Triennial Review of Circular DEQ12-B

Status of Discharger Groups and Variance Limits

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Nutrient Work Group Meeting
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Review Requirements

- 75-5-313, MCA. “Immediately after May 31, 2016, and every 3 years thereafter, the department, in consultation with the nutrient work group, shall revisit and update the concentration levels provided in subsection (5)(b).”

1. ≥ 1 MGD: 10 mg TN/L and 1.0 mg TP/L
2. < 1 MGD: 15 mg TN/L and 2.0 mg TP/L
3. Lagoons not designed to actively remove nutrients: maintain current performance

- Circular DEQ-12B: “The review…will be carried out at a state-wide scale, i.e., the Department will consider the aggregate economic impact to dischargers within a category…”

Scope of this Analysis

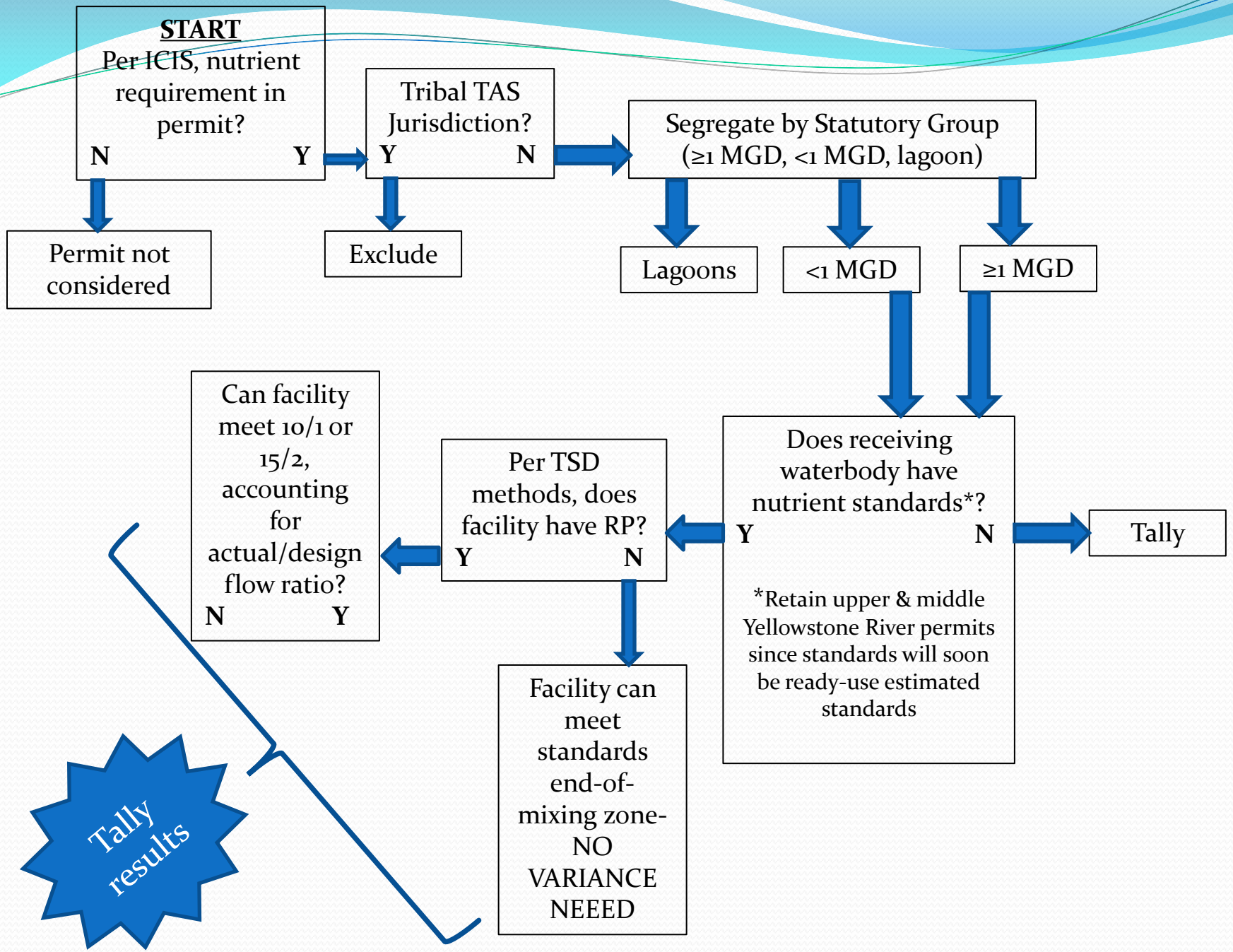
- Not addressing the nutrient standards (DEQ-12A), or individual *vs.* general variances

