Water Quality Standards Ammonia Criteria and Variances

Kansas
Department of Health and Environment

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

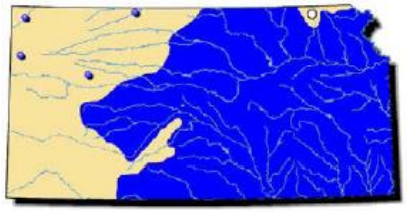
Brief History of Ammonia Criteria

- 1984 – EPA published original ammonia (NH_3) criteria
- 1987 – KDHE adopted the 1984 NH_3 criteria
- 1994 – KDHE proposed new NH_3 criteria
  - Based on preliminary EPA work adjusting pH
  - Legislature put on hold
- EPA published 1999 aquatic life NH_3 criteria
  - Took into account pH and early life stages
- KDHE adopted the 1999 criteria in 2001
- EPA proposed NH_3 criteria in 2009
  - Took into account sensitive mussel impact
  - Would drop chronic 1999 criteria by 5 times
  - KS submitted many comments on the proposed criteria

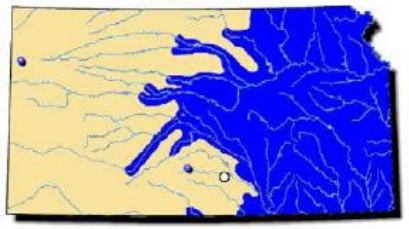
Brief History of Ammonia Criteria

- 2013 – EPA published new NH_3 criteria
  - Mussels and snails both considered
  - Drop 1999 chronic criteria by about 54%
  - Makes acute criteria temperature dependent
  - Analysis shows most modern mechanical plants can meet
    - A handful of older mechanical plants cannot
      - 15-17 appear to have consistent problems
        - » 20+ on the bubble – ops may solve
    - Initially assumed snails/mussels present east of Hays for analysis
  - Lagoons cannot meet criteria year round
    - Winter and summer limits more stringent
    - EPA recognizes this

Pondhorn



Maple Leaf



Legislative Update

- H2303 – The “variance” bill
  - Introduced in Appropriations Committee by Rep Schwartz
  - Amended in the Senate in S124
    - passed April 2, 2015
  - Bill clearly gives Secretary of KDHE authority to establish water quality standard (WQS) variances
  - We foresee the ability to adopt variances as an important tool in the future
    - Ammonia criteria compliance and possibly future nutrient criteria

Kansas WQS Variances

- Concept of the Kansas variance process has been based on EPA's release of 40 C.F.R. 131.14
- Variance may be requested and adopted for:
  - Individual discharger
  - Multiple dischargers
  - Waterbody specific
- Compliance with all other underlying WQSs, TBELs or WQBELs is still required
- All variances are considered WQSs
  - subject to the public participation process

Kansas WQS Variances

- Met with EPA HQ/R7 staff on monthly calls for past 18 months
- EPA issued the WQS Rule in summer of 2015
  - Significant language revisions regarding variances
- Development of draft language to comply with new rule
  - Lots of back and forth with EPA on language
  - EPA cautious with lots of national interest / precedence
- Regulations are drafted and going through the regulation update process

Kansas WQS Variances

- A time-limited designated use and criterion that reflects the highest attainable condition (HAC) as an alternative due to one or more of the following factors:
  1) naturally occurring pollutant concentrations prevent the attainment of the use
  2) natural, ephemeral , intermittent or low flow conditions or water levels prevent the attainment of the use, unless augmented by effluent or other discharges
  3) human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than leave in place
  4) dams, diversion or other types of hydrologic modifications preclude the attainment of the use and cannot be modified or operated to attain the use

Kansas WQS Variances

5) physical conditions of the natural water features of the water body, such as lack of a proper substrate, or inadequate cover, flow, depth, pools, or riffles preclude the attainment of the aquatic life use
6) controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact
7) actions necessary to facilitate lake, wetland or stream restoration through dam removal or other significant reconfiguration activities preclude attainment of the use while actions are being implemented

Kansas NH_3 Multiple Discharger Variance (MDV)

- Multiple discharger variance process is driven by factor 6, and the 2013 NH_3 criteria

- KDHE established MDV eligibility by considering
  - median household income (MHI) threshold
  - population threshold
  - maximum revenue generation
  - cost for mechanical treatment
  - Compare cost to maximum revenue

Kansas WQS Variances

- Variance requests shall demonstrate the assessment and consideration of the following factors:
  - Technology-based controls are sufficient to meet WQBELs derived to meet the underlying designated use and criteria at issue in the variance
  - Ensure there is no jeopardy to threatened or endangered species
  - Ensure there is no unreasonable risk to human health
  - Ensure the HAC applicable throughout the term of the variance does not result in lowering currently attained ambient water quality

