

Weird Stuff in Water!



Department of Municipal Affairs and Environment

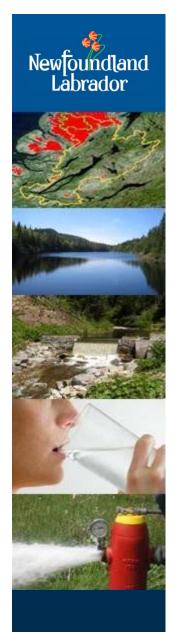


When You Think of Potable Water.....

You may think of:

- Water distribution system?
- Water supply?
- Chemical and physical properties (Iron and Manganese)?
- Microbiological parameters (Coliforms/Turbidity)

But you may not think of.....



This.....

- Orange gook in public water supply?
- Length of wood in a 12" DI water main?
- Truck in a public water supply?
- Rug-like material on intake screens?
- Decorative Fire Hydrants?
- Fish kill in Waterford River?







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Orange Gook in Water Supply (2011)

- August 13 8pm: orange particulate matter was noticed in and around the Town's water supply. Rainfall had been reported that day from 6-8 am, and thunderstorms and rain showers from 12-1 pm and again from 7-9 pm.
- August 14: Town Manager for Labrador City contacted the Water Resources Management Division (WRMD) concerning a neon orange particulate matter that appeared in the surface of Beverly Lake, the water supply for Labrador City, and Wahnahnish Lake, the water supply for Wabush.



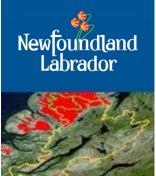






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- According to the Environment Canada, Wabush Lake weather station, 2.2 mm of rain fell and winds were gusting up to 37 km/h that day.
- The orange substance was also found in several other lakes in the area spanning a radius of 20 km.
- Labrador City and Wabush both issued Boil Water Advisories. A Non-Consumption Order was considered, but was not felt warranted at the time until further information became available.
- A sample of the orange substance was sent to Environment Canada for testing.







- August 15 WRMD staff traveled to Happy Valley-Goose Bay
- The orange substance was noticeable on the shoreline of waterbodies during the flight from the Northern Peninsula northwards
- The orange substance had already noticeably dissipated by the time the WRMD staff arrived
- A portion of the sample was sent to the Biology Department at Memorial University for further analysis





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- The substance was identified as biological in nature, ruling out a mineral or chemical source
- Staff at the Biology Department were able to make a positive identification of fungus rust spores
- The spores found in the water supplies are part of the natural life cycle of the rust fungus
- Staff with Environment Canada considered that the water quality event had all the characteristics of an airborne pollen release.







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- Expert opinions were that there was no toxicity associated with the rust spores. There was some concern that people with a general allergy to fungal spores may suffer from allergic reactions.
- The rust spores were considered to be more of an irritation than a public health issue.
- WRMD staff collected water quality samples for analysis of inorganics and total suspended solids at the water supplies and tap locations in the Towns.
- The laboratory results noted nothing unusual with water quality readings.









Orange Gook in Water Supply

- The towns also sent bacteriological samples to the public health laboratory in Happy Valley-Goose Bay from August 15-17 and again on August 23.
- All samples tested satisfactory and the BWA was lifted on Friday, August 26.





 Pictures taken on August 15th of surrounding vegetation indicate rust spores on spruce needles and on a green leaved tree (possibly a type of willow).





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- There are four possible identifications of the fungus rust spores:
 - Inland Spruce Cone Rust
 - Spruce Needle Rust
 - Spruce-Labrador Tea Needle Rust
 - Hemlock-Willow Rust
- Generally speaking, rust fungus over winter on an alternate host, such as the leaves of the Labrador tea plant.
- In early summer a spore that develops on the plant/tree is wind blown to the primary host, such as spruce trees. The spores then infect the needles, cones or leaves of the tree.
- These spores then spread the fungus back to the alternate host.
- Heavy infection tends to occur when wetter conditions exist.
- Reports show that the 2011 spring and summer at the Wabush Lake climate station has been wetter than normal.





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Orange Gook in Water Supply Summary

- The fungus rust event that occurred in August 2011 was an unusual event, particularly given the magnitude of the rust spores that accumulated in waterbodies in the area.
- An event of this nature in a drinking water source had never been reported to the WRMD before
- Given recent climate trends, conditions may be appropriate for more events of this nature to occur in the future.
- The multi-agency cooperation in identifying the orange substance and determining if there was any toxicity associated with it with respect to drinking water use was commendable and a model for future events of this nature.











Length of Wood in a 12" DI Water Main



4x4 timber posts



Fence posts









12" DI Water Main Repair



Water main repairs



Section of 12" DI water main removed



Ruptured Section of Main



Close-up of ruptured main and piece of timber





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Length of Wood in a 12" DI Water Main Summary

- 12" DI water main installed in 1983.
- The piece of timber was originally a 4x4 about 5-6 feet long.
- Water pressure and flow had reduced it to about a 3x3
- Water pressure in the area 145 psi
- It was hardwood.... the same used when stacking the DI water mains during storage.
- It was assume to be already in the pipe on install. Cannot pinpoint the origin.









Length of Wood in a 12" DI Water Main Summary

- During any install of water and sewer pipe, always be sure to inspect the inside of pipe before installation and remove any objects.
- Pigging and swabbing of a water main would reveal any obstructions that may be present inside the pipe.

