



*Potamilus purpuratus*  
By: Jim Rathert

# Changes to Ammonia Criteria



*Ellipsaria lineolata*  
By: Jim Rathert

By: Alex Bielefeldt

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# Numerical Changes

Who is affected?

- All waters of the state minus Missouri and Mississippi rivers
  - 644.016(31), RSMo.
- All current dischargers
- All future dischargers



*Reginaia ebenus*  
By: Jim Rathert

*Lampsilis reeveiana*  
By: Jim Rathert

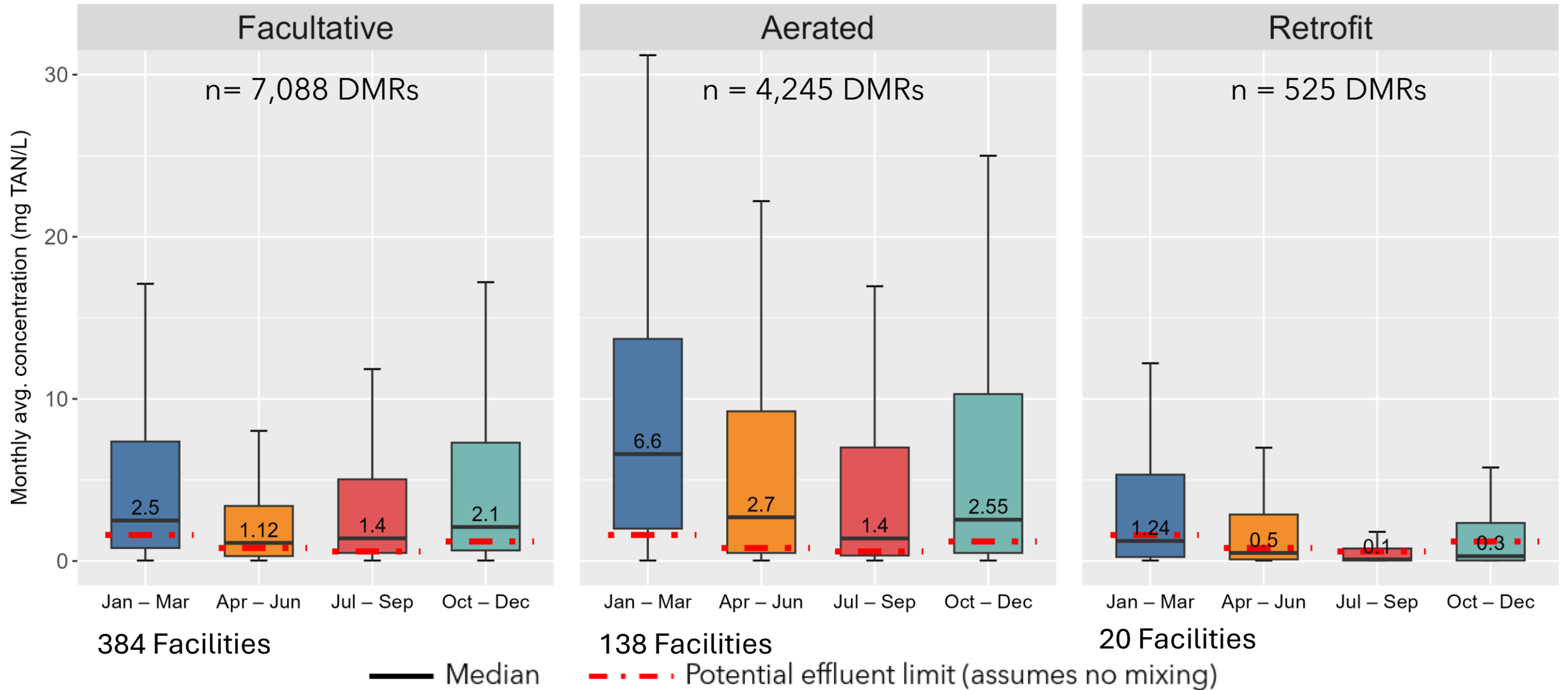


How is it changing?

