

# Trading TP: Sell It or Keep It?

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INDIANAPOLIS  
FIVE CITIES PLUS

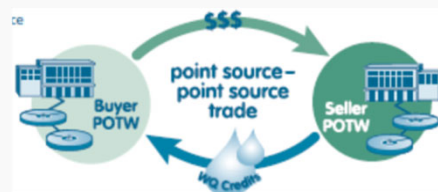
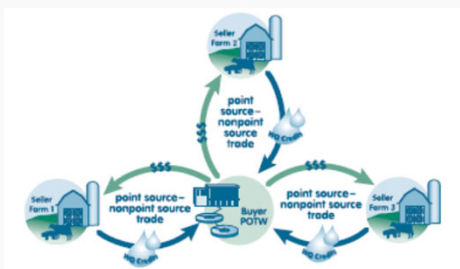
# Introduction

- Overview of Missouri's Total Phosphorus (TP) Effluent Rule and Trading Framework
- St. Louis MSD's Capital Project Plan and Compliance Strategy







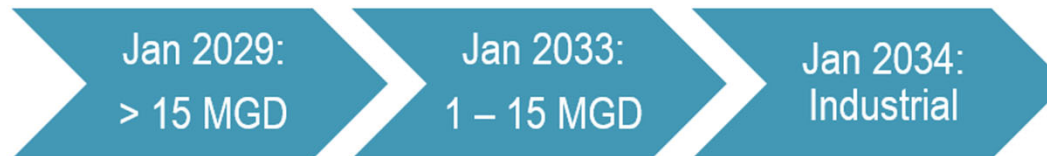
# Missouri Nutrient Trading Program Drivers

- 2014 Nutrient Reduction Strategy
- 2016 Water Quality Trading Framework
- 2019 EPA Trading Policy Update
- 2019 Lake Nutrient Criteria and Implementation
- 2020 Nutrient Reduction Strategy Update
- MDNR 2021/2022 NPS Trading Evaluation
- 2023 TP Effluent Rule