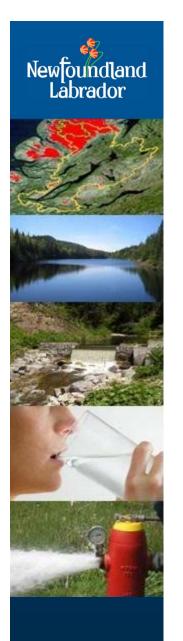




Truck in a Public Water Supply

- October 2016 Burin Big Pond Water Supply
- Services approximately 1500 with a hospital





Watershed Signage













Unauthorized Activity Within the Watershed



Partially submerged truck in the water supply



Close-up of truck in the water supply







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Truck in a Public Water Supply Summary

- October 2016 4x4 truck was driven into the Protected Pubic Water Supply Area.
- Truck was driven along the shoreline, in approximately 20inches of water, until it hit an embankment and became stuck.
- Big Pond Water Supply had adequate signage to and around the protected public water supply area
- Non-Consumption Order was issued October 31 and removed November 1 when the truck was moved to adjacent land









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Truck in a Public Water Supply Summary

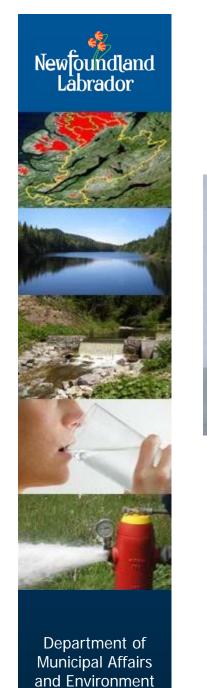
- Chemical and Physical Sampling was conducted by Department Staff, petroleum hydrocarbons at the intake and the truck location was LTD
- March 2-2017 Pick-up truck was removed from the Protected Pubic Water Supply Area
- Owner of the vehicle was charged under the Water Resources Act
- If any unauthorized activity is observed in the protected Public Water Supply area, please contact the Department of Municipal Affairs and Environment immediately
- If a community requires additional Protected Pubic Water Supply Area signage, please contact the Drinking Water Section of the Department





Rug-like Material on Intake Screens

- Gull Pond Public Water Supply for the Town of Rocky Harbour
- Gull Pond services a population of 979
- Chlorine gas is used has primary and secondary disinfectant.
- Turbidity and color have been an issue in the past



Rug-like Material on Intake Screens



Samples of surface water source intake screen













Rug-like Material on Intake Screens







May 2005 -Intake Screen Build-up

24







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Rug-like Material on Intake Screens Summary

- There was no analysis completed to pinpoint the composition of the buildup, but the elevated levels of turbidity and colour in the source water were likely a contributing factor
- It's imperative that the intake screens/screen chambers be inspected and cleaned on a regular basis
- Regular basis will be dependent on the water quality of the source. This could be semi-annually, annually, etc. based on source water quality.





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Decorative Fire Hydrants

- Hydrants serve as a point of attachment for a supply of water for firefighters when fighting a fire
- Serves as an outlet to flush a water distribution system to provide better water quality
- Should be inspected regular and maintained for when needed
- Below is a photo of a fire hydrant you will see in the field...most of the time.













Decorative Fire Hydrants









Decorative Fire Hydrants Summary

- While painting the fire hydrant body and bonnet, like in the photos we just seen, is aesthetically pleasing, it can pose problems for fire fighters and operators.
- Hydrants are usually painted in the summer by summer relief students
- In larger towns and cities hydrant bonnets are painted a certain colour to reflect system pressure in the area.
- Hydrant operating nuts are made of brass and should not be painted.







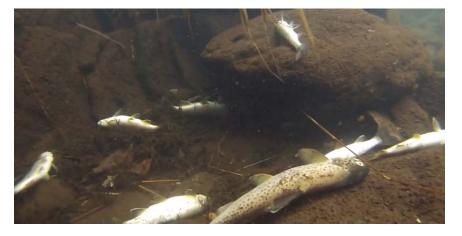




Fish Kill in the Waterford River



Dead Fish









Fish Kill in the Waterford River Summary

- September 10, 2016 City of St. John's Parks and Open Spaces Division notified of a large number of dead fish in the Waterford River and the Bowring Park Duck Pond.
- City staff investigated and found the likely cause was a water main which expelled significant quantities of drinking water into a river that feeds into the Waterford River.
- Chorine levels in the drinking water were within the Guidelines for Canadian Drinking Water Quality



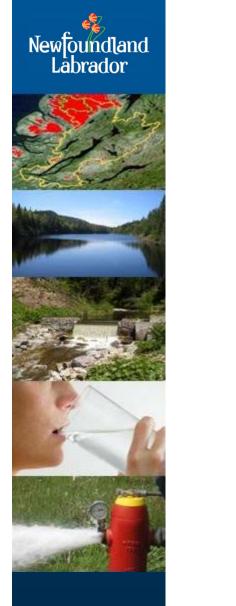






Fish Kill in the Waterford River Summary

- Chlorine levels were safe for human consumption but not safe for fish.
- City staff consulted with the Federal Department of Natural Resources and Water Resources Management Division and both agreed this was the likely cause.
- September 12, 2016 No traces of chlorine residual were found in the Waterford River and the fish have returned to the affected areas.



More Weird Stuff in Water

- Quarter of a moose hid in air release valve chamber
- Alcohol hid in a manhole somewhere in the Burin Peninsula
- Rare Earth Elements in homeowners tub harbor pond drinking water supply



If you see this.....



.....Run faster then your buddy



Acknowledgments

- Town of Conception Bay South
- Town of Burin
- Town of Rocky Harbour
- Town of Wabush
- City of St. John's
- Labrador City
- WWW