Rational IPP Permitting

Protect POTW/Environment

and

Promote Local Economy

FISHBECK, THOMPSON, CARR, & HUBER INC.

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Rational IPP Permitting?

- Accurate/Up-to-Date Headworks Loading Evaluation
  - Protect the POTW and its workers
  - Protect the environment
- Full Significant Industrial User (SIU) Characterization
  - Comprehensive database
  - Average/maximum flows and loads
- Sensible Permit Conditions
  - *Give 'em what they need* attitude (within constraints)
  - Justifiable limits and monitoring frequencies

AGENDA

1. Rapid Review
   - Pollutants of Concern
   - MAHLs, MAILs, & CSLs
   - Local Limits/SALs
2. Permitting Basics
   - The Permit Form
   - Permit Limits
   - Permit Monitoring Frequencies
3. Case Study

PART 1

RAPID REVIEW

Pollutant of Concern (POC) Definition

Any pollutant which could cause:

- Pass-through
  - Exceedance of NPDES permit limit
  - Exceedance of water quality standard
- Interference
  - Biosolids contamination
  - Operating disruption (e.g., biological inhibition)
  - Collection system hazard

Standard POCs – Compatibles

Surchargeable	Not Surchargeable
BOD_5 (or COD)	FOG
TSS	TDS
Total-P	pH
NH_3-N (or TKN)	

Standard POCs – Toxics

The "Michigan 12"	
Arsenic	Mercury
Cadmium	Molybdenum
Chromium	Nickel
Copper	Selenium
Cyanide	Silver
Lead	Zinc

Nonstandard POCs

- Worst-case effluent concentration (0% removal), exceeds critical fraction of WQBEL

  Recommended… ≥50% WQBEL

- Any significant health/safety risks
- Regulated by applicable categorical standard

Common Nonstandard POCs
Hexavalent Chromium
Total Phenols
VOCs
PNAs

MAHLs

- Max. Allowable Headworks Loading
- Lowest of:
  - Basis of Design
  - Pass-Through
  - Biosolids Quality
  - Biological Inhibition

MAILs

- Max. Allowable Industrial Loading

MAHL

– Safety factor (10 min.)