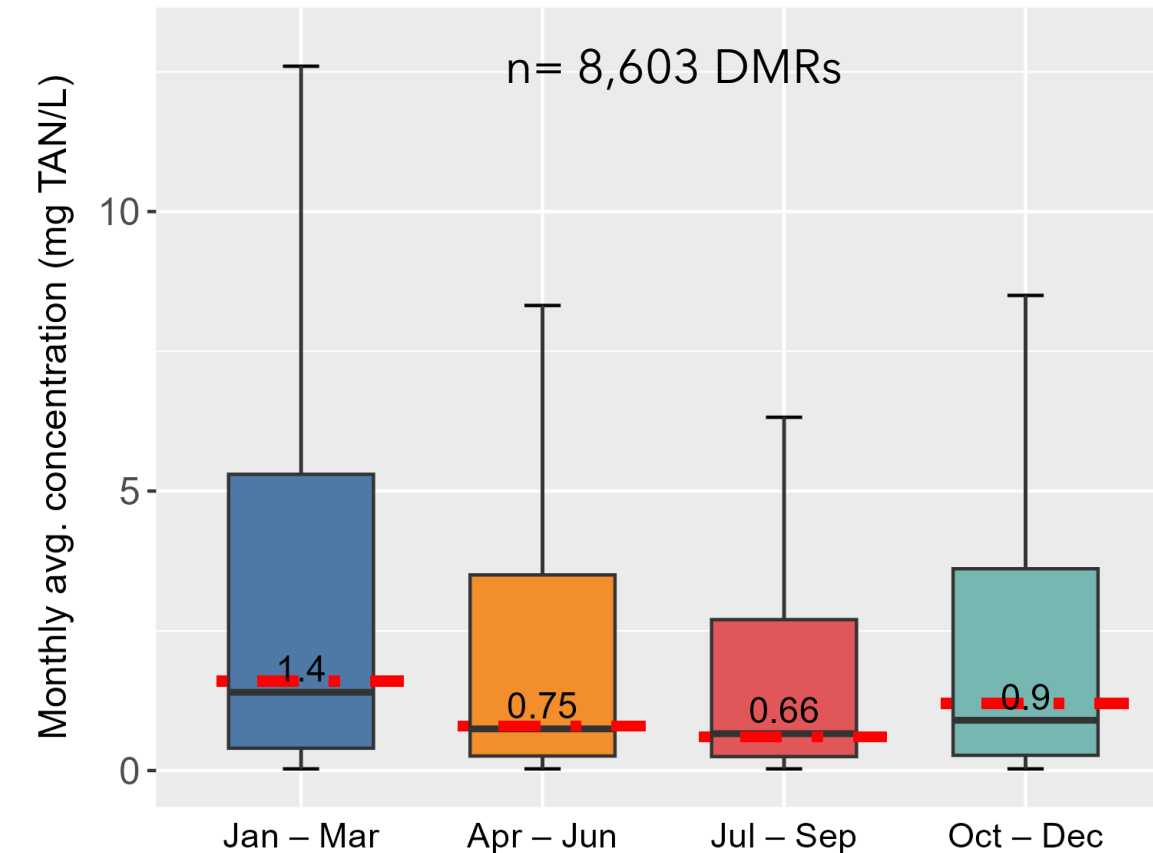
	1999 Limits		2013 Limits	
Quarter	Daily Max (mg/L)	Monthly Avg (mg/L)	Daily Max (mg/L)	Monthly Avg (mg/L)
Jan-Mar	10.1	2.7	3.9	1.5
Apr-Jun	12.1	1.8	1.7	0.6
Jul-Sep	12.1	1.3	1.2	0.5
Oct-Dec	12.1	3.1	2.9	1.1