- How many (1) don't have to address nutrient standards, (2) meet standards, (3) need variance and whether they meet current statutory requirements or not

- Key Assumption:
  - Used estimated standards for upper and middle Yellowstone River (0.5 mg TN/L, 0.05 mg TP/L)
    - Assumed mixing zones would be granted to applicable facilities in most cases

Data Sources

- DEQ permit Fact Sheets or Statements of Basis G:\WPB\2_Permits
- ICIS/DMR data compiled late 2015 through 2016, with analyses including determinations of RP using TSD methods
- DEQ's WPCSRF Public Wastewater Systems List
- ECHO (EPA's Enforcement and Compliance History Online) for DMR nutrient data (2013-2016) https://echo.epa.gov/facilities


START
Per ICIS, nutrient requirement in permit?
N
Y
Permit not considered
Tribal TAS Jurisdiction?
Y
N
Exclude
Segregate by Statutory Group (≥1 MGD, <1 MGD, lagoon)
Lagoons
<1 MGD
≥1 MGD
Does receiving waterbody have nutrient standards*?
Y
N
*Retain upper & middle Yellowstone River permits since standards will soon be ready-use estimated standards
Tally
Per TSD methods, does facility have RP?
Y
N
Facility can meet standards end-of-mixing zone- NO VARIANCE NEEED
Can facility meet 10/1 or 15/2, accounting for actual/design flow ratio?
N
Y
Tally results

Approach to the Analysis

GROUPS

- Lagoons: individual + general permits, n = 91
  - No CAFOs or storm water permits
- <1 MGD mechanicals: public & private, all individual permits, n = 37 (max)
- ≥1 MGD mechanicals: public & private, all individual permits, n= 21 permits (max)

Approach to the Analysis

- DMRs queried for nutrient concs. (2005-2015)
  - If facility recently upgraded/optimized, only looked at ≤2013-2016 (Paul LaVigne provided list)

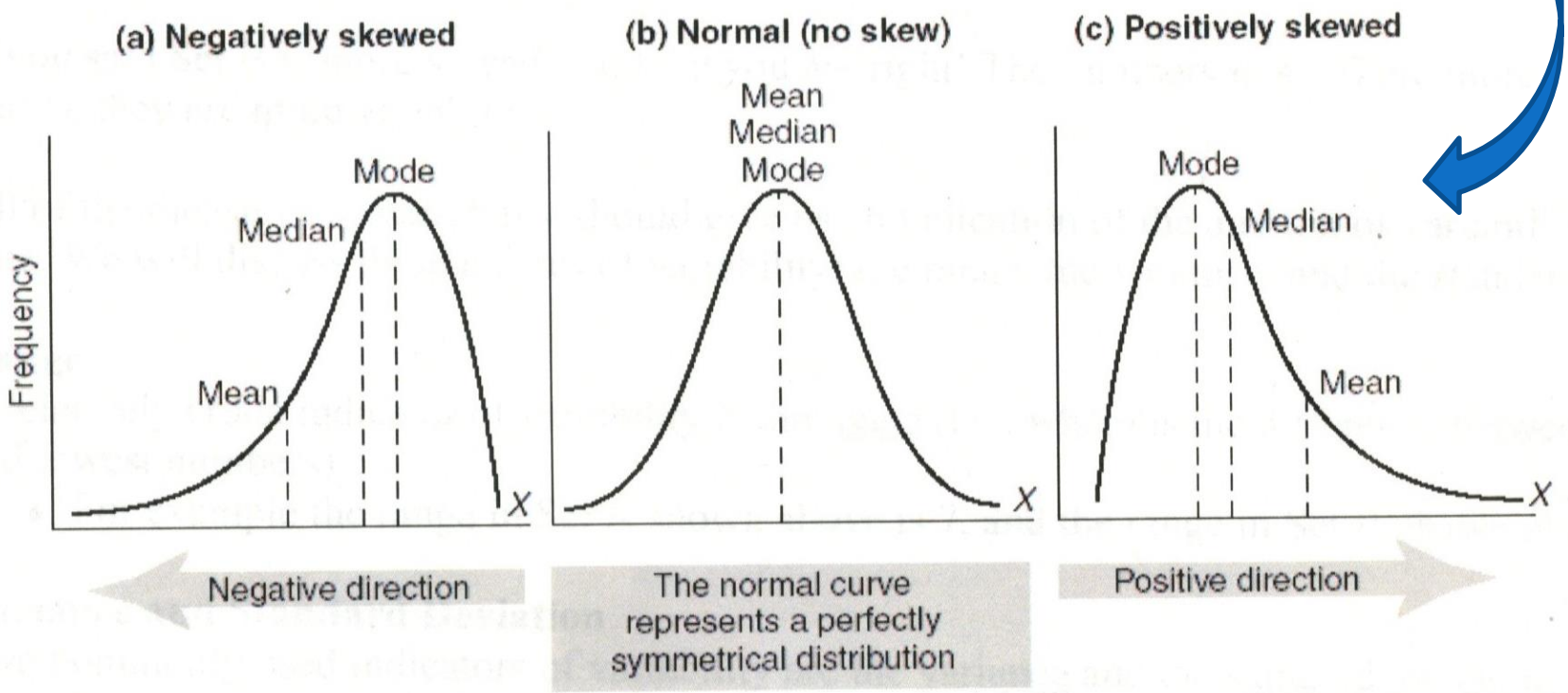
- Computed median nutrient conc. (of, usually, reported monthly averages); yields good central tendency for each facility's effluent (*next slides…)*