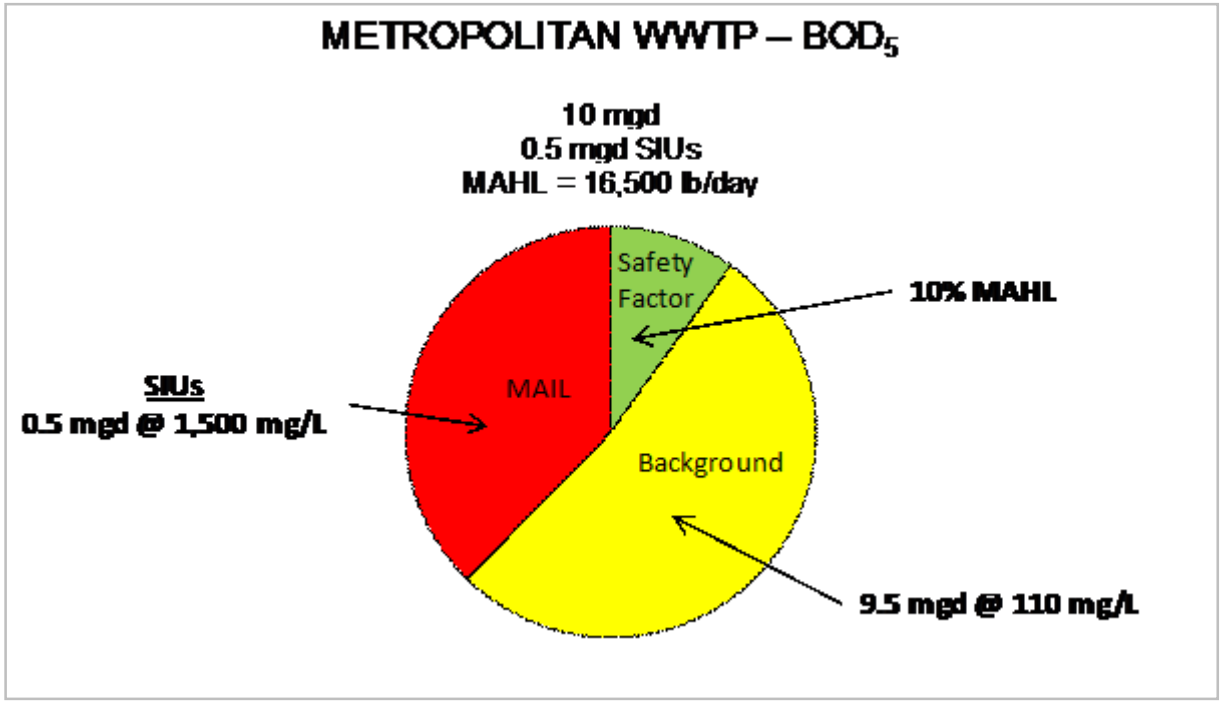
– Background Load

– Septage Load

- Compatibles: >50% of MAHL typ
- Toxics: <10% of MAHL typ

Local Limits

- Uniform Allocation Method most common
- MAIL-equivalent concentration for total SIU flow

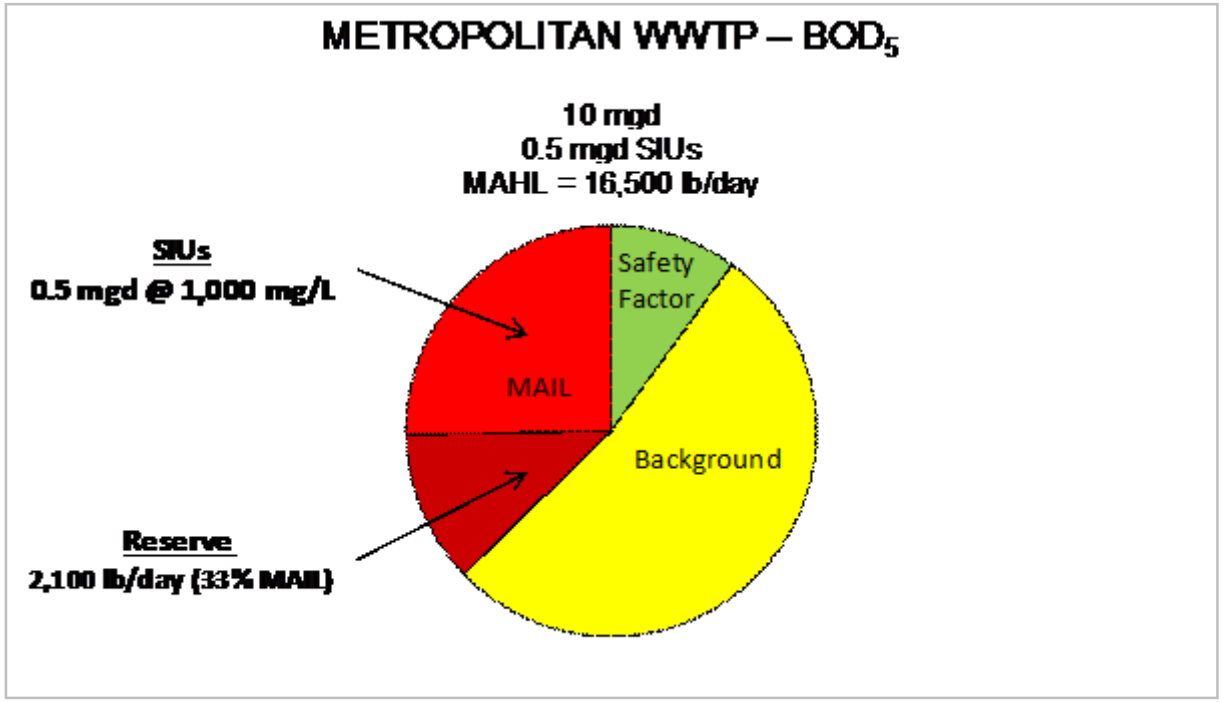


Special Alternative Limits (SALs)

- Many wastewater utilities experiencing lower flows, loads, and operating margins
- All available capacity cannot be accessed
  - "Consumed" by uniform allocation
- SALs provide flexibility and opportunity
  - Available capacity is asset for promoting local economy
  - Potential to increase extra-strength surcharge revenues
  - More complex procedures, but simple in concept
- Rapidly gaining popularity across Michigan, particularly for compatibles

SALs Concept

- Reserve portion of MAIL
- Uniformly allocate what remains
- When SAL assigned, withdraw from reserve



Collection System Limitations (CSLs)

- Not-to-exceed concentration, even for SALs
- FOG
  - Flow Obstruction
- pH, TDS
  - Structural Corrosion
- Organics
  - Fire/Explosion
  - Toxic Fumes