\*Central plains ecoregion, no mixing, P stream

# Lagoon effluent ammonia concentrations by quarter (reported 2018 – 2022)

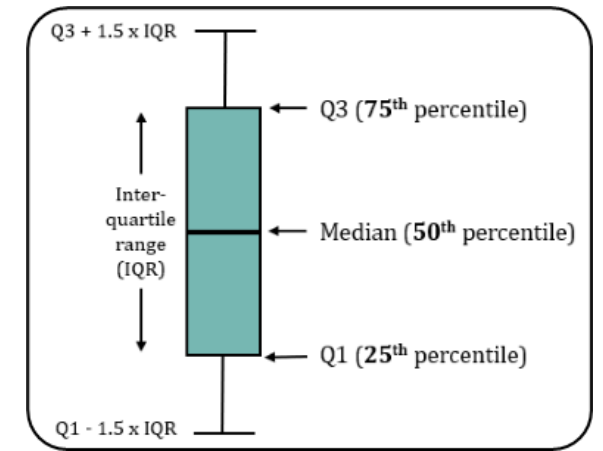


# Recirculating sand filter effluent ammonia concentrations by quarter (reported 2018 – 2022)

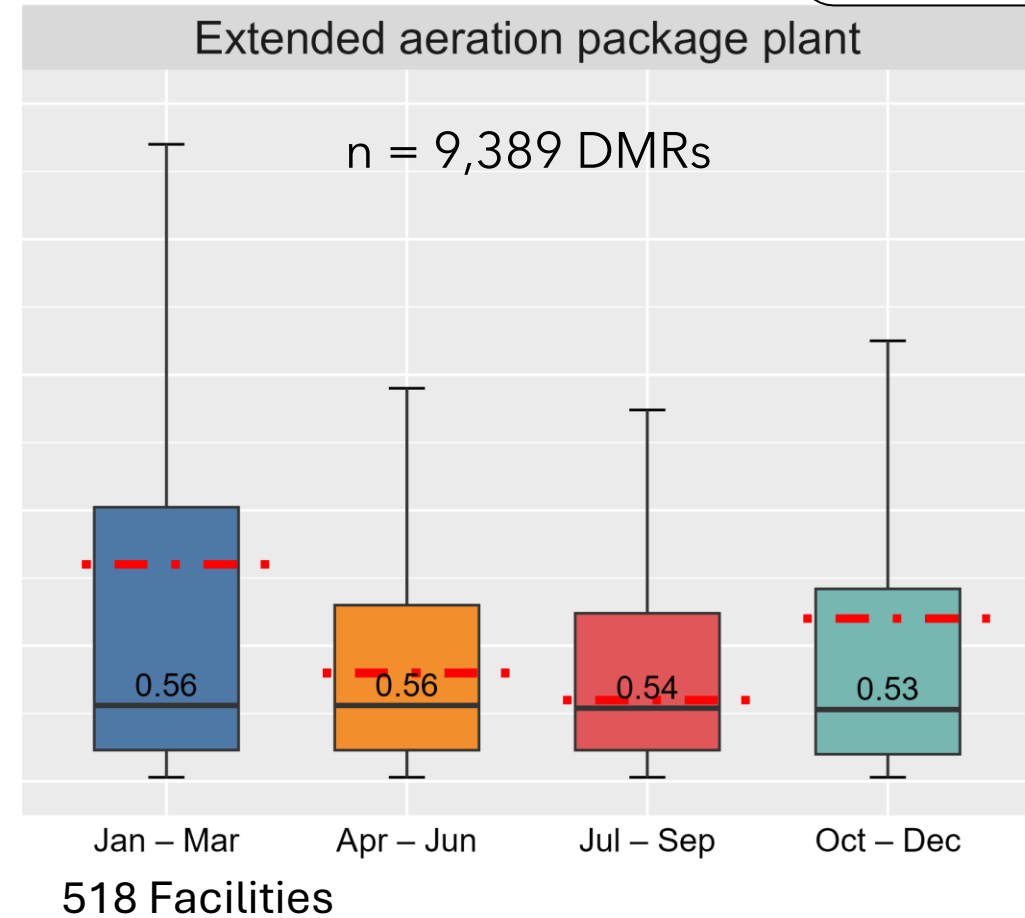
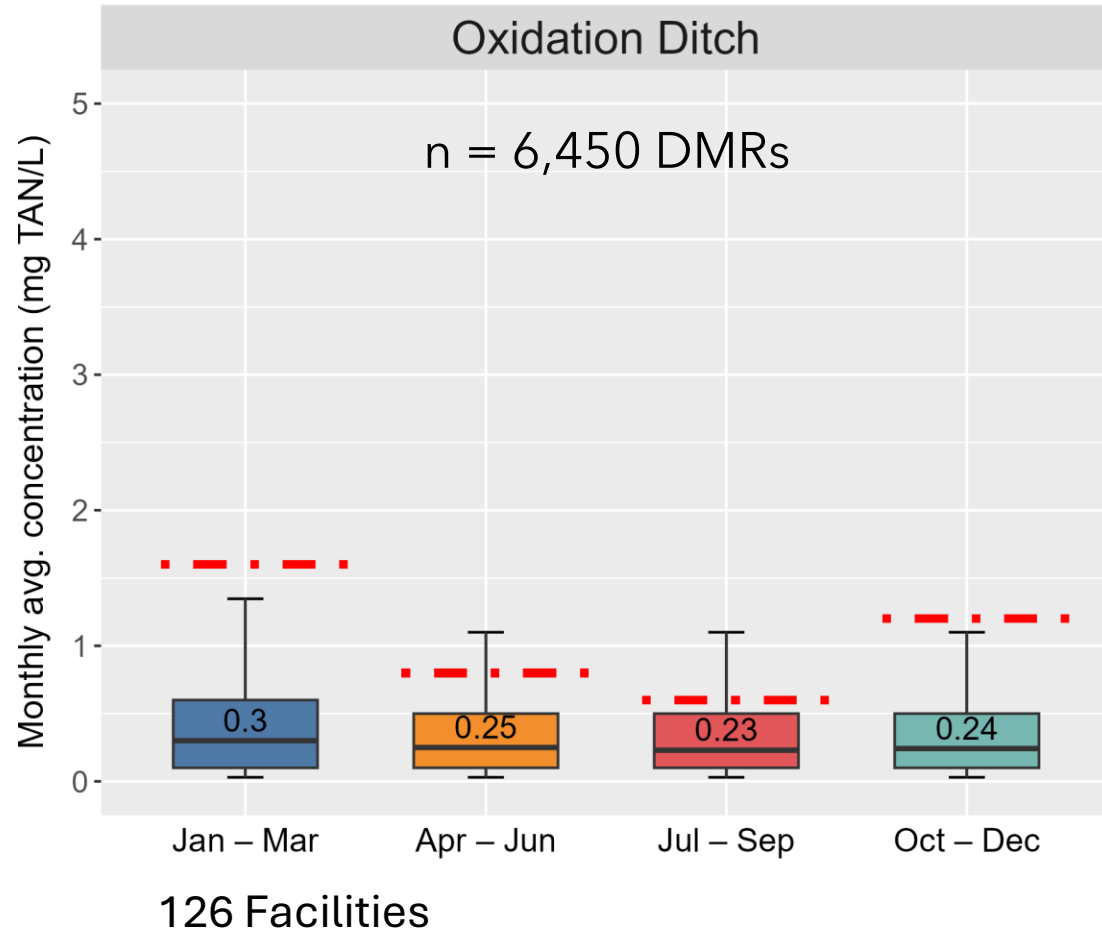
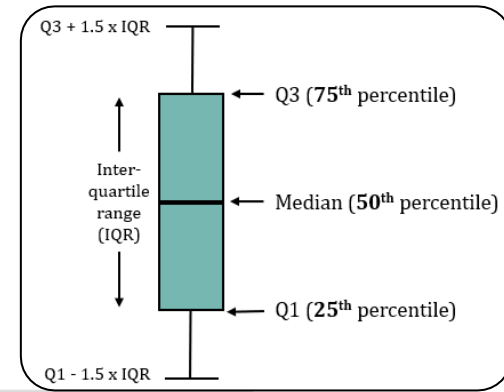