Kansas WQS Variances

- Submission requirements include:
  - Identify the applicable pollutant(s) or water quality criterion, and the water body/waterbody segment(s)
  - Identify the discharger(s)
  - All applicable requirements that represent the HAC throughout the term of the variance
  - Provide a quantitative expression for the discharger(s)-specific sites or water body or waterbody segment
  - A statement providing that the requirements of the variance are derived from the HAC
  - The term of the WQS variance

Kansas WQS Variance

- A schedule for reevaluation
- A provision that the variance is no longer applicable if reevaluation is not consistent with the schedule

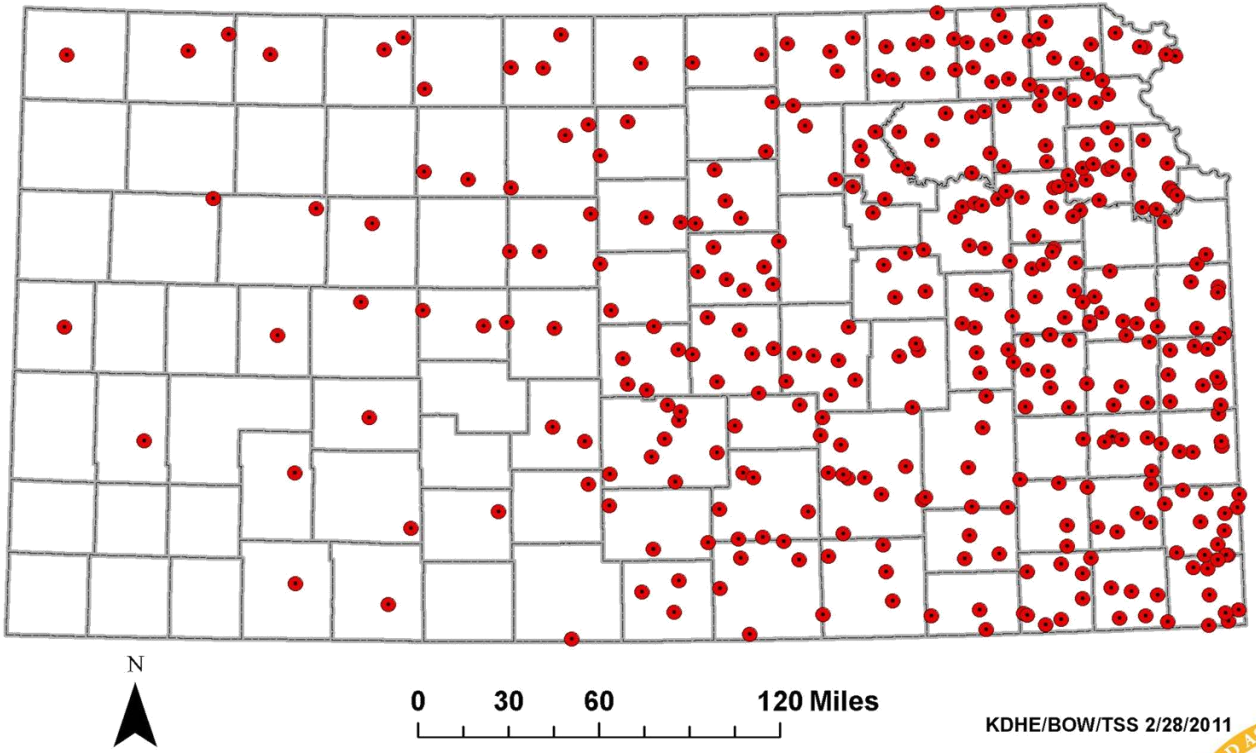
- Supporting documentation:
  - Submit documentation demonstrating the term of the variance is only as long as necessary to achieve HAC
  - Water body or waterbody segment variances require additional supporting documentation for nonpoint source controls or other process(s) that can improve water quality

