Cannabis and the Environment

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Michigan Department of Environment, Great Lakes, and Energy

- EGLE works side-by-side with partners at local, regional, state, and federal levels- safeguarding our state's environment while supporting the economic growth and development crucial for Michigan's future.
- Provides expert technical and pollution prevention assistance to businesses and individuals.
- www.Michigan.gov/egle

EGLE Divisions

- **Air Quality Division**
- Drinking Water and Environmental Health Division
- Environmental Support Division
- Finance Division
- Information Management Division
- Materials Management Division
- Oil, Gas, and Minerals Division
- Remediation and Redevelopment Division
- **Water Resources Division**

Water Resources Division

- Ensure Michigan's waters are safe and clean for drinking, recreating, fishing, and health aquatic ecosystems
- Administer:
  - Groundwater Discharge Permit Program
  - Surface Water Quality Program
  - Water Resources Program
- Make 9,000 permit decisions per year

Wastewater Regulations

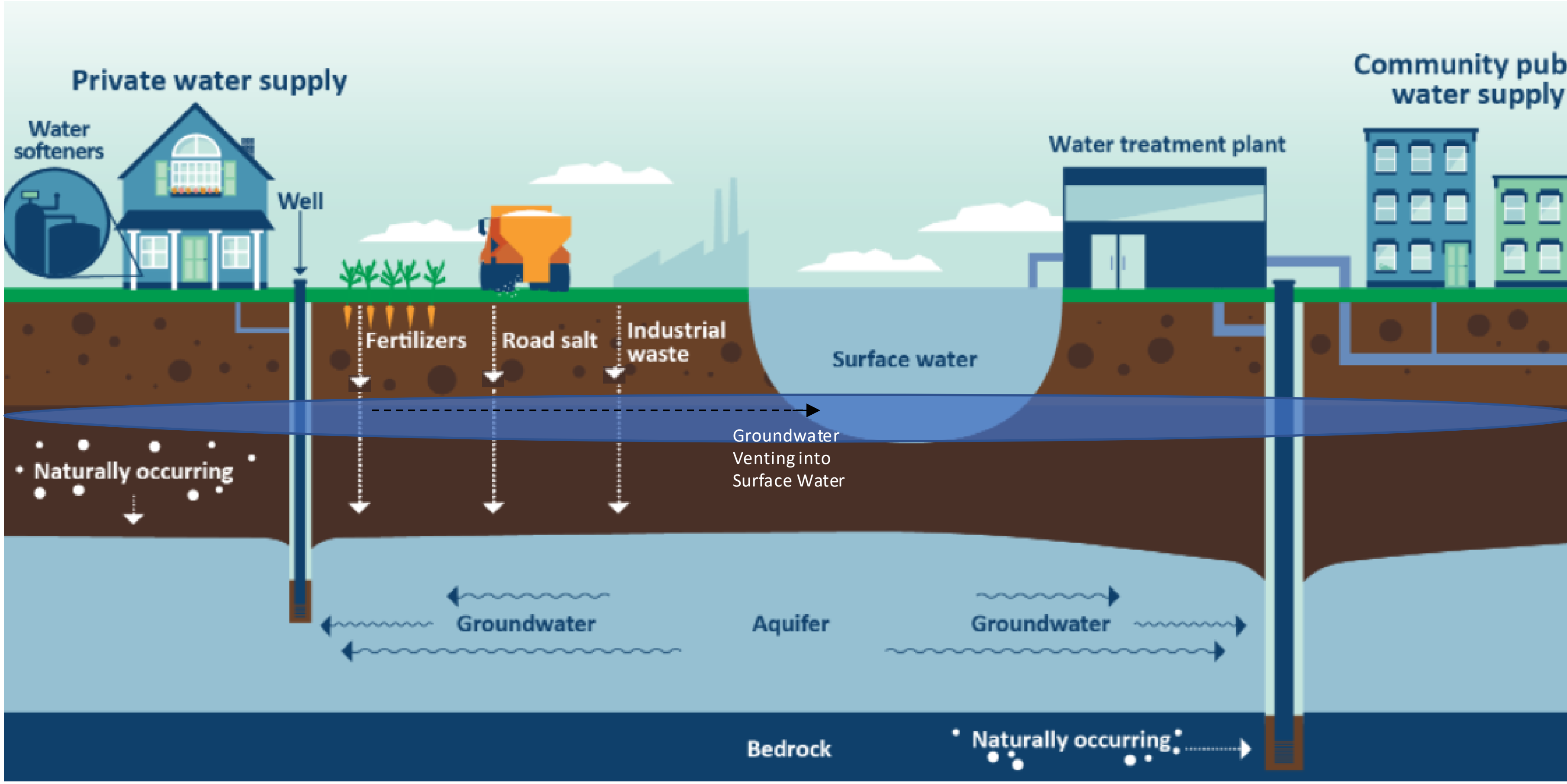
Michigan Act 451, Public Act of 1994, as amended