PART 2

PERMITTING BASICS

Regulation of Industrial Users

1. Identify users to be permitted
2. Characterize discharges
3. Control via permit
4. Observe by random surveillance
5. Enforce where necessary

Key Elements of Permit Form

Cover Sheet

- Permit number
- User ID/location
- Effective and termination dates
- Approval signature

Specific Requirements

- Location of outfall(s)
- Limits and monitoring frequencies
- Sample points/types
- Reporting
- Special conditions

Terms and Conditions

- General prohibitions
- Other SUO requirements
- Penalties

Permit Limits and Monitoring Frequencies

- Most common permitting issue
  - SUO often contains many local limits
  - What POCs should have limits in permit?
  - How often should these POCs be monitored?
- Rational permitting: apply reasonable potential for
  - Pass-through/interference
  - Limit exceedance

Reasonable Potential

- Derived from MDEQ rules and policies
- Convert sampling data to Potential Effluent Quality

Recommended…

Maximum Concentration Uncertainty Factor*

If D>10, uncertainty factor = 1.0

If D<10, uncertainty factor from reasonable potential table:

N=1	6.2
2	3.8
3	3.0
4	2.6
5	2.3
6	2.1
7	2.0
8	1.9
9	1.8
10-11	1.7
12-13	1.6
14-16	1.5
17-20	1.4
>20	1.3
>30	1.2
>40	1.1
>50	1.0

Permit Limits

- Not all local limits need to be in permit
- Can use reference to SUO, where appropriate
- Select by evaluation of reasonable potential for pass-through/interference or limit exceedance
  - Significant PEQ mass
    Recommended… ≥5% of MAIL
  - Significant PEQ concentration
    Recommended…≥ 50% of applicable limit

Monitoring Frequencies

- Select monitoring frequencies by reasonable potential for limit exceedance

Recommended…

PEQ:Limit Ratio	Monitoring Frequency x/yr
≥0%	0
>2[illegible]%	2
>50%	4
>100%	12
>150%	24
>200%	52

