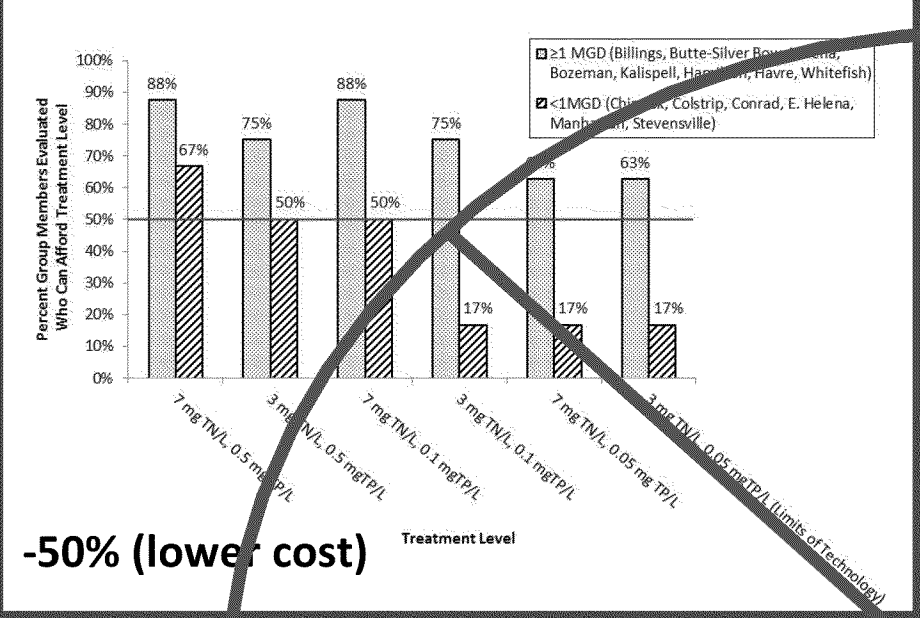
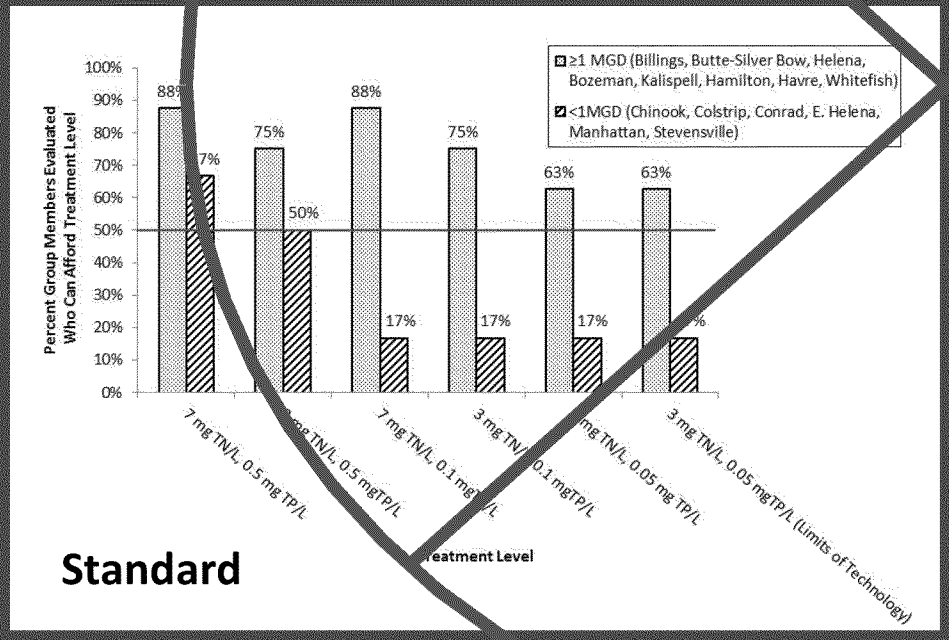
Nutrient Work Group Subcommittee Meeting