For the Two Mechanical Groups (≥, < 1 MGD)

- account for actual/design-flow ratio (*next slides…*)

Data and Central Tendency

for positive skew (like effluent data), <u>median</u> of the DMR data provides good central tendency for what the facility is typically discharging most of the time



Accounting for POTW Load-based Permits

- Per rules (DEQ12-B) variance limits for POTWs facilities are expressed only as a load*
- (Average Monthly Limit) X (Design Flow) = LOAD

15 mg TN/L X 100,000 L/day = 1.5 kg TN/day

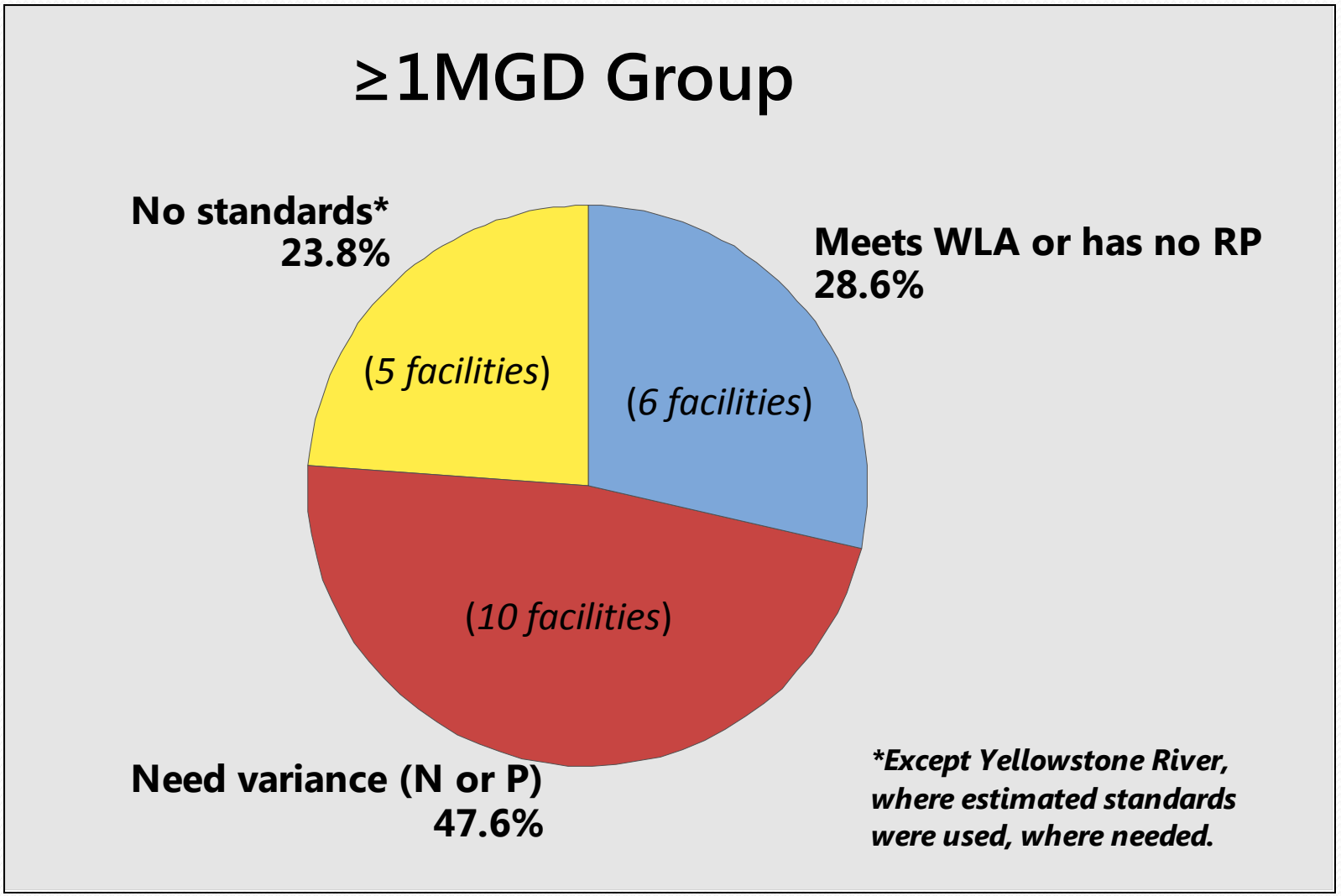
BUT….