- Part 31 Water Resources Protection Law
  - Regulates wastewater discharges to waters of the state

What is a water of the state?

Part 31 defines waters of the state:

- Lakes, rivers, and streams
- All other watercourses and waters, including the Great Lakes, within the jurisdiction of this state
- **Groundwaters**



The Hydrologic Cycle

- Surface and Groundwater are connected
  - Surface activities impact quality of groundwater
- Pollution Prevention is the best way to keep our surface and groundwater clean and safe for all uses

Why is treating wastewater so important?

Protecting Michigan's Surface Water

Waters of the state

- Recreation and watercraft navigation!
- Warmwater and coldwater fish
- Indigenous aquatic life
- Wildlife dependent on healthy environment

Why is treating wastewater so important?

Protecting Michigan's Drinking Water Source

Over 1,000,000 private drinking water wells

- On average 25,000 new domestic wells drilled per year.
- Almost 2.6 million Michiganders depend on groundwater as their sole source of drinking water.

What is Wastewater?

Wastewater

- Liquid waste discharged directly or indirectly into waters of the state or on the ground that results from industrial and commercial processes or municipal operations
- Including liquid or water-carried process waste, cooling and condensing waters, and sanitary sewage

Sanitary sewage

- Treated or untreated wastes that only contain human metabolic waste or wastes generated as a result of domestic or restaurant activities

Wastewater Characterization

- A wastewater characterization will be required for processing wastewater facilities on the application
- It is a sample of wastewater that is tested for certain parameters that we identify as concerns depending on the wastewater type
- Pesticides, fertilizers, pieces of product, sanitizers, etc. can affect the water quality and may require closer or more frequent monitoring

Raising Awareness…

- What is added into the system as part of the process can pass through to the groundwater.
- Sanitary sewage only vs. Co-mingled waste
- Municipal Wastewater Treatment Plants serving a community:
  - Be aware of what is connected:

Marijuana Grow Operations; Standard industry operations (such as the use of reverse osmosis and water softener backwash systems) may concentrate metals and other constituents of the source water. These will show up in the wastewater and possibly limit or prevent groundwater discharge options or can pass through a treatment system not designed to handle this type of wastewater (i.e., Sanitary Sewage Only).

KNOW YOUR WASTEWATER!

How does all this apply to the Cannabis Industry Wastewater?

Cannabis Cultivation

- Wastewater regulations apply to the industrial/commercial growing of cannabis plants.
- Plants may be found growing indoors, hoop houses, and/or in the ground.
    - Wastewater systems should be designed to adequately treat the strength and pollutants present.
    - If plantings are in the ground- a wastewater characterization may be required. Dependent on the results, the area may need monitoring wells to determine groundwater quality under the grow area or a collection system in place to sample effluent.

Potential Cannabis Wastewater Sources

- Any wastewater generated and discharged to the ground will need to be covered under a permit and meet limitations.
- This includes but is not limited to:
  - RO backwash or water treatment (softening) discharges
  - Non-solvent extraction wastewater
  - Dehumidification Condensate Water
  - Floor Drains
  - Additives (such as fertilizers, nutrients, pesticides, fungicides, cleaning chemicals, etc.)

Limits Guideline

- The Groundwater Permits Unit has developed a Limits Guideline document with expected limits for groundwater discharges.
- www.Michigan.gov/groundwaterdischarge
- These limits are based on Part 201 Generic Cleanup Criteria and Screening Levels for Residential Drinking Water.