February 15th, 2017

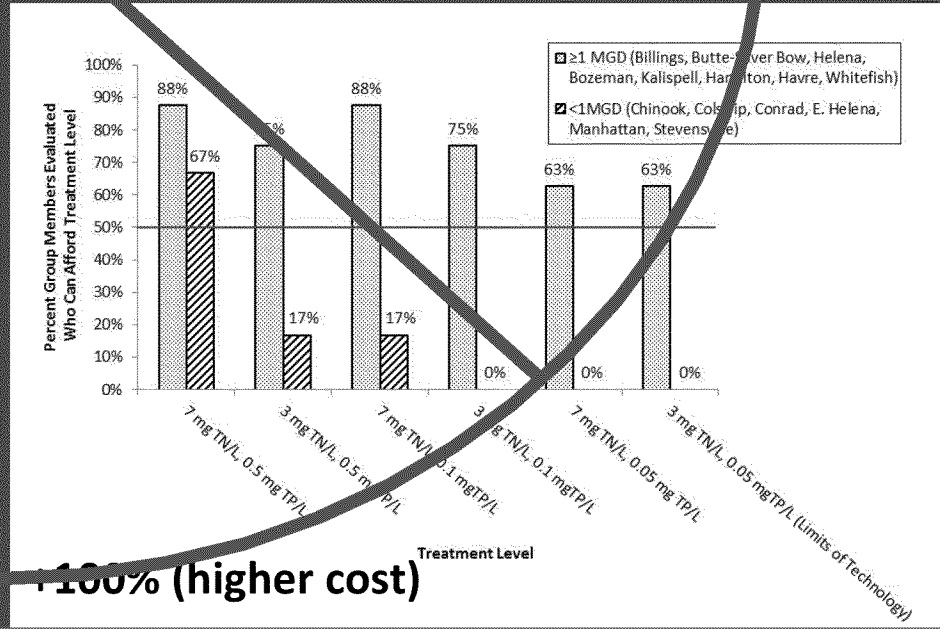
Group HAC: Effect of Different Cost Estimates (per TetraTech 2016)



-50% (lower cost)



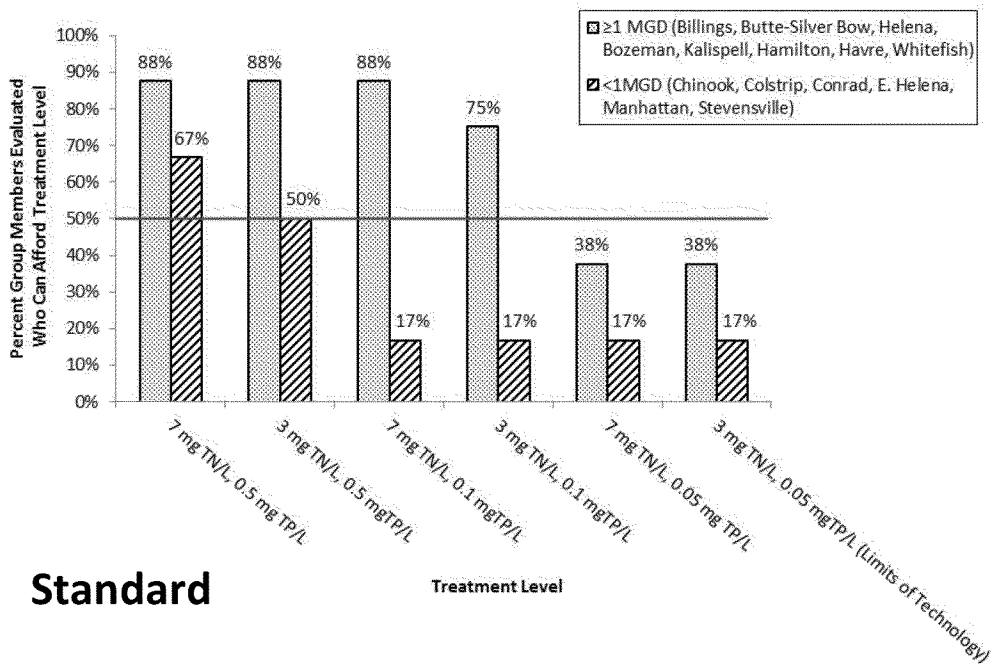
Standard



+100% (higher cost)

