions which provide public health protection. Conditions may include:

- **Irrigation using wastewater effluent shall occur only at times when public access to the irrigated area is restricted**

Protect Public Health (cont.)

- **Irrigation of crops produced for direct human consumption shall be prohibited**
- **A notice shall be placed on the golf course score cards indicating the irrigation system contains treated wastewater**

Protect Public Health (cont.)

Urban Irrigation example conditions

- **A sign shall be posted at a location conspicuous to anyone who will enter the golf course which bears the following notice: RECLAIMED WASTEWATER IS USED TO IRRIGATE THE GRASS AND COOL THE GREENS.**

Protect Public Health (cont.)

Urban Irrigation example conditions

- **Irrigation of effluent shall be conducted in such a manner as to prevent ponding of wastewater on the ground surface**
- **Cross-connections between treated wastewater lines and potable water supply lines shall be prohibited**

Protect Public Health (cont.)

Urban Irrigation example conditions

- **Irrigation spray shall not be allowed to fall or drift on areas used for picnicking, public drinking fountains, potable water hose bibs, private residences or any other areas where food or drink is routinely prepared or served**

Protect Public Health (cont.)

Urban Irrigation example conditions

- **Signs bearing the following notice must be posted around any treated wastewater holding pond: RECLAIMED WASTEWATER DO NOT DRINK OR SWIM**

Protect Public Health (cont.)

Urban Irrigation example conditions

- **Signs bearing the following notice must be posted at any hose bib which can discharge treated wastewater:
RECLAIMED WASTEWATER DO NOT DRINK**

Protect Public Health (cont.)

The level of treatment required depends on the intended use. Multiple barriers are employed to provide protection. General principals are as follows:

- Agricultural irrigation typically requires the treatment equivalent to that necessary for discharge to surface waters**

Protect Public Health (cont.)

- **Urban irrigation requires , treatment equivalent to that necessary for discharge to surface waters, the longer list of conditions addressed previously, and in some cases supplemental disinfection**

Protect Public Health (cont.)

- **A major priority is the prevention of cross connections**
- **The use of reuse water transmission pipe which is purple or has purple markings is common**

Funding

The State Revolving Fund (SRF) loan program can provide low interest loans for much of the necessary improvements to achieve improved treatment and/or non-discharge to surface waters.

Funding (cont.)

Community Development Block Grants may be available to help fund improvements associated with reclaimed wastewater use if necessary to upgrade wastewater treatment/management systems.

USDA Rural Development Loan and Grant

Rural Development Loan and Grant may be available to help fund improvements associated with reclaimed wastewater use if necessary to upgrade wastewater treatment/management systems.

Questions



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