Kansas NH_3 MDV

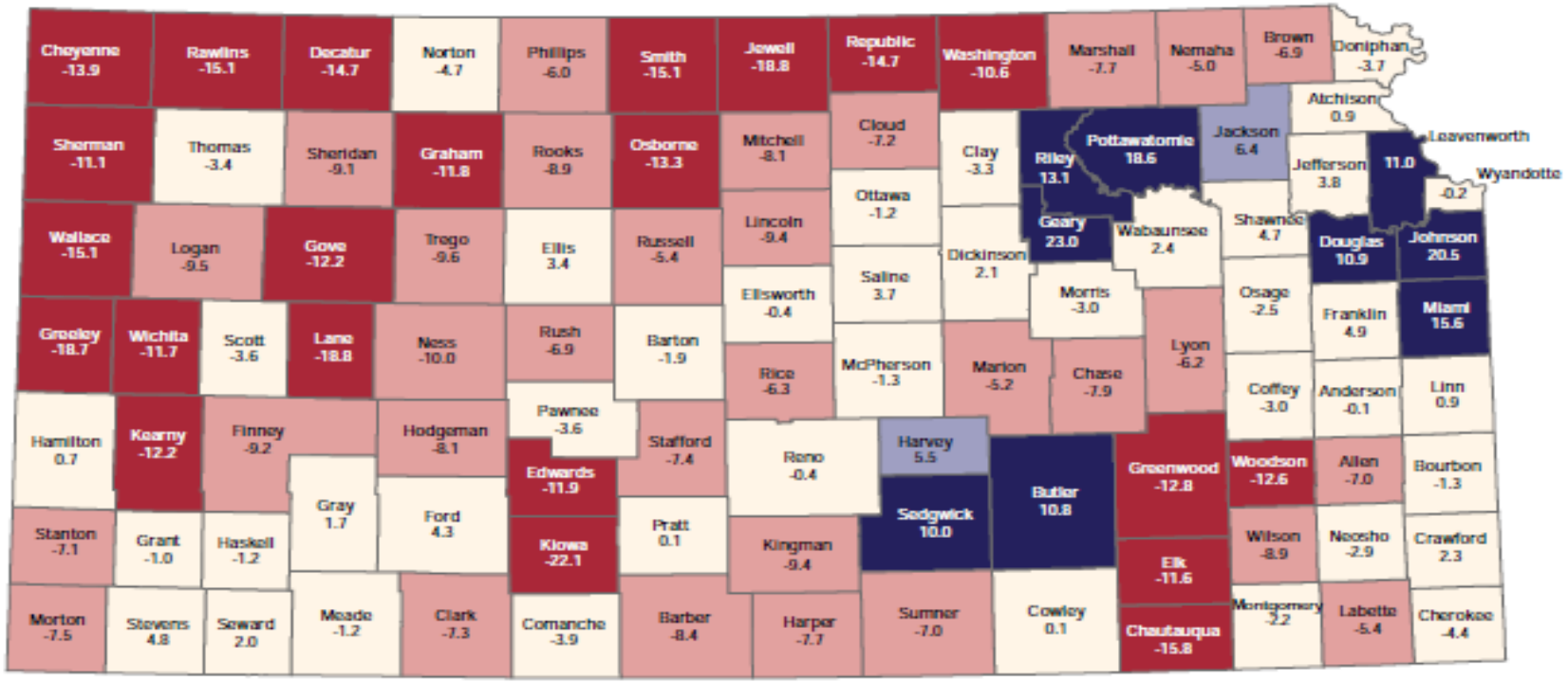
- Kansas has 325 NPDES Permits issued to municipal discharging lagoons, more to commercial facilities
- Small towns, small populations, small flows, and even smaller discharge amounts due to evaporation and seepage
- Kansas municipal discharging lagoons serve about 227,400 population, about 8% of total 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

Kansas NH_3 MDV

Municipal Discharge Lagoons



Percent Population Change in Kansas, by County
2000 - 2010



Source: Institute for Policy & Social Research, The University of Kansas; data from U.S. Census Bureau.

MDV Eligibility

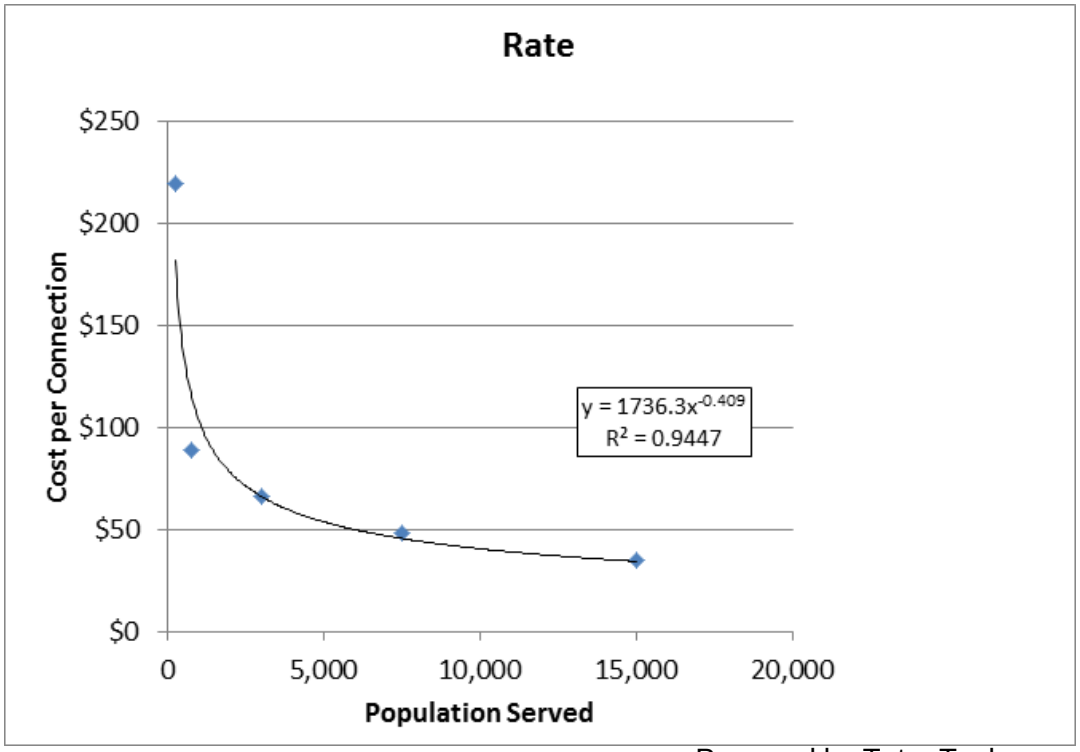
- Eligibility determination process
  - KDHE will:
    - review NPDES permit to determine if a discharger can potentially meet the new NH_3 criteria
    - calculate projected ammonia criteria limits
    - compare the historical ammonia effluent data to projected 2013 ammonia criteria limits
    - determine financial eligibility