536 Facilities

— Median    - - - Potential effluent limit (assumes no mixing)

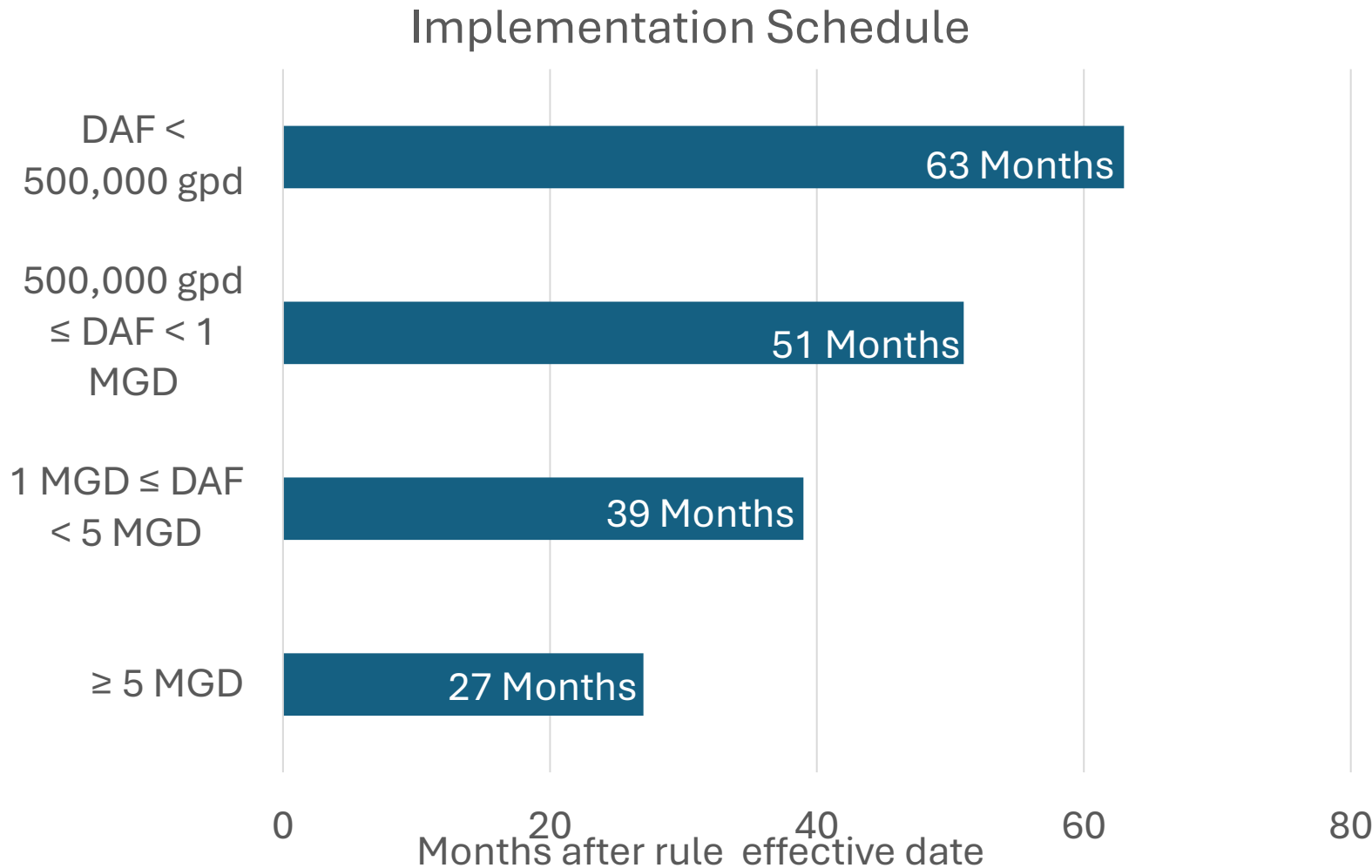


# WWTP effluent ammonia concentrations by quarter (reported 2018 – 2022)



— Median   - . - . Potential effluent limit (assumes no mixing)

# When will this happen?



- Will be implemented at first permit renewal or major modification after staggered implementation date
- Rule effective date based on approval of 10 CSR 20-7.015
- General permit holders will not be expected to comply until 2034



*Elliptio crassidens*  
By: Jim Rathert

# Achieving Compliance

Some are already in compliance:

- Addressed in Antidegradation Review

- Facility is operated well

- Remove Discharge
  - Land application
  - Regionalization
- Upgrade
- Outfall Relocation
- Water quality variance