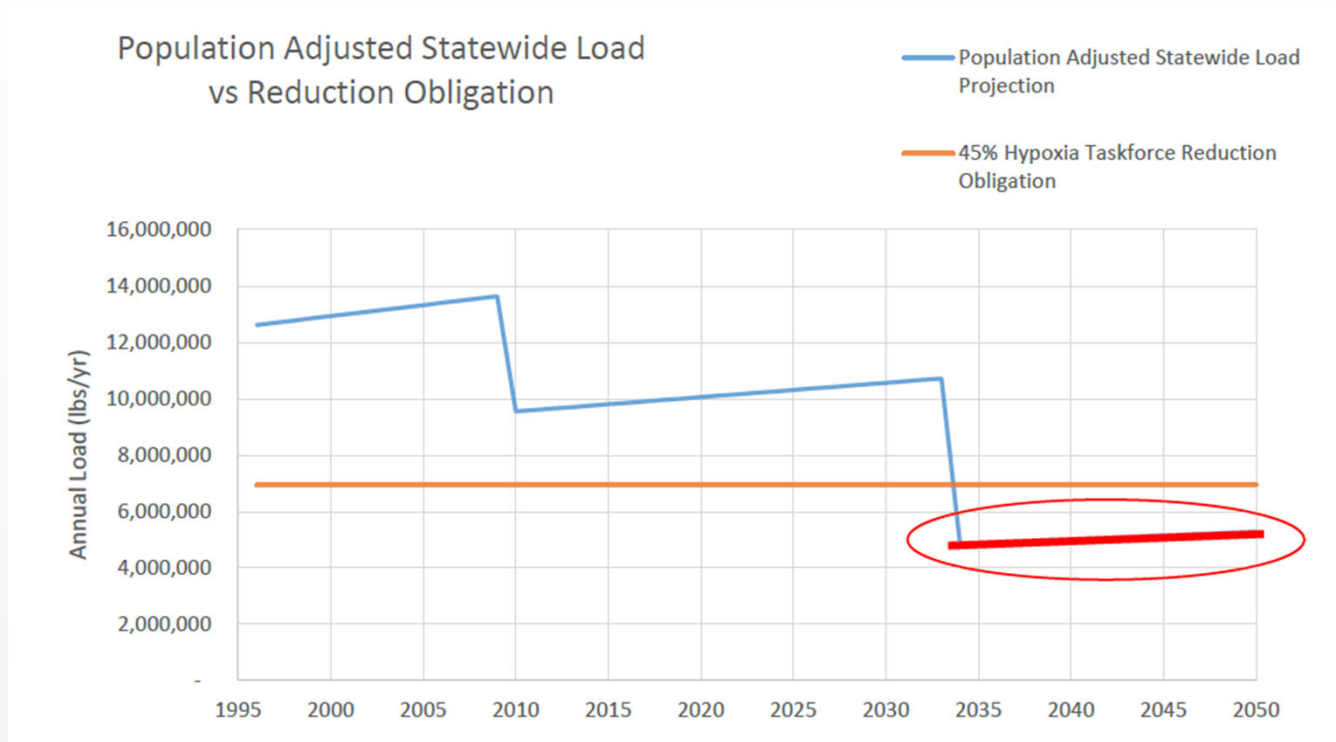


# Rollout of the TP Rule in MO

Major Point Sources	Annual Reduction Target	Set Compliance Date with Off-Ramp	Trading
<ul style="list-style-type: none"><li>• POTWs</li><li>• Industrial Sources</li><li>• Design Flow &gt; 1 MGD</li></ul> 	<ul style="list-style-type: none"><li>• 1 mg/L or equivalent mass design flow, or</li><li>• 75% reduction influent to effluent, or</li><li>• 75% reduction from baseline</li></ul> 	<ul style="list-style-type: none"><li>• Affordability</li><li>• Undue burden to indirect dischargers</li><li>• Integrated Plan</li><li>• Regionalization Plan</li><li>• Nutrient Reduction Master Plan to address both N &amp; P</li></ul> 	<ul style="list-style-type: none"><li>• Lowers Direct Cost</li><li>• Mississippi River Basin</li><li>• Aggregated Permits</li></ul> 



# The TP Rule will Drive Reductions From 90% of Municipal Dischargers



# TP Reduction Rule (4 options)

1. TP effluent  $\leq 1$  mg/L, as annual average
2. TP effluent  $\leq$  annual mass loading of 1 mg/L at design flow
3. 75% TP reduction from influent to effluent
4. 75% TP reduction of annual effluent load



# Option 2: TP effluent $\leq$ annual mass loading of 1 mg/L at design flow

- Data Needs
  - TP effluent sample concentration
  - Actual Flow
  - Facility Design Flow
- Compliance Calculations
  - Monthly and Annual Actual Mass of TP Discharged
  - Target Mass of TP
    - Design Flow (Annual) x TP Target (1 mg/L)
- Opportunity for Credit Generation
- Non-Compliance Option: Credit Need

# Option 2: TP effluent $\leq$ annual mass loading of 1 mg/L at design flow

## 1. Calculate Actual Annual Load

Month	TP Effluent (mg/L)	Volume (MG)	Actual Load (Tons)
January	0.95	521	2.1
February	0.9	597	2.2
March	1.1	1010	4.6
April	1.2	952	4.8
May	1.55	755	4.9
June	1.1	615	2.8
July	0.9	537	2.0
August	0.95	529	2.1
September	0.9	487	1.8
October	1.35	465	2.6
November	0.95	573	2.3
December	0.9	662	2.5
	<b>Total</b>	<b>7704</b>	<b>34.7</b>



# Option 2: TP effluent $\leq$ annual mass loading of 1 mg/L at design flow

## 2. Calculate Annual Allowable Load

Allowable Load = Design Annual Volume x Target

Ex: Permit Design Flow = 35 MGD

Annual Volume = 12,800 MG

Allowable Load: 12,800 MG @ 1 mg/L = 53 Tons

## 3. Evaluate Compliance

Allowable Load (53T) > Actual Load (34.7T)