Updated and Corrected Figures

MHI Source: *American Community Survey 5-year 2011-2015 estimates*

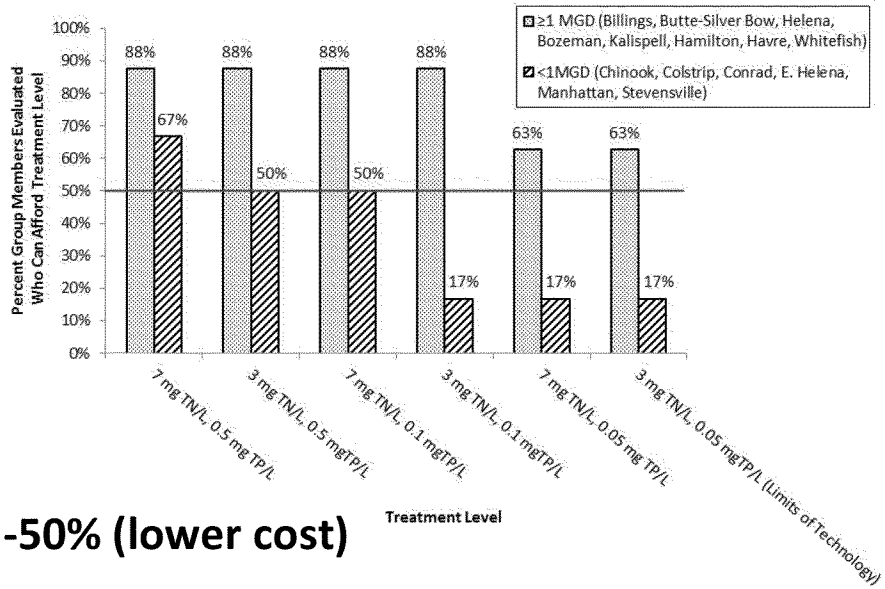


Standard

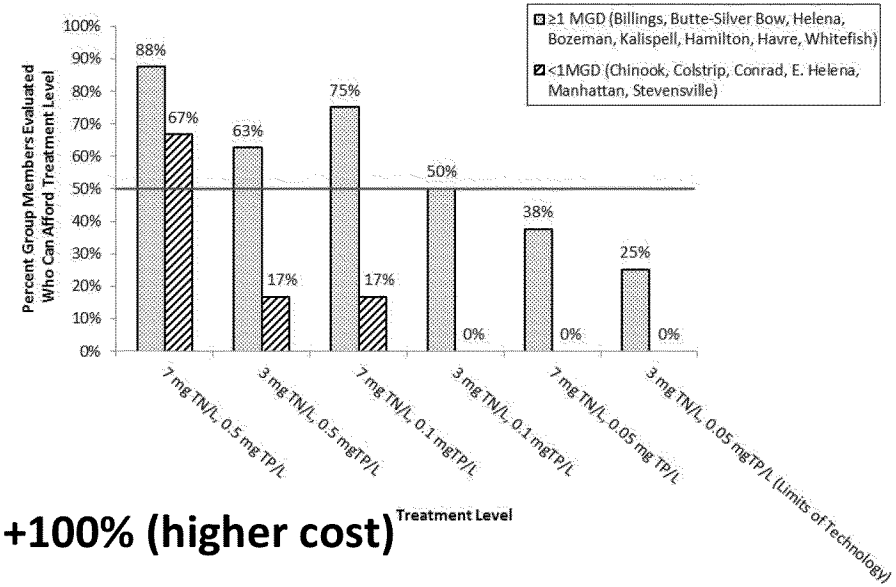
Suggests Group Cap:

≥1MGD: 3-5 mg TN/L, 0.1 mg TP/L

<1MGD: 3-7 mg TN/L, 0.5 mg TP/L



-50% (lower cost)



+100% (higher cost)

Limits of Technology (LOT)

Form	Common Removal Mechanism	Technology Limit, mg/L
Total Nitrogen		
Ammonia-N	Nitrification	<0.5
Nitrate-N	Denitrification	1-2
Particulate Organic-N	Solids separation	<1.0
Soluble Organic-N (non-biodegradable)	None	0.5– 1.5
Total Phosphorus		
Soluble P	Microbial uptake and/or chemical precipitation	0.1
Particulate	Solids removal	<0.05

Table 3: Effluent TN and TP Components and Achievable Limits

From Jeyanayagam 2005 (Biological Nutrient Removal)

~2.3 to 5 mg TN/L

~0.13 to 0.15 mg TP/L

- Can be viewed as absolute achievability or as consistent achievability
- Absolute: 3.84th percentile of effluent data*
- Achievable: 95th percentile often cited*

*WERF, 2011. Nutrient Management Volume II.

2017-010046-0000297

Table 5-2. Total Phosphorus Daily Data TPS Concentrations (mg/L) from Plants.