*Lampsilis siliquoidea*  
By: Jim Rathert

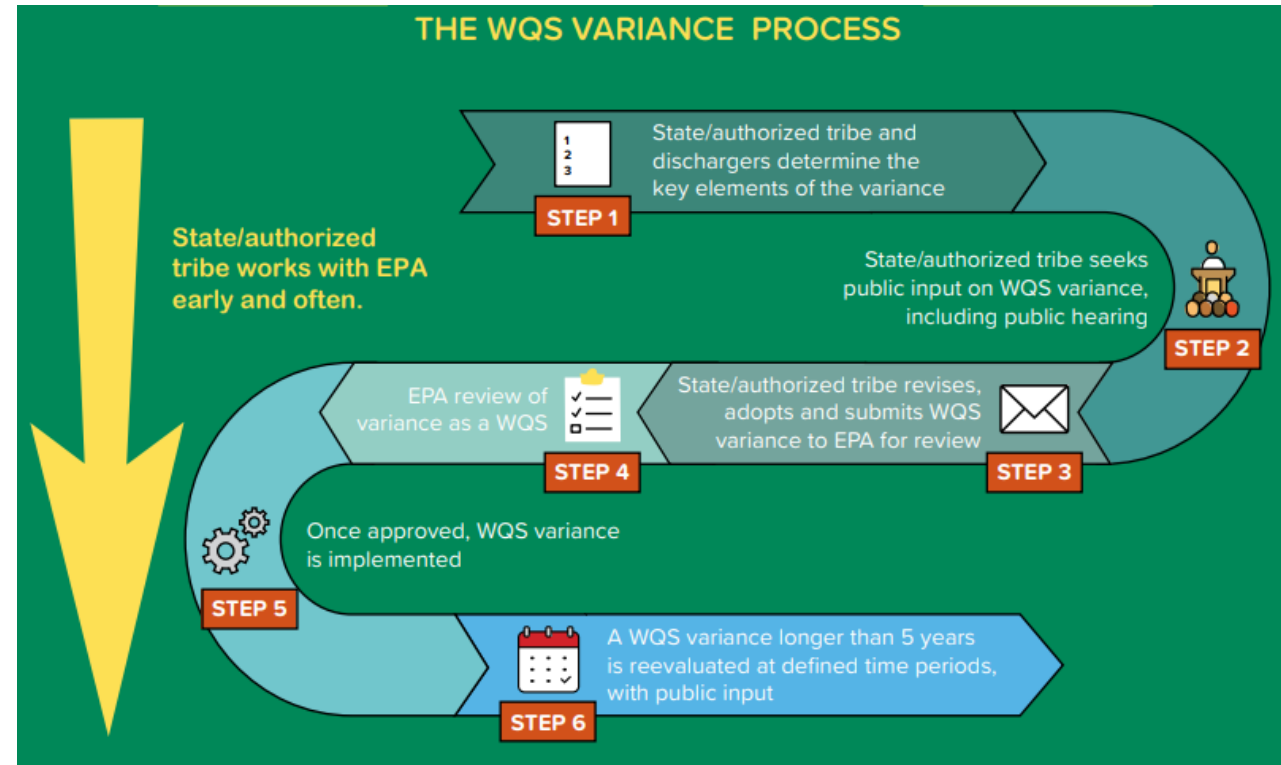


# Variances

- A variance is a time-limited WQS which applied to a specific facility
- Maintain current performance
- Allows for incremental steps of limits
- Approved by CWC and EPA
- 5-year term(s)



*Potamilus leptodon*  
By: Jim Rathert





# Factor 6 Variance - 40 CFR 131.14(g)(6)

- Replacing existing multiple discharger variance (MDV) framework with discharger specific variance (DSV) framework
- Based on economic impact
- Starting with guidance for lagoon systems, but pathway open for all user-rate based systems



*Obliquaria reflexa*  
By: Jim Rathert



*Cyclonaias nodulata*  
By: Jim Rathert



*Amblema plicata*  
By: Jim Rathert



*Plethobasus cyphus*  
By: Cliff White

# Economic Analysis

- EPA has provided guidance
  - Small Lagoon Community Economic Steamlining Tool (SLCES)
  - Individual Lagoon Tool (ILT)
- Other Information to use
  - Department's CafCOM
  - Engineering Reports



*Lampsilis teres*  
By: Jim Rathert

	Oxidation Ditch	Sequencing Batch Reactors	Floating Covers
% Community MHI (MPS value)	7.84% (large economic impact)	10.2% (large economic impact)	2.53% (large economic impact)
Secondary Test Score	1.67 (midrange economy)	1.67 (midrange economy)	1.67 (midrange economy)
Initial Economic Impact	substantial impact	substantial impact	substantial impact
LQPI Score	1.40 (high impact)	1.40 (high impact)	1.40 (high impact)
Expanded Economic Impact	substantial impact	substantial impact	substantial impact

# Variance Plan Form

- Incorporates info from financial questionnaire
- Affected community details
- Plant technology details
- Highest Attainable Conditions
- Evaluation of feasible improvements
- Pollutant Minimization Plan
- Initial facility list
- Working with MRWA and MPUA to assist facilities in applying



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH  
Application for Ammonia Discharger Specific Variance