PART 3

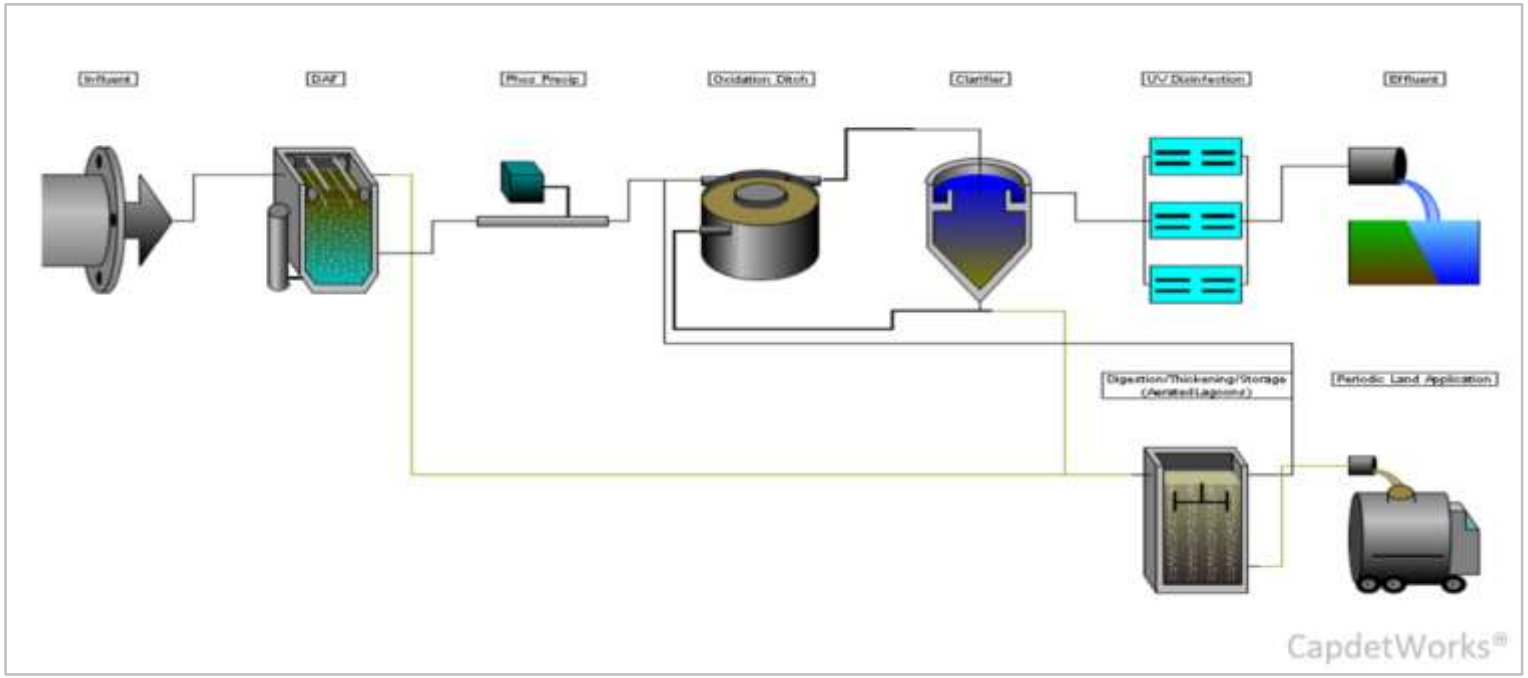
CASE STUDY

The Lakewood Experience

Lakewood Wastewater Authority

- Village of Lake Odessa
- Village of Woodland
- Parts of Berlin Township and Odessa Township

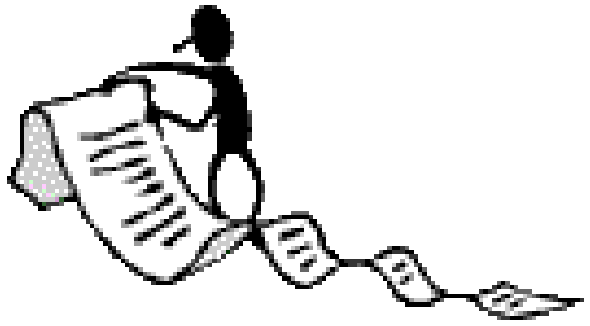
- WWTP
  - Permitted capacity of 1.2 million gallons per day (mgd)
  - Discharge to Little Thornapple River (low flow)



Unusually High Industrial Loads

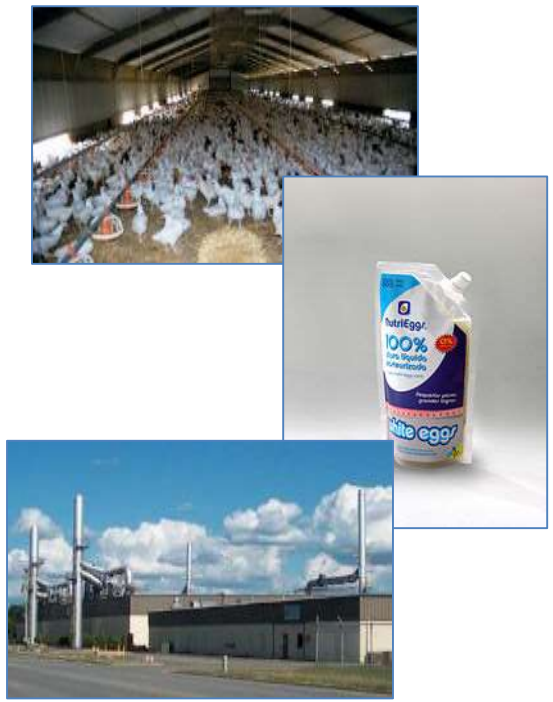
Parameter	Influent	Background	SIUs	SIU % of Influent
Flow, mgd	1.132	0.352	0.780	**70**
BOD_5, lb/day	5,933	508	5,425	**>90**
TSS, lb/day	2,079	781	1,298	**60**
Total-P, lb/day	53.5	15.2	38.3	**70**
TKN, lb/day (NH_3-N)	434 (121)	114 (90)	320 (31)	**75** (25)

MDEQ Enforcement



- Administrative Consent Order (ACO) findings
  - Numerous NPDES permit violations
  - Influent BOD_5 exceeded Basis of Design
  - SIUs causing pass-through and interference
- Many new requirements, including new IPP
  - User Survey
  - Headworks Loading Evaluation
  - Sewer Use Ordinance
  - Enforcement Response Plan
  - Manual of Procedures
  - SIU Permits

Permitting Challenge



- SIUs all large food industries
  - Commercial poultry
  - Bulk liquid eggs
  - Fresh-to-frozen vegetables
- No prior regulation or control
- Need for support of local economy and jobs