MDV Eligibility

- Eligibility determination process
  - KDHE will:
    - calculate primary screener – calculate the percent of MHI that city sewer utility residential customers would be paying to fund a new mechanical plant
      - If municipal primary screener > 4.0% than alternate effluent limits are calculated
      - If municipal screener is < 4.0% calculate secondary screener
    - calculate secondary screener – Can city afford to build a new mechanical treatment facility?

Kansas NH_3 MDV

Small Flows Biological Nutrient Removal Activated Sludge Cost Curve



Prepared by Tetra Tech

- Cost per connection to construct and operate for biological nutrient reduction treatment process
- Costs are beyond financial capability of small Kansas towns

SECONDARY INDICATORS

	Secondary Indicators		
Indicator	**Weak**	**Mid-Range**	**Strong**
Bond Rating	Below BBB (S&P) Below Baa (Moody's)	BBB (S&P) Baa (Moody's)	Above BBB (S&P) or Baa (Moody's)
Overall Net Debt as Percent of Full Market Value of Taxable Property	Above 5%	2%-5%	Below 2%
Unemployment	More than 1% above National Average	National Average	More than 1% below National Average
Median Household Income	More than 10% below State Median	State Median	More than 10% above State Median
Property Tax Revenues as a Percent of Full Market Value of Taxable Property	Above 4%	2%-4%	Below 2%
Property Tax Collection Rate	< 94%	94% - 98%	>98%
	①	②	③

Assigned Points

Typical KS Town Scores

0

2

2

1

2

2

Avg = 1.5

MDV Eligibility

ASSESSMENT OF SUBSTANTIAL IMPACTS MATRIX

Secondary Score	Municipal Preliminary Screener		
	Less than 1.0 Percent	Between 1.0 and 2.0 Percent	Greater than 2.0 Percent
Less than 1.5	?	X	X
Between 1.5 and 2.5	✓	?	X
Greater than 2.5	✓	✓	?

Secondary Score:_____

Key:

- ? Uncertain, studies need to be performed.
- X No, the city cannot afford the proposed mechanical plant and the variance can be granted.
- ✓ Yes, the city can afford the proposed mechanical plant and no variance will be granted and the city is not eligible for the MDV. A city or facility may, on its own, request an individual variance.

MDV Eligibility

- MDV decision
  - If determined to be eligible for the MDV: alternate ammonia effluent limits will be issued
    - 99th percentile or the highest value of recent historical effluent discharge data (serves as the HAC)
    - Quarterly Monitoring assessed against alt limit (HAC)
  - The alternate ammonia effluent permit limit and the Pollutant Minimization Plan (PMP) will be included in the NPDES permit

MDV Eligibility

- PMP requirements:
  - retain a certified operator as required by regulations
  - provide reasonable and adequate maintenance
  - maintain operation and performance of the existing lagoon system to comply with secondary treatment limitations
  - does not allow industrial strength wastewater containing high concentrations of nitrogen
  - monitor the depth of accumulated sludge
  - plan for expansion of the lagoon system should population and its associated pollutant loading approach the rated design capacity of the existing lagoon system.

Recap

- The 2013 NH_3 criteria will likely be adopted in the near future
  - Implement with permits expiring 9/2017 ?
- The revised variance regulations are currently under internal review
- The Kansas NH_3 MDV will aid small municipalities in obtaining the HAC with existing lagoon systems, minimizing the financial burden relative to large scale upgrades

Questions

www.kdheks.gov

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