- Most POTWs are below Design Flow, so they can discharge a *higher* concentration and meet permit load

30 mg TN/L X 50,000 L/day = 1.5 kg TN/day

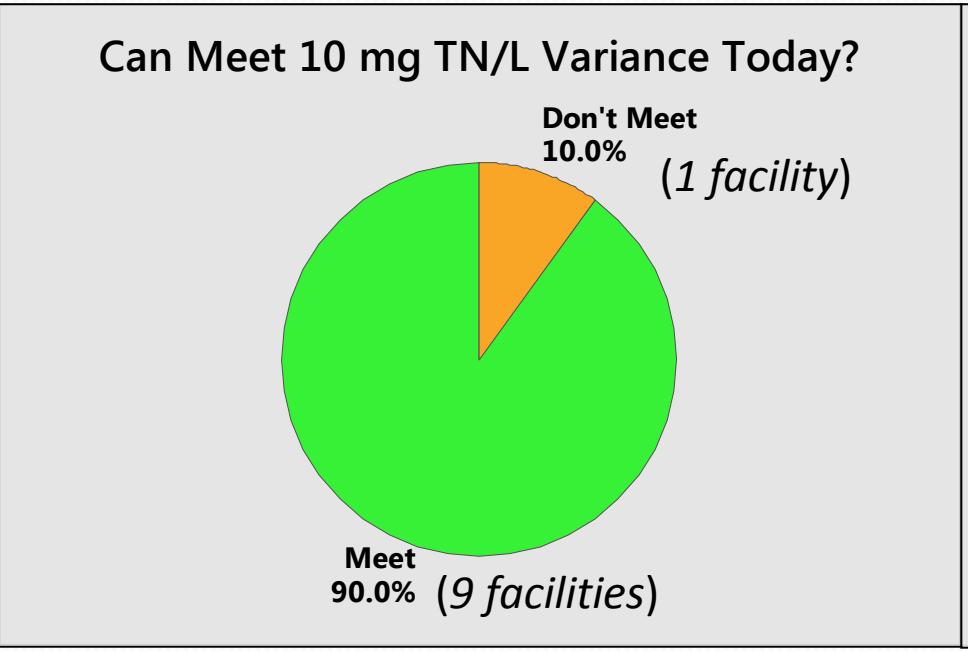
**Private facilities too, but theirs are based on recent actual flow only so no adjustment needed.*