Plant	Process Code [a]	TP Permit (mg/L)/Averaging Period [b]	3.84% (14d)	50%	95%	3.84%/50%	95%/50%
Iowa Hill, CO	2-3C_{Al}-3F	0.05/A	0.004	0.012	0.045	0.33	3.8
Blue Plains, DC	1C_{Fe}-2C_{Fe}-3C_{M}-3F	0.18/A	0.005	0.070	0.180	0.07	2.6
Pinery, CO	2BC_{F}-3C_{Al}F	0.05/M	0.013	0.023	0.045	0.58	2.0
F. Wayne Hill, GA	1-2BC_{Al}-3C_{Fe}-3UF	0.13/M	0.020	0.040	0.110	0.50	2.8
Rock Creek, OR	1C_{Al}-2-3C_{Al}-3F	0.10/MM	0.025	0.065	0.210	0.38	3.2
ASA, VA	1C_{Fe}-2$C_{M}$$C_{Fe}-3C_{Al}$-3F	0.18/M	0.025	0.050	0.120	0.50	2.4
Cauley Creek, GA	2BC_{Fe}-3UF	0.13/M	0.040	0.080	0.160	0.50	2.0
Clark County, NV	1C_{Fe}-2B-3C_{Al}-3F	0.14/M	0.045	0.081	0.201	0.55	2.5
Kalispell, MT	1-2BC_{Al}-3F	1.0/M	0.050	0.100	0.230	0.50	2.3
Kelowna, BC	1-2B$C_{Al}$$C_{F}$-3F	0.25/A	0.090	0.150	0.324	0.60	2.2

Note:
a. See Chapter 3.0 for explanation.
b. A = Annual, M = Monthly, MM = Monthly Median; Perm
the plant operates. Permits requirements varies – for exa
operates under an annual limit

Table 4-2. Total Nitrogen Daily Data TPS Concentrations (mg/L) from Plants.