Rational Permit Plan

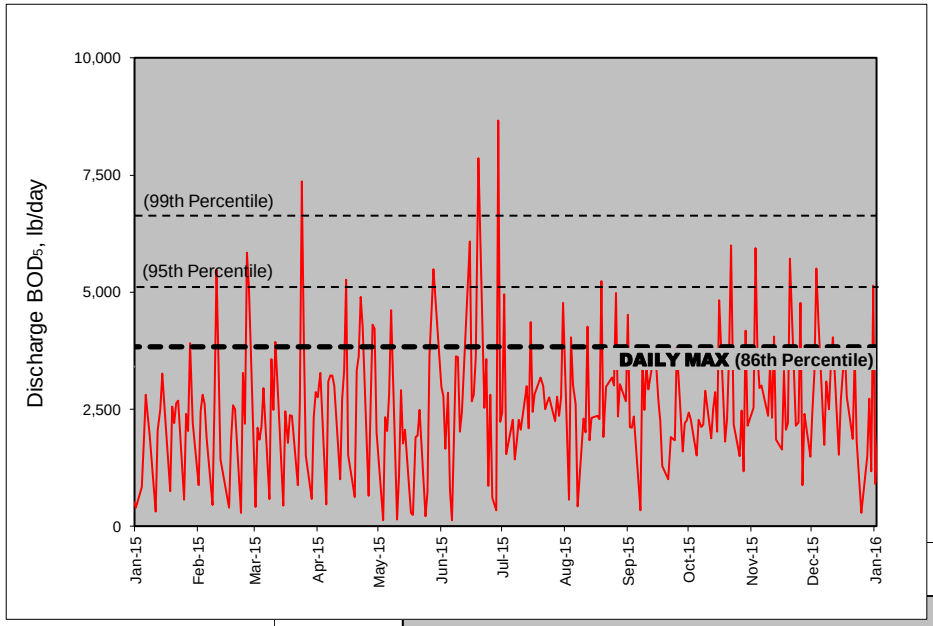
- Focus on the problem (compatibles)
- Seek sensible permit conditions
- *Give 'em what they need* attitude, subject to constraints:
  - MAHL cannot be exceeded
  - MAIL cannot be exceeded

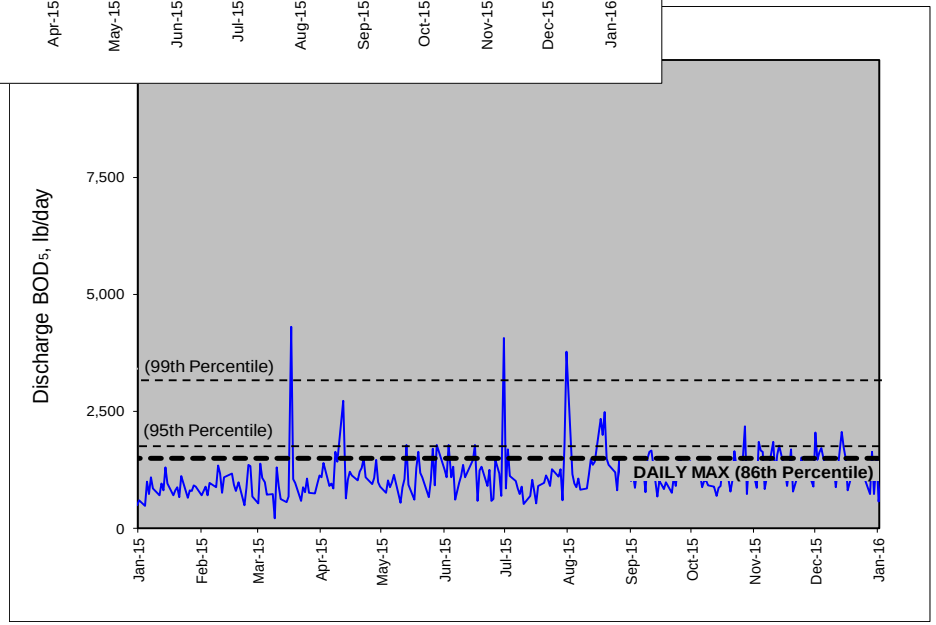
Allocation Options

- Willing to allocate ~100% of current MAILs
- Local Limit Option
  - Same concentration limits for all
  - Normal discharge concentration basis for surcharges
- SAL Option
  - Specific mass limits for each SIU
  - Mass limit basis (less domestic credit) for surcharges
- After investigating pretreatment feasibility and costs, unanimous agreement on SAL option