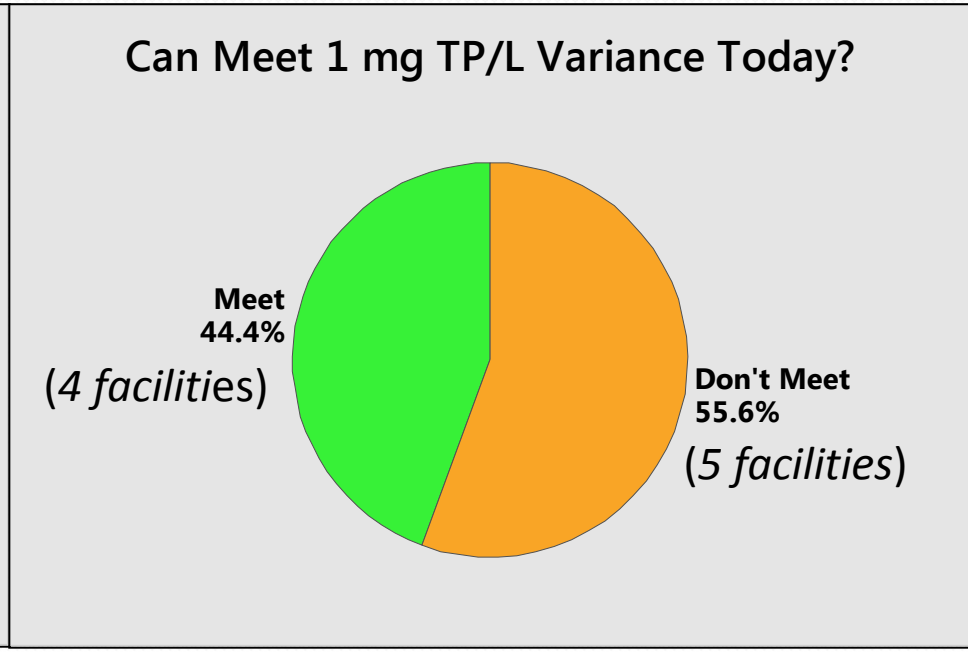
Results: ≥1 MGD Group (n=21)



≥1 MGD Group

Among the facilities that need a variance (n=9 or 10)



