

# Manitoba Conservation – Environmental Operations Watershed Presentation

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## Manitoba Conservation enforces several key pieces of Environmental Law in Manitoba

- -The Environment Act
- -The Dangerous Goods Handling and Transportation Act
- -The Ozone Depleting Substances Act
- -The Contaminated Sites Remediation Act
- -The Waste Reduction and Prevention Act

## Some of the program areas that our Environmental Operations staff focus on include:

- -Onsite Wastewater Management Systems (septic fields, holding tanks, sewage ejectors)
- -Environmental Livestock Issues (manure storage, manure spreading, dead livestock handling, confined livestock areas)
- -Waste Disposal Grounds
- -Petroleum Storage (gas stations, bulk distribution)
- -Crop Burning
- -Litter
- -Dangerous Goods Transportation
- -Anhydrous Ammonia Transport
- -Dangerous Goods Emergency Response
- -Hazardous Waste
- -Ozone Depleting Substances (refrigeration/cooling equipment)
- -Environment Act Licenses (dairy plants, grain elevators, meat processing and slaughter plants, plywood/particle board plants, wood treatment plants, bulk material handling facilities, permanent concrete and asphalt plants, manufacturing and industrial plants, electrical production (hydro, wind, thermal), pulp and paper mills, mining, recreation (marinas, golf courses, ski hills), hydro lines, pipelines, roads, sewage treatment (lagoons, treatment plants), water transfers, flood control projects and irrigation projects)

## Tank pull



## Emergency Response at derailment



## Potential impacts to water quality

- Based in input from watershed staff decided to map waste disposal grounds and impacted sites
- 26 waste disposal grounds
- 13 impacted sites

## Waste Disposal Grounds

- Waste disposal grounds are regulated by The Waste Disposal Ground Regulation and operate under the authority of operating permits issued the operators.
- Operators are responsible to ensure that waste or leachate is contained within the boundaries of the waste disposal ground site and do not contaminate groundwater.
- Manitoba Conservation has been encouraging Municipalities to close smaller less used waste disposal grounds so they can concentrate resources on having better waste disposal grounds.
- Newer waste disposal grounds use leachate collection systems in conjunction with evaporation ponds to protect groundwater quality.
- We have no information suggesting any problems with the identified waste disposal grounds.

## Impacted sites

- Manitoba Conservation tracks over 2000 impacted sites in the province.
- The bulk of these sites are related to petroleum storage
- A site is considered impacted when testing on the site indicates levels on contamination in excess of the standards and guidelines adopted by the province (generally those established by the Council of Canadian Ministers of the Environment (CCME)). In some instances standards developed by other jurisdictions are used (Alberta, Ontario).
- Guidelines are generally risk based. There is no one guidelines for various substances. Example; benzene (constituent of gasoline), 4 land use types (parkland/agriculture, residential, commercial, industrial), 2 soil types (coarse, fine), various cancer risks (10-5, 10-6), multiple pathways (groundwater risks, soil ingestion, dermal contact, inhalation pathways (basement, slab-on-grade), off-site migration, etc).
- Remedial work is generally required if there are links between the contaminant and a receptor.
- Once a site is on the list, generally it does not come off. We continue to maintain the file on site even if all the contamination is removed.
- We believe the identified sites do not pose an environmental threat at this time.

# Guidelines



Table 3  
Tier 1 levels (mg/kg soil) for PHCs for coarse-grained surface soils.

Land Use	Exposure Pathways	F1	F2	F3	F4	
		(C6-C10)	(C10-C16)	(C16-C34)	(C34)	
Agricultural	Soil Ingestion	15,000	8000	18,000	25,000	
	Dermal Contact	RES	RES	RES	RES	
	Vapour Inhalation (indoor, 30 m offset)	200	1100	NA	NA	
	Protection of Potable GW <sup>1</sup>	600	1200	NA	NA	
	Protection of GW for Aquatic Life <sup>2</sup>	230	150	NA	NA	
	Protection of GW for Livestock Wearing <sup>3</sup>	9000	4000	NA	NA	
	Nutrient Cycling	TBD	TBD	TBD	TBD	
	Eco Soil Counter <sup>4</sup>	130	450	400	2800	
	Eco Soil Ingestion	TBD	TBD	TBD	TBD	
	Produce, Meat and Milk	NC	NC	NC	NC	
Residential	Soil Ingestion	15,000	8000	18,000	25,000	
	Dermal Contact	RES	RES	RES	RES	
	Vapour Inhalation (indoor, basement)	50	240	NA	NA	
	Vapour Inhalation (indoor, slab-on-grade)	30	150	NA	NA	
	Protection of Potable GW	600	1200	NA	NA	
	Protection of GW for Aquatic Life <sup>2</sup>	230	150	NA	NA	
	Nutrient Cycling	TBD	TBD	TBD	TBD	
	Eco Soil Counter <sup>4</sup>	130	450	400	2800	
	Produce	NC	NC	NC	NC	
	Commercial	Soil Ingestion	RES	20,000	RES	RES
Dermal Contact		RES	RES	RES	RES	
Vapour Inhalation (indoor)		310	1700	NA	NA	
Protection of Potable GW		600	1200	NA	NA	
Protection of GW for Aquatic Life <sup>2</sup>		230	150	NA	NA	
Nutrient Cycling		190	180	190	190	
Eco Soil Counter <sup>4</sup>		130	760	1700	3300	
Industrial		Soil Ingestion	RES	RES	NA	NA
		Dermal Contact	RES	RES	RES	NA
		Vapour Inhalation (indoor)	310	1700	NA	NA
	Protection of Potable GW	600	1200	NA	NA	
	Protection of GW for Aquatic Life <sup>2</sup>	230	150	NA	NA	
	Nutrient Cycling	TBD	TBD	TBD	TBD	
	Eco Soil Counter <sup>4</sup>	130	760	1700	3300	
	Off-site Migration	NA	NA	RES	RES	

NA = Not applicable  
 RES = Resident PHC Scenario. Calculated value exceeds 10,000 mg/kg and solubility limit for PHC fraction.  
 NC = Not calculated. Insufficient data to allow derivation.  
 TBD = To be determined.  
 1 = Assumes average water body at 10 m from soil.  
 2 = Includes use of diaphragm and wells for supply of livestock water.  
 3 = Tier 1 values based mainly on laboratory bioassay response to fractions derived from fresh Federated Grade Oil.



## Other potential impact sources

- Wastewater treatment
- No geographic dataset exists
- Sewage lagoons are most common type of wastewater treatment system in area
- Sewage lagoons are a cost effective means of wastewater treatment for bacteria and Biological Oxygen Demand (BOD).
- They are less effective at treating for Nitrogen and Phosphorus.
- New wastewater treatment plants treat effluent to an N:P ration of 15:1.
- Lagoon effluent will typically contain Nitrogen of 25-30 mg/L and Phosphorus of 6-8 mg/L.
- Water Stewardship is discussing regulatory changes that may place new tighter discharge limits on all wastewater treatment, including sewage lagoons.

## Waste Disposal Grounds & Impacted Areas