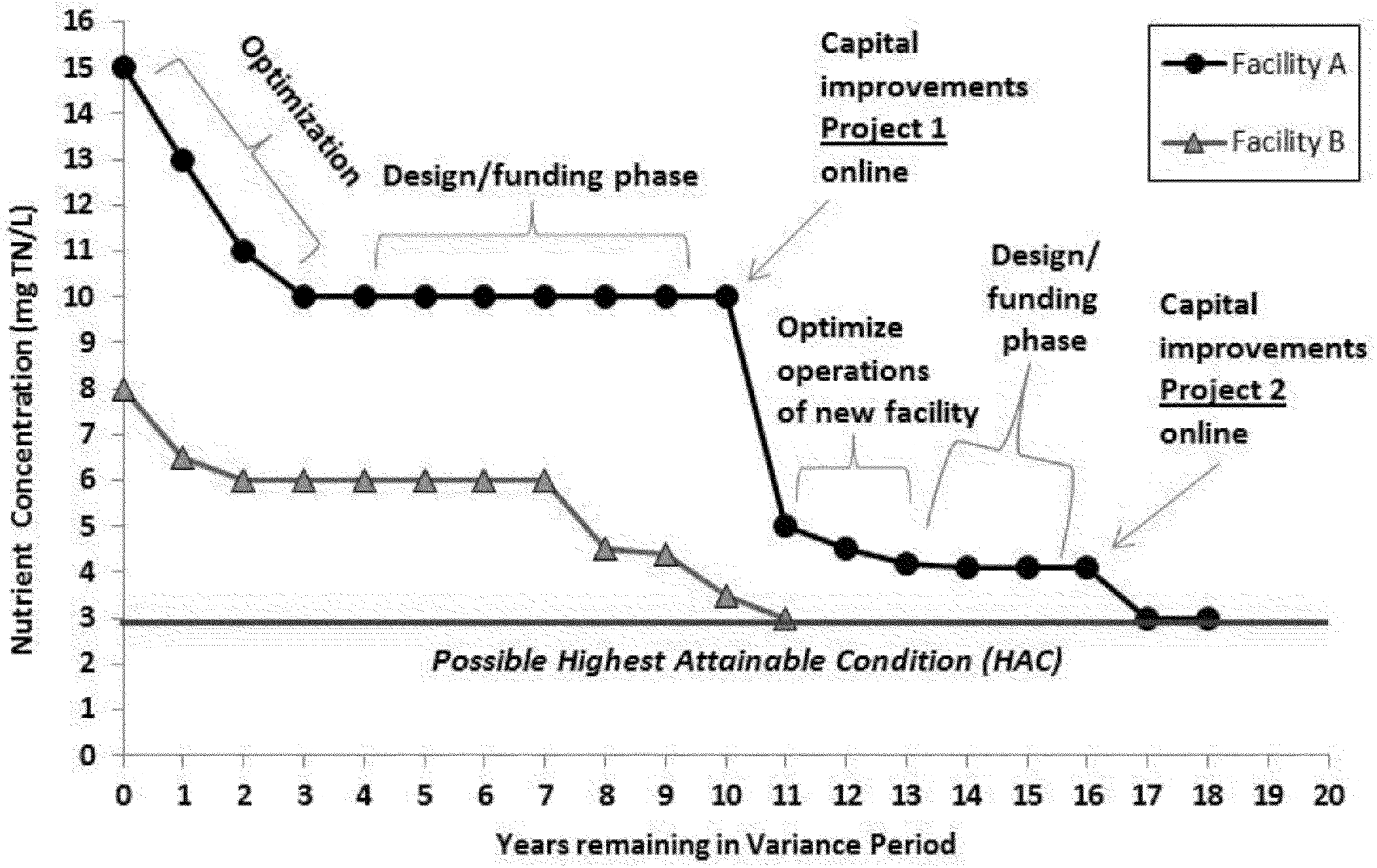
Plant	Process Code [a]	TN Permit (mg/L)/Averaging Period [b]	3.84% (14d)	50%	95%	3.84%/50%	95%/50%
Fiesta Village, FL	2C_{Al}-3C_{M}DF	3/M	0.25	1.03	2.71	0.25	2.62
Kalkaska, MI	2BC_{Fe}	5 [c]/W	0.31	0.75	2.40	0.41	3.20
Western Branch, MD	2$C_{M}$$C_{Al}$-3F	3/M	0.66	1.47	3.20	0.45	2.18
River Oaks, FL	1C_{Al}-2C_{Al}-3C_{M}-3F	3/A	0.78	1.45	2.92	0.54	2.01
Truckee Meadows, NV	1-2-3NTF-3C_{M}-3F	2/M	1.16	1.57	2.85	0.74	1.82
Scituate, MA	2-3C_{M}DF	4/M	1.21	2.37	4.22	0.51	1.78
Piscataway, MD	1-2C_{Al}-3F	8/M	1.30	3.00	8.00	0.43	2.67
Tahoe-Truckee, CA	1-3C_{L}-3C_{M}-3$_{CAl}$F	3/M	1.67	2.50	3.37	0.67	1.35
Eastern WRF, FL	2BC_{Al}-3F	3/A	2.08	3.64	8.56	0.57	2.35
Parkway, MD	1-2$_{CAl}$	7/M	2.10	3.40	6.40	0.62	1.88

Note:
a. See Chapter 3.0 for explanation.
b. A = Annual, M = Monthly, W = Weekly
c. Kalkaska has a TIN based permit.

From WERF 2011 Nutrient Management Vol. II

Go to spreadsheet…

Visual of Narrative Steps (TN example)



Reduction Steps in Current Guidance

- **1. Facilities > 1 million gallons per day:**

- A. By 2016 (or first receipt of general variance): 10 mg TN/L, 1.0 mg TP/L
- B. Next permit cycle (+5 years): 8 mg TN/L, 0.8 mg TP/L
- C. Next permit cycle (+5 years): 8 mg TN/L, 0.5 mg TP/L
- D. Next permit cycle (+5 years): *Under Development*

- **2. Facilities < 1 million gallons per day:**

- A. By 2016 (or first receipt of general variance): 15 mg TN/L, 2.0 mg TP/L
- B. Next permit cycle (+5 years): 12 mg TN/L, 2.0 mg TP/L
- C. Next permit cycle (+5 years): 10 mg TN/L, 1.0 mg TP/L
- D. Next permit cycle (+5 years): 8 mg TN/L, 0.8 mg TP/L

- **3. Lagoons not designed to actively remove nutrients:**

- A. By 2016 (or first receipt of general variance): Maintain current lagoon performance and commence nutrient monitoring in the effluent
- B. Next permit cycles (+5 years): Implement BMPs identified during optimization study so long as the BMPs do not require major investment

Thank You