



Water Quality Parameters and Discharge Limits

Eric Rozema



Overview

- Water Quality Parameters
 - What and why?
- Discharge Limits
 - Determination and best guesses



Suspended and Dissolved Solids

- Total Suspended Solids (TSS)
- Total Dissolved Solids (TDS)
 - Less than 1.2 microns
 - Includes ions: phosphate, nitrate, ammonium
- Turbidity
- Soil washed from the vegetables
- Problematic
 - Clogs pipes, reduces efficiency of disinfection
 - Adds sediment to water bodies



Organic Matter

- Oxygen demand
 - BOD, CBOD
- Break down of organic matter consumes oxygen
- Organic muck soil and debris from vegetables
- Problematic
 - Clogs pipes and interferes with disinfection
 - Reduces oxygen in water bodies



Nitrogen

- Multiple forms: organic N, ammonia, nitrate
 - Total Kjeldahl Nitrogen (TKN)
- Found in the soil (fertilizer) and from vegetative material
- Ammonia is very harmful to fish
- Nitrate can harm humans
- Organic N is broken down to ammonia or nitrate
- Nutrient imbalances



Phosphorous

- Measured as Total Phosphorous (TP)
 - Ortho-phosphate, particulate P, and dissolved P
- From the soil, fertilizer, plant material
- Nutrient imbalances
 - Eutrophication
 - Algae blooms



Pathogens

- Working with the Muck Crops Research Station
- Looking at human and plant pathogens
 - Food safety
 - Environmental contamination



Discharge Limits

- Multiple federal, provincial, and municipal regulations
- Usually site specific
- Difficult to make generalizations



Environmental Compliance Approvals

- ECAs
- Ontario Ministry of the Environment and Climate Change (MOECC)
- Any sewage discharge requires an ECA
 - Outlines what discharges will be acceptable
 - Legally binding
 - Contains site specific discharge limits



ECAs

- How does the MOECC decide what the discharge limits will be?
 - Ontario Water Resources Act: no discharge should compromise the current state of a receiving water body
 - Don't make it worse
- The location of the discharge is important
- Water **quality** and **quantity** matter



ECAs

- Everyone who discharges will need one

Estimated Limits

Parameter	Guideline (mg/L)
TSS	25-40
CBOD	20-35
Ammonia	1-3
TKN	2-8
Total P	0.5-1



Parameter	Averages (mg/L)	Guideline (mg/L)
TSS	470	25-40
CBOD	150	20-35
Ammonia	0.5	1-3
TKN	12	2-8
Total P	2.8	0.5-1



Conclusions

- Important to have a plan for wastewater
 - Protect the environment
 - Remain sustainable
 - Compliance
- More information available at:
 - www.hmgawater.ca
 - Factsheets

Questions?