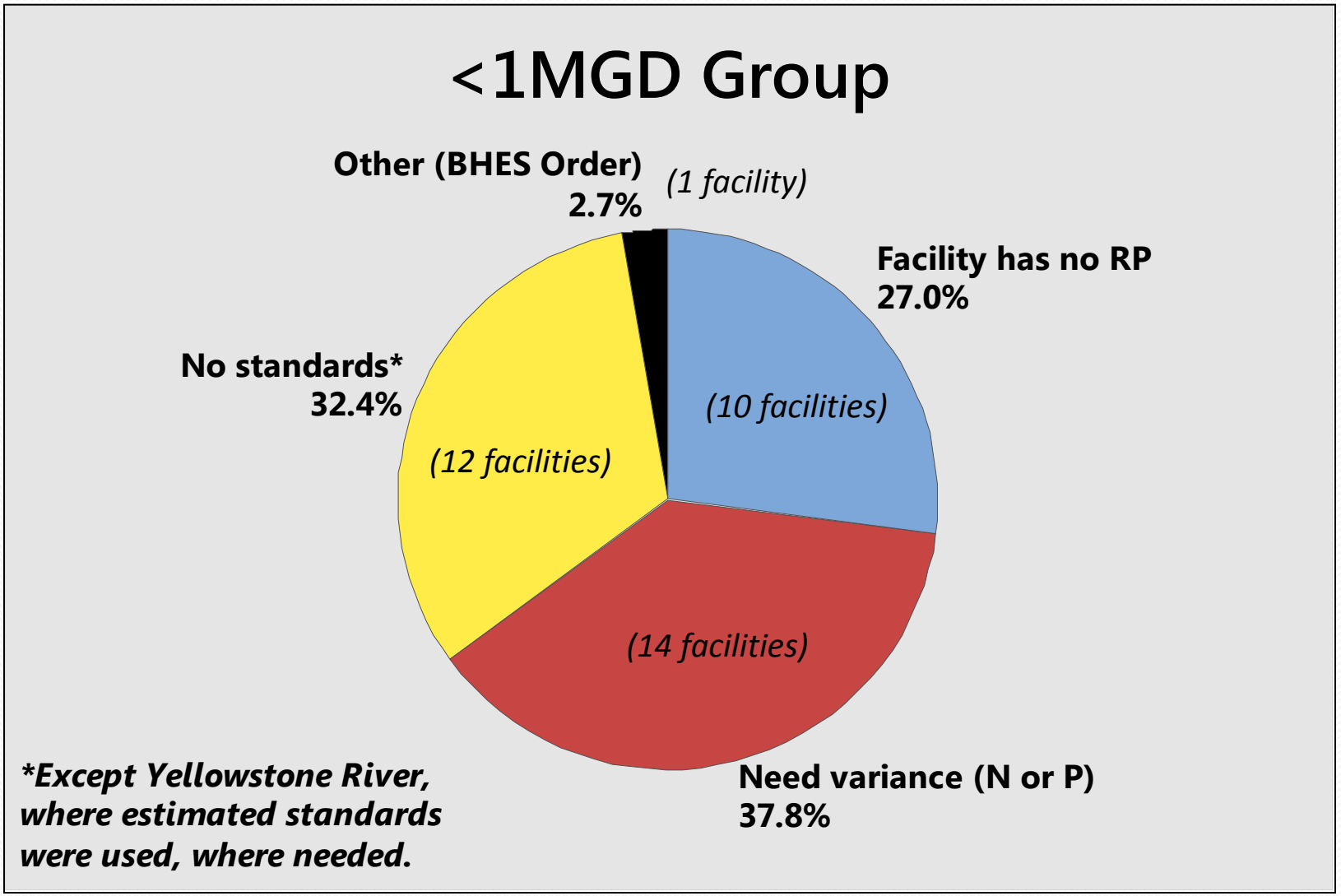


Only facility not meeting 10 mg TN/L variance is Whitefish WWTP.

Timelines and Permits for Whitefish (MT0020184)

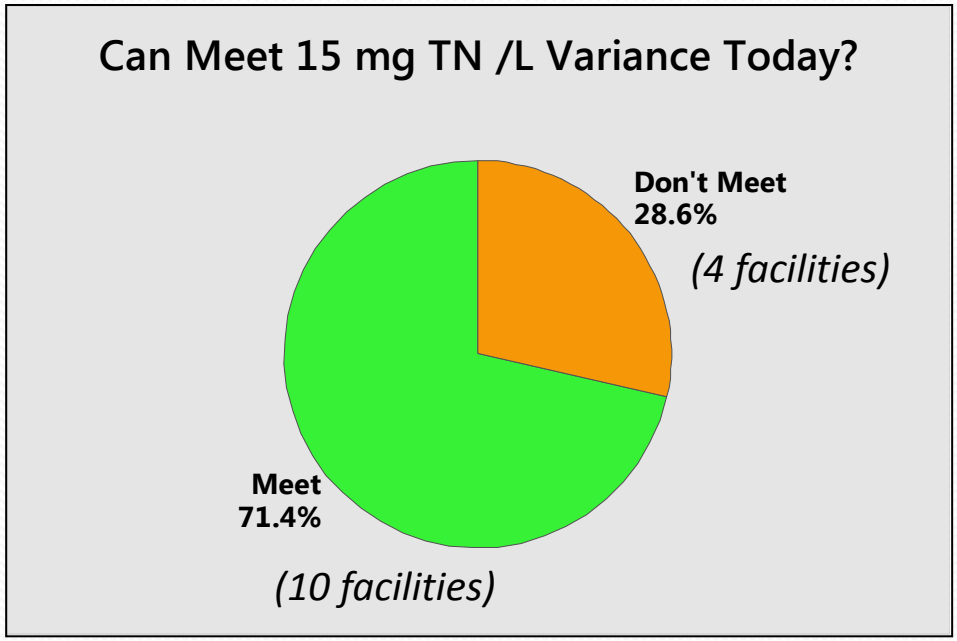
- Permit renewed in 2015, permits valid until 2020
- Next nutrient standards triennial review is 2019