## 4. Calculate Credit

Credit: Allowable Load (53T) - Actual Load (34.7T)

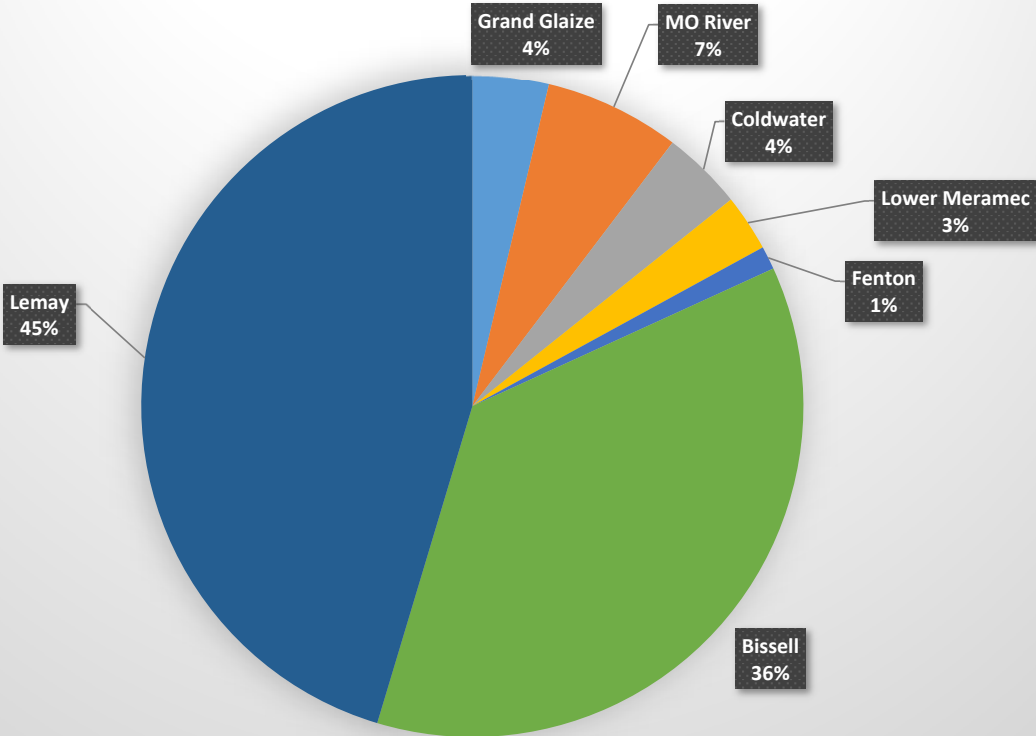
Credit = 18.3 Tons for Banking or Trade



# MSD Load Aggregation

(Option 2)