Parameter	Minimum Daily Limit	Maximum Daily Limit	Units
Flow (Daily)		site specific	GPD
Flow (Annual)		site specific	GPY
Total Inorganic Nitrogen (TIN)		10.0	mg/L
Ammonia Nitrogen		(report)	mg/L
Nitrate Nitrogen		(report)	mg/L
Nitrite Nitrogen		1.0	mg/L
pH	6.5	9.0	S.U.
Biochemical Oxygen Demand (BOD5)		(report)	mg/L
Dissolved Oxygen	(report)		mg/L
Chloride		500	mg/L
Sodium		400	mg/L
Total Phosphorus		site specific	mg/L
Aluminum		50.0	ug/L
Antimony		6.0	ug/L
Arsenic		10.0	ug/L
Barium		2.0	mg/L
Beryllium		4.0	ug/L
Boron		500	ug/L
Cadmium		5.0	ug/L
Calcium		(report)	ug/L
Chromium		100	ug/L
Cobalt		40.0	ug/L
Copper		1.0	mg/L
Iron		300	ug/L
Lead		4.0	ug/L
Lithium		170	ug/L
Magnesium		400	mg/L
Manganese		50	ug/L
Mercury		2.0	ug/L
Molybdenum		73.0	ug/L
Nickel		100	ug/L
Potassium		(report)	ug/L
Selenium		50.0	ug/L
Silver		34.0	ug/L
Strontium		4.6	mg/L
Sulfate		(report)	mg/L
Thallium		2.0	ug/L
Titanium		(report)	ug/L
Vanadium		4.5	ug/L
Zinc		2.4	mg/L

Cannabis Cultivation Run-off Water Effluent Sample

Parameter	Concentration	Part 201: Generic Clean-up Criteria Residential Drinking Water
Nitrate	43 mg/L	10 mg/L
Total Dissolved Solids	1200 mg/L	500 mg/L
Phosphorus	27 mg/L	1-5 mg/L *surface water proximity
Nitrite	9.5 mg/L	1 mg/L
Iron	690 ug/L	300 ug/L
Lead	120 ug/L	4 ug/L
Manganese	340 ug/L	50 ug/L
Thallium	37 ug/L	2 ug/L

Reverse Osmosis Filter Backwash Samples from Cannabis Cultivation Facilities

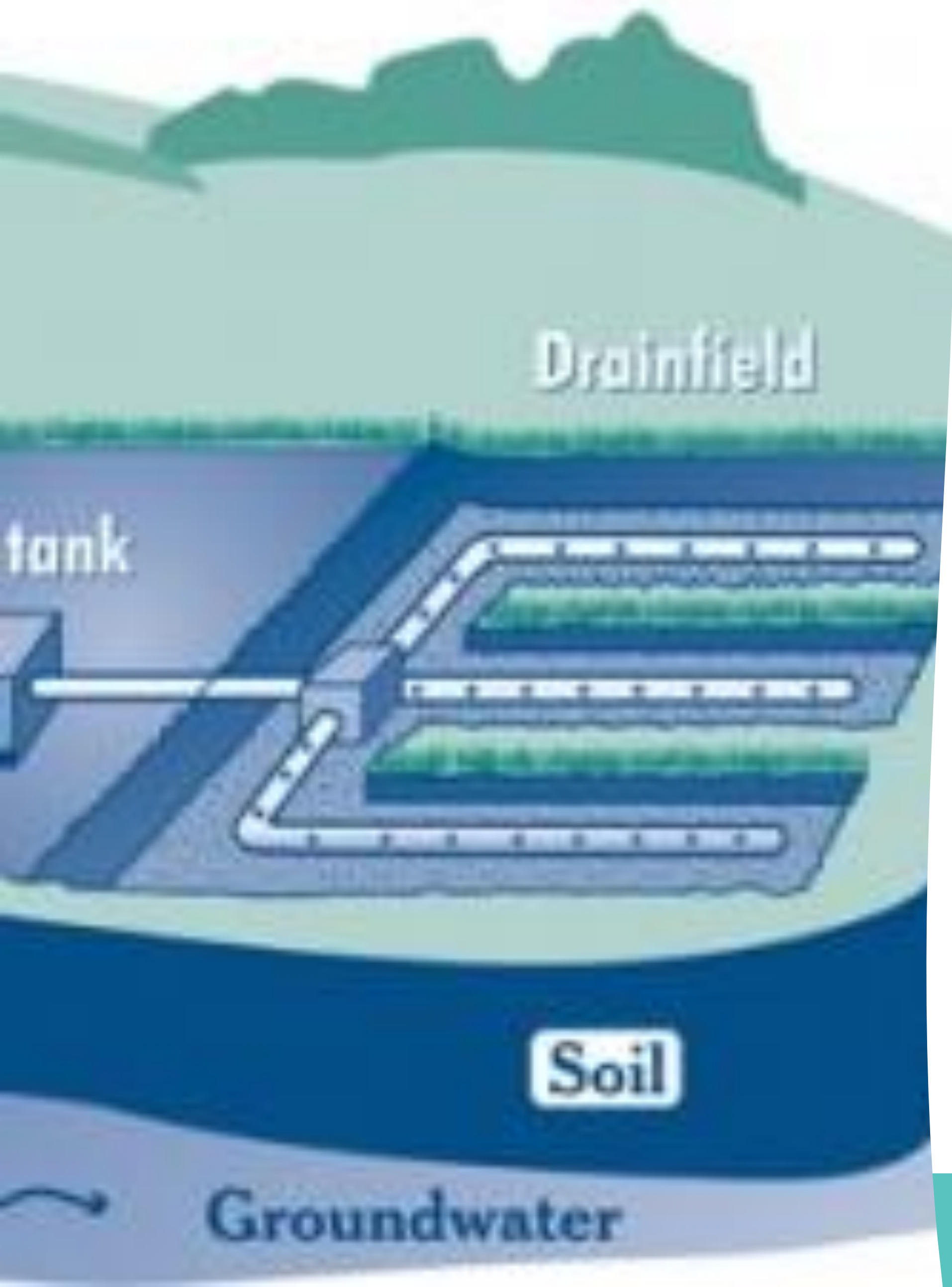
Parameter	Example 1 Concentration	Example 2 Concentration	Example 3 Concentration	Part 201: Generic Clean-up Criteria Residential Drinking Water
Antimony	ND	3.32 ug/L	8 ug/L	6 ug/L
Arsenic	29 ug/L	-	-	10 ug/L
Iron	ND	461 ug/L	550-660 ug/L	300 ug/L
Manganese	ND	--	80-97 ug/L	50 ug/L
Sodium	720 mg/L	--	--	230 mg/L
Sulfate	680 mg/L	--	350-380 mg/L	250 mg/L