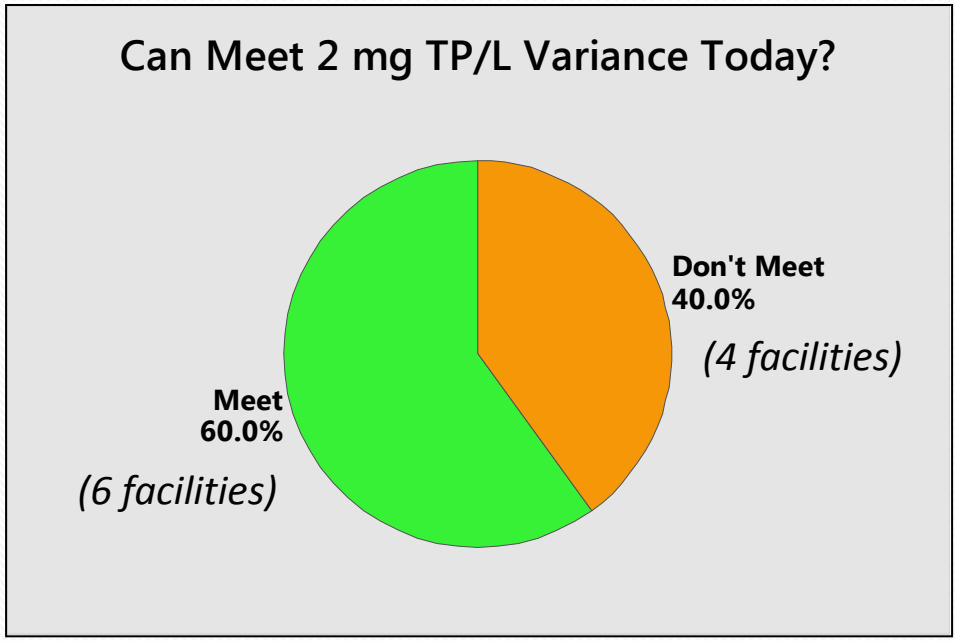
Results: <1 MGD Group (n=37)



<1 MGD Group

Among the facilities that need a variance(n=14 or 10)





Optimization, results to 2016

	MONTANA POTW	Effluent Total Nitrogen			Effluent Total Phosphorus		
		BEFORE (mg/L)	AFTER (mg/L)	PERCENT REDUCTION	BEFORE (mg/L)	AFTER (mg/L)	PERCENT REDUCTION
	BNR PLANTS						
<1MGD	Columbia Falls	10	7	32%	2.5	0.3	87%
<1MGD	East Helena	20	10	48%	NR	NR	NA
≥1MGD	Helena	7	5	31%	2.9	2.0	32%
<1MGD	Manhattan	10	8	21%	1.5	0.4	73%
	NON BNR PLANTS						
<1MGD	Big Sky	25	14	46%	1.3	1.4	-8%
<1MGD	Chinook	26	3	88%	2.8	0.30	89%
<1MGD	Conrad	35	5	85%	2.1	0.13	94%
≥1MGD	Hamilton	7	3	54%	5.5	4.0	28%
≥1MGD	Hardin	18	4	78%	2.1	2.4	-14%
<1MGD	Libby	32	21	34%	4.6	3.0	35%
<1MGD	Lolo	28	21	25%	4.6	4.4	5%

Lagoon Group

- 65 individual Permits
  - Also 26 General Permits, not included in this analysis

- DEQ has long recommended land application so that these facilities would be out of the stream in summer

Lagoon Optimization Studies

- DEQ pilot began June 2016, Joliet, MT
  - Continuous ‘before’ data in Joliet lagoon
    - Ammonia, nitrate, pH, ORP, temperature, DO
  - 2017: Install technology/optimization (TBD)

Observations and Findings

- 2 years since rules adopted, 5 years since statute adopted, >8 years since communities began learning of pending nutrient standards

- **≥1MGD group**: 90% meet 10 mg TN/L now, ~half meet 1 mg TP/L

- **<1MGD group:** ~30% don't meet 15 mg TN/L, ~40% don't meet 2 mg TP/L. Optimization has shown great promise for facilities in this group to greatly reduce nutrients

- **Lagoons:** Optimization studies starting (multi-year projects). DEQ has recommended land ap (where feasible) for many years and it has been applied in many cases

Questions/Discussion

≥1 MGD facilities not meeting TP variance

- Billings
- Helena
- Butte
- Hamilton
- Havre

<1 MGD facilities not meeting variance

Total N (TN)

- Stevensville
- Elkhorn Rehab Center (Clancy)
- MT Behavioral Clinic (Galen)
- Bonner Property Development

Total P (TP)

- Stevensville
- Rocker
- Elkhorn Rehab Center (Clancy)
- MT Behavioral Clinic (Galen)