Agenda

- Background
- Local Limits Defined & Purpose
- Calculating Local Limits
- Examples
- Implementation
- Final Thoughts
- Q&A
Background

Clean Water Act of 1972, amended 1977

Corrosion of Collection System and/or Treatment Plant

Injury to Workers from Hazardous Fumes

Explosions

Interference with Wastewater Treatment Facility

Pass-Through of Toxics into Surface Waters

Limitations on Sludge Disposal Options and/or Greater Expense
Background

- Clean Water Act (1972, amended 1977)
- General Pretreatment Regulations for Existing & New Sources of Pollutions – 40 CFR Part 403
- National Pretreatment Standards:
  - Prohibited Discharges
  - Categorical Standards
  - Local Limits
Specific Prohibitions [40 CFR 403.5(b)]

Pollutants that:

- Create fire or explosion hazards 🔥
- Cause structural damage due to corrosion
- Cause obstructions in the flow to the POTW
- Released at excessive rates of flow or concentration
- Excessive heat in amounts that inhibit biological activity
- Certain oils that cause pass through or interference
- Result in the presence of toxic gases, vapors or fumes
- Trucked or hauled pollutants (except at designated discharge points)
Categorical Standards

- Developed by EPA
- Applicable nationwide
- Limits for specific industries
- 40 CFR 405 through 471
- Some common categories in Michigan
  - metal finishing, centralized waste treatment, pulp, paper & paperboard, electroplating, dairy products processing, sugar processing, meat & poultry products
Local Limits

▪ Developed by POTWs to enforce specific prohibitions and limits

▪ Protect against site-specific pass through, interference and inhibition

▪ Work in tandem with categorical limits – local limits can be more or less stringent; however IUs must comply with the most stringent limitation for each pollutant
Local Limits

- Where do I start?
- EPA Decision Tree to determine if new limits are needed
- The process for developing all new limits or re-evaluating after significant changes is similar
Local Limits Development

- Developing local limits is a process, includes:
  - Determine Pollutants of Concern
  - Sampling and lab analysis
  - Calculate AHLs for several environmental criteria
  - Determine MAHL and MAIL for PoCs
Local Limits Development

- Can seem daunting if haven’t done it before
- Review EPA’s guidance
- Discuss with MDEQ District IPP staff before getting started
- Consider getting outside assistance
Step 1: Determine Pollutants of Concern

- EPA’s 15 National POCs

<table>
<thead>
<tr>
<th>Arsenic</th>
<th>Cyanide</th>
<th>Nickel</th>
<th>BOD$_5$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadmium</td>
<td>Lead</td>
<td>Selenium</td>
<td>TSS</td>
</tr>
<tr>
<td>Chromium</td>
<td>Mercury</td>
<td>Silver</td>
<td>Ammonia</td>
</tr>
<tr>
<td>Copper</td>
<td>Molybdenum</td>
<td>Zinc</td>
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</table>

- Review recent available data and NPDES permit to determine others
- Typically add Phosphorus in Michigan
Step 2: Develop Sampling Plan

- Typically need more analytical data than available from routine sampling
- Develop a sampling plan to review with MDEQ
- Sample requirements – at least 6 for:
  - Each SIU/CIU
  - WWTP influent
  - Primary effluent
  - Final effluent
  - Domestic sample(s)
- Biosolids/sludge
- Need corresponding flows
Step 2: Develop Sampling Plan

- **Representative data:**
  - Flow proportional composite samples, if possible
  - Grab samples for those parameters where required
  - Vary sample days
  - Account for hydraulic retention times
  - Don’t collect samples during rain events if you have a lot of I/I or combined sewer

- **Account for seasonal variations**
  - Food processors might have significant variations
  - Lagoon systems achieve different performance in summer vs. winter
  - Seasonal limitations – e.g. ammonia much lower during summer
Step 2: Develop Sampling Plan

Typically analyze the 1st set of samples for full scan of pollutants.

Determine if any of these should be added as a POC after reviewing first round of analytical data.
Step 3: Calculate MAHLs for each POC

Maximum Allowable Headworks Loading

▪ The estimated maximum loading of a pollutant that can be received at a POTW’s headworks without causing pass through, interference (or biosolids contamination)

▪ Determined as the most protective (lowest) of the AHLs estimated for a pollutant.
MAHL Determination – Non-Compatibles

- Criteria Considered:
  - NPDES discharge or GW permit effluent limits
  - Water Quality based limits (chronic or acute toxicity)
  - Secondary Treatment Inhibition
  - Nitrification Treatment Inhibition
  - Digester Inhibition
  - Biosolids Contamination (Part 503)
MAHL Determination – Non-Compatibles

- Discharge permit limits

\[ L_{NPDES} = \frac{8.34 \times C_{NPDES} \times Q_{POTW}}{(1 - R_{Avg})} \]

\[ L_{Chronic} = Q_{POTW} \times 8.34 \times \frac{WQBEL_C}{1000} \times \frac{1}{(1 - R_{Avg})} \]

- Water Quality based limits

\[ WQBEL_C = C_{WQS} \times \frac{(Q_{MAX} + (25\% \times Q_{STREAM})}{Q_{MAX}} \]

\[ C_{WQS} \text{ for various pollutants are tabulated in Part 57 Rules} \]
MAHL Determination – Non-Compatibles