FOR DEPARTMENT USE ONLY	
APP NO.	
FEE RECEIVED	CHECK NO.
DATE RECEIVED	

1. FACILITY			
FACILITY NAME		COUNTY	
ADDRESS (PHYSICAL)		CITY	STATE ZIP CODE
PERMIT NUMBER	FACILITY CONTACT EMAIL ADDRESS		TELEPHONE NUMBER W/ AREA CODE
2. OWNER			
NAME		SECRETARY OF STATE CHARTER NUMBER	
ADDRESS		CITY	STATE ZIP CODE
EMAIL ADDRESS		TELEPHONE NUMBER WITH AREA CODE	
3. CONTINUING AUTHORITY The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(2).			
NAME (or note same as #2)		SECRETARY OF STATE CHARTER NUMBER (if applicable)	
ADDRESS		CITY	STATE ZIP CODE
EMAIL ADDRESS		TELEPHONE NUMBER WITH AREA CODE	
4. FACILITY INFORMATION			
A. Permitted Design Flow:		B. Number of lagoon cells:	
C. Is the facility currently under enforcement with the Water Protection Program or US EPA? <input type="checkbox"/> Yes <input type="checkbox"/> No		D. Existing Highest Attainable condition- summer Maximum Daily Limit: Average Monthly Limit:	
E. Does this facility have pre-treatment program or industrial contributors? <input type="checkbox"/> Yes <input type="checkbox"/> No		F. Existing Highest Attainable condition- winter Maximum Daily Limit: Average Monthly Limit:	
G. Does the facility have an existing schedule of compliance for ammonia? <input type="checkbox"/> Yes <input type="checkbox"/> No		H. Does the facility have a schedule of compliance for other pollutants of concern? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, what parameters?	
I. Number of connections for this facility  Residential <input type="checkbox"/> Commercial Domestic <input type="checkbox"/> Industrial Non-domestic <input type="checkbox"/>		J. If this facility is part of a sewer district, total number of connections within the district?  Residential <input type="checkbox"/> Commercial Domestic <input type="checkbox"/> Industrial Non-domestic <input type="checkbox"/>	
K. Existing User Rate: <input type="checkbox"/>		L. Basis for rate <input type="checkbox"/>	
M. Proposed Highest Attainable Condition-summer at the end of the 1 <sup>st</sup> term of the variance Maximum Daily Limit: Average Monthly Limit:		N. Proposed Highest Attainable Condition-winter at the end of the 1 <sup>st</sup> term of the variance Maximum Daily Limit: Average Monthly Limit:	
5. RECEIVING WATERBODY			
Receiving Waterbody:			
1 <sup>st</sup> Classified Waterbody:			
4 <sup>th</sup> Classified Waterbody Identification Number:			

# Upgrade Options

- Designed with ammonia removal in mind
  - Membrane Bioreactor
  - Moving Bed Bioreactor
  - Biological Nutrient Reactor
  - Oxidation Ditch
  - Extended Aeration
  - Submerged Attached Growth Reactor
  - Etc.
- Underperforming Technologies
  - Lagoon
  - Sand filter
  - Trickling filter