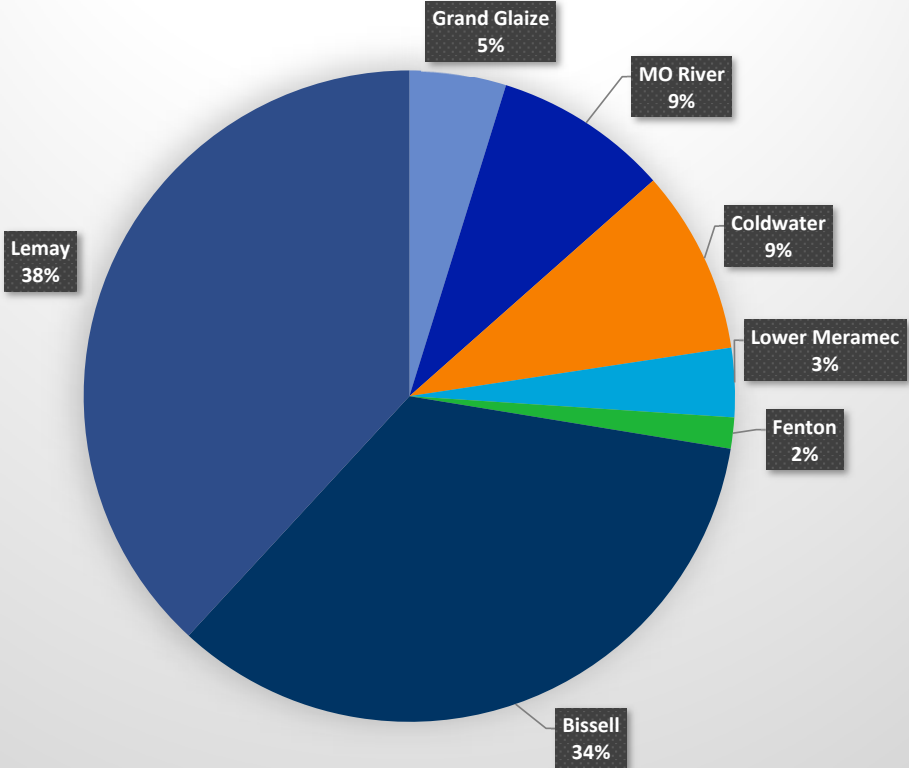
Actual TP Load (% Total)



# MSD Load Aggregation

(Option 2)

Allowable TP Load (% Total)



# MSD Load Aggregation

(Option 2)

## Estimating Load Reduction Needed

POTW	Bissell	Lemay	Lower Meramec	Fenton	Grand Glaize	MO River	Coldwater	Total
<b>Allowable Load</b>	<b>228</b>	<b>254</b>	<b>23</b>	<b>10</b>	<b>32</b>	<b>58</b>	<b>61</b>	<b>665</b>
Year	TP Load by Facility (Tons)							Total
2018	589	559	32	14	45	79	43	1360
2019	496	682	37	16	43	74	53	1401
2020	300	488	32	12	41	77	44	994
2021	431	514	31	12	45	81	48	1162
2022	378	486	34	14	50	88	49	1100
<b>Average</b>	<b>439</b>	<b>546</b>	<b>33</b>	<b>14</b>	<b>45</b>	<b>80</b>	<b>47</b>	<b>1203</b>

# Load Reduction Planning: Next Steps

- **Develop Treatment Scenarios**
  - Identify POTWs that require TP treatment infrastructure
  - Consider other factors that impact treatment planning
    - CSO control
    - Future regulatory requirements (e.g., Total Nitrogen)
    - Regional planning (expansion)
    - Integrated planning
- **Modeling & Designing Treatment Processes**
  - Estimate post-treatment TP loads
  - Develop optimal TP removal technologies & strategies
- **Estimating Capital and Operating Expenses**



# MSD Load Aggregation

(Option 2)  
Modeled Load Reduction (Chem-P Treatment)

POTW	Bissell*	Lemay*	Lower Meramec	Fenton	Grand Glaize*	MO River	Coldwater	Total
<b>Allowable Load</b>	<b>228</b>	<b>254</b>	<b>23</b>	<b>10</b>	<b>32</b>	<b>58</b>	<b>61</b>	<b>665</b>
Model Year	Annual TP Load After Treatment* (Tons)							Total
2018	191	186	32	14	22	79	43	566
2019	248	287	37	16	26	74	53	741
2020	216	197	32	12	24	77	44	603
2021	179	181	31	12	23	81	48	555
2022	180	186	34	14	22	88	49	574
<b>Average</b>	<b>203</b>	<b>207</b>	<b>33</b>	<b>14</b>	<b>23</b>	<b>80</b>	<b>47</b>	<b>608</b>

# MSD Load Aggregation

Model Year	Surplus/ Deficit	Running Total
2018	100	100
2019	-76	24
2020	62	86
2021	110	197
2022	91	288
<b>Average</b>	<b>58</b>	

- Time Term = 5 years
- Promotes Resiliency



Questions?