- **Treatment Inhibition**
  \[
  L_{\text{INHIB,Sec}} = \frac{Q_{\text{POTW}} \times 8.34 \times C_{\text{INHIB,Sec}}}{1 - R_{\text{PRIM}}}
  \]
  \[
  L_{\text{INHIB,Dig}} = \frac{Q_{\text{Dig}} \times 8.34 \times C_{\text{INHIB,Dig}}}{R_{\text{Avg}} \times F_{\text{sorp}}}
  \]

- **Digester Inhibition**

- **Biosolids Contamination**
  \[
  L_{\text{Sludge}} = Q_{\text{Sludge}} \times \frac{TSS_{\text{Sludge}}}{100} \times 8.34 \times \frac{C_{\text{Sludge}}}{R_{\text{avg}} \times F_{\text{sorp}}}
  \]
MAHL Determination – Non-Compatibles

- AHL formulas explained:

\[ L_{INHIB,Sec} = \text{Loading}_{\text{CRITERIA}} \]

\[ Q_{POTW} = \text{Flow}_{\text{LOCATION}} \]

\[ C_{NPDES} = \text{Concentration}_{\text{CRITERIA}} \]

\[ R_{Avg} = \% \text{removal}_{\text{CRITERIA}} \]
**MAHL Determination – Non-Compatibles**

- Example of non-compatible MAHL spreadsheet

<table>
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<th>Nickel</th>
<th>Selenium</th>
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<td>0.488</td>
<td>0.537</td>
<td>0.375</td>
<td>-</td>
<td>12.95</td>
</tr>
</tbody>
</table>

| MAHL (lbs/day) | 0.212 | 0.105 | 6.624 | 1.063 | 0.662 | 1.702 | 0.034 | 0.488 | 0.537 | 0.375 | 0.013 | 5.63 |
| Basis          | BS    | A     | SI    | A     | SI    | BS    | A     | BS    | BS    | BS    | BS    | C    | A    |
MAHL Determination - Compatibles

• Criteria Considered – Compatible Pollutants
  • NPDES discharge permit limits (or GW permit effluent limits)
  • Water Quality based limits
  • WWTP Design Basis
  • Calibrated Biological Wastewater Treatment Plant Models (for max day loading, if DEQ approves this method)
Safety Factors

- Need to include safety factor
- EPA Guidance recommends minimum of 10%
- Higher safety factors are needed if there’s a history of non-compliance due to a POC
- For example, community has history of digester inhibition problem with nickel, increase the nickel SF so the local limit is conservative & protective
Step 4: Determine Local Limits

▪ Once the MAHL is determined, determine the Maximum Allowable Industrial Loading

▪ MAIL = MAHL – background domestic loading

▪ Use MAIL to develop local limits

▪ A couple of different approaches:
  ▪ Uniform Allocation
  ▪ Non-Uniform Allocation
Uniform Allocation Approach

- Typically done for non-compatible POCs
- MAIL is divided equally by all industrial and/or non-domestic flow

**Example:**

Zinc MAHL = 1.8 lb/day
Domestic Loading = 0.25 lb/day
MAIL = 1.4 lb/day after 10% Safety Factor
Non-Domestic Flow = 0.10 mgd

Local Limit calculated as \[ \frac{1.4\text{lb/day}}{(0.1\text{ mgd} \times 8.34)} = 1.67 \text{ mg/L} \]
Non-Uniform Allocation Approach

• Very infrequently used for non-compatibles
• Becoming more frequent approach for compatible pollutants
• Optimizes the compatible pollutant capacity of the POTW
• MAIL is apportioned to each permitted user as needed, then “leftovers” are divided among non-permitted, non-domestic users
Non-Uniform Allocation Approach

- Divvy up the MAHL “pie”
- Account for domestic sources and reserve
- Allocate remaining MAIL
- Special Allocation Limits (SALs) for permit holders
- Other non-domestic user (non-permitted) mass is divided equally by the flow to determine local limit for users without an SAL or IU permit
Reserve Amounts

- Set aside a reserve amount for the compatible POCs to accommodate reasonable amount of growth in the future
- Future SALs or updated SALs can be allocated from that reserve amount
Review & Approval

- MAHL evaluation/report
- Proposed Local Limits
- Proposed SIU allocations/permits
- Proposed SUO updates/changes
Legal Review

- Local Limits are specified in the Sewer Use Ordinance
- Any proposed changes to the Ordinance should be reviewed by an experienced attorney
Continuing Improvements to IPP

▪ Ongoing Federal & State level improvements

▪ Many aspects of the IPP should be updated routinely:
  ▪ MAHL Evaluation & Local Limits
  ▪ IU/Non-Domestic User Lists
  ▪ Industrial Discharge Permits
  ▪ IPP Manual/Procedures if regs change

▪ So…

  Whether you’ve been doing IPP for 30 years OR are brand new to the program, stay involved and up-to-date!
Surcharges – Part of IPP?

- Surcharge threshold concentrations are **different** from Local Limits.
- IUs with extra strength wastewater are subject to all applicable federal and local limits and their IU discharge permit.
- Surcharges are separate from violation fines.
- Surcharges are extra fees to cover increased O&M expenses for higher strength wastewater (compatibles).
Final Thoughts

- IPP is specialized, highly technical, and site-specific
- Networking with fellow IPP staff-DEQ, other communities with IPP
- Join the MWEA IPP Committee, we have great discussions on lessons learned every 6 weeks at our meetings
QUESTIONS