Cannabis Processing (Extraction)

- Cannabis Grow Facilities that include extraction may not permitted to discharge any wastewater generated to the ground or groundwater.
- Oil extraction involves the use of chemical solvents (such as CO, propane, butane, etc.) that have the potential to be injurious to groundwater, drinking water, and/or surface water and will not be permitted for discharge to groundwater.
- The use of solvent-less or solvent-free extraction methods may be permitted dependent on a wastewater characterization of the discharge water.

Pumping and Hauling

- Wastewater can be pumped and hauled to a receiving facility, under the following conditions:
  - The holding tank is watertight with mechanism in place to notify when high levels in the tank are reached (audio/visual alarms)
  - The wastewater is being hauled by a licensed Liquid Industrial By-Product waste hauler.
  - The receiving facility has received wastewater samples and has agreed to accept it based on their hydraulic and pollutant loading capacity.
- If a receiving facility, such as a Wastewater Treatment Plant (WWTP) has approved a direct sewer connection or pump and haul, only the wastewater that they have agreed to accept can be sent.
  - Example: If the WWTP has agreed to accept sanitary sewage only from a facility, that facility cannot send any other wastewater (such as wastewater from the cannabis operation).
  - WWTPs can shut off service to a facility for violating this agreement.



Can Cannabis Cultivation Wastewater be Discharged to the Ground or put in an Existing Septic System?

- Cannabis cultivation wastewater can be discharged to the ground but must be accompanied by an **EGLE Groundwater Discharge Permit**.
- An existing septic system for sanitary sewage is not appropriate to receive wastewater from cannabis cultivation operations, especially if it is designed for sanitary sewage only!
- A wastewater characterization is required to assess treatment and discharge needs.

Non-compliance

Most cannabis facilities operating without required wastewater discharge and/or air permits as well as not properly disposing of their cannabis waste.

- Not one facility has obtained a groundwater discharge or NPDES permit to dispose of the wastewater on-site- a few have applied for a permit.
- Cannabis waste is being illegally composted at unpermitted facilities or with high levels of solvents.
- Only a small number of facilities doing oil extraction have applied for an air permit.