*Pyganodon grandis*  
By: Cliff White



*Theliderma metanevra*  
By: Jim Rathert



*Quadrula quadrula*  
By: Jim Rathert



*Tritogonia verrucosa*  
By: Jim Rathert





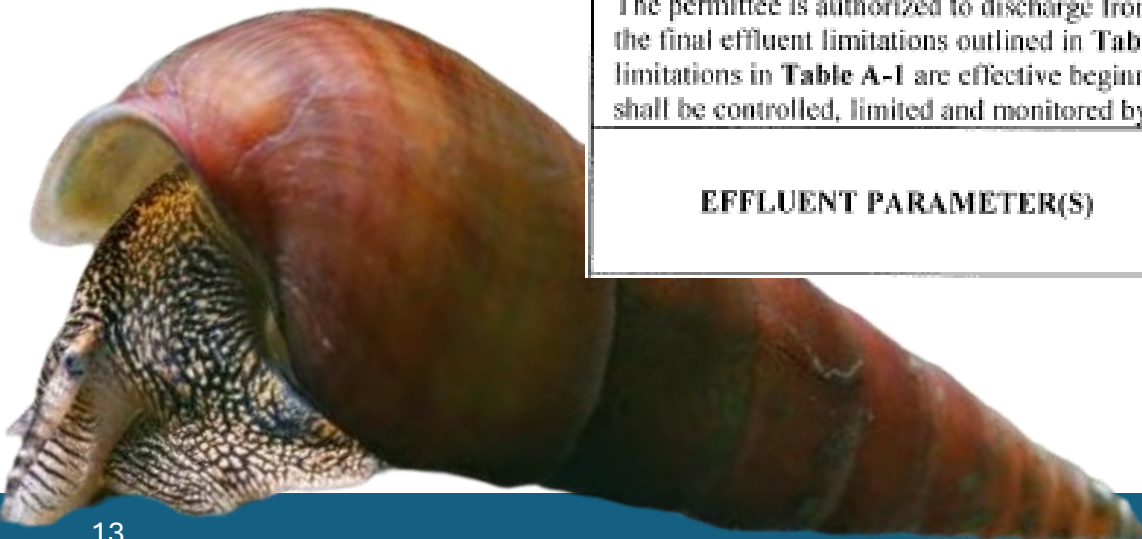
# Schedules of Compliance

- Same process as before
  - Site specific
  - Extra time develop and implement a plan
  - End goal of water quality standard

*Cyclonaias tuberculata*  
By: Cliff White



OUTFALL #001	TABLE A-1. INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
	The permittee is authorized to discharge from outfall number(s) as specified in the application for this permit. In accordance with 10 CSR 20-7.031, the final effluent limitations outlined in Table A-2 must be achieved as soon as possible but no later than <u>August 1, 2021</u> . These interim effluent limitations in Table A-1 are effective beginning <u>March 1, 2021</u> and remain in effect through <u>July 31, 2021</u> or as soon as possible. Such discharges shall be controlled, limited and monitored by the permittee as specified below:					
EFFLUENT PARAMETER(S)	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE



# Outfall Relocation

- Less stringent limits with mixing zones
- May not be long term solution
- Antidegradation required for new receiving streams
- Will consider current performance



*Lampsilis cardium*  
By: Jim Rathert



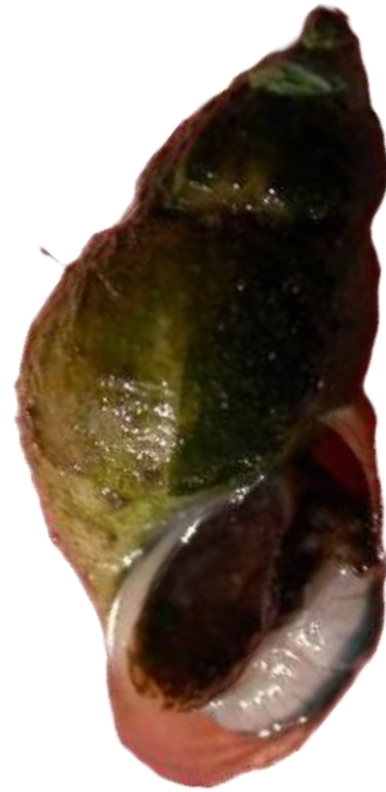
*Truncilla truncata*  
By: Jim Rathert

	W/O Mixing		W/ Mixing	
Quarter	Daily Max (mg/L)	Monthly Avg (mg/L)	Daily Max (mg/L)	Monthly Avg (mg/L)
Jan-Mar	3.9	1.5	5.1	2.0
Apr-Jun	1.7	0.6	2.2	0.9
Jul-Sep	1.2	0.5	1.6	0.6
Oct-Dec	2.9	1.1	3.8	1.5

\*Central plains ecoregion, P stream, default mixing

# Additional Discussion Opportunities

- Water Protection Forum August 13, 2025
  - 10 am - 3 pm at Lewis and Clark Office Building or Online
- WQS/Permitting Workgroup August 21, 2025
  - 1 pm - 4 pm at Lewis and Clark Office Building





# Lagoon Guidance

- MDNR Resources
  - <https://dnr.mo.gov/document-search/wastewater-treatment-lagoons-secondary-effluent-limits-pub3097>



*Fusconaia flava*  
By: Jim Rathert

- Other EPA resources
  - Optimizing Performance of Facultative Wastewater Lagoon Systems - Part 1 – EPA and Optimizing Performance of Aerated Wastewater Lagoon Systems - Part 2 – EPA.  
<https://www.epa.gov/compliance/optimizing-performance-facultative-wastewater-lagoon-systems-part-1-1>
  - <https://www.epa.gov/compliance/optimizing-performance-aerated-wastewater-lagoon-systems-part-2>

# Credits

- [https://mdc.mo.gov/field-guide/search?fgSpeciesType=1001&f%5B0%5D=species\\_subtype%3A1093&page=3](https://mdc.mo.gov/field-guide/search?fgSpeciesType=1001&f%5B0%5D=species_subtype%3A1093&page=3)