Potential SALs

- Each SIU offered potential SALs
- Selection based on percentile of current discharge mass
  - Adjusted for each POC to not exceed MAHL or MAIL
- SIU choice of how much to accept
  - Economic decision
  - SAL-based surcharge cost vs. pretreatment cost





Potential Surcharge Revenues

Local Limit Option

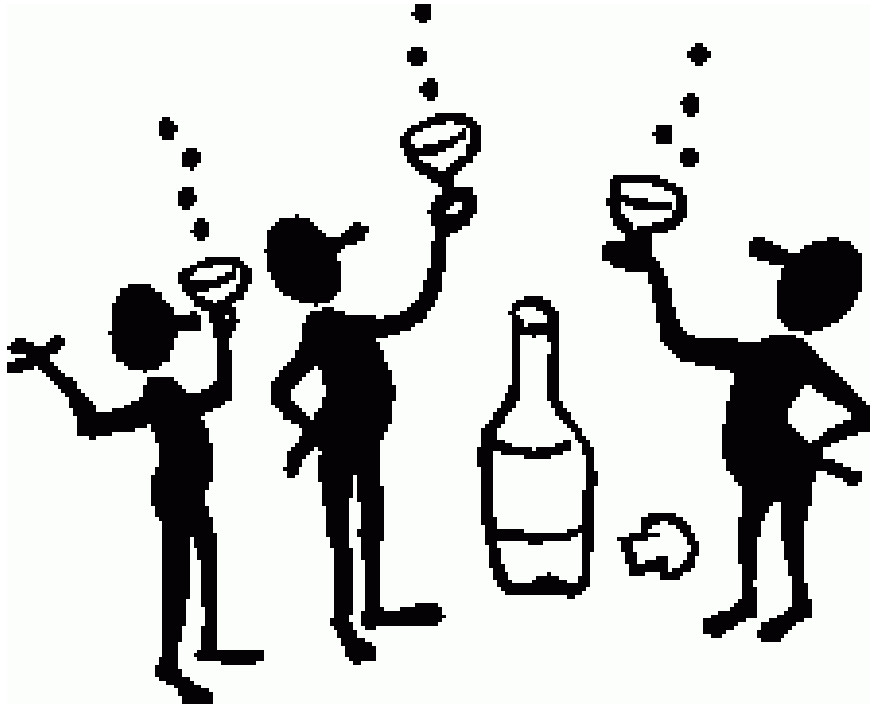
- Basis (discharge concentration)
  - $0.22/lb BOD_5 for >300 mg/L
  - $0.25/lb TSS for >350 mg/L
  - $3.90/lb Total-P for >10 mg/L
  - $0.57/lb TKN for >32 mg/L
- $24,500 monthly
- $290,00 annually

SAL Option

- Basis (mass limit less domestic credit)
  - $0.22/lb BOD_5
  - $0.25/lb TSS
  - $3.90/lb Total-P
  - $0.57/lb TKN
- $46,000 monthly **+$21,500**
- $550,000 annually **+$260,000**

The Goal

Mutually Beneficial Agreements



PERSPECTIVE

- Rational permitting means
  - Accurate/up-to-date headworks loading evaluation
  - Full SIU characterization
  - Sensible permit conditions
- Reasonable potential can help select permit limits and monitoring frequencies
- Where appropriate, consider compatible SALs
  - Help reduce unused WWTP capacity
  - Avoid major pretreatment costs for SIUs
  - Increase strength surcharge revenues
  - Achieve ultimate flexibility… and a potential win-win

Thank You

For additional information…

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Definitions & Acronyms

ACO – administrative consent order
BOD_5 – 5-day biochemical oxygen demand
COD – chemical oxygen demand
CSL – collection system limitation
D – number of detectable data points
IPP – Industrial Pretreatment Program
lb – pound
MAHL – maximum allowable headworks loading
MAIL – maximum allowable industrial loading
MDEQ – Michigan Department of Environmental Quality
mg/L – milligrams per liter
N – number of total data points
NH_3-N – ammonia nitrogen
NPDES – National Pollutant Discharge Elimination System
PEQ – potential effluent quality
PNA – polynuclear aromatic hydrocarbon
POC – pollutant of concern
POTW – Publicly owned treatment works
SAL – Special alternative limit
SIU – Significant Industrial User
SUO – sewer use ordinance
TDS – total dissolved solids
TKN – total Kjeldahl nitrogen
Total-P – total phosphorus
TSS – total suspended solids
VOC – volatile organic compound
WQBEL – water quality based effluent limit
WWTP – Wastewater treatment plant