Unauthorized Discharges

- Unauthorized discharges (discharges not covered by a permit or exemption) to waters of the state (lakes, rivers, streams, wetlands, groundwater) will result in violations and fines.
- Unauthorized discharges include, but are not limited to:
  - Discharges to the ground surface/groundwater
  - Discharges to surface water (lakes, streams, rivers, wetlands)
  - Piping wastewater to county drains
  - Discharging to a septic system, especially one under the authority of the local health department and/or designed for sanitary sewage only

EGLE Divisions Working Together

- Doing joint inspections across many programs in different divisions.
  - Coordinating on complaint investigations
  - WRD, AQD, MMD
  - Copying CRA on Enforcements and Site Inspections of Cannabis Facilities.

Guidance

- Working interdivisional in EGLE to develop guidance and interconnecting with the CRA to do outreach.
- Guidance and Instructions to Environmental Regulations pertaining to the Cannabis Industry

www.Michigan.gov/egle/regulatory-assistance/compliance-assistance/cannabis-environmental-obligations

Environmental Obligations for the Cannabis Industry

Hemp Growing and Processing

Although the hemp and marijuana industries are similar, these guidance documents are intended specifically for growers and processors of industrial hemp. The Michigan Department of Agriculture & Rural Development is the lead agency for industrial hemp and more information on this industry can be found on the industrial hemp webpage.

Protecting of Water Resources when Growing and Processing Hemp
This guidance document covers most state programs designed to protect water quality.

Solid and Hazardous Waste Regulations
This guidance document covers most state programs related to waste regulations.

Protecting Air Quality When Growing and Processing Hemp
This guidance document covers most state programs related to air quality regulations.

Marijuana Growing and Processing

These guidance documents are intended specifically for growers and processors of marijuana. The Cannabis Regulatory Agency (CRA) is the lead agency for recreational and medical marijuana. More information can be found on the CRA webpage.

Environmental Compliance for Growers and Processors of Marijuana
A brief overview of potential regulations as well as links to helpful forms and documents. See links below for more specific information.

Protecting Water Resources when Growing and Processing Marijuana
This guidance document covers most state programs designed to protect water quality.

Solid and Hazardous Waste Regulations
This guidance document covers most state programs related to waste regulations.

Composting Marijuana Waste Website

Protecting Air Quality When Growing and Processing Marijuana
This guidance document covers most state programs related to air quality regulations.

Marijuana Production and Processing Operations – Environmental Regulations and Concerns
(Local Leaders Webinar recorded 3/26/19, 68 min)

EGLE Working together with Cannabis Regulatory Agency

- CRA licensure rules require compliance with environmental regulations and non-compliance risks disciplinary sanctions or non-renewal of licenses.
- Working alongside CRA to gain access to licensed sites.

Next Steps

- Work alongside the CRA and EGLE to determine if a groundwater discharge permit is needed to discharge wastewater to the ground.
    - A wastewater characterization is necessary to know the type of treatment necessary to be within the limitations set to be protective of the receiving groundwaters.
- Any surface water connections are not permitted through a groundwater discharge permit.
    - That type of discharge would need to be protective of surface water and require a permit under NPDES

Air Quality Division

- Supports efforts to maintain clean air and minimize adverse impacts on human health and the environment.

- Staff work to reduce existing outdoor air pollution and prevent deterioration of air quality through air emission control programs, air monitoring, control strategy planning, permit issuance, and inspection of air emission sources.

Air Permitting

- About 50+ facilities completing extraction
  - 11 currently permitted (plus 3 applications in house)
- Currently Permitting
  - Solvent extraction
  - Power generation
- Not reviewing emissions from growing
- We typically only inspect if we get a complaint

AQD Regulated Processes & Activities

- Odor Control
  - Foggers
  - Misters
  - Masking agents
  - Activated carbon

AQD Regulated Processes & Activities

- Essential Oil Extraction
  - Gross extraction
  - Purification

Air Permitting

$$VOC_{emissions} = \left(Product_{consumption}\right) * (VOC\ \%)$$

Where:

$$Product_{consumption}$$
$$= [Beginning\ Inventory] + [New\ Purchases] - [End\ Inventory]$$

VOC % is in weight percent (i.e. VOC's weight percent in the product)

AQD Permitting

- Power
  - Power plants
  - Emergency generator emissions

Questions?

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